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South African Research in Management, Informatics and Governance in a 21st Century Hyper Connected World

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South African Research in Management, Informatics and Governance in a 21st Century Hyper Connected World

Guest Editor
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Acknowledgement of Reviewers

Editorial: South African Research in Management, Informatics and Governance in a 21st Century Hyper Connected World

Rembrandt Klopper

*Alter*nation Special Edition 22,1 of 2015 forms a continuation of on-going research in the fields of Management, Business Leadership, Informatics, and Governance at a number of South African universities. This issue contains nineteen contributions from authors in South Africa, Britain and New Zealand. Contributions vary from the nature of transformational leadership, integrity in research and organisational management, and the ubiquitous role of informatics in the present-day digitally hyper-connected world in which we all now live. In one way or another, these nineteen contributions all focus on, relate to, or depend on Informatics as organisational management and communication backbone.

The image of the front page of this is a blend of a painting in my possession, painted by my former colleague and friend Jan Zaal who is now deceased, which I photographed and which I overlaid with a simulated three-dimensional image of digital information code. Jan Zaal's painting is of a display window of the former Stuttafords in West Street Durban. Having witnessed the various phases that the painting went through, and having had privilege of discussing them with Jan Zaal, it is worth mentioning that he took over 700 photographs of the display window at various times of the day in different seasons over a nine month period and that his painting is a composite image, capturing the essential spirit of that display window.

In order to appreciate the extent to which Informatics has transformed 21st Century life it is useful to remember how communication has changed over the past century and a half. Then communication and business transactions – including fistfights and shootouts – were all conducted on an inter-personal basis, at close proximity. Today communication and transactions more often than not have become remote, distributed and indirect, mediated by layer upon layer of artificial intelligence (AI). What has happened between then and now to transform our way of life so radically?

Rembrandt Klopper

Communication Back Then

Most people over 40 remember a time when cordial personal communication meant chatting to a neighbour over the backyard fence, occasionally receiving a letter delivered at home by the postman, or writing a letter or a festive card in one's own handwriting, sealing it in an envelope, licking a stamp and putting it on the envelope, before posting it in a nearby post box where it would be lifted (collected) at some set hour every day.

A little later on personal communication also entailed on special occasions, going to the post office to fill in a form (in long-hand, when one was required to only use UPPERCASE print script, devoid of any punctuation), carefully counting and recounting each word in the terse text because there was a common misconception in those days that one paid by the word when sending a telegram. If one needed to demarcate the boundary between two sentences on a telegram for clarity's sake, you had to insert the word "STOP" in the appropriate places in the message to indicate a full stop and pay for each STOP. Revising a telegram usually meant trying to reword it as economically as possible to eliminate as many STOPs as possible and still have the message make sense. After being satisfied that one's efforts at word economy would not lead to absurd interpretations by the recipient - that s/he would more or less get out of the text the same message that you tried to put into it, one joined a queue and waited one's turn; eventually handing your all-uppercase handwritten message to the official behind the counter who ignored the number of words, and calculated the cost of the message eight-bits per-byte style because the average English word was deemed to consist of eight letters, recalculating several times before eventually announcing the cost, after which you had to count out the requisite number of coins as payment.

With everyone nowadays carrying a mobile phone for instantaneous, ubiquitous personal communication, and some people even owning two or more phones, only South Africans in their sixties may remember the time when even in towns there were communal phone lines known as party lines, requiring of the prospective caller to first listen whether or not there was another call in progress before cranking the phone's handle to give the number of the recipient to operator on duty who ever so often would cut into one's conversation in progress to announce the duration of the call. Only some people may also remember that in many neighbourhoods there would

only one telephone per block, installed in a particular home with occupants in good social standing on condition that neighbours on the block would also have access to the phone for emergencies. In practice it required of everyone in the neighbourhood to remain on good terms with the telephone subscriber who had to put up with neighbours wanting to make calls.

When Cash was King

When I was ten years old my mother on some afternoon just after the end of the month when she had been paid, would hand me her endorsed paycheque, along with a signed note to the bank teller that indicated how much of the cheque had to be deposited into her savings account, and how much had to be handed back to me in cash to conclude the rest of the family business for the month.

I then got on my bike, cycled to the bank, joined a queue and waited for the teller to record particulars about the cheque in a ledger, before handing me the required cash, organising it in little stacks of bank notes and coins as listed on my mother's note. I then secured each stack with a paper clip and carefully buttoned them up in my shirt pocket, before consulting a list of businesses where monthly accounts had to be paid for goods that my mother had ordered by telephone and which had ben delivered by bicycle in the course of the month.

One particular businesses in my hometown was so technologically advanced that a desk clerk took one's account, one's money, rolled them together, inserted them in a bronze tube that was sealed and despatched with a swoosh via a pneumatic vacuum tube to a mysterious place elsewhere in the building, and a few moments later to arrive with a swish and a thump, with a receipt stapled to the account, along with one's change. In those days everyone paid for toys, cold drinks, sweets and movie tickets, restaurant meals and all other goods in cash - even the grownups did. Cash was King.

The Internet Then and Now

When I started using the fledgling Internet in the late 1980s I had to first formulate a search query in prescribed format on my computer, make a trunk call from Durban to the CSIR in Pretoria, request an official for access to one of their remote-access servers, and when given the go ahead use my dial-up modem to log on and deposit my query and then logged off again while

my query was transmitted via satellite to somewhere in the USA where human operators would use my search terms to conduct human-mediated searches on the various electronic networks in the USA to which only specialist searchers had access. Twelve hours later I would again phone and log on to the CSIR's remote server to retrieve my search results, downloading three or four electronic documents by means of FTP (file transfer protocol), and sometimes none at all.

It is not generally appreciated that in South Africa we had an early system of electronic payments between the mid 1980s and 1999 that predated the Internet. It was a Videotext based system managed by Telkom that enabled subscribers with computers and modems to dial in to a server to conduct remote business transactions via a system called Beltel.

The system required of clients to use telephone lines and modems connected to personal computers or to dumb terminals, which had built-in modems but which had no data processing functionality. Telkom's dedicated terminal was named the Minitel. The system incorporated a billing system which enabled information providers and service providers to receive payment for information and services provided to users. The billing system was also capable of handling very small transactions that were referred to as micro-billing. Today handheld cell phones and PDAs deliver all of the functionality of the Beltel system, and as well as a range of more powerful functionalities.

Now it is common for persons to communicate with others via the Internet (email, Facebook, Skype, chat rooms and various discussion forums). Many persons read blogs or log on to electronic web sites like News24 rather than read printed newspapers. We talk on mobile phones, send email by mobile phone, access social media through mobile phones, or text messages, and we conduct business transactions via electronically accessible credit card accounts, and to top it all we play computer games on computers, on games machines, on mobile phones, all of it an experience in electronic immersement that has become the predominant narrative fiction medium of the late 20th and early 21st centuries generating even more profits than cinema.

For electronic payment one now goes online via an ADSL line rented from Telkom on one's computer linked to one's service provider, log on to one's bank account to pay whatever beneficiaries one has set up for

electronic funds transfer (EFT), or one uses a smart phone to do the same. While cash withdrawals from conveniently located automated teller machines (ATMs) or cash payments to unconnected service providers is common, as is payment to service providers (shops, restaurants and vendors) by producing a credit card to be swiped by the vendor, this system of payment is about to be replaced on mobile phones by applications (APPs) that will allow near field communication (NFC) data exchanges between a mobile phone and a vendor's payment-receiving electronic device.

What has Happened Over the Past 50 Years to Transform our Lives so Completely?

There is a pattern emerging of how the ways in which 21st Century societies worldwide live, learn and work, how also the values by which they live are being transformed by two disciplines that originated independently in the 20th Century, namely *Organisational Management* and *Informatics*, but which have now achieved synchronicity with one another - transforming life as we know it.

Of the nineteen contributions in this issue of *Alter*nation nine provide systematic and critical accounts of research regarding how information systems and technology drive the reconfiguration of business management, organisational management, education and governance:

- Transformational leadership is generally considered to be a way of developing social capital in organisations and achieving productivity, innovation and social transformation. These factors are therefore considered to be drivers of social and business development, and as being important for social and economic development in Africa. **Colene Hind and Renier Steyn** report the results of an empirical investigation among 868 employees at 17 South African organisations to determine the extent to which an environment where transformational leadership is practised in South Africa actually coincides with an environment that is conducive to the practice of corporate entrepreneurship. The researchers conclude that while transformational leadership proves to be important for social and business development, on their own they are not sufficient for the development of entrepreneurial spirit.

- **JS Wessels, RG Visagie and M van Heerden** state that truth, trust and integrity are essential to research at higher education institutions. Their contribution, in the form of a single qualitative case study, evaluates the likelihood that relevant policies at a selected South African institution of higher education actually do foster research integrity. Their findings indicate that a combination of policies regarding ethical research complement each other in fostering research integrity but conclude that further research will be necessary to establish whether policies indeed contribute to responsible researcher conduct.

- **Vannie Naidoo and Dwain Bailey** focus on warehousing as an integral component of every logistics system since it is the primary link between producers, suppliers and customers. Their research investigates the efficiency of warehousing within Protea Chemicals, with specific reference to the quality of the organisation's service. They report the results of empirical research regarding the company's operational staff, line management and internal customers' perceptions of Protea Chemical's warehouse quality.

- **Darrell Myrick** utilises Marxism to frame his essay on the need to distinguish between the poor and working classes during social transformation. According to Myrick since poverty cannot be eradicated without a working class that strives towards becoming the "new middle class" class, one can therefore describe class as being dynamic because the poor benefit from social distribution emanating from the working class and the middle class. The author concludes that since the ranks of the working middle class are expanded through the most mobile and successful members of the poor class, class migration is desirable and a necessity for eradicating poverty.

- **Renier Steyn and Leon Jackson** continue on the organisational transformation trajectory that Colene Hind and Renier Steyn introduced in their contribution regarding transformational leadership. In this article Steyn and Jackson gauge levels of gender-based discrimination perceived by managers and employees by an empirical analysis of information gathered from 145 South African managers and 1,740

employees working for 29 organisations by means of the standardised fair-treatment-at-work survey and the gender-based-discrimination questionnaire. Steyn and Jackson report that their analysis of the surveys of managers and employees confirmed that gender-based discrimination was the primary source of discrimination in the workplace, more so than race or ethnicity.

- **Bashir Amanjee and Teresa Carmichael** report the results of an empirical study on how team-based learning among South African MBA students could be enhanced through collaborative learning to enhance the employability of MBA graduates and foster good performance in workplace settings. The project entailed semi-structured in-depth interviews to gather qualitative data from a purposively selected sample of 13 current MBA students from several accredited business schools in the Gauteng province of South Africa. Amanjee and Carmichael's key insight was that learning to operate as part of a team did not emerge as a primary objective of team members. Not surprisingly students reported that their main goal was to submit an assignment, but also did learn something about teamwork in the process.

- Related to the theme of teamwork is research by Rubeshan **Perumal, Sadhasivan Perumal and Loganathan Govender** regarding knowledge sharing in Human Resource Management within the context of at higher education institutions in multiple countries. Rigid organisational structure, political interference, poor communication between employees, and a command-and-control approach were considered to be barriers to knowledge sharing, particularly in South Africa and Mauritius.

- **Eric Mang'unyi and Krishna Govender's** research on the relationship between service quality and customer satisfaction presents the results of an empirical quantitative survey on employees' and students' perceptions in a select number of Kenyan private universities. They conducted the survey by means of an adapted higher education service quality performance research instrument. Their findings reveal that regarding service quality, "access" and "non-academic" are most

significant determinants of perceived service quality in the private higher education sector in Kenya. More notably, the project did not find any empirical support for a positive and significant relationship between the academic dimension and perceived service quality in selected Kenyan higher education institutions.

- **Loganathan Govender, Sadhasivan Perumal and Rubeshan Perumal** provide a critical review literature about global benchmarks for knowledge management best practices in human knowledge management implementation. The authors conclude that distinct benefits of knowledge management benchmarking lead to an improved pace of service delivery, a corporate knowledge sharing culture, optimal use of existing organisational knowledge resources, and development of world class organizations through the formation of a knowledge management best practices directory.

- **Irene Govender and Menzi Mkhize** present the results of exploratory empirical research regarding students' perceptions about using e-learning in place of face-to-face lectures at university. They conclude that perceived usefulness as well as perceived ease of use have important influences on intention to use e-learning or to attend face-to-face lectures. The results also reveal that interaction is vital for effective learning to take place, and that students' choices are informed by their preferred learning styles.

- **Sarah Mello, Sam Lubbe, Nehimia Mavetera and Rembrandt Klopper** report the results of an empirical investigation into the social impact of information systems at Mafikeng Campus of North Western University. The authors conclude that information systems have an effect on social relationships because they have the power to change how other relationships are structured when people use these systems. The relationships include those among peers, students, lecturers and friends. Most users were reasonably satisfied with the current systems, but indicated that in future their needs should be considered as well as their inputs when developing and implementing new or upgraded system.

- **Kenneth Ohei, Sam Lubbe, Jan Meyer and Rembrandt Klopper** present the results of an empirical research project focussing on social differences between IS and non-IS students in the Faculty of Management, Administration and Law on the Mafikeng Campus of North West University, and students' views about Information Systems as a study choice and career choice. The project also focusses on the extent to which students utilise the information systems and technology resources available on the NWU Mafikeng Campus. The investigation reveals the importance of students' prior involvement with computer usage and interaction, namely that students must have acquired both computer knowledge (concepts) and computer skills (applications) in high school or through personal experiences before having enrolled on the NWU Mafikeng Campus.

- **Vikash Ramharuk and Mudaray Marimuthu** report the results of an empirical investigation into the preparedness of nurses to utilise a paperless record keeping in hospitals. The authors used a quantitative approach to gather information at a private hospital in the eThekwini Municipality in KwaZulu-Natal, South Africa. Hundred and sixty questionnaires were handed out to nurses and a total of 102 completed questionnaires were returned, giving the researchers a response rate of 64%. The results indicate that nurses considered both perceived usefulness and perceived ease of use as enablers to paperless recordkeeping. The results also indicate that knowledge about paperless recordkeeping and perceived compatibilities with existing systems of recordkeeping were positively correlated with the perceived usefulness and perceived ease of use.

- **Webster Chinjavata, Sam Lubbe and Rembrandt Klopper** report the results of a quantitative empirical evaluation of Information System (IS) Service Quality in a South African Governmental Department, based on the responses of 25 middle managers with access to IS equipment and tools in the Department of Economic Development, Environment, Conservation and Tourism situated in Mafikeng in the North West Province of South Africa. The main findings of the project reveal that there is a strong correlation between service delivery and the IS

infrastructure in the department and encompassing other factors which may include perceptions of clients, support systems to IS and the capabilities of the IS operators.

- The contribution of **Dan Remenyi**, which was solicited by the editor of this issue, provides a critical assessment of the requirements for completing a doctorate by writing the traditional monograph dissertation versus the approach of writing a series of research papers, which is increasingly being used at South African universities. The request was made after the editor was appointed as an examiner of a dissertation that was based on a number of scholarly articles, some of which were co-authored by the candidate's supervisor, in the absence of any examination criteria appropriate for the new approach provided by the university where the candidate studied in spite of repeated requests for such criteria by the examiner, and particularly when no documents containing such criteria could be found on any Internet-based research repositories.

- **Itumeleng Mogorosi, Sam Lubbe and Theuns Pelser** report the results of an empirical investigation into the impact of the implementation of an Enterprise Resource Planning (ERP) system on a typical governmental office in Mafikeng, situated in North West Province, South Africa. The results of this study revealed that there was deficiency in ERP system implementation, that employees were worried about data loss when they use the system, found system errors, experienced difficulty in exporting data, and were not satisfied with quality of output from ERP system.

- **Chipo Mavetera, Magda Huisman, Nehemiah Mavetera and Sam Lubbe** report the results of a critical assessment of the implementation of specific Business Process Reengineering (BPR) procedures due to rapidly changing technological trends in South African organisations, particularly the development of completely new Information Systems, not existing systems that are only being improved or reengineered. The authors conclude that problems remain regarding the use of legacy Systems Development Methodologies for Business Process Re-engineering.

- **Peter Denny and Manoj Maharaj** report the results of a quantitative empirical study of educator - student cultural congruence as a predictor of academic performance in Information Systems and Technology education in South Africa, "because challenges related to race and culture-based performance gaps continue to be an unavoidable characteristic of the South African educational landscape." The authors recommend a review of teacher education with a view to ensuring that specific programmes are included that enhance teachers' abilities to relate appropriately to students of various cultures, to "counter the influences of deep seated prejudices and the expression of these via discriminatory teaching practices, assist educators to cultivate and nurture immediacy behaviours that are shown by research to appeal to the various students they teach, and which generally assist educators to create and maintain a higher level of affinity with their students."

- **Gary Mersham** provides a concise and lucid overview of e-learning as disruptive, innovative and inevitable digital communication force in the reconfiguration of higher education worldwide. Drawing on communication theory, Mersham offers alternative perspectives on understanding, describing, and scrutinising online communication and challenging educators to consider the effects of technology on the processes of online communication and interaction.

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Transformational Leadership and the Corporate Entrepreneurial Spirit

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Abstract

Introduction: Transformational leadership is hailed by many academics as a way of improving human capital and increasing productivity. In the same way, corporate entrepreneurial spirit is seen as a road to innovation and transformation. Productivity, innovation and transformation are often cited as drivers of development, which could be important in promoting such activities in Africa. Objectives: To determine the extent to which an environment where transformational leadership is practised coincides with an environment that is conducive to the practice of corporate entrepreneurship. Method: Data was collected from 868 employees from 17 Southern African organisations. The respondents were asked to complete a series of questionnaires, including one on transformational leadership and one on corporate entrepreneurship. Informed consent was obtained before the questionnaires were administered. As well as descriptive statistics, correlations were also calculated. Results: The reliability coefficients measured were acceptable (transformational leadership, alpha = .870; corporate entrepreneurship, alpha = .810). The results indicate that transformational leadership correlates significantly ($p < .001$) with the elements of entrepreneurship. The strongest correlations were with the domains of Rewards/Reinforcement ($r = .523$) and Management Support ($r = .405$), while the weakest were with Time Availability ($r = .107$) and Work Discretion ($r = .233$). Conclusions: Although an environment in which transformational leadership is practised coincides with important elements conducive to the practice of entrepreneurship, transformational leadership does not facilitate all these processes. Transformational leadership may thus be important, but it is not sufficient for the development of entrepreneurial spirit. Methods of boosting corporate entrepreneurial spirit are suggested for transformational leaders.

Keywords: Transformational leadership; corporate entrepreneurial spirit; Africa

Introduction

For some time now, Africa has been severely handicapped by poor leadership. Rotberg (2004) uses such epithets as "predatory", "kleptocrats", "military-installed autocrats", "economic illiterates" and even "puffed-up postures" to describe the general state of leaders and leadership in Africa. Poor leadership has contributed to a decline in economic activities in most African countries (Lumumba-Kasongo, 2002).

The lack of appropriate leadership on the continent has also resulted in a reduction in the number of African countries that share in the distribution of wealth, and Africa remains alienated from most global trends (Rugumanu, 2001). Balogun (2007), for example, states that Nigeria has everything it would take to reach a state of economic prosperity and working democracy, but lack of good leadership prevents this from happening. Kaperus (1999) maintains that Zimbabwean citizens suffer because of a severe lack of leadership. In a recent interview, former South African President Thabo Mbeki blamed the lack of adequate leadership for the failure to respond properly to dire situations in both Mali and Libya (Gernetzky, 2013).

Leadership can be defined as the process of influencing others to understand and agree on what has to be done and how to do it (Yukl, 2006). Robbins and Judge (2011:410) concur with the core elements of Yukl's definition, referring to leadership as "the activity to influence a group towards the achievement of a vision or set of goals". Palmer (2009) adds the important element of context to the definition, stating that definitions of leadership are born out of the context within which the phenomenon exists. He concludes that, at its core, leadership involves influencing others to act in light of a vision of how best to achieve a shared mission. In this article, Africa is the context in which leadership has been researched and will be discussed.

In Africa, issues of national leadership enjoy a great deal of attention, but research on leadership practices and styles within formal organisations in Africa is relatively scarce (Blunt & Jones, 1992). In addition, African research is important to Africans, because the adoption of homogeneous

westernised leadership styles is problematic in African organisations, which are characterised by the richness of diverse cultures (Jackson, 2004). Because Africa seems to be failing as a region, it has become imperative to explore alternatives for development, seeing that current methods appear to be ineffective. If organisations are going to survive and thrive, they will have to change the ways in which they function (Denton & Vloerberghs, 2003). African economies and, by implication, African organisations, need to re-invent their leadership and business processes (Rugumanu, 2001).

The word "re-invent" and the renewal of an organisation go hand-in-hand with corporate entrepreneurship, which by definition involves processes whereby individuals in organisations pursue opportunities and introduce new methods that are beneficial to the organisation, and differ from the norm or status quo (Hisrich & Kearney, 2012). As seen in this definition, corporate entrepreneurship enables renewal from within. This type of activity enables businesses to optimise innovation and exchange knowledge, which empowers them to compete in international markets (Wood & Kaplan, 2005), which may benefit African development.

Literature documents that a transformational leadership style facilitates intellectual stimulation, encouraging employees to approach existing problems in new ways (Barbuto, 2005). Aseka (2005), in considering the emergence of transformational leadership in Africa, states that this type of leadership should play a vital role in building political capital and societal transformation in Africa. Possibly this style, rather than the typical African authoritarian style (Blunt & Jones, 1992) would be conducive to change in Africa. Visser, De Coning and Smit van der Merwe (2005) concur, noting that, owing to significant developments in technology, international competition and increasing diversity in industry, transformational leadership should be applied if entrepreneurial orientation is to be enhanced.

In this article the assertion by Visser *et al.,* (2005) is tested by linking transformational leadership style and corporate entrepreneurship. The aim of the research on which this article is based was therefore to explore quantitatively, by means of a cross-sectional survey design, the extent to which an organisational environment where transformational leadership is practised is akin to an environment that is conducive to the practice of corporate entrepreneurship. Both elements seem to facilitate innovation, a commodity essential to development in Africa and elsewhere.

Literature Review

Transformational Leadership and Corporate Entrepreneurial Spirit

For the purposes of this discussion, the literature review is presented under three sub-headings. First, the concept "transformational leadership" is briefly explained. Second, there is a brief examination of the concept of "corporate entrepreneurial spirit". Finally, the main focus of the research, the link between transformational leadership and corporate entrepreneurial spirit, is explored and discussed.

Transformational Leadership

The theory and practice of transformational leadership have undergone a great deal of empirical scrutiny, considerably more than any other current leadership theory has received. The specific subject of scrutiny has been the nature of the concept of transformational leadership and, more importantly, its effects (Barling, Slater & Kelloway, 2000). Before exploring the concept of transformational leadership, it is important to understand how this differs from transactional leadership.

According to Den Hartog, Van Muijen and Koopman (1997), transactional leadership is founded on the idea that the relationship between leader and follower is based on a series of exchanges and bargaining. When the task or environment does not provide sufficient motivation or direction, it is the leader's role to compensate for these shortcomings by using transactions. The anticipated behaviour from the follower, together with accompanying rewards, forms the basis of these transactions, which are often negotiated beforehand. The follower is thus motivated to enact certain behaviour that is linked to certain known rewards or threats. Dalglish, Du Plessis, Lues and Pietersen (2009) refer to transactional leadership as "contingent reinforcement", whereby followers are motivated by rewards, promises and praise. Behaviour is thus corrected by negative feedback, reproof, threats or disciplinary action. The leader's reaction is determined by whether the followers behave in the manner prescribed in the transaction.

By contrast, transformational leadership aims to inspire followers to perform beyond expectations (Den Hartog et al., 1997). The goals are achieved by arousing an elevated interest, awareness, acceptance and sense

of purpose in the follower (Yammarino & Bass, 1990). Transformational leadership departs from the premise that the follower's emotional and motivational stance is directly dependent on the emotional connection with the leader. This emotional connection relates to a strong personal identification with the leader, a shared vision and action that go beyond self-interest. According to Dalglish *et al.,* (2009), transformational leaders achieve this connection by raising the followers' level of awareness of the importance of specified and idealised goals. Followers thus focus on the interests of the team or organisation rather than on their own concerns, and are thereby inspired to meet their higher-level rather than simply their lower-level needs. Higher-level needs can be identified with relatedness and societal objectives, whereas lower-level needs focus on the self and personal gratification. Thorn (2012) defines transformational leadership in similar terms as a process where the intention is to join leaders and followers in a mutual pursuit of higher goals. The transformational leader is one who endeavours to bring leaders and followers alike to heightened levels of morality and motivation. A combination of characteristics defines the transformational leader: the ability to determine and build a common vision, ability to inspire followers and finally to constantly develop followers' skills (Thorn, 2012). Thorn also states that the transformational leader seeks creative solutions to problems, puts the needs of the group, organisation or society first, and establishes superior performance.

Bono and Judge (2004) identify three dimensions or elements of transformational leadership. If leaders want to be transformational, they ought to direct their behaviour towards these dimensions:

Inspirational motivation: This is related to the formulation and articulation of a future vision or goals. According to Dionne, Yammarino, Atwater and Spangler (2003), the transformational leader should encourage followers to behave beyond the level of self-interest, providing reassurance that obstacles can be overcome, promoting confidence by engaging in optimistic conversation about the future, sharing and inspiring vision, and imparting a positive perception of change.

Intellectual stimulation. The transformational leader should encourage employees to approach existing problems in new ways (Barbuto, 2005). Carless (1998) maintains that stimulation relates to the frequency with which the leader encourages innovation in problem-solving.

Individualised consideration. The transformational leader should cultivate a developmental approach to his followers (Rafferty & Griffin, 2006). Individualised consideration, together with inspirational motivation, correlates with higher emotional intelligence, specifically the ability of the transformational leader to monitor and manage emotions in him/herself and others (Palmer, Walls, Burgess & Stough, 2001).

A transformational leader who addresses these dimensions can be of great advantage to an organisation. Organisational financial performance positively and significantly correlates with high ratings on transformational leadership, which is more significant for transformational leadership than for transactional leadership (Bass, 1990). It was also found that transformational leadership results in greater individual effort and performance, even when the leader is absent (Avolio, Waldman & Yammarino, 1991). There is also a correlation between transformational leadership and the intellectual stimulation of followers (Barling, Slater & Kelloway, 2000). Apart from encouraging the individual, transformational leadership has a positive influence on team mediation processes and potency, and unites followers into a collective (Shaubroeck, Lam & Cha, 2007). It also has a positive impact on conflict management (Dionne et al., 2004).

Corporate Entrepreneurial Spirit

In this context, corporate entrepreneurial spirit relates to an environment that facilitates the development of corporate entrepreneurship. Hornsby, Kuratko and Zahra (2002) define corporate entrepreneurship as a process of organisational renewal, whereby the organisation commits sanctions and resources to entrepreneurial efforts for the purpose of carrying out innovative activities in the form of products, processes and organisational innovations. They also state that corporate entrepreneurship is linked to processes that are initiated for the purposes of profitability, strategic renewal, innovation, gaining knowledge and international success. Similarly, Hisrich and Kearney (2012) define corporate entrepreneurship as the act of doing new things or pursuing opportunities in a way that is different from the norm or status quo. The result is the creation of new organisations, or renewal and innovation within the organisation. They add that this pursuit of

opportunities often occurs regardless of the resources that can be controlled at a specific stage.

Corporate entrepreneurship is no longer a luxury. Rapid advancement in technology, for example, calls for organisations to capitalise on the current waves of technological innovation. Corporations often procrastinate over opportunities, only to be overtaken by young start-ups (Gompers, 2002). Davis (1999) adds that, owing to the intense competitive pressure on organisations, together with heightened environmental turbulence, technological innovation has become a critical activity in the contemporary organisation.

This innovation requires a unique combination of both managerial and entrepreneurial skills. Kuratko, Montagno and Hornsby (1990) argue that, through corporate entrepreneurship, a corporate entity can enhance the innovative capabilities of its own employees, thereby addressing competitive issues. Van Vuuren and Antonites (2003) suggest that, apart from survival, entrepreneurial accomplishment within organisations will be reflected in improved productivity, organisational development, increased organisational value, greater profitability and the achievement of market-related transactions. Lastly, Kuratko *et al.,* (1990) note that the need for corporate entrepreneurship has been fuelled by the need for change, innovation and improvement in the market to avoid stagnation or decline (as stated above), because traditional methods of corporate management are perceived to be weak, and particularly because bureaucracy in organisations leads to a large turnover in innovation-minded employees.

In developing an environment that facilitates the development of corporate entrepreneurship it may be important for managers and leaders to note the kind of environment that facilitates such behaviour. The following are elements of such an environment (Hornsby et al., 2002) and should be addressed:

Management support: This implies willingness on the part of senior management to facilitate and promote entrepreneurial activity in an existing firm. In this scenario, it is essential to consider and implement the championing of innovative ideas and providing resources, expertise and protection when necessary.

Work discretion: An environment that allows for individual decision-making, risk-taking, and a reasonable tolerance of failure promotes corporate

entrepreneurial activity. This type of environment also places emphasis on individual responsibility.

Rewards and recognition: Hornsby *et al.,* (2002) point to the appropriate use of rewards. The literature shows that entrepreneurial activity is encouraged by an effective reward system in which the focus lies on the consideration of goals, feedback and results- based incentives.

Time availability: Time available to employees within the completion of their daily tasks can be a scarce resource and a stumbling block when trying to foster the entrepreneurial spirit in organisations. A positive perception of the availability of this specific resource should be cultivated to encourage experimentation.

Organisational boundaries: Structural boundaries are seen as a major challenge for middle managers who aim to be more entrepreneurial. The organisational structure should allow for effective mechanisms by which ideas are evaluated, chosen and implemented.

An important fact to note is that corporate entrepreneurship is not a single event. Macmillan, Block and Narasimha (1986), for example, found that the amount of successful venturing corresponded with the number of attempts at corporate venturing. Linked to this is the necessity for planning. Organisations should plan for corporate venturing to ensure sufficient support (Macmillan et al., 1986). This relates directly to the organisational life-cycle, where start-up organisations may be highly entrepreneurial but become progressively bureaucratic over time (Morris, Kuratko & Covin, 2008). If these organisations want to remain entrepreneurial, they need to consider these dynamics. At the employee level, there is the challenge of retaining the attention of corporate entrepreneurs (Katz & Shepherd, 2004), many of whom may leave their organisation if the environment constrains them and limits their freedom to make individual decisions (Hisrich, Peters & Shepherd, 2013). Katz and Shepherd (2004) point out the "process problem", where innovative ideas are more often than not never implemented. This could be owing to poor allocation of resources or an infrastructure that is not supportive to the corporate entrepreneur. It is also often said that investments in innovative activities are ineffective for many different reasons (Gompers, 2002). The crux of the matter is the need for an entrepreneurial culture: an organisational culture that encourages the generation of ideas and experimentation with them by trial and error.

Most of the literature reviewed agrees that companies are in need of corporate entrepreneurship for their sustainable growth and competitiveness. However, according to Duncan, Ginter, Rucks and Jacobs (1988), such companies are not set up to nurture this, for two reasons. Firstly, companies are reluctant to hire the creative individuals who are corporate entrepreneurs, and, secondly, there is no reward structure for such creativity.

Transformational Leadership and Corporate Entrepreneurial Spirit

In the report by Visser *et al.,* (2005) on their study on transformational and entrepreneurial leaders, the authors demonstrate a significant and positive relationship between the characteristics of the entrepreneur and those of the transformational leader. Hisrich *et al.,* (2013) maintain that successful corporate entrepreneurs should possess certain leadership characteristics. Besides having a good understanding of the environment, they also have to be visionary and flexible. This ability to create management options goes hand-in-hand with encouraging teamwork and open discussion. Finally, the authors state that the ability to create coalitions of supporters and resilience in persisting are essential for the successful creation of new corporate ventures. This description of the corporate entrepreneur by Hisrich *et al.,* (2013) seems to a great extent to overlap the description of transformational leadership.

Methodology

The following methodology was used in constructing the data:

Respondents

The respondents targeted in the empirical study were employees who could read and write at the Grade 12 level. In total, 17 random samples were drawn from 17 companies. The companies selected were identified by ease of access. It was therefore a convenient sample (Rosnow & Rosenthal, 2008).

Method

Seventeen students collected the data as part of their mini-dissertation for the Master's degree. The students were required to identify an organisation

with at least 60 employees and then, with permission from the head of the organisation, to draw a random sample of 60 employees from the personnel records of the company.

Once the employees had been identified, the students organised a meeting with them to explain the purpose of the research and the matter of informed consent. The voluntary participants completed two questionnaires, which will be discussed in the next section. No personal identifiers were used in the questionnaires. On completion of the questionnaires, the data were captured on an Excel spread sheet for transfer to a Statistical Program for Social Sciences (SPSS) file.

Measurement

The corporate entrepreneurial spirit was measured, using the Corporate Entrepreneurship Assessment Instrument (Hornsby et al., 2002). This instrument measures five constructs: the level of management support; work discretion/autonomy; rewards/reinforcement; time availability; and organisational boundaries (Hornsby, Kuratko, Montango & Naffziger, 1993). The questionnaire consists of 48 items, but only 20 were used in this study. In other words, there were four items per construct. The items selected were those with the highest loading on the construct, as reported by Hornsby *et al.,* (2002).

The items were presented as statements, such as the following: "Individual risk takers are often recognised for their willingness to champion new projects, whether [these were] eventually successful or not" and "I almost always get to decide what I do in the context of my job". Respondents were asked to respond to the statements by selecting one of five options: "Strongly agree" (5), "Agree" (4), "Undecided" (3), "Disagree" (2) or "Strongly disagree" (1). A high score on management support, work discretion/autonomy and rewards/reinforcement could be seen as management fostering entrepreneurial spirit, while a high score on time availability (little free time available) and organisational boundaries (many boundaries), should be seen as hampering entrepreneurial activity. A total score may be calculated, reversing the values of the last two dimensions. Hornsby *et al.,* (2002) and Kamffer (2004) report acceptable validity and reliability data for the Corporate Entrepreneurship Assessment Instrument.

Only the transformational leadership section of the Multifactor Leadership Questionnaire (Avolio, Bass & Jung, 1995) was used in the study. The section is comprised of nine items. Respondents were asked to indicate their levels of agreement with statements such as "My leader exhibits behaviour that promotes high levels of trust amongst his/her associates and followers, which translate into them displaying a strong sense of purpose and perseverance to achieve the most difficult objectives" and "My leader articulates an attractive future that gets the attention and stimulates the imagination of his/her associates and followers". Respondents were asked to indicate how often this behaviour is seen in their managers, where (0) indicates "Not at all"; (1) "Once in a while"; (2) "Sometimes"; (3) "Fairly often"; or (4) "Frequently, if not always". A high score (maximum 36) would indicate a workplace where transformational leadership is often displayed, while a low score (minimum 0) would indicate the absence of transformational leadership. Extensive research on the instrument indicates an acceptable validity and reliability (Antokonis, Avolio & Sivasubramanian, 2003; Bass & Avolio, 1994; Muenjohn & Armstrong, 2008; Rowold & Schlotz, 2009).

Statistical Analysis and Decision-Making

Descriptive statistics as well as reliability of information on the measures was reported. This was followed by a report on the correlation between the variables, and the result of a regression analysis. Ideally, the Cronbach alpha coefficient should be above 0.7 (Cooper & Schindler, 2003), and this was set as a minimum standard. The strength of the relationship between variables is calculated between +1 and -1, where .1 is a small correlation, .3 a medium correlation, and .5 a strong correlation. A correlation may be significant at .05 and .01 (Cooper & Schindler, 2003). In this research, the bar was set much higher (.001) because of the relatively large sample size. With the regression analysis variables with a significant beta ($p < .001$) was deemed to contribute significantly and uniquely to the declared variables.

Ethical Considerations

Several ethical considerations were applicable to this study. The first was the use of students as fieldworkers. The students benefitted from collecting

the data as they used it when writing their own mini-dissertations. A possible second ethical concern could be that students accessed respondents in the organisations where they worked, which gave them undue influence over the respondents. This matter was partially addressed by requiring the head of the organisation to give permission to conduct the study (suggesting that the student did not have ultimate authority in the setting). Further, the respondents had to give their consent. The informed consent form stated that participation in the survey was voluntary and all respondents agreed before entering into the study.

Results

Demographic Information

In total, 868 employees completed the questionnaire. Of these, 479 (55.2%) were male and 389 (44.8%) were female. The largest portion of them were black (567; 65.2%), followed by whites (208; 23.9%), people of Indian descent (65; 7.5%) and coloured South Africans (28; 3.2%). The largest portion (152; 43%) of those who completed the questionnaire reported that they were in middle management, followed by those whose regular work involved administrative or support functions (263; 30.3%). A small number were on the supervisory level (152; 17.5%) and the smallest group were in senior management (76; 8.7%). The average tenure was 9.28 years (standard deviation = 8.44). The average age of the respondents was 37.96 years (standard deviation = 9.22).

Descriptive Statistics

The descriptive statistics for the transformational leadership measure was as follows: mean = 21.97; standard deviation = 7.91; minimum = 2; maximum = 38. The Cronbach's alpha for the nine items in the measure was .870. The percentages of respondents who answered "Fairly often" and "Frequently, if not always" on the transformational leadership measure are reported in Table 1.

Table 1: Top-Two Boxes for Transformational Leadership

Item	Percentage
1. My leader exhibits behaviour that promotes high levels of trust amongst his/her associates and followers, which translates into them displaying a strong sense of purpose and perseverance to achieve the most difficult objectives.	49.1%
2. My leader articulates an attractive future that gets the attention and stimulates the imagination of his/her associates and followers.	43.0%
3. My leader stimulates associates and followers to approach many typical problems by questioning assumptions that have been used previously, and by encouraging them to look at the problem from many different angles.	45.1%
4. My leader shows his/her associates and followers that he/she understands their capabilities, needs and desires, and works to develop each of them to their full potential.	45.5%
5. My leader's associates and followers trust him/her and exhibit the values he/she portrays. The associates and followers are committed to achieve the common vision, even if sacrifices are necessary.	45.0%
6. My leader sets goals to help clarify, through either participative or direct means, what is expected of his/her associates and followers, and what they can expect to receive for accomplishing these goals and objectives.	44.4%
7. My leader systematically looks for and monitors mistakes, and takes corrective actions when mistakes occur.	48.0%
8. My leader waits for matters to be brought to his/her attention about something that has gone wrong before he/she considers taking corrective action.	30.5%
9. My leader avoids taking stands on issues, clarifying expectations and addressing conflicts when they arise.	41.7%

Table 1 indicates that the top two boxes were selected by roughly 45% of all respondents. The lowest endorsement was for item 8, with 30.5%

responses. Item 1 had the larger percentage of the top two boxes' responses, at 49.1%. The following table presents the descriptive statistics for the measure corporate entrepreneurial spirit.

Table 2: Descriptive Statistics for Corporate Entrepreneurial Spirit

Corporate entrepreneurial spirit	N	Min.	Max.	Mean	Std. dev.
Management support	862	4.00	20.00	11.79	2.91
Work discretion	861	4.00	20.00	13.48	3.64
Rewards and recognition	865	4.00	20.00	12.67	3.18
Time available	861	4.00	19.00	10.87	3.12
Organisational boundaries	868	4.00	20.00	14.41	2.56
TOTAL	848	20.00	71.00	51.87	7.68

Reliability

The Cronbach's alpha for the 20 items of corporate entrepreneurial spirit was .810, which was satisfactory. The highest mean was for organisational boundaries, which indicates that most respondents experienced the existence of boundaries, the implication being that structure dictates behaviour at work. The lowest score was for availability of time. The low score for the availability of time indicates that respondents did not have sufficient time available for engaging in entrepreneurial activities. Both elements should be seen as hampering entrepreneurial growth.

Correlation between Variables

Correlation between transformational leadership and corporate entrepreneurial spirit is presented in Table 3.

Table 3: Correlation between Transformational Leadership and Corporate Entrepreneurial Spirit

Corporate entrepreneurial spirit	N	r	p
Management support	848	.405	>.001
Work discretion	850	.233	>.001
Rewards and recognition	852	.523	>.001
Time available	848	.107	>.001
Organisational boundaries	854	.251	>.001
TOTAL	836	.368	>.001

Table 3 shows that the correlation between corporate entrepreneurial spirit in general (total score), and transformational leadership was .368. This result is similar to those of Coning *et al.,* (2005), who found that 39.71% of the values of transformational leadership can be explained by the general entrepreneurial variable. These authors also reported that individuals who have high scores for entrepreneurship also score high in transformational leadership. According to Cooper and Schindler (2003), this is a moderate correlation. The strongest correlation was for rewards and recognition and the weakest was for time availability. Thus, rewards and recognition and transformational leadership seem to overlap while the overlap for time availability seems less pertinent.

A very similar picture is painted when a regression analysis was performed. In a model in which leadership style (the level transformational leadership) and the variables of corporate entrepreneurial spirit were introduced, the reported overlap between the constructs was 33.6% (R = .583; R^2 = .340; $R^2_{adjusted}$ = .336). This overlap corresponds well with the correlation with the corporate entrepreneurial spirit total score, which was .368. Management Support (Standardized beta = .168; $p < .001$), Rewards and Recognition (Standardized beta = .444; $p < .001$), Time Available (Standardized beta = .145; $p < .001$) and Organizational Boundaries (Standardized beta = .153; $p = .004$) all contributed significantly and uniquely to the declared variance. As was the case with the correlation analysis Rewards and Recognition contributed most significantly to the

equation. Work Discretion (Standardized beta = -.008; p < .809) did not contributed significantly and uniquely to the declared variance.

Discussion

In total, 868 employees from 17 companies completed the questionnaires. These companies were all situated in South Africa, so, although they were not representative, they allowed a glimpse of what is occurring in the South African business environment. Because South Africa is part of Africa, the results may also reflect certain truths about the continent, at least more than about any other region.

There was a reasonable range in the score for transformational leadership (mean = 21.97; standard deviation = 7.91). Leaders in the 17 companies seemed to score rather low on transformational leadership, considering that only 49.1% of all the respondents indicated that their leader exhibited behaviour that promoted high levels of trust and a strong sense of purpose and perseverance in trying to achieve the most difficult objectives "Fairly often" and "Frequently, if not always". The leaders also seemed aware of their environments, as only 30.5% of the respondents indicated that their leader waited before pointing out when something that had gone wrong before considering corrective action "Fairly often" and "Frequently, if not always". The mean scores reported for transformational leadership in the sample assessed showed that the 17 companies had leaders who showed moderate to low levels of transformational leadership. The level is seen as moderate to low when comparing these figures with the total item mean scores reported by Avolio *et al.,* (1995). If transformational leadership is important for African development, renewed efforts should be made to facilitate the development of suitable leaders.

Certain elements of corporate entrepreneurial spirit were present in all the companies. Most prevalent was the existence of organisational boundaries. On a score range of 4 - 20, the mean score of 14.4 suggests that many organisational boundaries were in place. This could hamper the development of corporate entrepreneurs. It may thus be assumed that the design and structural management of the sampled companies did not allow for the development of corporate entrepreneurship.

The low score for time availability, 10.8 on a range of 4 -20, suggests that the respondents had little time for creative or innovative thinking. This could also be detrimental to the development of entrepreneurs in the organisation. There should therefore be efforts to allow time for creative endeavours.

The result indicating that work discretion is reported quite frequently scored the second highest (13.84). Respondents thus had the opportunity of using their own initiative in the workplace. This discretion may be a first step towards experimentation and eventually entrepreneurial activity.

Most important to note is the correlation between the set constructs. On average, the correlation between transformational leadership and corporate entrepreneurial spirit was .368 ($p < .001$), which is a moderate correlation (Cooper & Schindler, 2003). Transformational leadership and corporate entrepreneurial spirit (in general) thus coincide moderately. More specifically there is a strong correlation between the entrepreneurial construct rewards and recognition and transformational leadership ($r = .523$; $p < .001$). It thus seems that the transformational leader provides the type of rewards and recognition necessary if the entrepreneurial spirit is to flourish. This relationship was not expected, as rewards and recognition are usually associated with transactional leadership. The second strongest correlation was between transformational leadership and management support ($r = .405$; $p < .001$). Transformational leaders therefore seem to provide the management support associated with an environment that is rich in entrepreneurial spirit. When it comes to time available, for which the mean score is low, the correlation with transformational leadership is also low ($r = .107$; $p < .001$). This may suggest that these variables have little influence on each other. Mechanisms other than transformational leadership should be established to foster this element. Formal programmes, such as Building New Businesses in Established Organisations presented by the Harvard Business School, may foster such ideas (Harvard Business School, 2013).

The strong correlation between the entrepreneurial construct rewards and recognition and transformational leadership ($r = .523$; $p < .001$) is worth noting. It appears that the transformational leader provides the type of rewards and recognition necessary for the entrepreneurial spirit to flourish. Evidence of this relationship was not expected, as rewards and recognition are usually associated with transactional leadership.

Conclusions and Recommendations

In summary, it could be stated that, although an environment in which transformational leadership is acknowledged and coincides with important elements conducive to the practice of entrepreneurship, transformational leadership does not facilitate all these processes. The low correlation between transformational leadership and time availability demonstrated this shortcoming. Consequently, transformational leadership may be important, but it is not sufficient for the development of the entrepreneurial spirit.

Should corporate entrepreneurship be a goal in Africa, and even if transformational leadership did not accord with it, Hisrich *et al.,* (2013) provide important advice for those who want to create a corporate entrepreneurial environment. Some of this relates to transformational leadership. Hisrich *et al.,* (2013) maintain that leaders should emphasise a strategic orientation, while the thinking in the organisation should be about its future and growth. Although both traditional and entrepreneurial firms aim to grow, the latter pursue a more aggressive, rapid approach to growth, whereas the former aim for steady, slow growth. Next, managers who want to inspire corporate entrepreneurship should be committed to providing opportunity. The descriptive statistics show that time availability could be a problem. This being the case, managers ought to address the matter. Also of importance, as noted in the descriptive statistics, is the matter of organisational boundaries, which include management structure. The management structure in an entrepreneurial organisation is organic in nature. Fewer layers of bureaucracy ensure that entrepreneurial firms are better able to capture external information, and acquire an increased ability for rapid decision-making. This last item relates to the philosophy of reward. Entrepreneurial firms compensate employees for their contribution to opportunity exploitation or newness, whereas in the traditional environment, employees are compensated depending on their responsibilities. The measure used in this study does not differentiate in this way, which may explain the high correlation found between the two constructs.

The work of Hisrich *et al.,* (2013) relates well to the results found here, particularly regarding the minimisation of organisational boundaries. These elements are structural and could be corrected by organisational design, rather than day-to-day leadership. However, the element of leadership remains important, and transformational leadership may encourage strategic

orientation and a commitment to opportunity, as discussed by Hisrich *et al.,* (2013).

This research has many limitations, the most important of which is sampling. The results reflect a convenient sample of South African companies. Results may thus not be representative of South African organisations as a whole, and even less so for Africa. Future researchers are encouraged to take samples representing a wider regional coverage, rather than following this strategy. It is also important to note that the respondents were mostly at the middle and lower management levels. Given this, questions may be asked as to their entrepreneurial orientation. Examining corporate citizenship, as well as targeting employees at higher levels could further enhance the significance of this research. Future researchers could also investigate these points.

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Fostering Research Integrity through Institutional Policies: The Case of a Selected Institution of Higher Education[1]

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> *There is nothing more necessary than Truth, and in comparison with it everything else has only secondary value. This absolute will to truth: what is it? Is it the will to not allow ourselves to be deceived? Is it the will not to deceive?*
>
> (Nietzsche 1890).

Abstract
Truth, trust and integrity are essential to research at higher education institutions. These institutions have accordingly adopted several policies to foster research integrity. This article explores the likelihood that relevant policies at a selected institution of higher education foster research integrity. The qualitative, single exploratory case study commences with a review of scholarly literature and results in a conceptual model used for a directed content analysis of relevant institutional policies. The findings indicate that these policies do complement each other in fostering research integrity. Further research will be necessary to establish whether policies indeed contribute to responsible researcher conduct.

Keywords: Research integrity, research ethics, research misconduct, research ethics policies, researcher behaviour, higher education institutions; regulation

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[1] This article is based on a paper presented on 8 May 2013 at the 3rd World Conference on Research Integrity, Montreal, Canada.

Introduction

Truth, trust and integrity are essential to research at higher education institutions. Whitbeck (2004:48) puts it simply: "Scientific research, like other cooperative endeavors, requires trust to flourish". Trust is defined by Baier (in Whitbeck 2004:48) as confident reliance; whereas integrity refers to the moral quality of being honest reflected by a state of being whole, sound and of perfect condition (Dictionary.com 2013). A loss or decrease in the confidence of research by the scientific community and the public will mostly impair their reliance on its scientific merit. The effect is lowered expectations, defensive behaviour and reduced cooperation. Whitbeck (2004:48) does not advocate blind trust, but supports Luhmann s (1988:94) notion of "warranted trust and trustworthy behavior" to foster enduring trust and cooperation.

As authors we agree with Whitbeck that trust by peers and the public in the truth of research, namely research integrity, is exemplified by the responsible conduct of researchers, trust in their competence to achieve trustworthy outcomes in their fields of expertise, and trust in their devotion to demonstrate and transmit the values and principles associated with ethical scientific conduct (Whitbeck 2004:51). Disappointment and betrayal of the trust of the scientific community and public related to scientific misconduct undermines future trust and the integrity of science.

Higher education institutions have adopted numerous regulatory measures to foster research integrity in a context marred by scientific misconduct (Resnik 2003). Institutional research ethics policies remain a key regulatory measure to this end. The Singapore Statement on Research Integrity (World Conference of Research Integrity, 2010) represents the first international effort to promote the development of unified policies, guidelines and codes of conduct with a long-term goal to foster greater research integrity globally. Research integrity is anchored in the following moral principles: honesty in all aspects of research, accountability in the conduct of research, interpersonal professional courtesy and fairness and good stewardship of research on behalf of others (Singapore Statement on Research Integrity 2010). The ideals of the Singapore Statement have been extended and refined during the 3rd World Conference on Research Integrity (5–8 May 2013) in Montreal. The deliberations at this conference led to the creation of the Montreal Statement on Research Integrity (World Conference of Research Integrity 2013).

This study has been undertaken against the background of the recent adoption of policies by various institutions of higher education and funding authorities globally aiming at fostering research integrity (Cossette 2004:213) as well as the publication of several articles and books on the subject (Cossette 2004:213). The debates for and against the regulation of research integrity by means of ethical protocols and governance at institutions of higher education are as lively as ever. Those in favour of the regulation of knowledge through ethical protocols and governance argue that a university, as the custodian of knowledge, must safeguard and sustain the integrity of knowledge continuously (Holzbaur *et al.,* 2012:21). Those opposing the current system of research ethics regulation argue that the developments in research ethics ultimately limit scholarly research and thus "the structure what truths can be spoken and by whom" (Haggerty 2004:391).

Similar discourses for and against the regulation of research ethics echo in the passages of the selected higher education institution that represents the substantive context of the study. This institution responded formally to the international and national call for ethics regulation as evidenced in the adoption of a number of related policies and procedures, including the Policy on Research Ethics in 2007. Researchers in opposition of the regulation of research ethics display defensive behaviour and reduced co-operation in the formalised regulation process evident in insufficient application of related policy stipulations, complaints about the scope of ethics protocols and publicly voicing their objections about the perceived constraining effect of research ethics review. Against this background the following research question arises: What is the likelihood that relevant policies in the selected institution of higher education foster research integrity?

This article contributes to the current literature by proposing a conceptual model that could be applied in the context of higher education institutions to assess research integrity related policies for their likelihood to foster research integrity. This model consists of a combination of recognised characteristics of good policy and dimensions of research integrity. The model has been developed through a theory generating approach which will be explained in the next section.

Methodology

The study employed a qualitative, single exploratory case study. A case study is a "set of qualitative procedures to explore a bounded system in depth" (Plano Clark & Creswell 2010:243). The study commenced with a review of scholarly literature related to integrity at institutions of higher education, followed by the development of a conceptual model for assessing the likelihood of relevant institutional policies to foster research integrity. The conceptual model presented in table 2 was used as a framework to qualitatively assess four policies related to research integrity in a selected institution of higher education (representing the bounded system), namely the research and innovation policy, the policy on research ethics, the policy on copyright infringement and plagiarism and the employee disciplinary code. These policies were purposively selected as the unit of analysis upon the discretion of the authors because of its explicit or implicit intent to foster research integrity.

The assessment was done through a directed content analysis (Hsieh & Shannon 2005:1281) of the selected texts. The analysis focused predominantly on the contents of the policies. The directed content analysis entailed the use of a deductive category application consisting of predetermined codes derived from the conceptual model that emerged from the existing theory.

In an attempt to enhance the credibility of the study, the authors analysed the policies independently and after that, consensus was reached on the findings. The authors have extensive experience of the topic under study as they have served on research ethics committees (either as chairperson or a member) for more than three years. The transferability of the study is enhanced through a clear indication of the parameters of the theoretical framework to indicate how data production and analysis were guided by specific concepts, ultimately resulting in the development of a conceptual model. Dependability is reflected in the presentation of a logical, well documented study and conformability by creating a chain of evidence (Tables 1 and 3). (De Vos *et al.,* 2011:419 – 420.)

The article is divided into the following four sections: a brief overview of the regulatory history of research ethics and research integrity; a theoretical perspective on fostering research integrity through institutional policies consisting of a conceptual model representing the elements present in institutional policies likely to foster research integrity; the assessment of

the likelihood of the relevant policies of the selected institution of higher education to foster research integrity; and a reflection on the findings of the critical assessment.

Research Integrity and Research Ethics: A Historical Overview

The history of research integrity is interwoven with the reactive nature of research ethics regulation, marked by a number of important turning points. These turning points are situated in ethical transgressions against human participants in research in the biomedical field predominantly. The Nuremburg Code of 1947 marked one of the most notorious of these turning points. The Nuremberg Code is the first international statement of principles governing medical research as a response to the ethics transgressions linked to the war crimes committed by leading German doctors during World War II (Harrison & Rooney 2012:39). The Nuremberg Code was an attempt guided by the United States of America to regulate medical and scientific research involving human participants and focused on the voluntary consent of human participants, full disclosure and a favourable risk-benefit ration. The principles of the Nuremberg Code formed the basis for the World Medical Association s Geneva Declaration of Human Rights the following year (1948) (Harrison & Rooney 2012:39).

Another significant turning point was the disclosure of scientific misconduct, even amongst prominent researchers, by the works of Beecher from the USA and Papworth from the UK in the 1960s (Dingwall 2006:193). The Declaration of Helsinki (1964, last revised in 2008) was a response by the World Medical Association to establish international ethical guidelines that focused on clinical research protocols and Good Clinical Practice (World Medical Organization 2008).

The Belmont Report (Belmont Report, 1979 in Amdur & Banker 2011:19), a foundational document for the ethics of human participant research, followed due to the negative publicity of the Tuskegee Syphilis Study (1932–1972). The Belmont Report aims to protect the rights of human research participants by preserving respect for persons, beneficence and justice (Amdur & Bankert 2011:19).

Research ethics review in South Africa started in response to the work of Beecher in the 1960s, with the first research ethics committee constituted

at the University of the Witwatersrand. Since then research most institutions of higher education in South Africa have steadily adopted ethics regulations aiming at the protection of those who participate in research. Dhai (2005:595) argues that while South Africa has a climate favourable to enormous growth in research, it is also "home to a large number of vulnerable groups or poor populations who have limited or no access to education and health services and who accepts authority without question". South Africa has also had its fair share of research shames such as the Bezwoda scandal of the late 1990s (Dhai 2005:595).

The history of research integrity and research ethics reveal that the exploitation of the vulnerabilities of relevant actors (the public, peers and participants) by researchers remain a relevant concern in scholarly communities, initiating the adoption of relevant institutional policies and procedures to mitigate the risks.

Fostering Research Integrity by Means of Institutional Policies: A Theoretical Perspective

The purpose of this section is to obtain, by means of a review of scholarly literature, a theoretical perspective on the use of institutional policies to foster research integrity. Four concepts have surfaced as being of theoretical importance for this purpose, namely research integrity, research ethics, fostering and institutional policies.

Bearing in mind the wide collection of scholarship on research integrity, this review of scholarship has set out to firstly clarify the meaning of each of the concepts research integrity and research ethics, secondly, to identify the main discourses on the fostering of research integrity, and thirdly to develop a conceptual model for assessing the likelihood that the relevant policies foster research integrity in general and research ethics in particular. The authors view fostering as the encouragement and the promotion of an environment conducive to research integrity while an institutional policy is regarded as one of the instruments through which fostering is realised.

In order to identify a suitable theoretical perspective on the fostering of research integrity, a literature review related to key words such as research integrity and research ethics has been conducted. The literature has shown that various concepts exist for research integrity, perhaps because "…what is

right and true, ethical and fair may not be readily definable" (AAAS 2000:2). The reason for this, according to Cossette (2004:214) may be due to the lack of objective information on responsible conduct.

However, notwithstanding this assumed lack of empirical information on responsible conduct, the American Association for the Advancement of Science (2000) and various other scholars (Khanyile *et al.,* 2006:41; Cossette 2004:214; Macfarlane *et al.,* 2012:2, 3) have contributed to attempts to attain a common understanding of the concept research integrity. A review of their attempts has shown that the concept consists mainly of three dimensions, namely values, actors and conduct. See table 1 below.

Source	Values	Actors	Conduct
AAAS 2000:5	Scientific, (publication) standards, confidentiality	Scientist/ Researcher (implied)	Validity, falsification, fabrication, plagiarism, authorship, conflicts disclosure, public/ press announcements, data from unethical experiments, confidentiality of review
Khanyile *et al.,* (2006:41)	Justice and honesty; doing it right; telling the truth; aspirational standard	Emphasis on researcher vs. research communities, research institutions, and research environment	Proposing, conducting and reporting research; scientific conduct
Cossette (2004:214)	Responsible; quest for truth	Researcher (implied)	Conduct

Source	Values	Actors	Conduct
Cossette (2004:214)	Lack a clear image of the more or less explicit standards; lack of any measurement of how standards are transgressed	Researchers; scientific community	
Cossette (2004:214)	Study through lapses in ethics	Researchers	Empirical research
Cossette (2004:215)	Probity and honesty, absence of misconduct	Researchers	
Macfarlane *et al.,* (2012:2, 3)	Values	Academics; researchers	Conduct and behaviour in teaching research and service
Dingwall (2012:7, 13)	Minimal reputation risk for institutions	Researchers	Research programmes
Dingwall (2012:8)	Sensitivity of issues	Researchers	Research projects
Dingwall (2012:9)	Confidentiality, anonymity, privacy of informants	Researchers	Institutionalised social research

Table 1: The Various Dimensions of Research Integrity

The summary in table 1 reveals that these scholars are in fair agreement that the concept research integrity refers to the values applying to the actions, behaviour and inclination of researchers when they are proposing, doing and disseminating research. Although the literature seems to agree that values such as justice, honesty and respect for the truth, underpin research

integrity, different views exist on the specific emphasis of these values, for example whether they are set to promote integrity or to prevent misconduct.

While the concept "research ethics" is also applied in this discourse, it is used synonymously by Cossette (2004:216) with "research integrity". He refers to lapses in ethics in a similar way as to lapses in integrity. He divides these lapses into two categories, namely fraud and infringements of standards of scientific conduct. Both these categories have been shown to meet the criteria for research misconduct, namely "any deliberate conduct that goes against the more or less explicit rules that a community of researchers has agreed on at a specific point in time concerning the behaviour to adopt when preparing or publishing the results of a research project" (Cossette 2004:215).

The examples of misconduct provided by Cossette (2004:216), focus primarily on the ethical relationship between the researcher and the broader scientific community (e.g. fabrication and falsification of information), co-researchers (abusive co-authorship, denial of contribution, unfair ordering of authors) and funders (misuse of research funding). It does not include the possible lack of concern for the participants in the research project as an example. This observation supports the view of Dingwall (2012:7, 13) that the initiative to foster research integrity had "very little to do with human subjects protection as such", but more with the limitation of institutional reputation risk. The gradual inclusion of the protection of human subjects into the centre of the research integrity discourse and institutional practice is thus reported by Dingwall (2012:13) as part of a process of preventing or limiting the risk of damage to institutional reputation.

In order to accommodate the diverse perspectives on research integrity, this study uses the concept research integrity as referring to (a) researchers accountability to their scholarly community, the participants in their research projects, and their employing and funding institutions, (b) the extent to which the actions, behaviour and inclination with regard to their planning, proposing, conducting and disseminating of research, (c) meeting the values, principles and standards as determined by their constitutional, regulatory and scholarly imperatives.

The above definition postulates relationships between the researcher and a diverse other consisting of a scholarly community, research participants, employing and funding institutions. The integrity of this relationship is determined by constitutional, regulatory and scholarly

imperatives reflected in, inter alia, research policies. The next few paragraphs demonstrate how the views on the centre of responsibility for fostering the integrity of this relationship has gradually shifted from the researcher as part of a scholarly community (AAAS 2000:2) on the one side of the spectrum, to the employing, funding and regulatory institutions (Cossette 2004:213; Hammersley 2009:214; Hedgecoe 2008:882) on the other side of the spectrum.

We view the regulation of research ethics thus within the context of research integrity as a specific focus on the relationship between the researcher and human participants as a specific category of the diverse other, whether it is primarily to protect institutional reputation (Dingwall 2013:13) or the interests of human participants.

Fostering Research Integrity by Researchers and their Scholarly Communities

The custodians of disciplinary knowledge, traditions and norms (including the fostering of research integrity) were regarded traditionally as the responsibility of researchers as organised in scientific societies (AAAS 2000:2). An example of this self-regulation is the so-called group consideration of research as practiced by the Clinical Centre of the US National Institutes of Health (Hedgecoe 2009:333). One of the reasons for their high standards of group consideration was to "emphasize the good standing of research at the Clinical Centre, and to insulate its work from oversight and interference by policymakers and lawyers at the NIH" (Hedgecoe 2009:333). Scientific societies are most commonly organised on a voluntary basis and their sanction on their members is consequently limited to their voluntary compliance with their professional standards and norms.

Professional Codes of Ethics

The standards or norms used by scientific societies for self-regulation or group consideration are codified, not in official policies, but in professional codes or guidelines such as Codes of Ethics or Foundational Guidelines (AAAS 2000:2–5). These codes were supposed to initiate "activities that will further promote the ethical conduct of research" (AAAS 2000:2). However, history has shown that when these codes are not enforced,

researchers will not necessarily comply (Dingwall 2012:5). This probably explains why the regulation of research ethics (even if it is self-regulation) and the enforcement of the codes are deemed to be necessary for ensuring that professional standards and norms, as well as research integrity, are upheld.

Regulating Research Integrity by Employing, Funding and Regulatory Institutions

External regulatory institutions are on the opposite side of the research integrity spectrum as the self-regulating scholarly community discussed above. This phenomenon of external regulating of research integrity is integrated with the growth of managerialism and corporatism within universities (Dingwall 2012:22). Within the context of managerialism, the regulation of research integrity has shown to be an exercise to reduce corporate and financial risks (Feeley 2007:764–765). Institutional regulation is sometimes perceived as a process that is more concerned with protecting the employing or funding institution than the research participants (Hedgecoe 2008:883). While the external regulation of research integrity is already common practice in those countries directly related to the United States of America, the introduction of processes of external regulation of research integrity as a condition for funding, is still in the discussion phase in Europe (Dingwall 2012:21). In fact, France, Germany and Italy have not shown any intention to adopt such controls for social science research (Dingwall 2012: 1). Institutional controls or regulation of research integrity seem to focus primarily on the protection of human participants in research and are usually enabled by appropriate policies and procedures. Institutional research ethics policies, thus, have shown to be pivotal in the regulation process and are discussed in the following section.

Research Ethics Policies

A more formal version of codification of norms and standards than codes of ethics is an official policy for research ethics. The main difference between codes of ethics as discussed above and an official policy is that the aforementioned is usually an instrument of self-regulation whereas the latter is an instrument of external regulation. External regulation is done by scholarly journals, funding institutions and universities (Cossette 2004:213;

Redman & Merz 2006:257). Where the research by Redman and Merz (2006:257) indicates that leading journals have not yet adopted "policies for managing allegations of misconduct involving manuscripts or published articles", the compulsory nature of research integrity policies by funding institutions and universities has already resulted in fierce scholarly debates (Dingwall & Rozelle 2011:45–56; Hedgecoe 2009:350; Redman & Merz 2006:257). Some of the arguments against the compulsory nature of regulatory policies and procedures are as follows (Dingwall & Rozelle 2011:45–56; Rhodes 2010:34):

- The danger exists that procedures and the adherence to prescribed rules may be elevated above normative evaluation.

- The increased number of interventions does not necessarily result in a change in perception of researchers on research integrity.

- Research integrity policies may not be enforced due to resource limitations.

- If the distance between the regulator and the regulated is small, the enforcement of research integrity policies will be limited.

- The unjustified inhibition of research and misconduct of research is equal to an "ethical catastrophe" (Rhodes 2010:34).

- Some research ethics policies imposed an unjustified constraint on researchers.

The inverse of the above arguments against research ethics regulation may be the following expectations from a justified research integrity policy:

- Enhancing of normative evaluation (opposite to a merely compliance approach).

- Fostering a change in researchers' ethical inclination with regard to research.

- Adequate institutional resources supporting the implementation of research integrity policies.

- Provision for adequate distance between the regulator and the regulated.

- Enhancing and not inhibiting research.

- Not imposing unjustified constraints on researchers.

The existence of research integrity policies implies the existence of implementing entities such as research ethics committees, which are discussed in the next section.

Research Ethics Committees (RECs)

Research Ethics Committees are well established in, for example the United Kingdom (UK) where the number of health research related Research Ethics Committees has expanded in a relatively short period of time (Hedgecoe 2009:349). The main reason for this rapid increase in the number of committees is an attempt to protect human subjects in research (Hedgecoe 2009:349). This trend was also evident in the United States of America (USA) where Institutional Review Boards on university campuses were established through federal legislation (Dingwall & Rozelle 2011:45–56).

These committees are clearly powerful as they have the authority "to request that research protocols be revised", and to disallow the research to continue (Dingwall & Rozelle 2011:45–56). Non-approval of proposals will result in the withholding of federal funding for their research and most probably in the rejection of publication by reputable journals (Dingwall & Rozelle 2011:45–56). Institutional Review Boards are clearly not advisory boards, but real decision-makers with far-reaching powers (Feeley 2007:764–765). Hammersley (2009:220) however, suggests that the role of RECs should be limited to the offering of advice, the provision of a structure in which ethical principles and their application can be discussed, as well as the initiation and facilitation of discussions about problem cases.

Although the RECs originated in the health sciences, research by Hedgecoe (2008:882) has shown that the RECs are not hostile to social

science research, especially qualitative research. However, a lack of qualitative and social science methodological knowledge in members of these committees may be the reason why "past committees have given qualitative research a rough ride" (Hedgecoe 2008:882). One would therefore expect that research integrity policies would provide for adequate methodological expertise in the composition of RECs.

As in the case of Research Integrity Policies, the existence and functions of RECs are widely criticised, for the following reasons (Hammersley 2009:212–214):

- Their perceived incapability of making sound ethical decisions about particular research projects and consequently inability to improve the ethical quality of social science research.

- The dubiousness of the legitimacy of their control.

- The serious negative consequences of increased ethical regulation.

- The dubiousness of the expertise of committee members.

- The insufficiency of the common ground on what is regarded as ethically within diverse contexts.

The literature has shown that the functions and scope of RECs are guided by the policies in terms of which they operate. The resistance against RECs seems thus to be directed to the policies in terms of which these committees operate.

A Conceptual Model for Fostering Research Integrity through Institutional Policies

Based on the review of scholarship in the field of research integrity discussed in the previous section, this section proposes a conceptual model representing the elements present in institutional policies likely to foster research integrity (see table 2). This model consists of the following three elements: (a) the researchers accountability to their scholarly community, the participants in their research projects, and their employing and funding

institutions, and (b) their actions, behaviour and inclination with regard to their planning, proposing, conducting and disseminating of research, (c) and the extent to which the aforementioned meet the values, principles and standards as determined by their constitutional, regulatory and scholarly imperatives. Leonard (2010:online) gives a list of 17 characteristics of a good policy that can help to determine whether it is going to be effective prior to its implementation. The criteria can be used as a checklist to identify any shortfalls in the policy. For the purposes of this conceptual model, the following four characteristics of good policy are pivotal:

- Clarity in purpose and outcomes.

- Alignment with organisational direction (vision, mission and values).

- Clarity of accountability.

- Enforceability by means of clear sanctions.

With regard to the fostering of research integrity it can thus be expected that these policies demonstrate the above characteristics of good policy embedded within those values, principles and standards that will achieve the following:

- Enhance normative evaluation of research.

- Foster a change in researchers ethical inclination with regard to research.

- Be implemented through the support of adequate institutional resources.

- Provide for adequate distance between the regulator and the regulated.

- Enhance and not inhibit research.

- Not unreasonably constrain researchers.

- Enable Research Ethics Committees to make sound ethical decisions about particular research projects and consequently avoid inability to improve the ethical quality of social science research.

- Clearly legitimise the jurisdiction of Research Ethics Committees.

- Adequately limit any negative consequences of ethical review.

- Clarify and assure the needed expertise of committee members.

- Establish a common ground on what is regarded as ethical within diverse contexts.

A close reading of the above characteristics and values, principles and standards has shown a substantive conceptual overlapping. Consequently a conceptual model to assess the likelihood of relevant policies to foster research integrity is presented in table 2 below.

Accountability	
Concepts	Assessment criteria
Policy intent	Clarity of purpose and outcomes of the policy and alignment with organisational vision, mission and values (Leonard 2010:online)
Jurisdiction	Clarity about the jurisdiction of research ethics committees (RECs); information on accountabilities and legitimacy of the process (Hammersley 2009:212–214; Leonard 2010:online)
Institutional Support	Provision for adequate institutional support (Dingwall & Rozelle 2011:45–56)
Expertise	Clarify and assure the needed expertise of committee members (Hammersley 2009:212–214; Hedgecoe 2008:882)
Independence/ Objectiveness	Provision for adequate distance between regulator and regulated (Dingwall & Rozelle 2011:45–56; Rhodes 2010:34)

Sanction	Enforceability through clear sanctions (Leonard 2010:online)
Values, principles and standards	
Norms	Establish common ground of what is regarded as ethical within diverse contexts to enable RECs to make sound ethical decisions (Leonard 2010:online)
Normative evaluation	Enhance normative evaluation of research through a description of what ought to be (prescriptions for actions or modification) (Dingwall & Rozelle 2011:45–56)
Researcher behaviour	
Enhance research	Intend to enhance and not to inhibit/unreasonably constrain research; adequately limit negative consequences of ethical review (Rhodes 2010:34)
Behavioural change	Intent to foster a change in researchers ethical inclination with regard to research (Dingwall & Rozelle 2011:45–56)

Table 2: Conceptual Model to Assess the Likelihood of Relevant Institutional Policies to Foster Research Integrity

A Brief Overview of the Policies Related to Research Integrity in a Selected Institution of Higher Education

This section gives an overview of a collection of policies within an institution of higher education in order to provide a critical assessment of the extent to which the policies meet the characteristics of good policy and comply with the values, principals and standards of research integrity as identified above. For the purpose of this critical assessment, the following policies related to research integrity have been identified and are summarised below.

Policy on Research and Innovation

This policy is based on the vision of the selected institution and aims to advance the institution s mission with regard to research and innovation in accordance with the constitutional provisions, policies and legislative frameworks, ethical considerations and the protection of human participants. This policy expects researchers to deliver quality and innovative research

and commits the institution to the provision of an enabling environment to this end.

Policy on Research Ethics

In support of the institution s Policy on Research and Innovation, the Policy on Research Ethics (first approved in 2007, and updated in 2012) aims at fostering an ethical and scientific intellectual culture demonstrated by research practices (paragraph 2.1). This policy is not intended to restrict or discourage research but, on the contrary, to enhance researchers capabilities for undertaking ethical research and to discourage unethical research practices.

Policy for Copyright Infringement and Plagiarism

The Policy for Copyright Infringement and Plagiarism 2005 states (paragraph 2) that all academic work, written or otherwise, submitted by a researcher is expected to be the result of his or her own skill and labour. This policy refers to the Copyright Act 98 of 1978 of South Africa and gives details of what copyright infringement and plagiarism entail. Paragraph 5 contains a sanction and states that a researcher who is guilty of the infringement of copyright or unethical practice will be subject to the applicable disciplinary code. This policy does not however elaborate on this matter.

Employee Disciplinary Code

Paragraph 3 of the Employee Disciplinary Code 2010 contains a list of the most often encountered types of behaviour that this institution of higher education regards as misconduct. Plagiarism is in the list and is given as representing one s own work as the work of another, without appropriately acknowledging the source (paragraph 3.13).

Fostering Research Integrity by means of Institutional Policies and Procedures: A Critical Assessment

For the purpose of the critical assessment of the abovementioned policies, the characteristics of good policies and the values, principles and standards for research integrity were combined in a conceptual model and are used as

criteria to assess the four mentioned policies. Table 3 below contains a summary of this assessment.

Criteria	Research and Innovation Policy	Policy on Research Ethics	Policy on Copyright Infringement and Plagiarism	Employee Disciplinary Code
Accountability				
Policy intent: Clarity of purpose and outcomes of the policy and alignment with organisational vision, mission and values	Yes as evident in sections 1, 1.3 and 5; Yes, as evident from sections 1, 4.3 and 4.5	Yes, as evident in part 1, section 1–3	Yes as highlighted in section 2; implied through reference to ethical values related to research integrity and the purpose of education (section 1)	Yes, section 1: content and outcome of misconduct; yes, implicit in section 2
Jurisdiction: Clarity about the jurisdiction of research ethics committees (RECs); information on accountabilities and legitimacy of the process	Yes, as evident from sections 7 and 10; not explicit	Yes, as evident in annexure A (Guidelines for ethics review)	Not clear at all	Yes, 7.2.3 provides the process and powers of an Employee Disciplinary Committee but not RECs

Criteria	Research and Innovation Policy	Policy on Research Ethics	Policy on Copyright Infringement and Plagiarism	Employee Disciplinary Code
Accountability				
Institutional support: Provision for adequate institutional support	For research in general	Yes, specific procedures, committees and role-players identified	No	Yes, specific procedures, committees and role-players
Expertise: Clarify and assure the needed expertise of committee members	No	Yes, as evident in Annexure A, 5.2–5.3	Not applicable	No (see section 7.2.3(x)
Objective-ness: Provision for adequate distance between regulator and regulated	No, as regulation is not mentioned in this policy.	The Policy indicates that the institution should promote the observance of the Policy and take appropriate steps for protection against	No provision as the regulator is not mentioned	Yes, through the identification of specific role-players and committees

		pressures inimical to or resisting the observance of the Policy (4.3) without identifying the specific regulator		
Sanction: Enforce-ability through clear sanctions	Vague	Absence of clear sanctions. Does state that the Policy should be read in conjunction with other relevant institutional guidelines and policies (3.3)	Vague: section 5 contains a sanction (subject to applicable disciplinary code); no provisions for how such determination should be made	Partially, yes (7.2.3(x))

Table 3 continued on next page

Criteria	Research and Innovation Policy	Policy on Research Ethics	Policy on Copyright Infringement and Plagiarism	Employee Disciplinary Code
Accountability				
Values, principles and standards				
Norms: Establish common ground of what is regarded as ethical within diverse contexts to enable RECs to make sound ethical decisions	Yes, very broad: section 4	Part 2, section 1.1 provides a framework for ethical decision-making, guided by the moral principles of the Belmont report, followed by a description of general ethics principles (1.2)	Yes: definitions in sections 3 and 4; no reference to or link with RECs	Section 3 provides a list of what is regarded as misconduct with reference to plagiarise; no link to RECs

Criteria	Research and Innovation Policy	Policy on Research Ethics	Policy on Copyright Infringement and Plagiarism	Employee Disciplinary Code
Accountability				
Values, principles and standards				
Normative evaluation: Enhance normative evaluation of research	Yes, as evident from sections 3, 4 and 5	Yes, normative evaluation is intrinsically woven into the policy	By implication	With specific reference to plagiarism
Enhance research: Intend to enhance and not to inhibit/unreason ably constrain research; adequately limit negative consequences of ethical review	Yes	Yes, as indicated in section 3.1 of Part 1	Yes, reflected in section 6: Avoidance of liability; no evidence of constraint at all	Not applicable; no evidence of constraint at all
Behavioural change: Intent to foster a change in researcher ethical inclination with regard to research	No	Yes, as evident in the rationale of the Policy, (section 2), the provision of guidelines	Yes, by implication through awareness of what is regarded as copyright infringement and plagiarism,	Yes, with reference to the nature of scholarship (Section 3)

		for ethical research (Part 1), guidelines for research involving human participants (Part 2), guidelines for research involving animals or living organisms (Part 3) and guidelines for ethics review (Annexure A)	and the avoidance of liability	

Table 3: Critical Assessment of Institutional Policies Fostering Research Integrity

Discussion

Both the Policy on Research and Innovation and the Policy on Research Ethics have clear descriptions of the intentions (Leonard 2010:online) of the policies. In this way the accountability coupled to the research delivered is readily determined. In view of the fact that both the Policy on Research and Innovation as well as the Policy on Research Ethics do not contain specific provisions and requirements as to enforce (Leonard 2010:online) certain provisions in order to foster the integrity of research, it is necessary to turn to other relevant policies such as the Policy for Copyright Infringement and Plagiarism as well as the Employee Disciplinary Code to find provisions to read and apply in conjunction with these research policies. In this manner the sanction of certain unwarranted conduct by a researcher or an

infringement of a prescribed requirement, can be appropriately enforced. Although this may be an indirect way to reach a goal, the intention of the institution is clearly to foster the integrity of research and to prohibit unethical conduct in research.

The Policy on Research and Innovation and the Policy on Research Ethics contain various provisions that describe and relate to the normative aspects in research (Dingwall & Rozelle 2011:45–56). Therefore these policies indicate what conduct is regarded as ethical. Research Ethics Committees (RECs) are supposed to follow these provisions in order to make sound decisions when reviewing research. The research ethics review systems in the institution of higher education aim to protect potential human participants, animals and other living or genetically modified organisms, and contribute to the highest attainable quality of scientific and ethical research. The Policy on Research Ethics serves as the fundamental guide for normative ethics review (Dingwall & Rozelle 2011:45–56). During reviews, other local and international guidelines may be used by RECs as references to obtain clarity on certain aspects.

With regard to the expected independence and objectiveness of the RECs (Dingwall & Rozelle 2011:45–56; Rhodes 2010:34), RECs have shown to be independent bodies, as allowed within the policies of the institution, comprising members who have the ability to undertake thorough, competent and timely reviews of research proposals. They ought to be independent from political, institutional, professional and market pressure. The main role of RECs is to protect human participants and animals in research by promoting the conduct of ethical research at the institution. In particular, the RECs contribute to safeguarding the dignity, rights, safety and well-being of all actual or potential research participants and communities, as well as animals, while taking into account the interests and needs of researchers and the integrity of the institution. Research projects not involving humans or animals seem to fall outside the scope of the RECs functioning in terms of the relevant institutional policy.

When dealing with the behaviour of a researcher, or the behavioural change of a researcher (Dingwall & Rozelle 2011:45–56; Rhodes 2010:34), the Policy on Research and Innovation states that all academic work, written or otherwise, submitted by a researcher is expected to be the result of his/her own skill and labour. The Policy refers to the Copyright Act 98 of 1978 and gives details of what copyright infringement and plagiarism entail.

Paragraph 5 of this Policy contains a sanction and states that a researcher who is guilty of the infringement of copyright or unethical practice in terms of this specific Policy will be subject to the applicable disciplinary code. The Policy does not though contain provisions as to how such a determination is to be made and by whom. In the event of relevant evidence being available to support a complaint of copyright infringement and/or plagiarism, the applicable disciplinary code to turn to should be the institution s Employee Disciplinary Code. It accordingly appears that the matter will be dealt with in terms of the Disciplinary Code.

These provisions are not intended to inhibit research even though there may be a threatening touch. These provisions do rather enhance research and could serve to foster a change in a researcher s ethical inclination regarding research.

In paragraph 3 of the Employee Disciplinary Code a list is given of the most often encountered types of behaviour that this institution of higher education regards as misconduct. Plagiarism is listed and is given as the presenting as one s own work the work of another, without appropriately acknowledging the source (paragraph 3.13). Any alleged misconduct must be reported to the Directorate: Employee Relations and Human Resources Policy where it will be investigated (paragraph 4.1.1). If the employee charged with misconduct based on plagiarism is found guilty by the Employee Disciplinary Committee, the Committee must determine an appropriate sanction which could include, among others, corrective and rehabilitative measures, a written warning or dismissal (paragraph 7.2.3(x)). It appears though that the list of types of behaviour in this Policy does not cover all the aspects described in the Plagiarism Policy that amount to unethical practice.

It appears from the selected policies that the intention of this institution of higher education is to enhance research to enable researchers to deliver quality research outputs, but also to discourage unethical research practice among researchers. It is unfortunate that the two primary policies involved, namely the Policy on Research and Innovation and the Policy on Research Ethics, do not contain details of research regulation, sanctions and enforcement that form a clear and complete procedure under one title. This implies that some parts in the policies of the institution need to be revisited in order to meet the criteria of good policy in all respects. Besides this

aspect, the relevant policies as a collection have shown the likelihood to foster research integrity in the selected institution.

Conclusions

This article sets out to assess the likelihood that the relevant policies within a selected institution of higher education aim at fostering research integrity. This has been done against the historical backdrop of the gradual development of an awareness of research integrity and the regulation thereof.

This article contributes to the existing body of scholarship by proposing a conceptual framework for assessing the likelihood of institutional policies to foster research integrity. In an effort to validate this model, it has been applied to policies related to research integrity of a selected institution of higher education.

This model is structured around the main concepts accountability, values, principles and standards and research behaviour and has been used to assess the likelihood to which these policies foster research integrity. The assessment has shown that these policies complement each other. The institutional accountability for research integrity is reflected in the complementary structure of policy intent, procedural jurisdiction, expertise, objectiveness and adequate sanctions. In addition, the policies have been assessed for the extent to which they reflect the institutional values, principles and standards for research integrity. To this end the assessment focused primarily to the extent to which these policies encourage a normative evaluation of research. Again the assessment has shown that the policies complement each other by providing collective institutional values as well as specific principles and standards guiding research integrity. The third part of the model reflects the likelihood of the collection of policies to influence research behaviour. As a collection, these policies intend to enhance and not to constrain research.

The application of this model on the collection of relevant policies in the selected institution has shown their likelihood to foster research integrity. The focus on a specific selected institution of higher education may inhibit the generalisability of the study to other contexts. The authors dealt with this potential limitation by presenting the theoretical parameters of the study to allow the reader to determine whether the case described can be generalised to assess current research integrity related policies and thus

being transferred to other settings (de Vos *et al.,* 2011:420). However, further research will be necessary to investigate whether these policies have changed researchers attitude towards research integrity and research ethics, consequently resulting in behavioural change. Future research should also be conducted to evaluate the quality of the model and its usefulness for other settings.

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Identification of Quality within the Warehousing Function - A Study within Protea Chemicals

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Abstract

The process of warehousing is an integral component of every logistics system as it is the primary link between production, suppliers and customers. Warehousing should play a pivotal role by providing a desired level of customer service at the lowest possible total cost. If a logistics system functions effectively, warehouse facilities are able to reduce stock outs whilst simultaneously reducing inventory levels which leads to improved customer service levels. One of the most complex challenges that an organisation encounters is determining what customers (internal or external) truly values. Once an organisation has determined what factors customers value, only then can the organisation begin to attempt to put in place measures and systems to ensure that customer satisfaction is achieved. This research study aims at investigating the efficiency of warehousing within Protea Chemicals, with specific reference to the quality of its service. It investigates operational staff, line management and internal customers' perceptions of Protea Chemical's warehouse quality.

Keywords: warehousing, service quality, efficiency, customer perception

Introduction

Protea Chemical provides warehousing to many of its internal and external customers. The emphasis in warehousing should be on planning of warehousing activities, which include goods receiving and its proper storage. Assembling, packaging, picking and distributing of customer's orders for delivery are also included. The reason for an existence of a warehouse is to

provide storage and delivery of goods to customers. In this context, it can be regarded as a complex system. This article is investigating new insights of operation staff, line management and internal customer perceptions of the Protea Chemical's warehouses. The researchers use the SERVQUAL instrument to identify quality variables such as tangibles, reliability, responsiveness, empathy and assurance that can impact on warehouse quality within Protea Chemicals. The quality gaps are identified and explained and recommendations are made with which Protea Chemical can close such gaps.

Assumed Problems Investigated

- The challenge facing each of the Protea Chemicals warehouse facilities is to improve the variance between the company's current service quality and the expected service quality within the warehousing function.
- Protea Chemicals warehouse facilities fail to have accurate stock levels and thus face the risk of losing customers to competitors.
- Warehouse staff needs to respond promptly to customer requests in order to retain existing customers and attract new customers.

Background of the Study

Protea Chemicals is a member of the Omnia Group family of companies located in South Africa. The Omnia Group consists of Omnia fertilizer, Bulk Mining Explosives, Protea Polymers, Protea Food Ingredients, Protea Bulk Resources and Protea Chemicals. For the purpose of the research study, the researcher will focus on the Protea Chemicals division only. Protea Chemicals is a diversified and specialist chemical services company. Protea Chemicals manufacture and distribute chemicals, and polymers throughout the African continent. Protea Chemicals operates in every sector of the chemical distribution industry, with widespread satellite facilities throughout Africa Omnia Group's business framework is underpinned by its vast resources namely intellectual capacity and innovative technology, and this provides the organisation with a competitive advantage over its competitors (Omnia, 2010a:2).

State of the art plant and warehouse facilities combined with widespread rail car and tank truck handling capacity permit superior efficiency,

guaranteed quality control and reduced overheads in the transportation of inbound and outbound distribution of raw materials, work in progress and finished goods within South Africa, (Omnia, 2010b:5).

Literature Review

In the literature review various books, journal articles and company documents and articles were studied to examine the debates on warehouse quality. The literature will first look at the warehousing function and thereafter the SERVQUAL model and service quality will be discussed.

Warehousing

Warehousing is about storing materials/goods and making timely delivery so that goods are manufactured on time. According to Murphy and Wood (2008:242) warehousing has been defined as "that part of a firm's logistics system that stores products (raw material, parts, goods-in-process, finished goods) at and between points of origin and point of consumption".

According to Waters (2009:399) warehousing is the general term for any place where materials are stored on their journey through a supply chain. Warehouses are needed for a variety of reasons, primarily reducing the overall costs of maintaining a supply chain while improving customer service. Emmet (2005:4-5) adds that warehousing is about having the right product in the right place at the right cost and at the right time. The emphasis in warehousing should be on planning and managing of warehousing activities, which include receiving, storing, assembling, packing, picking and distribution of customer's orders.

Another view put forward by Bowersox, Closs and Cooper (2010:267) is that warehousing has traditionally existed to stock inventory. Contemporary warehousing provides a broader value proposition in terms of economic and service benefits. Economic benefits include consolidation and break-bulk, sorting, seasonal storage, and reverse logistics. Service benefits include spot-stocking, full line stocking, and value-added services.

Emmet (2005:214) suggests that to obtain customer satisfaction the warehouse company has to improve warehouse efficiencies and have quality within the warehouse function.

To improve warehouse efficiency requires the following:

- Identifying Location in Warehouse Management

- Process Improvements in the Warehousing Function

Identifying Location in Warehouse Management
Emmet (2005:214) found that choosing a warehouse location is a critical decision in the strategy of an organisation. When taking location into consideration, an organisation should consider the location of raw materials, location of production site, location of customers and location of skilled labour.

Process Improvements in the Warehousing Function
It is necessary that the logistics managers to develop their own respective frameworks for the evaluation of their own performances and according to which their own procedures can be designed and implemented. Once the framework is ascertained, the logistics manager can create a detailed audit format based on history, projections, and reasonable goals (Ackerman, 2004:2-3).

In warehouse management the audits should focus on the following (Ackerman, 2004:3):

- Monitoring customer relationships
- Auditing for process and cost control
- Auditing to maintain quality
- Auditing the performance of staff in the warehouse
- Monitoring physical assets
- Using audit data to justify warehouse improvements

An important consideration to improve customer satisfaction within the warehousing function is to have quality in the warehousing function. According to Evans and Lindsay (2005:18) quality in warehousing function can be identified in:

- Quality as a Management Framework

- Customer and Stakeholder Focus
- Participation And Teamwork
- Process Focus and Continuous Improvement

Quality as a Management Framework

Quality as a management framework will include: customer and stakeholder focus, participation and teamwork and process focus and continuous improvements.

Customer and Stakeholder Focus

According to Evans and Lindsay (2005:18) the customer is the primary decision maker when it comes to quality. Perceptions of value and satisfaction are influenced by numerous factors of customers overall purchase, ownership and service experiences. To meet or exceed customer expectations, organisations have to fully understand all product and service attributes that contribute to customer value and lead to satisfaction and loyalty. An organisation must understand that internal customers are as important in assuring quality as are external customers who buy the product. Employees who understand that they are customers of and suppliers to other employees understand how their work links to the final product. In essence, the responsibility of any supplier is to understand and meet customer requirements in the most effective and efficient way possible. An organisations success depends on the knowledge, skills, motivation and creativity of employees and partners. A total quality organisation has to demonstrate commitment to employees and partners by providing opportunities for growth and development, provide recognition beyond normal compensation systems, share knowledge and promote risk taking (Evans & Lindsay 2005:18).

Participation and Teamwork

When management provide staff with the tools in order to arrive at sound business decisions and the liberty and support to make contributions, they assure enhanced quality goods and sound operations procedures as a consequence. By allowing employees to contribute to decision-making which impacts on their work functions and the client, may lead to significant quality improvements (Evans & Lindsay (2005:18).

Process Focus and Continuous Improvement

A process perspective links together all relevant activities and increases understanding of the entire system. Continuous improvements refer to both incremental changes that are gradual, and breakthrough or rapid improvements. These improvements enhance customer value, reduce defects and the associated costs, drives productivity and usefulness of resources and advances receptiveness and cycle time performance to resolve client non-conformances or introduce new products. The key enhancement in response time may necessitate simplification of work processes and often foster immediate development in quality and efficiency (Evans & Lindsay (2005:18). The next part of the theory that the study is based on is the SERVQUAL and GAPS model.

The Conceptual Model of Service Quality

This study uses the SERVQUAL instrument to test quality within the warehousing function. The Gaps model will also be adapted as it is an extension of the SERQUAL model.

The SERVQUAL Instrument to Measure Service Quality

According to Parasuraman (2004:46), the first and second components of the SERVQUAL instrument determine client expectations versus their perceptions respectively alongside a selection of service characteristics assembled into the five dimensions which follow:

- Reliability: ability to perform the promised service dependably and accurately.
- Responsiveness: willingness to help customers and provide prompt service.
- Assurance: knowledge and courtesy of employees and their ability to inspire trust and confidence.
- Empathy: caring, individualized attention the firm provides its customers.
- Tangibles: appearance of physical facilities, equipment, personnel, and communication materials.

Gaps Model

According to Bhattacharjee (2006:488), the Gap model for service quality can assist an organisation seeking to improve service quality to better focus on its strategies and service processes. Quality in service is as perceived by the customer. As service is intangible, the only way to measure quality in service is to measure the customer expectation and before the receipt of the service and measure the perception after the experience or service encounter. The gap between the two is the measure of service quality. The larger the gap, the worse is the service quality. The inverse also applies, where the narrower the gap, the better the service quality.

According to Cravens, Crittenden and Lamb (2002:458), business functions such as marketing, accounting and operations form a continuous chain of customer service that extends to the end user (buyer) of the product.

Evans and Lindsay (2005:4) confirmed that internal customer requirements need to be understood. Historically, organisations failed to comprehend client requirements, and significantly less to internal customer requirements. Management and specialists directed operations and workers were told how and what to do. Teamwork was non- existent.

For the purpose of the research study, the supplier is the warehouse and warehouse staff and the customers are sales representatives, telesales representatives and line management of Protea Chemicals. According to Parasuraman (2004::47), the organization needs to find ways and ask questions to close each of the gaps:

- Gap 1: For closing the market information gap. Does the company have mechanisms in place for channeling feedback from front line staff (sales or telesales staff) to warehouse and operations staff?
- Gap 2: For closing the service standard gap. Is warehouse staff swift to discard customer expectations as impractical and irrational?
- Gap 3: For closing the service performance gap. Does the company support warehouse staff with appropriate information systems and adequate training?
- Gap 4: For closing the internal communication gap. Does the company have tools in place for encouraging cross- functional interaction?

Methodology

A survey was conducted on warehouse Operations staff, Line Managers and Internal Customers (telesales and sales representatives) at Protea Chemicals. The survey was designed to collect information from staff on their perceptions on service quality wards warehouse service quality within Protea Chemicals warehouse facilities. The Questionnaire was designed using a five point LIKERT Scale. Closed-ended questions were used in the questionnaire. The questionnaire used in the study was adapted to the quality dimensions peculiar to warehousing environment and adapted to the SERVQUAL instrument developed by Parasuraman et al., (1985).

The researchers distributed all questionnaires via electronic mail to respondents inviting them to participate in the survey.
Probability sampling procedures were used by the researchers as they met the sampling objectives adequately. Stratified random sampling was chosen as it provides more information with a given sample, (Sekaran 2003:272). The sample was stratified according to the following groups in Protea Chemicals namely: the warehouse Operations staff, Line Managers and Internal Customers (telesales and sales representatives).

The researcher chose internal customers (telesales and sales representatives) as respondents due to their direct interaction and reliance on the warehouse to perform their selling functions effectively and efficiently. In addition to the sales team, the researcher also chose line managers as respondents as they have a direct vested interest in the operation of the warehouse and the service delivery offered to the end customer. Furthermore, the researcher chose warehouse and Operations staff as it is imperative to understand these staff members' perceptions and expectations of the facilities and service quality which they provide.

The study adhered to the specific ethical guidelines by Cavana, Delahaye and Sekaran (2001: 165) that the information provided by the respondent be treated as strictly confidential. A primary ethical responsibility of the researcher was the guarding of the privacy of the respondent.

The size of the population for the study was eighty Warehouse Operations staff, Line Managers and Internal Customers (telesales and sales representatives). The researchers had access to all four warehouses nationally. The members of the population were located in Durban,

Johannesburg, Port Elizabeth and Cape Town Distribution Hubs of Protea Chemicals.

Sample Size

According to Krejcie and Morgan's sample size table (Cavana, Delahaye & Sekaran 2001:278), for a given population of eighty, the sample size is sixty-six. The researchers had access to all four regional hubs throughout the South Africa and distributed the questionnaire using stratified random sampling.

Out of the sixty-six questionnaires distributed, only fifty-one completed questionnaires were returned to the researchers.

The Cronbach Alpha coefficient for Warehouse Perceptions was 0.947 and Expectations was 0.909, which represented an above average level of internal reliability.

The Limitations of the Study

- This study was confined to Protea Chemicals four Distribution Hubs in Durban, Johannesburg, Port Elizabeth and Cape Town and cannot be generalized to other chemical businesses in the same industry
- The study made use of stratified random sampling. Therefore a subsequent research study is required to build on the findings of this research study. All the employees of Protea Chemicals were not included in the research study, only those which are directly related to the warehouse function were included namely, warehouse staff, internal customers (external sales representatives and call centre consultants) and line managers of Protea Chemicals.
- Due to logistical, time and cost constraints, other Protea Chemicals business units were not included in the research study.

Results and Discussion

The table 1 below illustrates the gaps in scores revealed in the study.

Service Quality (SQ) By Dimension		
Dimension	SQ for Internal Customers	SQ for Warehouse Staff and Line Managers
Reliability	-1.68	-1.11

Responsiveness	-1.62	-1.11
Assurance	-1.27	-0.93
Empathy	-0.45	-0.44
Tangibles	-1.7	-1.09

Table 1: Service Quality by Dimension for internal Customer and Warehouse Operations staff and Line Management

The negative Gap scores are an indication that the internal customers and the operations and line management staff are dissatisfied with the quality of services provided by Protea Chemicals warehousing function. As illustrated in Table 1, internal customers believe that tangibles, followed by reliability and then responsiveness, are the dimensions which yield the most serious shortfall. Warehouse operations staff and line management believe that the dimensions of reliability and responsiveness have an equal (-1.11) service quality shortfall, followed by the tangible dimension.

The main objective of the research study was to evaluate the efficiency of warehousing within Protea Chemicals and assess its impact on service quality. Relevant data was collected from warehouse operations staff, line managers and internal customers (telesales and sales representatives) on their expectations and perceptions of the warehousing function. The research revealed that for each of the five service quality dimensions (tangibles, reliability, responsiveness, assurance and empathy), Protea Chemicals failed to meet the operational staff, line managers and internal customer expectations.

Recommendations

In order to improve the quality dimensions and have a significant impact on service quality afforded to the operations staff, line management and internal customers, the warehouse operations of Protea Chemicals need to focus on improving warehousing operational efficiencies. The significant Gaps found in tangibles, reliability, responsiveness, empathy and assurance have revealed that there is a problem with Protea Chemical's warehouse quality. The following recommendations were put forward.

Implementation of Warehouse Management System

Protea Chemicals can implement a Warehouse Management System. In order for managers to make good decisions, it is import that the quality of information and communication technology within the system be accurate and timely. As Protea Chemicals customers strive to achieve Just In Time (JIT) production facilities, there is an increasing need to have access to inventory without unnecessary delays. Protea Chemicals can implement bar-coded tracking systems as opposed to the paper- based manual methods. Mobile computing in the form of onboard computers systems on forklift trucks and handheld laser scanners capture data with real- time wireless communication which result in real- time decision making information and increasingly accurate stock.

A Warehouse Management System assembles, analyses, and reports information required to process the flow of inventory through a warehouse. A Warehouse Management System directs human resources on the optimal way to perform warehouse activities and guides the flow of inventory through the warehouse facility. Warehouse Management Systems can facilitate the transition in Protea Chemicals warehousing from a manual operation to an automated storage and retrieval system. Warehouse management systems can integrate all handling operations within a warehouse into one system, including receiving inventory through automated scanning, put-away or storage facilitated by automated bin locations, generating pick-lists of specific product batches to promote first-in-first-out and automated replenishment and distribution load planning and scheduling. As this process is automated, significant economic benefits can be achieved as a result of faster processing of transactions and reduction of errors.

Implementation of Radio Frequency Identification

Protea Chemicals can implement Radio Frequency Identification (RFID) technologies which is an information gathering system that enables automatic identification of products through tags which emit a continuous signal. An item bearing a RFID tag becomes networked without human intervention or manipulation by machinery.

Through the use of RFID Technology warehousing tasks can be automated to speed up the flow of inventory and to enhance customer service. It is common practice at Protea Chemicals that employees reconcile

shipments against delivery notes by performing physical counts and manual data entry which leads to counting and picking errors as well as slower processing times. By implementing RFID Technology, Protea Chemicals will have increasingly accurate orders and faster dispatching times which provide superior customer service and loyalty, ultimately contributing to an overall improvement in customer service. By removing personnel from performing the physical manual counts and documentation processing tasks, Protea Chemicals will reduce labour costs as people are increasing required to perform these functions.

An additional benefit of reduced labour is the reduced risk of error and exposure to product loss through theft. A third disadvantage of manual order processing is the friction as a result of the slowing down of the flow of goods. Each time an employee has to count, check and double- check the goods against documentation to process an order reduces the speed of goods moving within the supply chain

Cooke (1996:51) argues that in distribution businesses, where the quality of customer services is a key factor, RFID Tags can assist in achieving error-free delivery, reduced lead-times and availability of goods. The cost of implementing the automated RFID systems and the payback period will need to be determined and shown in order for Protea Chemicals to invest in this new technology. The Operations Manager of Protea Chemicals will need to conduct an analysis of the service and economic benefits and costs and payback period of implementing a radio-frequency system in the warehouse facility.

Focus on Operational Process Improvements

Protea Chemicals will need to focus on operational process improvements. Protea Chemicals Management will need to perform a detailed audit of the warehouse operation in order to identify ineffective processes. The objective is to transform the warehouse operation into an effective and efficient operation that ultimately reduces costs and improves customer service levels. A framework needs to be developed to evaluate Protea Chemicals performance and design a procedure. Once the framework is ascertained, the Operations Manager can create a detailed audit format based on history, projections, and reasonable goals. Key focus areas of an audit include:

- Monitoring customer relationships
- Auditing for process and cost control
- Auditing to maintain quality
- Auditing the performance of people in the warehouse
- Monitoring physical assets
- Using audit data to justify warehouse improvements

Protea Chemicals has various warehouses across the country, therefore service performance should be compared and visual performance management tools (graphs and tables) should be used to identify the better performing sites from the weaker sites.

Performance audits can prove valuable in ensuring consistency of service at each of the Protea Distribution Hubs. The performance audits can be used as a powerful motivator when utilized on the basis of recognition and reward. National Scorecards can be used to the same effect as performance audits.

Ask Questions which Focus on Closing Service Quality Gaps

In order to improve customer service to internal customers and ultimately external customer Protea Chemicals needs to find ways and ask it questions to close each of the service quality gaps:

- Gap 1: For closing the market information gap. Does the company have mechanisms in place for channeling feedback from front line staff (sales or telesales staff) to warehouse and operations staff?
- Gap 2: For closing the service standard gap. Is warehouse staff quick to dismiss customer expectations as unrealistic and unreasonable?
- Gap 3: For closing the service performance gap. Does the company support warehouse staff with appropriate information systems and adequate training?
- Gap 4: For closing the internal communication gap. Do you have mechanisms in place for encouraging communication across different functional departments?

Each of the above Gaps is a result of a series of shortfalls within Protea Chemicals warehouse facility. Protea Chemicals need to diagnose the causes

and correct internal deficiencies (Gaps 1 – 4) which will result in improvement of service experienced by customers and closing Gap 5.

Review Warehouse Layout

In determining the warehouse layout, the Warehouse Manager of Protea Chemicals needs to develop a floor plan which facilitates inventory flow whilst also taking into consideration the proposed materials handling system. As warehouse layout is an essential factor in obtaining the lowest total cost of materials handling, a systematic flow of materials through the warehouse improves staff morale and productivity. Most of the handling operations in the warehouse are repeated daily. The optimal method to improve quality of packaging and condition of inventory is to reduce the handling of stock.

Warehouse Management can minimise material handling by reducing the distance between storage locations and inbound or outbound areas. The time required to transport the inventory will be shortened. The shorter travel distance enhances productivity of the operation whilst reducing wear and tear on material handling equipment and employee fatigue. Inventory will be handled less and employees will be less fatigued and less likely to make errors when picking, binning and loading stock.

Focus on Housekeeping and the Aesthetics of the Warehouse Facility

In order to facilitate safe and efficient handling and storage of materials, stock is required to be stored and stacked according to safe and efficient standards whilst continuously maintaining cleanliness. Designated locations should be marked for receiving, dispatch, storage locations, quarantine and inspections locations. Warehouse management should conduct random spot checks to ensure that stock is in the correct location as compared to the Enterprise Resource Planning System (ERPS). Materials should be stored neatly and squared off according to safe and efficient.

An additional option for cleaning and housekeeping of the warehouse facility is to outsource the cleaning of the warehouse. A contract and service level agreement can be agreed upon with the service provider and Warehouse management will only be required to manage the performance of the cleaning contractor. The benefit of outsourcing the cleaning function is that the cleaning company has specialised sweeper and scrubber equipment

to effectively and efficiently clean the warehouse facility. An additional benefit is that Protea Chemicals Warehouse Management will be able to focus on their core competencies and leave cleaning to the specialists. The financial implications of outsourcing this function will have to be taken into consideration.

Training of Warehouse Personnel

Protea Chemicals' success depends on the knowledge, skills, motivation and creativity of employees and partners. In order for Protea Chemicals to be a quality organisation it has to demonstrate commitment to employees and partners by providing training, opportunities for growth and development, provide recognition and share knowledge.

A structured training schedule has to be developed that will address gaps in warehouse operations and staff skill. Training is required to commence at the shop floor level of picking inventory. As training improves the level of skill, attention to detail will improve which will result in improved picking accuracy. The morale of employees usually also improves as knowledge is enhanced. The real value of improvements will be the service quality perception as rated by internal customers.

Outsource the Warehouse and Logistics Function

Due to the competitive chemical environment in which the firm operates, a further recommendation would be to consider focusing on their core competencies and outsource their non-core functions such as logistics (warehouse, primary distribution and secondary distribution) to third party logistics (3PLs) providers.

In deciding on whether to outsource their logistics functions, Protea Chemicals will base the decision on the following:

- To focus on their specialist function
- Adapt to new ideas or developments in thereby allowing a world class logistics organisation to perform logistics function
- 3PLSP can perform the logistics function with improved customer service and reduced cost
- Develop a strategic partnership based on mutual trust with world class logistics leader

Recommendations

By conducting a survey, valuable information came to light to improve service quality within the warehousing function at Protea Chemicals. It is a complex task as it involves constant monitoring, training and using the proper technology to improve overall warehouse function efficiencies. The following managerial recommendations are made:

1. In order for Protea Chemicals to be a quality organisation it has to demonstrate commitment to employees and partners by providing training, opportunities for growth and development, provide recognition and share knowledge.
2. A structured training schedule has to be developed that will address gaps in warehouse operations and staff skill.
3. Training is required to commence at the shop floor level of picking inventory.

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Marx, Class and Poverty -
The Necessity of Class to Eradicate Poverty

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Abstract
A popular theme in the discourse on class is the distinction between the poor and working classes. Recently, there has been a tenuous relationship between the two classes. Marx proclaimed the working class as the agent of change to facilitate a revolution. The working class, in understanding the historical implications of its role in the production process, was tasked to deconstruct the notion and existence of class. The goal would then be to eliminate any differences between the classes. However, the creation of a social surplus and subsequent redistribution effects are contingent upon the existence and productivity of a working class. This article argues that with a [social] surplus being a by-product of the working class, class [distinction] is necessary for further redistribution of a surplus contributing to the eradication of poverty. Poverty cannot be expected to be eradicated without a working class that strives towards becoming the "new middle class." Class, therefore, can be described as being dynamic in that the poor benefit from social distributions emanating from the working class and the middle class. Importantly, the poor aspires and has the potential to become part of the middle class. Consequently, the ranks of the working middle class are expanded by way of the most mobile and successful of the poor class. Class migration is desirable and a necessity for eradicating poverty.

Keywords: Marxism, Poverty Eradication, Social Mobility, Class Migration

Introduction
Karl Marx the author of one of the world's most influential political manuscript must have known that he was at best providing a framework for discussing complex relationships between the classes.   In his *Manifesto,* however, one would be hard pressed to find mention of "the poor class," in contrast to repeated reference to "the working class" as the Proletarians – a class exploited by the Bourgeoisie, yet poised to over-throw it. In Marx's

seminal work the *Capitalist*, the Bourgeoisie and the Proletariat feature prominently, implying a hierarchy of classes. Less prominent, however, is the poorest of the poor classes that appear at the bottom just below the Proletarians. Marx's Manifesto does refer to the Proletarians as having created a class of laborers who live so long as they can find work. They then must be the poorest class that lives to subsist and sell themselves piecemeal. They are merely a commodity to be exploited by the classes above them.

Referring again to the Communist Manifesto, if the Bourgeoisie felled their feudal masters and if the Proletarians are motivated to fell the Bourgeoisie, will the poor rise up to overthrow the Proletarians? This is an added possibility of the class struggle and the tenuous relationship between the classes. The next lower class, arguably, is exploited and the next higher class benefits from its ability to exploit. Characteristically, the capitalist strives to maximize profits and does so by requiring workers to be paid less than the value of their labour. Should they, the poor be fortunate to have a job, they as workers are trapped in a cycle of poverty. This is yet another explanation for the tension between classes (Qaedi, n.d.). Nevertheless, Marx (1844) hinted of the passive link [bond] that exists between classes. A consequence is that poverty as a passive bond causes human beings [classes] to need other human beings – i.e., other classes. This article, therefore, discusses the reason for that need, as the next lower class benefits from the success of the next higher class, with that next lower class being a beneficiary and recipient of a social surplus.

Marx's Manifesto allowed for contextualizing the notion of class and the identification of a class hierarchy. The poor, however, were not recognized akin to a class to be located even at the lowest end of the order. The poor and even poverty as concepts are conspicuously absent from the Manifesto. Rather, there is the notion of a "dangerous class," a social rot from the lowest layer of society that is swept along by the Proletarian and used as a reactionary tool. This is the nature of the poor's exploitation. Disparagingly, the poor as the lowest of the low (as implied by Marx) are vagabonds – a sickly underclass. Nineteenth century depictions and characterization of the poor as being deviant and less than human is a paradox as the Capitalist, the Bourgeoisie and even the Proletarians that

Marx spoke of did much to create the underclass through their exploitation and use, again, as a reactionary tool (Anon, n.d.).

In terms of a new political economy for his time, Marx qualified class, laid the foundation for socialism and communism, and called for the Proletarians to be instruments of revolution. The poor were all but disregarded, as the post industrial revolution class struggle centered on labour and the owners of capital. Up until the postmodern period, the poor were expected to remain in a perpetual state of poverty. Speculating, the reason for [Marx's] obscuring the poor and poverty is because class according to Marx is less to do with the stratification of society in terms of a lower, upper or middle class. Rather, class is contextualized relative to the "means of production." This is the reason for his focusing on the Capitalist, the Bourgeoisie and the Proletariat. More than any other class, the Proletariat recognized as the working class was highly regarded by Marx (Wheen, 1999). As a mentor, Marx's affection for the likes of Weitling (1808-1871) and Eccarius (1818-1889) is at odds with his reputation as an elitist who regarded the Proletariat as unable to initiate the revolution. Nevertheless, his arguably high regard for workers is devoid of the fact that a worker, or any gainfully employed Proletarian can still be poor and of the poor class. Still, the worker who may be poor and subject to the Bourgeoisie is a force to be reckoned with and their feeling of enslavement to the Capitalist. In contrast, the poorest of the poor, the dangerous, unemployed deviant who having no job cannot be defined in terms of [any] means of production. In the postmodern period, being poor and poverty are relative distinctions that are qualified and quantified to differentiate between the working class and the poor. The former may at least be employed and their state of poverty is relative to lifestyle and means. The latter, however, has no means, no resources and will be dependent on the state or the next higher class for a social surplus. Discounting the state, next follows an examination of the relationship between the higher working class and the poor as a recipient and beneficiary of a social surplus.

The Poor and Working Class Symbiotic Relationship

Anton de Bary (1879) described symbiosis as a close association between organisms and different species. Symbiosis is characterized by roles that are mutualistic and at times parasitic. There, however, is a greater

inclination to think of symbiotic relationships [symbiosis] in more positive terms of mutualism where benefits are realized by one organism from another. In the age of globalization, a symbiotic relationship (mutual bond) between the poor and working class is becoming more "obligatory" as the gap between the rich and poor widens. The rich and even the working class cannot continue to maximize their own self-interests without regard for the welfare of the poorest of the poor. The rich getting richer and the poor getting poorer has become unacceptable.

Zweig (2000) argued that concern for the poor should be expressed in terms of an alliance with the working class. In the manner put, it is an unholy alliance. Unholy in that "the middle class is suffering as the poor are taking away tax money and living on welfare." In his view, there is a negative relationship between the poor and the working middle class. Whether positive or negative, there is an economic dependency, a relationship, a bond that manifests itself in money targeted for socio-economic policies, say, to eradicate poverty or to provide [income] maintenance. The question is whether there is a [distinct] class identity that sets them apart from the greater working class? Zweig (*loc. cit.*) argued that the working class is so broad that the poor [women] should be considered to be part of the working class. He debunks the notion that the poor does not work. Rather, the poor in some way or form work and have always worked. Notably, the relationship and the bond between the poor and the working class is strongest when grievances against the Capitalist are vocalized – literally, thorough demonstrations, or through other methods. This relationship can be described as "a coalition" among all working people, as the working poor, non-working poor and the working class in general suffer indiscriminately at the hands of capitalism and in the most modern terms from the negative effects of globalization. In *Globalising the Working Class,* Seabrook (1999) says it best: "People are always poor in the same way. Hunger, insufficiency, and sickness know nothing of cultural [class] differences."

Globalization is therefore thought to be eroding and fragmenting the working class. As it relates to wages and economic power, this may be true. In reaction to globalization, unified coalitions seem to refute notions of fragmentation. In 2009 May Day demonstrations by workers, unions, and the United Russia party a coalition was exemplified made up of differing

factions – politicians, workers and the unemployed – coming together to take note of a worldwide economic crisis that left 2.8 million Russians unemployed at the end of 2009 (TASS-Online). While globalization has caused economic fragmentation, globalization has also become a unifying force bringing the poor and the working class together – a convergence that has come about due to an inherent need to survive.

Banerjee and Duflo (2007) pointed out the most obvious characteristic of the middle class – i.e., they are most likely to be holding a steady job. In a developing country, a working middle class person could be an entrepreneur running a small but unprofitable business. Their health and the health of their children will be marginal. The education of their children will be marginal as well. The quality of life, however, for a middle class household in a developing country will differ from the quality of life of a poor household in that same developing country. Banerjee and Duflo's (2007) study pointed out that the working class did indeed live differently than the poor. In South Africa, for example, it was found that a middle class person was in a position to save by buying cheaper food – having an income of $8 per day. In the case of the poor with an income of $2 per day, they are less inclined to save, spending 67% of that amount on food. Conclusively, higher income levels facilitate consumption options – i.e., an ability to exercise spending alternatives.

The value of a middle [working] class should not be understated. A gainfully employed middle class is highly associated with resource endowments (Easterly, 2001). When the middle [working] class experiences higher levels of income, development outcomes include higher income levels, higher national growth, increases in education and health, improvements in infrastructure and improvements in the quality of life of the poor. In many ways, those development outcomes are indicative of a social surplus.

Defining a Social Surplus

Poverty can result from inadequate channels of distribution. A contention here then is that the poor are poor due to inadequate channels of distribution of created surplus. Poverty and being poor is a distribution problem – i.e., a distribution of a social surplus created by the working class. Essentially, the creation of surplus [value] is a natural occurrence associated with

capitalism. Capitalism has a drive to produce surplus value (Slaughter, 1975). The problem is not supply but distribution (Parenti, 1996).

From the preceding discussion to here, Marxism is at odds with itself. It proposes to do away with the Bourgeoisie for the benefit of the workers – to eliminate exploitation. However, that which it seeks to destroy [capitalism] produces a vital surplus that benefits the poor and the working class. Marxism strived for a non-exploitive society (Chakrabarty, Cullenberg & Dhar, 2008) but the eradication of exploitation would have a perverse outcome and a negative impact on workers and the poor. Assumingly, this is a trade-off that Marxists are prepared to accept – i.e., the eradication of capitalism, the eradication of exploitation, minimal surplus value and prolonged poverty. This exemplifies the contradictory relationship between Marxism, poverty and how Marxism is at odds with itself.

Unfortunately, for developing countries in the south such a trade-off is hard to accept. In theory, development has replaced capitalism and even under development, as in capitalism, there is a natural occurrence to create a [social] surplus. Nevertheless, poverty and the plight of the poor are relative to the ability of societies, developmental or capitalistic, being able to distribute a social surplus. The question then is: What is a social surplus? Towards understanding a *social surplus,* Resnick and Wolf (1987) defined class in terms of performance, appropriation, distributions and the receipt of surplus labour. These are terms of consumption that have distributional connotations for class. Chakrabarty *et al.* (2008: 674) built on the notion of a surplus by differentiating between a production surplus and a social surplus. Focusing on a social surplus, it is an excess over consumed class payments - class payments being distributions of surplus products or items having surplus value. The implication for poverty eradication is that a reduction in class payments (production surplus) results in a greater amount of social surplus being available to maximize conditions of existence or processes relating to need. Initially, Resnick and Wolf (*loc. cit.*) focused on surplus labour; subsequently, Chakrabarty (2008:675) unpacked surplus labour into components of production surplus and social surplus. The logic follows that to maximize the latter, minimize the former. To eradicate poverty, extract a portion of surplus beyond the existing production surplus. This can be illustrated through the following class equation that equates surplus value to the sum of subsumed class payments:

Darrell Myrick

$$SV^{1} = \Sigma \ SC$$

(1)

Where:

SV^{1} is the surplus value that materializes from surplus labour; SC is subsumed [inclusive] class payments pertaining to distributions and receipt of surplus labour. Further to the earlier discussion surplus value may also be construed as the sum total of surplus value distributed as social surplus (SS). This is illustrated as:

$$SV^{2} = SS = \Sigma \ SS_{n}$$

(2)

Where:

SV^{2} is the sum total surplus value equal to the sum of social surplus to the *nth payment.* Notably, the expectation is that there would be a distribution for socio-economic purposes such as poverty eradication, the elderly, education, improvements in infrastructure and the quality of life, etc. Putting equations 1 and 2 together allows for illustrating Total Surplus Value.

$$TSV = \{SV^{1} = \Sigma \ SC\} + \{SV^{2} = SS = \Sigma \ SS_{n}\}$$

(3)

Where:

As TSV is the combination or addition of surplus value and social surplus, it can be derived that by minimizing (shifting to become negative) surplus value, more social surplus will be available for distribution. The resulting equation is as follows:

$$\Sigma \ SS_{n} = TSV - \{SV^{1} = \Sigma \ SC\}^{1}$$

(4)

For this article a fundamental question remains to be answered – that is: How is it that class is necessary to eradicate poverty? The answer lies in

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[1] See Chakrabarti *et al.* (2008: 676-678) for the complete derivation for appropriated use value SUV.

identifying a production surplus as being based on class processes and recognizing that a social surplus (characterized by appropriation, distribution and receipt) is distinctly different from class processes. The distinction of a social surplus not being of class processes is inherent in the beneficiaries (the poverty stricken, children, elderly, the unemployed, the poor) who provide no conditions of existence to class process. Recall where it was stated that the poor cannot be defined in terms of any means of production. Thus the need of the poor and impoverished can only be addressed by class process that comes about by way of a production surplus. And again, a social surplus can only occur from minimizing a production surplus. The former could not exist without the latter – thus the need for class [processes] to eradicate poverty.

Social Mobility and Class Migration

Reading Parenti (1996) one might think that there is some grand strategy to keep the poor in their place – i.e., keep the poor "poor" and in a perpetual state of poverty. Rather, it is a paranoiac state of affairs to think that the government of the day conspires to restrict social mobility and the poor from becoming part of the working middle class. Parenti would argue that when the poor try to fight for a larger share of the pie, they are met with the full force of the capitalist state. Yet in and of itself, mobility is a paradox in that as a fundamental component of class structure (Lopreato & Hazelrigg, 1972), mobility resultantly diffuses and fragments class ideology. The definition of any one class is in flux due to the outflow and inflow of aspiring individuals - aspiring to better themselves, desiring to change occupations, their acquiring greater income, etc. There is little merit in arguing that the poor themselves desire to remain poor and not migrate to the next higher class. Their aspirations, however, nurture the dissociative function of class – individuals moving away, migrating either economically or at times physically by relocating. While social mobility promotes demographic diversification, it is an internal [class] destructive force making in this instance the poor class dynamic and again in flux. Consequently, some numbers of poor are motivated to migrate and become part of the working middle class.

Nonetheless, it is suggested that there is an inherent desire by the poor to move to a higher class or status group. It would appear that the most

obvious way to do this is through an occupational change but a change in occupation will not necessarily lead to a change in status. If occupations can be viewed in terms of social groups, the achievement of status within some social working group could be an opportunity to "move up the ladder." In the postmodern period this is characterized by social groups such as the professional versus the amateur, white collar versus blue collar, the supervisor versus the subordinate, the high income tax bracket versus the low income tax bracket and so forth. The achievement of membership in any of those supra-ordinate social groups can only be realized by migration or mobility – with exception to inheritance. In that instance, mobility and migration will be undesirable and downward.

Sorokin (1959) defines social mobility as the transition of an individual from one social position to another; social mobility can be horizontal or vertical. In the case of horizontal mobility, as the individual moves from one social group to another, the movement is on the same level. There is lateral movement but no upward mobility. In the case of vertical mobility, there is movement that is ascending or descending – termed respectively as social climbing or social sinking. For the poor, ascending social mobility would be most desirable. Social mobility of an ascending kind, characteristically, can occur through infiltration, creating one's own higher social group or insertion into a higher social [stratum] group. What is most interesting is that Sorokin expands on the concept of social mobility such that a number of propositions allow for discussing how individuals may move through a stratified society. Consequently, the literature allows for determining how rigid a society may be and the tendency for social inclusion or seclusion.

With a view towards South Africa, there is a pressing question that needs to be explored relative to social mobility and class migration. While the question obviously pertains to the status and movement of the poor, an empirical study on the movement of rural-urban migrants will facilitate an understanding of poor aspirants seeking to improve their quality of life by moving to South African cities. The question is what is the nature of the selection mechanism that motivates some to migrate to the urban areas while others remain in the rural areas? Those who do migrate, sadly, remain in a state of poverty in townships, locations and informal settlements. Notably, the phenomenon of rural-urban migration in South Africa is not unlike the

urbanization that took place during Victorian Britain. Long (2002) studied the socio-economic transition that took place at that time and provided an empirical model that can be used to simulate migration patterns and social mobility in South Africa.

Conclusion

Any discussion of class would be incomplete without reference to Marx and Marxist ideology's response to the poor and poverty. At the conception of Socialism and Marxism, the poor were disregarded and their state of poverty was accepted as a natural occurrence. Nevertheless, being poor and poverty are not absolute states of being. One can be gainfully employed and still be poor. Poverty and for that matter being poor, are binding forces between the poor and working classes. Arguably, there is a symbiotic relationship between the classes. However, in contrast to the poor the working class can at least be defined in terms of its labour and contribution to the production process. The working class thus produces surplus value and a portion of that surplus value entails a social surplus that benefits the poor. Without a working class, the poor would not be the beneficiaries of a social surplus resulting from the surplus labour of the working class.

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Marx, Class & Poverty - The Necessity of Class to Eradicate Poverty

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Differences between Managers' and Employees' Perceptions of Gender-Based Discrimination in a Selection of South African Organisations

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Abstract

Introduction: The relationship between employees and employers depends, among other things, on the level of consensus on what is perceived as fair or unfair in the workplace. When these perceptions are similar, a certain harmony results, but when there are appreciable differences, conflict may follow. Objective: To gauge the levels of difference in gender-based discrimination perceived by managers and employees. Method: Information was gathered from 145 managers and 1 740 employees working for 29 organisations, using the Fair Treatment at Work Survey and the Gender-Based Discrimination Questionnaire. This was a cross-sectional quantitative research design. Results: Both managers and employees pointed to gender-based discrimination as the primary source of discrimination in the workplace, more so than race or ethnicity. When presented with a list of the consequences of discrimination, managers and employees provided similar ranking orders. Confronted with the question of whether males or females enjoyed more privileges at the appointment, promotion, training and development levels, or whether remuneration for both gender groups was perceived as fair, managers and employees answered similarly. They agreed that most gender-based discrimination occurs at the appointment and promotion levels, and that less discrimination is experienced at the training, development and fair remuneration levels. They also concurred that discrimination sometimes occurs in favour of males and on certain occasions in favour of females. Conclusions: No real differences were found in the ways in which both managers and employees viewed the levels of discrimination in the workplace. The fact that gender-based discrimination was the most frequently listed type of discrimination suggests that more interventions should be implemented for its elimination.

Keywords: gender, discrimination, appointment, promotion, remuneration, South Africa

Introduction

This article discusses managers' and employees' perceptions of gender-based discrimination in the workplace. According to Robbins and Judge (2011), managers are concerned with the employee attitudes reflected in shifting perceptions of race, gender and other diversity issues. This concern may be valid, as perceptions often influence behaviour (Myers, 2008). The greater the difference in perceptions on an important issue, the greater is the possibility of conflict (Robbins & Judge, 2011). Moorhead and Griffen (2008: 411), referring to the context of the workplace, state that "conflict also may arise between people who have different beliefs or perceptions about some aspect of their work or their organization".

Conflict between managers and employees may be considered intergroup conflict. This type of conflict could relate to the fact that managers and employees have different goals (Moorhead & Griffen, 2008) or mutually exclusive aims (Ivancevick, Konopaske & Matteso, 2014). Intergroup conflict may also be the result of status incongruence (Ivancevick et al., 2014). The matter of status incongruence and conflict can be grounded in critical theory (Max Horkheimer), which suggests that the truth is created and uncreated by human beings, mostly by people in positions of authority (Higgs & Smith, 2006). Other theories that may be applicable are the social identity theory (Tajfel, 1981; Turner & Reynolds, 2004) and group-serving bias (Pettigrew, 1997), which explains differences in perceptions based purely on group membership. Social identity theory states, inter alia, that individuals contrast their own group (in-group) with others (out-group) and develop a favourable bias towards their own entity (Myers, 2008). Group-serving bias builds on this and suggests that in-group members explain away or negate the positive behaviours of out-group members (attributing them to situational circumstances) and ascribe negative behaviours disproportionately to out-group members' dispositions (personality and values), rather than more appropriately to situational circumstances (Myers, 2008). Tension between management and employees therefore seems inevitable.

In the context of South African labour legislation, the tension between

employers (who often include managers) and employees is evident. The Basic Conditions of Employment Act (RSA, 1997), for example, describes the duties of employers when dealing with situations involving employees. Empirical studies conducted in South Africa suggest that employers are involved in gender-based discrimination (see Ncayiyana, 2011; Pretorius, De Villiers Human, Niemann, Klinck & Alt 2002; Stone & Coetzee 2005). The topic of employers as agents of discrimination who therefore occupy a different and unequal position to that of employees is also evident in human resources management literature. Grogan (2007), for example, defines discrimination as the action whereby some are afforded benefits and others are denied access to them. Cascio (2010) adds a group element, stating that discrimination entails a group of individuals being given preferential treatment over others. Referring to gender-based discrimination, Channer, Abbassi and Ujan (2011) maintain that discrimination entails giving an unfair advantage or disadvantage to members of a particular gender rather than to members of the other gender. It is therefore through actions or activities that employers and managers discriminate in the workplace.

The aim of this article is to contrast the perceptions by managers and employees regarding gender-based discrimination in the workplace. Should managers and employees differ in the way they perceive discrimination in the workplace, tension may arise, which could lead to disputes. However, knowledge of such differences, and knowing exactly where the greatest number of differences occur may lead to awareness, which could minimise the likelihood of disputes. Awareness of where differences occur may also give rise to interventions that could create greater congruence between managers and employees.

Method
Respondents
Two groups of respondents participated in this study. The first group was comprised of managers who had a direct influence on the appointment, promotion and remuneration of employees. Five managers per organisation were targeted, namely the most senior human resources manager, the general manager, and three other senior managers, all of whom were directly involved in decision-making relating to personnel. Purposive sampling was used when selecting the managers (Cooper & Schindler, 2011). Only

managers from relatively large organisations were involved. In order to qualify for inclusion in the study, the organisations had to have a diverse workforce of at least 30 males and 30 females. The second group involved in the study was comprised of employees of these relatively large organisations where the managers worked. In each organisation, a random sample of 30 males and 30 females was drawn. This amounted to the stratified random sampling (Cooper & Schindler, 2011) of employees. In total, 29 organisations participated in the study. The companies approached were those to which students enrolled for the Master of Business Leadership programme at the Unisa Graduate School of Business Leadership had access, primarily on account of their own employment in these organisations. It was therefore a convenient organisational sample (Cooper & Schindler, 2011).

Procedure and Approach
Data on discrimination was collected by means of the Fair Treatment at Work Survey and the Gender-Based Discrimination Questionnaire. Respondents were asked to rank items (using the Fair Treatment at Work Survey) and to select options (in the Gender-Based Discrimination Questionnaire). The method of data collection represented a quantitative study. As the data was collected at a particular point in time, it can be seen as a cross-sectional design. This particular design is suitable for describing the population and relationships between variables (Shaughnessy, Zechmeister & Zechmeister, 2009). Before the managers and employees were asked to complete the questionnaires, they were given informed consent forms. After consenting, they were requested to answer all the questions that applied to them. They were requested to provide answers based only on their perceptions of their workplace, and not workplaces in general.

Measurements
Managers and employees were asked three questions about their work situation. The first two came from the Fair Treatment at Work Survey (Grainger & Fitzner, 2007). The questions in the Fair Treatment at Work Survey held different emphases for managers and employees. The first question put to managers read as follows: "In the last two years at this

organisation, has anyone been treated unfairly because of any of the following?" The equivalent question to the employees was: "In the last two years with this organisation, have you been treated unfairly because of any of the following?" The respondents could select any one (or more) of 19 possible reasons for saying they had been treated unfairly. This list included age, gender, nationality, religion, race or ethnic group, and 14 other possible reasons. The second question, also originating from the Fair Treatment at Work Survey, related to the consequences of the unfair treatment listed. For managers, it read as follows: "To what did the unfair treatment you have personally witnessed relate?" Question 2 for employees read as follows: "To what did the unfair treatment you have personally experienced relate?" The respondents could select any one (or more) of 18 possible consequences of being treated unfairly. These included salary, pension, other benefits, perks and bonuses other than pay, as well as 13 other possibilities. The data generated was ranked in order of the frequency of endorsements.

Question 3 related to access to the organisational resources and was comprised of four similar sub-questions. (Managers and employees were asked exactly the same question). In answer to the first sub-question, the respondents had to select one of three options:

(1) It is easier for a woman to get appointed to this organisation than it is for a man;
(2) It is equally difficult for a man or a woman to get appointed to this organisation; and
(3) It is easier for a man to get appointed to this organisation than it is for a woman.

The next three sub-questions were identical in structure to the first, except that the content related to promotion, access to training and development, and equal pay for equal work, instead of appointments. This measure was called the Gender-Based Discrimination Questionnaire, which was developed specifically for this research. Answers were treated as categorical data.

Data Analysis
The data was presented as frequencies and per organisational position, as

differences in scores between managers and employees were expected. In the case of the Fair Treatment at Work Survey, the statistical difference in ranking between the organisational position groups was calculated by using the Spearman rank-order correlation formula. The differences in scores for males and females on the Gender-Based Discrimination Questionnaire were calculated using the Pearson chi-square test. In all cases a significant level of less than .01 was seen as significant.

Ethical Considerations
Several ethical considerations were applicable in this study. The first was the use of students as fieldworkers. The students benefitted from collecting the data, which they used when writing their Master of Business Leadership research reports. A possible second ethical concern could be that students accessed respondents in the organisations where they were working, which could have allowed them to exercise undue influence over the respondents. This matter was addressed partly by the requirement that the Chief Executive Officer or Director-General first had to grant permission to conduct the research (suggesting that the student did not have ultimate authority in the setting). The students also had to obtain consent from the respondents. The informed consent form clearly stated that participation in the survey was voluntary and all the respondents gave consent before entering into the research.

Results
In total, data from 1,740 employees and 145 managers, working for 29 different companies, was captured. There were 871 male and 869 female employees. No enquiries were made about the gender of the managers as their anonymity would have been compromised, given that only five managers per company were targeted. The respondents were mostly from financial service providers (seven organisations), the government (seven organisations) and the mining sector (four organisations). Other sectors included the hospitality industry, the manufacturing industry and agriculture.

The results pertaining to Question 1, on the type of discrimination to which employees were exposed, and which managers witnessed at their re-spective companies, are presented in Table 1.

Table 1: Sources of Unfair Treatment at Work

Question 1 In the last two years with "this organisation" have you been treated unfairly (employees) / have you witnessed someone being treated unfairly (managers) because of any of the following?	Number of endorsements, percentage, and ranking: Managers (N=145)			Number of endorsements, percentage, and ranking: Employees (N=1 740)		
	Count	%	Rank	Count	%	Rank
My age	12	8.3	8	162	9.3	4
My gender	28	19.3	1	210	12.1	1
My nationality	16	11	4	86	4.9	10
My religion	5	3.4	16.5	56	3.2	14
My race or ethnic group	22	15.2	2.5	188	10.8	2
My sexual orientation	6	4.1	14.5	39	2.2	18
My disability	9	2.6	10	27	1.6	19
My long-term illness	14	9.7	6	40	2.3	17
My marital status	7	4.8	13	80	4.6	11.5
My political beliefs	10	6.9	9	52	3.0	15
My skin colour	22	15.2	2.5	171	9.8	3
My physical appearance	6	4.1	14.5	76	4.4	13
The way I dress	5	3.4	16.5	111	6.4	5
Being pregnant	13	9.0	7	48	2.8	16
Union membership	15	10.3	5	88	5.1	9
Accent or the way I speak	8	5.5	11.5	94	5.4	7
Address or where I live	3	2.1	18.5	80	4.6	11.5
My social class	3	2.1	18.5	89	5.1	8
My family responsibilities	8	5.5	11.5	102	5.9	6

The Spearman rank-order correlation was calculated to determine whether the groups entertained similar thoughts on the sources of unfair treatment in the workplace. The Spearman rank-order correlation value was .339, which was not significant at the .01 level. The rankings were therefore

not similar, suggesting that managers and employees reported differently on their testimony and experience of unfair treatment in the workplace. However, this result should be interpreted with caution, as the type of discrimination most frequently witnessed by managers and experienced by employees was gender-based. For both groups, gender was associated also with race or ethnic group and skin colour. Thus, despite the lists not being statistically similar, a definite overlap occurs at the top. Here, gender, the topic of this paper, is placed first by both groups.

As the main focus of this research is on gender-based discrimination, the significance of the difference in gender-based discrimination was considered in greater detail. Table 2 provides information on the count data in a two-by-two table reflecting position (management / employee) and reported gender discrimination (yes / no).

Table 2: Perceived unfair treatment: gender by organisational position

Question	Position	
	Employees	Managers
No: No gender discrimination	1529 (87.9%)	117 (80.7%)
Yes: Gender discrimination	210 (12.1%)	28 (19.3%)
Total	1739 (100.0%)	145 (100.0%)

Like Table 1, Table 2 shows that 12.1% of the employees reported falling victim to gender-based discrimination, while 19.3% of managers reported witnessing gender-based discrimination. The Pearson chi-square value was 6.347 (degrees of freedom = 1) and the asymptotic significance (2-sided) was equal to .012, and (just) more than .01, which indicated that the rows and columns of the contingency were not dependent. The Cramer's V value, suggestive of effect size, was .058 (p = .012), which indicates a lesser effect. Employees and managers therefore did not differ in the degree to which they reported on gender-based discrimination. This result should also be treated with caution, as the significance level is close to the fixed critical level of .01, which "became entrenched in minds of leading journal editors" (Rosenthal, Rosnow & Rubin, 2009: 5). The value should be used as a guide, rather than as a reason for sanctification (Rosenthal et al., 2009). In Table 3 below the consequences of discrimination per position are presented.

Table 3: Consequences of Unfair Treatment

Question 2 To what did the unfair treatment you personally experienced (employees) or witnessed (managers) relate?	Number of endorsements, percentage, and rankings: Managers (N=145)			Number of endorsements, percentage, and rankings: Employees (N=1740)		
	Count	%	Rank	Count	%	Rank
The pay you receive	18	12.4	7.5	388	22.3	1
Your pension	5	3.4	18	103	5.9	14
Other benefits, perks and bonuses, besides pay	21	14.5	4	343	19.7	2
Your working hours	18	12.4	7.5	200	11.5	7
Taking holidays	8	5.5	15	194	11.1	8
Applying for a job (horizontal movement)	24	16.6	2.5	222	12.8	6
Being promoted (vertical movement)	34	23.4	1	331	19.0	3
Receiving training	24	16.6	2.5	238	13.7	5
Disciplinary action	15	10.3	10	94	5.4	15
Redundancy	7	4.8	17	55	3.2	17
Early retirement	8	5.5	15	27	1.6	18
Being allowed to work flexibly (changing hours of work)	11	7.6	11.5	131	7.5	12
Being ignored	17	11.7	9	259	14.9	4
Being excluded from social activities	9	6.2	13	123	7.1	13
Not being part of social group	8	5.5	15	92	5.3	16
Type of work given	19	13.1	5.5	189	10.9	9
Bullying/ harassment	19	13.1	5.5	135	7.8	11
Falsely accused of something	11	7.6	11.5	141	8.1	10

The Spearman rank-order correlation, calculated to analyse the correla-

tion between the lists, was .753, which was significant at the .001 level. The rankings were therefore similar, suggesting that the workplace consequences of discrimination observed by managers and experienced by employees are comparable. Managers primarily perceived the consequences of discrimination as relating to promotions, job applications and receiving training, while employees viewed the effects of discrimination as relating to pay received, benefits besides pay and promotion.

The results pertaining to data gathered by means of the Gender-Based Discrimination Questionnaire are presented in the following tables. It is important to note that exactly the same questions were posed to the managers and the employees. Regarding the question on the fairness of the appointment process, approximately 61% of the respondents agreed that no gender-based discrimination occurred during this process.

Table 4: Perceived discrimination during appointments by position

Question	Position	
	Employees	Managers
It is easier for a woman to get appointed at … than it is for a man.	386 (22.3%)	25 (17.2%)
It is equally difficult for a man or a woman to get appointed at ...	1062 (61.3%)	89 (61.4%)
It is easier for a man to get appointed at …than it is for a woman.	285 (16.4%)	31 (21.4%)
Total	1733 (100%)	145 (100%)

Differences in scores between managers' and employees' perceptions were calculated, with the Pearson chi-square value of 3.484 (degrees of freedom = 2). The asymptotic significance (2-sided) was .175, and more than .01, indicating that the rows and columns of the contingency were not dependent. Table 4 shows that pro-female discrimination was reported more often by employees than by managers (22.3% versus 17.2%) and that pro-male discrimination was reported more often by managers than by employees (21.4% versus 16.4%).

Apropos of the promotion process, approximately 62% of all respondents selecting the middle option reported no difference in the way males and females were treated.

Table 5: Perceived discrimination regarding promotions by position

Question	Position	
	Employees	Managers
It is easier for a woman to get promoted at … than it is for a man.	359 (20.7%)	26 (17.9%)
It is equally difficult for a man or a woman to get promoted at ...	1074 (62.0%)	90 (62.1%)
It is easier for a man to get promoted at … than it is for a woman.	299 (17.3%)	29 (20.0%)
Total	1732 (100%)	145 (100%)

Differences between perceptions by managers and employees were calculated, with the Pearson chi-square value being 1.084 (degrees of freedom = 2) and the asymptotic significance (2-sided) equal to .582, and more than .01. This indicates that the rows and columns of the contingency were independent. Although the differences are not significant, it is interesting to note that employees reported more pro-female discrimination (20.7% versus 19.9%) whereas managers reported more incidents of pro-male discrimination (20.0% versus 17.3%).

Regarding access to training and development, most respondents, almost 76%, reported that males and females were treated equally.

Differences between perceptions by managers and employees were calculated, with the Pearson chi-square value being .408 (degrees of freedom = 2) and the asymptotic significance (2-sided) equal to .816, and more than .01. This indicates that the rows and columns of the contingency were independent. As for appointments and promotions, employees reported more pro-female discrimination (13.1% and 11.7%), whereas managers reported more pro-male discrimination (12.4% versus 11.1%).

Table 6: Perceived discrimination regarding access to training and development by position

Question	Position	
	Employees	Managers
It is easier for a woman to get access to training and development at ... than it is for a man.	227 (13.1%)	17 (11.7%)

It is equally difficult for a man or a woman to get access to training and development at ...	1310 (75.8%)	110 (75.9%)
It is easier for a man to get access to training and development at ... than it is for a woman.	192 (11.1%)	18 (12.4%)
Total	1729 (100%)	145 (100%)

When it came to equal pay for equal work, fewer employees (76.5%) than managers (81.4%) reported that no discrimination occurred.

Table 7: Perceived discrimination regarding equal-pay for equal work by position

Question	Position	
	Employees	Managers
Generally women get paid more than what would equate to their inputs, compared to men	133 (7.7%)	2 (1.4%)
The rule of equal pay for equal work is enforced at ...	1321 (76.5%)	118 (81.4%)
Generally men get paid more than what would equate to their inputs, compared to women	273 (15.8%)	25 (17.2%)
Total	1727 (100%)	145 (100%)

The differences between male and female perceptions were calculated, with the Pearson chi-square value being 8.002 (degrees of freedom = 2) and the asymptotic significance (2-sided) equal to .018, and (just) more than .01. This indicates that the rows and columns of the contingency were independent. The Cramer's V value, which is suggestive of effect size, was .068 (p = .018), which indicates a small effect. As in the case of the previous processes, employees reported more pro-female discrimination (7.7% versus 1.4%) and managers more pro-male discrimination (17.2% versus 15.8%).

Discussion

In this article the perceptions of gender-based discrimination by managers and employees are contrasted. Should managers and employees differ in the way they perceive discrimination in the workplace, tension may arise that could lead to disputes. However, knowledge of such differences may bring awareness, which could minimise the likelihood of conflict.

The responses reported in this article are those of male and female employees, almost exactly 50 per cent of each. The managers' gender was not asked for, but, given recent reports (see South African Institute of Race Relations, 2012), it may be assumed that the manager group was dominated by males.

Table 1 shows that both managers and employees perceived gender to be the primary reason for unfair treatment in the workplace. This finding coincides with the reports by Stangor, Lynch, Duan and Glass (1992), who stated that people are more attuned to gender than to any other characteristic, including race, when considering interpersonal differences.

Employees were asked about their own experiences of discrimination, while managers were asked about witnessing such acts. When comparing the percentage of incidents in which managers had witnessed gender-based discrimination with the percentage of incidents in which employees had experienced discrimination, one may expect the percentage of managers who had witnessed discrimination to be higher than the percentage of employees experiencing the same. One reason for expecting this difference was that employees were limited to reporting on themselves, while managers could report on many other details. The difference could also be anticipated, given the person/group discrimination discrepancy (Dixon, Durrheim, Tredoux, Tropp, Clack & Eaton, 2010; Taylor, Wright, Moghaddam & Lalonde, 1990), which suggests that individuals (say male managers) rate the discrimination suffered by their group (e.g. gender-based discrimination) as more severe than that suffered personally (say as male managers). As can be read from Table 2, this difference was not significant and the percentage of managers witnessing gender-based discrimination did not differ significantly from the percentage of employees experiencing discrimination. This result was not expected and it could be argued that managers are not sensitive enough to the discrimination experienced by employees.

The consequences or outcomes of discrimination in the workplace are perceived similarly by managers and employees (ρ = 753; p < .001). It is interesting to note that Table 3 shows managers referring primarily to human resources processes (namely promotions, job applications and receiving training), while employees refer to more concrete and direct outcomes (pay received, benefits other than pay and promotion) when they report on these consequences. This result suggests that, although managers may present the outcomes of discrimination in a more abstract manner, managers and employees largely concur on the outcomes of discrimination.

When using the Gender-Based Discrimination Questionnaire, managers and employees were shown to have similar perceptions of discrimination, as reflected in the non-significant results found with the chi-square tests performed. Tables 4-7 show that managers and employees agree to a similar extent that gender discrimination is not present in the workplace. With reference to the appointment process, 61.4% of managers and 61.3% of employees reported no discrimination. For the promotion process, these figures were 62.1% and 62.0% and for access to training and development they were 75.9% and 75.8%. In the case of fairness in remuneration, the difference was greater, with 81.4% of managers reporting no discrimination, compared with 76.5% of employees. Even this greater difference was not statistically significant. Other than this, managers and employees held similar perceptions of non-discrimination in different human resources management processes.

Considering the Gender-Based Discrimination Questionnaire, it is interesting to note that managers reported less pro-female discrimination and more pro-male discrimination (see Tables 4 - 7). With reference to fair remuneration, for example, in Table 4, employees reported pro-female discrimination more often than managers did (22.3% versus 17.2%), whereas pro-male discrimination was reported more often by managers (21.4% versus 16.4%). However, these differences were not significant and may constitute a topic for investigation at a later stage.

A further important point pertaining to the Gender-Based Discrimination Questionnaire is the agreement between managers and employees on the stages at which most incidents of discrimination occur, in other words, where non-discrimination is at the lowest levels. Tables 4 and 5 show that the level of non-discrimination the appointment level was about 61/62%, and

that both managers and employees judged it to be at that level. Approximately the same result was found when it came to promotions. More non-discrimination occurs at access to training and development (around 76 %) and even more at the remuneration level (see Tables 6 and 7). This suggests that most episodes of discrimination occur at the appointment and promotion levels and that the least of these incidents occur at the access to training and development and remuneration levels. Managers and employees agree about this.

Conclusion

This research focused on the differences between managers and employees on their experiences of workplace discrimination, specifically gender-based discrimination. The results show that both managers and employees deem gender-based discrimination to be the most important source of discrimination in the workplace. Interventions into the elimination of discrimination should therefore focus on this type of discrimination rather than on the issue of race, which seems paramount in most initiatives in South Africa. The proliferation of programmes such as Broad-Based Black Economic Empowerment (RSA, 2003) echoes the emphasis currently placed on race. No gender-based equivalence of such a program is available.

Although managers perceived discrimination to be the most pertinent source of discrimination in the workplace, it was expected that they would proportionately witness more discrimination than that experienced by employees. It may thus be hypothesised that managers are not sufficiently alert in detecting discrimination in the workplace. It could be suggested that managers receive sensitivity training to become more aware of the manifestations of discrimination in the workplace. Frame-of-reference training seems effective in this regard (Bernardin & Buckley, 1981), while rater-error-training seems to have some positive short-term effects (Fay & Latham, 1982).

Managers and employees are in consensus that most discrimination occurs at the appointment and promotion levels and that the least discrimination occurs at the access to training and development and remuneration levels. This consensus opens up the opportunity for human resources practitioners to focus on the first two practices when they develop programmes, as this seems to be important to both managers and employees.

The level of consensus at the human resources practice level could also be used to leverage co-operation between managers and their employees. Human resources managers or individuals involved in organisational change interventions should note this consensus.

The research had some limitations. The first relates to the difference between the questions posed to the managers and employees. Although the response repertoires were identical, Questions 1 and 2 (posed to both managers and employees) differed slightly. This limited the possibility of comparing the responses. A further limitation was that the respondents were asked about the effects of discrimination in general in the workplace. The question thus did not direct their attention specifically to gender-based discrimination. The results reported may thus be ambiguous, but it should also be noted that gender-based discrimination was mentioned most often by both managers and employees.

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Collaborative Learning among South African MBA Students

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Abstract

The purpose of this study was to explore how learning amongst South African MBA students could be enhanced through collaborative learning. Collaborative learning groups are established in MBA programmes to build team-working skills, which will enhance the employability of MBA graduates and foster good performance in workplace settings. However, it had been observed that not all students agreed that this outcome materialized, although schools advised that the syndicate groups created by the school were the ideal vehicle for learning, where interaction and debate could flourish. Semi-structured in-depth interviews were used to gather qualitative data from a purposively selected sample of 13 current MBA students from accredited business schools in the Gauteng province of South Africa. Data were analyzed through coding, classifying and mapping of transcripts. The key insight was that "learning" (i.e. "conent") did not emerge as an objective, either overtly or covertly. Students were adamant that their goal was to submit an assignment and learn something about teams in the process. Business schools should re-evaluate their assumptions about effective group learning, and modify the assessments to maximize both team effectiveness and learning. Students need to embrace opportunities to facilitate their own group processes (including diversity management and dealing effectively with conflict) to achieve their goals.

Keywords: Study groups; collaborative learning; group learning; MBA; teams.

Introduction

The purpose of this research was to determine how learning amongst South African MBA students could be enhanced through collaborative learning. The study was undertaken because it had been observed that group work on MBA programs (in the form of syndicates), had many shortfalls, and was

seen by many students to be not particularly effective. It has been widely acknowledged that working in teams is a critical workplace skill (Johnson & Johnson 1989; Bacon, Stewart & Silver 1999; Chapman *et al.* 2006; Beals 2010), and the use of syndicate groups in MBA courses is intended to teach students to work effectively in teams. On this basis it has been assumed that the study group phenomenon with post-experience MBA students proxies the functioning of work groups or teams in the business setting, so that conclusions may possibly be transferable to the work setting.

Assessment on MBA programs is generally through similar mechanisms, eg two formative assessment assignments (one individual and one in groups, comprising six to eight students in syndicates with school imposed membership) and a summative assessment in the form of an examination or a research proposal. The two assignments contribute 25% each to the final mark and the final assessment 50%. It transpired that a large number of students found syndicate work ineffective and frustrating; consequently they formed parallel study groups with self-selected controlled access to membership. This report explores perceptions of both syndicate and study group learning experiences and to suggest ways in which learning effectiveness in the MBA program could be optimized through collaborative learning. The study examines, amongst other things, cooperative learning principles, team development and adult learning theory.

Problem Statement

The problem was to explore ways in which collaborative learning approaches can be applied in South African MBA classrooms, to enhance both content learning and team working skills. The team working skills are anticipated to boost effectiveness and productivity back in the workplace, to the benefit of both graduates and the organizations.

Literature Review

Learning Theories

Behlol and Dad (2010), in their literature review on concepts of learning, described how early definitions of learning were characterized by 'stimulus-response' mechanisms, where learning was perceived largely as memorizing and rote learning, leading to a quantitative increase in knowledge. In 1979, Säljö (1979) had added to these definitions of learning, by positioning it as

an intellectual process, wherein learning went beyond memorizing and included concepts such as sense-making, abstracting meaning from information, interpreting and understanding realities in different ways and reorganizing facts into new configurations.

More recent research into the realm of learning (Merriam 2001; Marquardt & Waddill 2004; Kolb & Kolb 2005; Bergsteiner, Avery & Neumann 2010) support these views in the move towards one of mental processing and internal sense-making. One of the better known learning theories is that of Kolb and Kolb (2005), where they posit a cognitivist theory of learning, which is built on six propositions:

a) Learning is a process, not an outcome. To improve learning in higher education, the primary focus should be on engaging students in a process that best enhances their learning, a process that includes feedback on the effectiveness of their learning efforts.
b) All learning is relearning and can be built on the students' beliefs and ideas about a topic so that they can be re-examined, re-tested, and re-integrated.
c) Learning requires the resolution of conflicts between opposing modes of adaptation to the world. Learning is fuelled by conflict, differences and disagreement, which the individual must move between using reflection, action, feeling and thinking.
d) Learning is a holistic process and does not solely entail cognition. It requires the integrated functioning of the person, i.e. thinking, feeling, perceiving and behaving.
e) Learning results from active engagement between the person and the environment whereby new experiences are interpreted in relation to existing concepts and experiences.
f) Learning is the process of creating knowledge whereby social knowledge is created and recreated in the personal knowledge of the learner. Learning is thus unlike the transmission models where pre-existing fixed ideas are transmitted to the learner.

Kolb's model sees the learner going through the phases of experiencing something unfamiliar or new, reflecting on that experience before applying cognitive processing (thinking about it - particularly with reference to known

facts, eg published material), constructing their own interpretation of how it should be done, then actually attempting the new task.

Andragogy

Adult learning has made a significant shift away from early learning theory, with the popularization of andragogy (Knowles 1975) representing the shift away from viewing adult learners in the same light as child learners (Daloisio & Firestone 1983; Mitchell & Courtney 2005; De Dea Roglio & Light 2009). Soney (2003:17) refers to adult learners as, "*They're not just big kids*", referring to the incorrect and common application of the term "pedagogy" to adult learning.

Knowles' (1975) principles of andragogy is reinforced by Mitchell and Courtney (2005). Knowles (1975:85-87) defines adult learning in its broadest sense as "self-directed learning", which refers to the process in which individuals take initiative for their own learning, i.e. they diagnose their needs, formulate learning goals, identify appropriate resources, implement appropriate learning strategies and evaluate learning outcomes. More importantly, the definition extends to state that self-directed learning usually occurs in association with "helpers, such as teachers, tutors, masters and peers". He identified the conditions that must be met when seeking to educate adults successfully. These conditions are:

a) Learners must feel a need to learn, usually on the basis of an identified knowledge or skill gap;
b) The learning intervention objectives must align with their identified need;
c) Mutual trust, respect and helpfulness, freedom of expression, and acceptance of differences should characterize the learning environment;
d) The learners must accept responsibility for their own learning (the facilitator being responsible for teaching);
e) Active commitment to and participation in the learning process by the learners is fundamental;
f) The learning process must be cognizant of the learner's existing knowledge and experience; and

g) The learners should welcome and embrace feedback and use it to progress towards their desired outcome.

Gom (2009) and Illeris (2009) reiterate the points above; adults will always go through some form of internal self-dialogue, during which they question the reasons behind the purpose of the knowledge transfer, the usability of the knowledge, and how the knowledge fits into the individual's life perspectives (Illeris 2009). Therefore, outside influences, irrespective of the forms in which they transpire, (eg conversation, guidance, persuasion, pressure or compulsion), are always received in the light of the adult's own experience and perspectives.

Other adult learning theories have been presented by Kiely, Sandmann and Truluck (2004) and Trotter (2006). Kiely *et al.* (2004) have developed a theoretical model, which underpins adult learning which they refer to as the four lens model. They contend that the four lenses combined provide a holistic perspective of how adults learn and what must be done contextually to facilitate such learning. If used on its own, each individual lens will provide insight into the specific component of the adult learning process. The four lenses are:

1. Learner: This lens focuses on participation and motivation patterns, the characteristics of adult learners, learning styles, self-direction, the role of experience and andragogy amongst others. This positions the learner as an active participant, which must be engaged with to facilitate learning.
2. Process: Refers to the 'how' of adult learning. Is it instructional versus interactive, what is the role of dialogue, why is reflection important and how can experiential learning drive adult learning?
3. Educator: The role of the educator is highlighted here with educator orientation, beliefs and style cited as a key determinant in the success of the knowledge acquisition by the adult learner. The educator is positioned as an enabler and facilitator.
4. Context: The authors argue that learning is not an individual process but rather a social process, based on interaction, socialisation and dialogue. The physical context is also an important factor as it influences how the individual responds to a changing environment.

Cooperative / Collaborative Learning

A working definition of cooperative learning is offered by Johnson and Johnson (1999:2) who describe it as "the instructional use of small groups enabling students to work together towards the maximization of their own and others' learning". They suggest that the benefit of the cooperative learning model is that it develops and reinforces active learning, such as learning how to learn, interpersonal communication and teamwork. These skills are in demand in many professional sectors. They proposed a model of cooperative learning that encompasses five basic elements, *viz.* positive interdependence, individual accountability, face-to-face promotive action, social skills and group processing. They argue these must be present for an activity to be considered cooperative. In various publications, they (Johnson & Johnson 1993, 1999; Johnson *et al.* 1990) describe that students not only achieve higher grades in cooperative learning but they also acquire social skills and values, which benefit them throughout their lives. Cooperative learning also encouraged higher-order critical thinking and problem solving skills (Koppenhaver & Shrader 2003). Similarly, Beals (2010:2) shared that, at MIT, "most students learn fundamental concepts more successfully, and are better able to apply them, through interactive, collaborative, student-centered learning.…" and Shihab (2011) found that students within successful cooperative learning environments exhibit greater intrinsic motivation to learn and consequently, achieve higher grades.

Johnson and Johnson (1999) emphasize that instructors / lecturers at schools have a responsibility to create an environment conducive to collaborative learning, which should include developing the required social skills needed to enable group functioning. Shimazoe and Aldrich (2010) concur with this skills development sentiment and suggested tangible actions which could be taken to ensure the successful implementation of cooperative learning. These include the establishment of group goals and rewards, communication of the cooperative process to students, the development of students' social skills before classroom groups start engaging and monitoring group performance through peer evaluation and other techniques.

However, cooperative learning is not without its pitfalls. The effects of cooperative learning do not merely arise through the formation of work groups (Johnson *et al.* 1990). These authors had pointed out that students may be unsure of course goals, which can be remedied by the instructor

carefully structuring the assignment to facilitate understanding. It is up to the lecturer to create this environment and not to abdicate their responsibility (Bacon, Stewart & Silver 1999), which could result in students becoming unproductive and disillusioned. Other factors affecting group learning are; the length of time the team exists, with longer times resulting in greater learning, how the members were selected, with moderated self-selection seemingly the most effective and the proportion of the final mark allocated to teamwork.

Fellers (1993) highlights a fundamental flaw in the cooperative learning process, that is, the widely held belief that anyone who has expertise in a given field can teach. This belief, he argues, must be based on the incorrect assumption that content (what is taught) is more important than process (how it is taught). This error, according to the same author, explains the non-realization of syndicate goals, which can only be corrected by ensuring the correct mix of skills and knowledge is combined into such cooperative learning groups. Koppenhaver and Shrader (2003) point out that cooperative groups require additional time to meet, which provides an increased opportunity for group conflict. They further argue that such groups may create a sense of frustration amongst high achievement individuals who may believe that they are doing the job of the instructor, while seemingly not gaining much benefit from the group. Furthermore, research conducted by Krause and Stark (2010) found that cooperative learning did not necessarily facilitate learning when comparing students who worked individually and students working in groups.

Intragroup diversity was found by Shaw (2004) to benefit creative thinking and innovative solutions in learning groups. However, if the heterogeneity was too great, learning suffered (Chin-Min 2011). This author observed that groups with extremely diverse characteristics, particularly regarding learning ethic, abilities and learning styles, are forced to work together, difficulties and conflict may arise leading to dysfunctional behavior in the group, resulting in the loss of benefits associated with cooperative learning.

Thus, to summarize, pitfalls of this type of learning include a) a low level of involvement by the course facilitator b) not teaching the learners both content and process, including social skills and emotional intelligence c) not allowing enough time for meetings and collaboration, d) diversity can

lead to conflict instead of synergy and e) the group needs to be allowed to go through the normal cycles of team development.

The next section in this review of the literature examines some of the popular theories on team functioning

Team Theory

Learning to work together in a group may be one of the most important interpersonal skills a person can develop since this will influence one's employability, productivity, and career success (Johnson & Johnson 1989:32).

In the context of this study, team development is an important aspect, which contributes to the understanding of the functioning of the cooperative work group. Team development, team processes and team / individual assessments are included in this discussion.

Models

The concept of team theory and team effectiveness is widely reported in academic literature. For the purposes of this paper, two team development frameworks are utilized, *viz.* the Tuckman and Jensen (1977) team development model, and the "Big Five" model developed by Salas, Sims, and Burke (2005), which was based on their earlier TEAM model (Morgan Jr, Salas & Glickman 1993). The first model was selected due to its widespread popularity and ease of application to the team context. Its current value has been described by Betts (2010) and confirmed in a comprehensive review (Bonebright 2010:119) of the development of the model in which the concluding remark is "HRD scholars and practitioners can learn something from a model that has proved valuable for almost 45 years. The utility of providing a simple, accessible starting point for conversations about key issues of group dynamics has not diminished".

The five phases of team development (Betts 2010; Tuckman & Jensen 1977) are: forming, storming, norming, performing and adjourning. This model emphasizes the stages involved in-group development, with high levels of energy and productivity visible in the early stages of team formation. The team then goes through a phase of intense questioning, disagreement with jostling for power and position, which impacts negatively on team performance. As this stage passes, energy and productivity levels

settle with the team progressing towards high performance. The fifth stage of adjourning was added later, as it takes into account the end of a particular cycle of activity or project.

The TEAM model (Morgan Jr, Salas & Glickman 1993) splits the Tuckman and Jensen (1977) model into task work and team work and incorporates its phases. They describe how team-building efforts often show no correlation to increased team performance unless combined with task work – equally and in parallel. The more recent work, lead by Salas (Salas, Sims & Burke 2005:555) built on the this model, and suggested that the "Big-Five" of team work are, "team leadership, mutual performance monitoring, backup behavior, adaptability, and team orientation", and that team development is driven by supporting coordinating mechanisms: viz. "shared mental modes, closed-loop communication, and mutual trust". In a subsequent systematic review of the literature (Wildman *et al.* 2012), it was reported that there are still numerous research gaps relating to teams, including, amongst other things, the acknowledgement that there is a need for more unified theories, suggesting that the ideal model is yet to be found.

Other Team Characteristics

These include team synergy in which it has been highlighted (Cohen & Bailey 1997) that effective team performance is not the natural outcome of bringing together a team to accomplish interdependent tasks. The authors argue that it is not sufficient that each individual optimally performs his/her own tasks, but it is fundamental that each individual adjusts to complement the other. This is much like any team sport, in which an individual's performance can make the whole team either win or lose.

Team stability is another factor; teams characterized by low levels of turnover and comprising people who have played together extensively in the past, achieve on average better performances than teams that implement major changes in their rosters every year (Montanari, Silvestri & Gallo 2008).

It has also been acknowledged (Kearney, Gebert & Voelpel 2009) that the diverse assortment of knowledge, skills and perspectives in the group should in enhance team performance, even though a large body of literature has indicated that people prefer to work with similar rather than dissimilar

individuals. It is the dissimilarities among team members, which are argued to give rise to conflict.

Relationships between team members; Shu-Cheng, Chiung-Yi and Artemis (2010) distinguish between relational and task conflict where relational conflict is defined as members' experiences of negative emotions due to their differences in beliefs and values. Task conflict refers to disagreements about procedures, policies, or resource allocations. These authors found that relational conflict had a detrimental effect on team performance.

Research Methodology

Semi-structured in-depth interviews were used to gather qualitative data from a purposively selected sample of 13 current MBA students from accredited business schools in the Gauteng province of South Africa. Data were analyzed through coding, classifying and mapping of transcripts (Jansen 2010). Although the findings may not be generalized beyond South African MBA students, it is hoped that they will provide useful andragogical (as opposed to pedagogical) input to programs in similar contexts.

Results and Discussion

Learning Theory Analysis

A notable observation from the majority of the respondents (eight) was something not stated specifically, but implied. This was that "learning" did not seem to be primary objective of the syndicate exercises, but rather the aim was to "get the assignment submitted". This emerged during discussions on the phases of team development (Morgan Jr, Salas & Glickman 1993; Tuckman & Jensen 1977), when students were defining the "performing" stage. This highlights one of the key cautions about collaborative learning regarding the role of the lecturer (Bacon, Stewart & Silver 1999) in making the objectives clear and teaching that both team and task objectives existed. This deficiency is somewhat alarming in a university context, and may link to Fellers' (1993) observation about academics not necessarily having acquired teaching (and by implication, assessment) skills.

A summarized view of cooperative learning (Johnson & Johnson 1999; Shimazoe & Aldrich 2010) is the perception that we are linked to others in

such a manner that we cannot succeed unless we help them to succeed; our actions benefit them and their actions benefit us, a respondent said, "there's not much synergy, it's all about compromise". A perspective emerged relating to the need for a critical mass or coalition in the group, if effecting positive change in behavior was to be achieved. One respondent summarized this sentiment, "Unfortunately we were in the minority and another quick learning was that unless you have a critical mass of people willing to work, there is no way the syndicate will achieve what intends to achieve".

There are two elements to the definition of individual accountability (Shimazoe & Aldrich 2010; Johnson & Johnson 1999; Bulut 2010). The first relates to group members being held individually accountable to perform their work and the second to sharing of performance and feedback with all group members. Syndicate group members seldom held team members accountable for non-performance as, "it was often easier just to redo the work or get it done myself", and "I don't want to create unpleasantness" Laszlo, Laszlo and Johnsen (2009) queried the value of cooperative work groups to high-ability individuals, particularly in instances when the groups also comprised individuals with medium and low abilities, "he just doesn't get it! We've got a deadline to meet, and I'm already going through the night on other work". The overall view was that "no-one really wins. Sure, the assignment goes in, but it's the work of a few of us usually, so we're overloaded while the rest don't do anything and don't get any better for the next one". Laszlo *et al.* (2009) sought to validate the effect that cooperative work group settings have on the self-esteem and performance of high-ability individuals. The results of their study showed that individuals achieved more in a cooperative group setting (as opposed to a group in conflict) than the individualistic learning setting, as the cooperation and challenge within the group promoted a higher level of reasoning.

Three respondents working in parallel, self-assigned study groups were much more content with their learning experiences based on group cohesion and respect between members – although they could not be said to be guilty of "groupthink", "I think that I got so much value from the group that I realized I may not feel comfortable actually fighting in the group. I knew that I was getting something out from the group, in fact probably getting more than I was giving. It was worth not rocking the boat". A certain competitiveness amongst members appeared to be positive, "In my study

group, we were in it for the team. If I wasn't on the Dean's List, then I wanted one of my study group to be there. Knowing that I helped you get there was a sense of pride". Such statements are also indicative of face-to-face promotive action, ie promoting others' success by helping, supporting encouraging and praising individual efforts, taking time to explain and discuss problems and issues

Team members must be socially competent, and must have the requisite leadership, decision-making, trust building, communication and conflict management skills if they are to contribute to the success of the group (Johnson & Johnson 1989). Using this definition as the basis for assessment, it was clear that the syndicate groups presented with a mixed bag of social skills.

Decision-making skills appeared to negatively impacted by the nature of group dynamics, where initially, respondents indicated, ""So we often ended up having two hours of discussion, with no decision in sight, filled with high levels of tension. In the end, the general sense of "do what you want" prevailed". This sentiment prevailed in all syndicate groups, especially related to the early part of the MBA. Decisions were thus arrived at because of time pressures or because group members were frustrated at the duration of syndicate group meetings. The level of relationship building skills amongst team members also seemed to vary between groups and specifically, amongst certain individuals. Most respondents found at least one person in the group with whom they "gelled', and often this relationship formed the basis of "a coalition within the group to achieve some positive outcome". In other instances, the relationships between group members were strained due to a lack of basic interpersonal skills.

Group processing refers to the ability of the team to reach a point where there is open discussion about goal achievement and team relationships, which ultimately enables the team to drive the type of behavior it desires. Closely linked to open dialogue about relationships is the management of conflict within the group, which many respondents indicated, was managed poorly within the group. Syndicate groups preferred to ignore non-performance and other issues and focus on getting the job done, "We actively chose not to argue when people did not come prepared as often, the argument would take longer than just putting our heads down and getting the work done."

The groups' propensity to avoid risk seems to rest on the importance some respondents placed on using the MBA to develop a network, and they feared that providing feedback would result in conflict which could impact on the value of the individual in one's network. A specific example was provided by a respondent who was a member of one of the study groups regarding the performance of two colleagues, "What was particularly interesting for me in this group was that we had two people who probably contributed less to the group, yet we carried them. In essence, they didn't really contribute to the study group such that they probably got more benefit from it then we got from them. Yet we tolerated that". This respondent was questioned regarding the group's unwillingness to deal with the issue and could not explain the inaction. At best, he suggested that their behavior had not caused harm to the group, which made their membership of the group more palatable. This lack of action contradicts research by Laszlo *et al.* (2009) which found that team members who shirk their responsibilities result in dissonance being created in the team, which is closely followed by remedial action.

Team Theory Analysis

In relation to the Tuckman and Jensen (1977) model: "forming" was excluded from the discussion by ten of the 13 respondents as they felt that the syndicate groups were not self-forming, as indicated by one, "In our first syndicate, we were put into a group and that was essentially the formation of the group". To these group members, the first phase of the model experienced was that of storming. In the three instances where group forming was induced, respondents indicated that members made a conscious effort to get to know each other, "The main one that you would see is 'forming' because everyone is meeting each other. Syndicate groups were interesting as it forced you to get to know people whom you have never met". Both these perspectives are interesting as in the former, 'there was no forming', where it appears that syndicate group members may not have realized that forming was still a necessary part of the team development process. It is also likely that their understanding of forming may have been limited solely to the coming together of the group, and the need to explore, to find common ground, to agree that objectives or similar were missed. In the second perspective, it appears that the groups actively engaged in

forming behavior. This level of tolerance and politeness as referred to by Staggers, Garcia and Nagelhout (2008) decreased substantially as members progressed to their second syndicate group.

The storming phase (Tuckman & Jensen 1977) relates to the period after the joy and harmony of meeting new team members. The team begins to deal with the reasons for its existence and the individual personalities and aspirations begin to manifest in terms of how the team operate. Staggers, Garcia and Nagelhout (2008) refer to this stage as the 'why we are here' phase. Of all the stages, this one elicited the highest levels of emotive responses. The majority of descriptors relating to disagreements were regarding approaches to tasks and the interpretation and application of theories and concepts. These disagreements were also driven by power plays within the group as some members of the group jostled for leadership.

The norming phase relates to the group beginning to find itself i.e. the sense that the group is beginning to function as it should. The groups are positive and 'play-up' the benefit of group work. Whilst this was successful in some cases, some groups didn't really move beyond "storming". Assignment submissions were sometimes made despite the challenging nature of the group rather than because it was functioning effectively.

The definition of performing was inconsistent across respondents, and hence syndicates. Some defined syndicate group performance as the successful delivery of an assignment on its due date. Several respondents were dissatisfied with mere submission, "Yes, we got them in, but I know they pulled my marks down" and "It's SO frustrating that some people just can't write properly". Others defined performing as the submission of an assignment of a particularly high standard on the due date. The final definition that emerged was that performance of a syndicate extended beyond the submission of an assignment and included the extent to which a syndicate group had effectively learnt. One student shared, "the problem is that people in charge of a particular assignment are the ones who are good at that topic. Like finance – I'm hopeless and I'm never going to learn anything when the accountants do those ones". She said that she believed syndicate groups never reached the performing stage based on her definition of the syndicate group as a vehicle for learning.

All respondents referred to adjourning as the end of the semester, and the group disbanded. The six-month syndicate group cycle had become

normal to respondents, with no formal adjourning process to signify the end of the syndicate group reported by respondents.

Many respondents indicated that six months was not a sufficient time span for all of the stages to materialize, and that the continuous changing of the groups only increased the levels of stress which they had to manage, "there's no time to do teamwork. We are just getting to know each other when we all have to change again". This aligns with previous research (Montanari, Silvestri & Gallo 2008; Cohen & Bailey 1997) relating to the negative impact of high turnover in groups.

In relation to the TEAM model (Morgan Jr, Salas & Glickman 1993): the perception of teamwork and task work was clearly described by respondents. Syndicate group work was perceived by all 13 respondents to be task work orientated, which linked to their definition of performing. Conflict in the first syndicate group experience was common across the sample, and typically related to disagreements on the understanding of the scope of an assignment, or differing perspectives on the application of key concepts, "I didn't understand it that way. I'm sure what he meant was . . .". This is another indicator of lack of clarity in assignment instruction (Fellers 1993). The likelihood of conflict in the first semester was high, particularly as most respondents felt that this was the period when many class members were trying to establish themselves, or as respondents put it, "make their voices heard". People wanted to make an impression and often this meant not backing down from a point of view.

The levels of conflict identified by respondents could be grouped into 1) personality clashes or disagreements about interpretation or the application of concepts or models, 2) task-linked tensions where forced control over syndicate group assignments around timeliness and quality emerged. This resulted in some marginalization of team members and the consequent formation of subgroups, 3) perceived aggression, verbal or otherwise, related to stress and repeated episodes of emotional outbursts / crying, which lead to breakdowns in communication, and 4) slander or defamation of character, or behavior perceived as such. Disciplinary processes were invoked and there was a breakdown in group structure and functioning. This could be interpreted as an extreme form of storming (Morgan Jr, Salas & Glickman 1993; Tuckman & Jensen 1977), and use of

social skills (Shu-Cheng, Chiung-Yi & Artemis 2010; Edwards *et al.* 2006) would be stretched.

Smith, Johnson and Johnson (1984) found that controversy at a level of disagreement on ideas, information, conclusions or theories, contributes to team performance as the process the team must engage in to find solutions stimulates thought and reflection. This sentiment is also aligned with the task work definition of controversy proposed by Shu-Cheng, Chiung-Yi and Artemis (2010). A respondent in the latter group used the words "... diplomacy fatigue" to describe the onset of conflict on her part in a syndicate group. In another, an individual had instituted legal action against a fellow group member if a public apology was not provided for comments passed about the other's perceived lack of contribution to the group assignment. These incidents are similar to those previously reported (Shu-Cheng, Chiung-Yi & Artemis 2010), where it was identified that relational controversy in which disagreements occur due to different beliefs and values are detrimental to the team.

In line with the research findings from Kearney, Gebert and Voelpel (2009), respondents in general agreed that demographic diversity contributed to the effectiveness of syndicate groups, and different perspectives added value both to tasks at hand and to personal growth. Responses to cognitive diversity, however, indicated concerns regarding the spread of skills, resources and experiences in the make-up of syndicate groups, "we're just different, that's all".

It appears that the perceived time wastage as the group tip-toed in the early ("forming") (Betts 2010) stages, identifying different levels of work ethic, different aspirations and unexpected levels of individual competence. The one issue mentioned by all respondents related to the presence of individuals who were keen to contribute as little as possible to the syndicate group, who often refused to attend syndicate group meetings and, when they did attend, found reason to leave early, "those two are just excess baggage, free-loaders. Can't we chuck them out? We can't let them just get away with it!". The impact of having these individuals was significant as it meant that the remaining syndicate group members had to carry an extra burden, as summarised by this respondent, "Syndicate work was probably the worst experience in my life, I have never in my life spent so much time working such late hours, doing other people's work, and reviewing other people's

"drivel"". This response adds support to findings by Sonnentag and Volmer (2010), which highlighted the negative impact of the lack of a common goal amongst team members, which is very much aligned to the experiences mentioned here. Learning or the lack thereof, was a key factor in the group dynamics, which occurred. However, a narrow definition of learning may have robbed many of an ideal opportunity for self-growth and development. Learning as a positive outcome from the first syndicate group seemed to occur only for those who were able to realize that there was something to be learnt, and that they should have differentiated between content and process learning much sooner in the MBA program. Where this differentiation was not made, the learning opportunity was lost.

Additional Findings

Voluntary formation of parallel study groups; "Stated simply, it (the group) formed by excluding the people who were not willing to contribute and we continued with people all were contributing and who added value to the learning experience. That's the basics behind the formation of the study group. It was born out of people looking for common ground, common values, similar expectations, and found those characteristics in other individuals. It was born out of necessity". The formation of study groups represents a key development in the syndicate group process. These groups were self-forming, self-regulating, entry-controlled groups (Chapman *et al.* 2006) consisting of individuals who shared similar aspirations of the program. Nine respondents were in some form of study group whilst two respondents had never participated in a study group and preferred to study alone. The remaining two participated in study groups on an ad hoc basis, usually driven by the complexity of course subject matter. There was a common sentiment expressed by respondents who were members of study groups, regarding the relevance of these stages. Notably that as study groups were naturally formed, the initial 'getting to know you' of the forming stage enhanced the foundation of the group (Bonebright 2010). Consequently, the storming phase in study groups was less about wanting to impress others with one's cognitive prowess or about personality issues, and more about the core objective of the group. By the time the study groups started storming, it appears there were strong working relationships established, with sufficient levels of mutual trust and respect (Wildman *et al.* 2012) to overcome some

of the issues that may have arisen. This foundational strength of relationship amongst study group members was described by Edwards *et al.* (2006). It is also likely the self-forming nature of the study groups contributed to team performance as the TEAM model (Bonebright 2010) posits that the forming phase is one where individuals are testing each other in terms of trust and dependability, without which the storming phase will be characterized by emotional responses to task demands and intragroup conflict.

What is clear is that in instances where a group made the distinction between the two streams of teamwork and task work, and adapted these as required, these groups claim to have benefitted and achieved more from the group. Both demographic and cognitive diversity (Kozlowski & Ilgen 2006) were reported to have a positive influence on the group. This was especially marked where the group had selected individuals with specific skills – they were able to do well across most MBA disciplines.

By far, the biggest drawback of participating in a study group is the need to invest additional time and effort into an already challenging schedule. Respondents indicated that whilst their families or partners may have understood their need for the study group, it was an added source of pressure (Carmichael & Sutherland 2005).

Conclusions

This study found that MBA students find the formalized syndicate study groups with purely imposed membership a hindrance to learning rather than a facilitating mechanism. The other major factor contributing to low levels of learning was found to be inadequate understanding regarding expectations of team assignments, which should be beyond mere assignment delivery, and encompass specific content learning as well as teamwork skills. The students do value opportunities to study in groups but feel that both team and learning processes can be improved to increase the value to themselves and to the business school.

Recommendations

Based on respondent experiences of syndicate groups, it seemed appropriate to use the end of the interview to get their specific thoughts and insights on how they felt syndicate group functioning could be enhanced, irrespective of cooperative learning principles.

Recommendations to improve the effectiveness of syndicate groups:

- Universities should require their lecturing staff to obtain some form of qualification or instruction into the principles and practices of teaching
- Syndicate assessments should include an evaluation of the team working and learning processes experienced in the production of the hand-in assignment
- Syndicate groups should be given the rights to 'select' and 'evict' group members, thereby enabling self-regulation of the group. If the business school wants to retain ownership over allocation to syndicate groups, then they should allow the syndicate group to evict non-performing members.
- Find a way to assess emotional maturity, and then ensure it becomes part of the selection criteria.
- "Why so many engineers? Syndicate groups struggle when there isn't a fair spread of skills in the group. The business school should consider accepting a wider spread of professions into the program".
- The business school should consider placing students in groups for the first semester, after which students are allowed to form their own groups. This will encourage people who really want to achieve, achieving at extraordinary levels, and those who have not formed into groups could be allocated to syndicate groups in the manner the university has always applied.
- Enhance the content and duration of the orientation program so that it benefits students. "Allow senior students to deliver the program, set up mini-tasks in "Apprentice" style, so that we can learn quickly about other people".
- Include aspects of the Organization Design and Development module such as Team theory, in the orientation program.
- "Lecturers should alternate the tasks given to the syndicate groups. The same story of individual assignment, syndicate assignment and presentation is boring and drives "beat the system' behavior. The variety will stimulate student interest and remove the repetition of the same requirements".

Alternatives to syndicate groups:

- Only one respondent suggested alternatives to syndicate group work. The remainder of respondents indicated that they believed the groups were necessary and would prefer to have the problems addressed.

The two suggestions as alternatives to syndicate group work were:

- "The Business School should consider the use of business simulations instead of typical syndicate group task work. This will not only stimulate working in a group but will contribute to the overall enjoyment and richness of the MBA program".
- "Students could be asked to take on social projects aligned to course content. In that way, there is some give-back to society from both students and the school, and society is a beneficiary".

Given the volume of recommendations, many respondents have been actively considering ways to overcome the challenges and problems they have experienced in their syndicate groups. It is additionally encouraging that an overwhelming majority indicated they would not dispense with the group process, as there is value in working with others. However, many of these recommendations are very transactional in nature and may address the explicit issues syndicate groups are facing. Unfortunately, there are only a few of these recommendations which allude to creating an environment which is conducive to cooperative learning leaving it to the business school to reflect on how cooperative learning could be operationalized.

The two alternatives to syndicate groups as presented must be given due consideration as in many ways, these are not really replacements. Rather, they are a format change to how people can learn and interact, and depending on the format, will include built-in monitoring and feedback mechanisms whereby individual performance in the group can be monitored. These suggestions resemble precisely what many of the respondents have been asking for.

Recommendations for future research:

- A qualitative analysis that builds on this one, and possibly includes students and lecturers from other universities will assist to make this research topic more generalizable.

- A quantitative approach towards determining the critical success factors of MBA student behavior in syndicate or study groups, the output of which could assist business schools and students to aspire towards the development of the ideal characteristics.
- An assessment to determine the effectiveness, validity and reliability of assessor ratings of syndicate group tasks.
- An in-depth analysis of the impact of syndicate group work on individual and group learning.
- A comparison across a number of business schools which assesses how syndicate groups function in different contexts. This could include a quantitative assessment on the extent to which the grades achieved across schools are actually different or not.

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The Service Quality - Customer Satisfaction Nexus: A Study of Employees and Students Perceptions in Kenyan Private Universities

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Abstract

The Higher Education Performance (HEdPERF) instrument was adapted to measure service quality (SQ) in private Kenyan higher education institutions (HEIs). Exploratory factor analysis was used to determine the scale's validity, and path analysis examined the model linking the SQ and customer satisfaction (CS) constructs. It was ascertained that with respect to Kenyan private higher education, SQ is an antecedent of customer satisfaction (CS) in that it directly influences CS. Given that employees and students of selected private universities were surveyed, the results provide an opportunity for HE managers to develop strategic SQ delivery deliverables for their universities. HEdPERF was also found to be a valid measurement tool that could be used for measuring service delivery in the private higher education sector in Kenya.

Keywords: Private Higher Education, Service Quality, Customer Satisfaction, Higher Education Performance.

Introduction

With the increasing number of students qualifying for higher education, and the mushrooming of universities (especially privates) in Kenya, the question of service quality management in the institutions of higher learning (IHL) becomes very fundamental (Ngome 2010). Hogg and Hogg (1995) argue that university customers have different experiences as service consumers, in that they want quality, and their expectations for better service performance is increasing, thus the need for increased customer satisfaction (Dohert 1994). For many years, higher education provision has been considered a service calling requiring its providers to adopt a customer-focused approach (Angell, Heffernan & Megicks 2008).

Furthermore, Vaill (2008) asserts that education is a service and not a product therefore providers have to be mindful and responsive to the characteristics, needs and expectations of its customers, specifically the student by adopting a student-customer approach.

Some stakeholders in higher education (Quinn, Lema, Larsen & Johnson 2009) have argued that the measurement of service quality and customer satisfaction in educational institutions is a challenging task. This is because over the years, issues concerning the quality of service have taken on new dimensions and received varied treatment. The increasing pressure towards service quality and the desire to achieve business excellence and high performance to become a world-class organization drives the adoption of service improvement initiatives (Kimani 2011). This mindset has urged organizations to continuously improve their services and adopt new ways to deliver the same services, which has become a common practice especially in fast-developing countries such as Kenya.

Oswald (2009:1) cites Bounds, Lyle, Mel and Gipsie (1994), who assert that over three decades, organizations throughout the developed world have been aggressively pursuing quality management.

This has been attributed to a commonly held view that high quality products and services result in improved organizational performance.

Educational establishments have adopted various ways of addressing quality issues, for example total quality management (TQM) in order to meet stakeholders' expectations and needs efficiently, without compromising the underlying moral principles (Ngome 2011). The need for continuous quality improvement especially in universities means that Kenya is not an exception in pursuing service quality in HE. TQM also implies that quality should not only be perceived from a student-customer perspective, since staff is also recipients of services as the 'internal' customers of the HEIs.

In light of the above, this paper examines the relationship between certain service quality attributes/dimensions and the overall services quality (SQ), as well as the relationship between SQ and satisfaction (CS) from both the HE students' and employees' perspectives.

Service Quality and Customer Satisfaction

The debate on the association between service quality and customer satisfaction is on-going, and these two constructs have sometimes been used

interchangeably, albeit incorrectly. Perez, Juan, Gemaand, and Raquel (2007) argued that the growth in the importance of service quality has been greatly influenced by the customers' changing needs, preferences and tastes, and more so, the changing nature of global markets. As a significant factor, service quality has enabled firms to achieve a differential advantage over competitors (Perez *et al*. 2007) and service quality is viewed as a critical construct of competitiveness (Shahinand & Samea 2010). Seth, Deshmukh and Vrat (2005) posit that SQ is a function of the differences between expectation and performance along the quality dimensions. According to Hung *et al*. (2003), although providing service quality excellence and superior customer satisfaction is vital, it still remains a challenge facing the service industry. Regardless of the sector (public or private), SQ remains an important subject for consideration among leaders, managers and researchers (Zahari, Yusoff & Ismail 2008).

Some researchers (Seilier 2004; Zahari *et al*. 2008) define service quality as the extent to which a service meets or exceeds customer needs and expectations, and others (Khodayari & Khodayari 2011) argue that perceived service quality reflects the difference between consumer expectations and perceptions.

Through an investigation of the five dimensions of SERVQUAL (Parasuraman, Ziethaml & Berry 1988), Ham and Hayduk (2003) found that a positive relationship existed between satisfaction and each of the SERVQUAL dimensions, with the Reliability dimension having the strongest relationship, followed by Responsiveness, Empathy, Assurance and Tangibility. By assessing the importance of CS, SQ and service performance of a library in Taiwan, Wang and Shieh (2006) found that the overall, service quality has a significantly positive effect on satisfaction. Some researchers such as Hasan and Ilias (2008) explained that Empathy and Assurance are critical factors that contribute most to students' satisfaction. However, Hishamuddin and Azleen (2008) argued that all the service quality attributes were significantly related with satisfaction and highly correlated with one another as well. Leading sources of information on students' expectations of universities include past experiences, advertising, and word of mouth (Prugsamatz, Pentecost & Ofstad 2006). The aforementioned researchers suggested that by explicitly and implicitly making service promises, the desired and predicted expectations of the uni-

versity's service quality become higher.

From the above, it may be deduced that customer satisfaction is directly or indirectly a central issue for universities and the university management. Therefore, satisfaction with the quality of service provided by the university becomes vital, and this requires the university to focus on both internal and external customers.

Several researchers have alluded to the importance of service quality and customer satisfaction (Cronin & Brady 2001; Perez *et al*. 2007; Maddern, Roger & Andi 2007; Kara, Lonial, Tarim & Zaim 2005), and organizational competitiveness (Rust, Danaher & Sajeev 2000). Being a major area of attention for practitioners, managers and researchers, SQ has had a strong impact on business performance, costs, customer satisfaction, allegiance, return on investment, and profitability (Seth & Deshmukh 2005; Chang, Wang & Yang 2009; Yee, Yeung & Cheng, 2010; Siddiqi 2011).

The rapid development of and competition for service in both developing and developed realms has made it important for organizations to measure and evaluate the quality of service encounters (Brown & Bitner 2007). Furthermore, several aspects of service quality have cumulative outcomes on its perception, thus they complement each other and therefore cannot be treated in isolation. Therefore, by focusing on SQ, organizations may risk their competitiveness, since satisfaction and competitiveness are inter-related (Hishamuddin & Azleen, 2008).

Hishamuddin and Azleen (2008) affirm that service quality is a widely accepted antecedent of satisfaction, and their view has been supported by several other researchers, inter-alia, Jamal and Naser (2002), Hensley and Sulek (2007), and Herington and Weaven (2007).

Several researchers have differing opinions on the issue of service quality and its determining factors (Siddiqi 2011; Yee *et al*. 2010; Hasan & Ilias 2008; Hishamuddin & Azleen 2008), and have alluded to a relationship between service quality, customer satisfaction and to an extent institutional excellence.

Employees as Customers

While HE possesses the traditional characteristics of a service offering, the unique characteristics are notable which differentiate it from any other retail service. One such characteristic is the conflicting views on the customer,

since various stakeholders inter alia employees, students, parents, sponsors, and the government utilize the services of HE (Quinn *et al*. 2009). Although students are possibly the first and most obvious customers because they pay for the education service (sometimes), or if the cost of education is met by their parents or guardians, these individuals act as a point of contact for some service interactions with the HEI.

Similarly, employees (academic and administrative), exercise control in the design of some of the services, and therefore also make use of a number of the HEI's services (Quinn *et al*. 2009:141). Whereas residence halls exclusively serve student-customers' accommodation needs, administrative areas in a university have explicit internal and external customers.

For example, a research function or office serves internal staff and graduate students as well as government agencies and research sponsors (Quinn *et al*. 2009). The involvement of different stakeholders within the HE environment makes the measurement of HE services complicated compared to retail services, including how each stakeholder perceives the indicators of service which may also be conflicting (Becket & Brookes 2006; Quinn *et al*. 2009).

In light of the above, it is important to examine employees' (internal customers of HE) and students' (external customers), perceptions of service quality and service satisfaction. The perceived experiences of the employees are important since, it may provide more objective and practical information for assessing service quality and customer satisfaction in the HE context.
Thus, this paper reports exploratory research conducted among a sample of employees (administrative and academics), and students (undergraduates and postgraduates) at select Kenyan private universities, to determine their perceptions of the quality of services delivered, and whether this perception determines their satisfaction with the service.

The HEdPERF Model

The management of quality issues has been the focus of many managers within the education service industry. By referring to the work of Hill (1995), DeJager and Gbadamosi (2010: 253), argue that in an education setting, service provision and customer satisfaction rely on the interface between students and staff. Through this contact and its labour intensive nature, this service translates into a potentially highly heterogeneous service

quality experience.

Within the services marketing literature, debates revolve around the use of the 'gap' measures, and great interest seems to be on the service-quality-service performance (SERVPERF) relationship (Cronin &Taylor 1994). For example, by citing Babakus and Mangold (1992), Cronin and Taylor (1994: 126) recognized in equal measure, strong support for the use of performance-based evaluations.

Although there has been wide-ranging use of the SERVQUAL tool in the measurement of service quality in higher education (Rajasekhar, Muninarayanappa & Reddy 2009; Sunanto, Taufiquarrahman & Pangemanan 2007; Shekarchizadeh, Rasli & Hon-Tat 2011), its use in this study was avoided for inter-alia, reasons that follow.

For instance, Aldridge and Rowley (1998) argue that SERVQUAL application in HE has had its fair share of criticisms, which include the need to ask the same questions twice, and the fact that the instrument captures a snapshot of perceptions at one point in time. Furthermore, Buttle (1996) argues that the model lacks complete applicability since its five dimensions are not universal. However, with careful modification, the SERVQUAL instrument could lead to its successful use since it has been employed in HE (Hair 2006: 11).

Due to inter-alia, the limitations of using SERVQUAL in the HE environment alluded to above, and bearing in mind that service quality is a construct that fits a specific context (Roostika, 2009), the HEdPERF tool developed by Firdaus (2005) was used. Modified to a six-factor structure with 41 items (Firdaus 2006), the HEdPERF instrument has clear distinct dimensions, namely, academic aspects, reputation, non-academic aspects, access, program issues and understanding characterized within HE.

Several researchers (Ham & Hayduk 2003; Firdaus 2006; Wang & Shieh 2006; Calvo-Porall *et al*. 2013; Govender & Ramroop 2013;) applied various instruments to measure the impact of SQ on customer satisfaction within HE. However, the aforementioned studies have solely focused on students' perception of quality, and little attention was paid to the perspectives of both the students and employees (academic and administration) or on other non-academic aspects of the educational experience.

Research Questions and Hypotheses

The main purpose of this research is to explore the relationship between service quality (SQ) and customer satisfaction (CS) among employees and students in Kenyan private universities. The study endeavoured to recognize the dimensions of university service quality, assess dimensions/attributes of quality that contribute to customer satisfaction, and determine the association between SQ and CS. In order to address the aforementioned, two research questions were formulated:

- **RQ1:** What are the service quality dimensions that impact on the employees and students perceived SQ?

- **RQ2:** Is there a difference in the satisfaction of employees and students in HE?

In relation to the above-mentioned research questions the following hypotheses have been formulated:

- **H1:** The HEdPERF service equality dimensions (academic aspects, non-academic aspects, programme aspects, reputation, access and understanding) form the perceived service quality construct, and these dimensions have a significant positive relationship with the overall service quality.

- **H2:** There is no significant difference in the satisfaction between the students and employees as university customers.

Methodology

A cross-sectional survey was conducted among a sample of 600 students and 250 employees from four private universities in Kenya. Using stratified random sampling based on the type of private university (faith-oriented and commercial), employees in the academic and administrative departments and

students (both undergraduate and postgraduate), were selected to participate in the study. Of the total 655 valid cases, 133 were full-time employees and 522 were fully registered students in the selected private universities. Participation in the study was voluntary and the participants were required to complete a pre-designed questionnaire.

Each of the items in the structured instrument was anchored on a 7-point Likert scale, and respondents were required to indicate their agreement with the each item, ranging from 1 absolutely disagree to 7 absolutely agree. The first part of the questionnaire addressed attributes of service quality contributing to customer satisfaction in private universities, and the second part included statements pertaining to customer satisfaction and overall evaluation of satisfaction. The same (although with slight modification in wording where necessary) questionnaires were administered to both samples. The data was collected over a four-month period extending from late September 2013 to January 2014.

To measure perceived SQ in HE, the 41-item HEdPERF scale developed by Firdaus (2006) was adapted to suit the Kenyan context. Perceived SQ is captured in six dimensions/attributes namely: non-academic, academic, reputation, access, programme issues and understanding.

The data was subject to Exploratory Factor Analysis (EFA) and structural equation models (SEM) using SPSS (AMOS), since SEM allows for identification of the influence of each of the HEdPERF dimensions on perceived SQ in HE (Schumacker & Lomax 2004). Levene's t-test was also performed to compare the employee and customer samples in the study.

Results

Reliability of the Research Instruments

The internal consistency of the two questionnaires was determined through calculating the Cronbach alpha (α) coefficients using Stepwise Reliability Analysis, whereby internally inconsistent items were sequentially deleted, therefore maximizing the scales' reliability (Sekaran & Bougie 2010: 325). Table 1 reflects that the Cronbach coefficient alphas were acceptable (exceeding 0.7), as suggested Hair *et al*. (2006; 2010), implying that the measurement instruments were fairly reliable.

Instrument	Student-Employee Instrument	
	Final No. of Items	**Final Cronbach Alpha Coefficients**
Non-academic Aspects	22	0.875
Academic Aspects	14	0.854
Reputation	10	0.886
Access	10	0.911
Programmes	4	0.750
Understanding	3	0.832
Overall Satisfaction	7	0.887

Table 1: Instrument Reliability

Validity of the Instruments

To address the issues of dimensionality, construct and discriminant validity, Exploratory Factor Analyses (EFA) was conducted using Principal Component Analysis (PCA) with oblique rotation, to summarize the factor loadings (Browne 2001), which resulted in items with factor loadings below 0.4 being deleted (Hair *et al*. 2006).

As illustrated in Table 2, the validity measures of the employee-student instrument reveal that discriminant validity was achieved since none of the correlation coefficients of the factor loadings was equal to or more than 0.9 (Browne, 2001).

Furthermore, from the rotated factor loadings presented in Table 2, it is evident that the data for the combined sample loaded on three factors which were labelled as follows: Factor 1 - Service Satisfaction, Factor 2 - Health Service Quality and Factor 3 - Programme Quality. Since all factor loadings exceeded 0.4 this implies that the combined instruments had internal consistency, and that they were considered ideal measures of reliability (Hair *et al*. 2006).

	Satisfaction Factor 1	**Health Service Quality Factor 2**	**Programme Quality Factor 3**
NOACD1	**.755**	.335	.160
NOACD2	**.659**	**.450**	.138

NOACD3	**.435**	.149	-.019
NOACD4	**.514**	.064	.111
ACD1	**.751**	.054	.224
ACD2	**.726**	.047	.336
REP1	**.499**	**.539**	.248
REP2	**.539**	**.506**	.454
ACC1	**.530**	**.528**	.403
ACC2	.448	**.578**	.304
PRG1	.188	.328	**.751**
PRG2	.260	.345	**.717**
PRG3	.205	.199	**.793**
PRG4	.012	.091	**.650**
UND1	.137	**.741**	.401
UND2	.116	**.764**	.306
UND3	.246	**.783**	.106
OvrQual	.374	.221	-.015

Table 2: Rotated Factor Matrix for Combined Student-Employee Measurement Instruments

**Note: NOACD = non-academic, ACD = academic, REP = reputation, ACC = access, PRG = programme, UND = understanding, OvrQual = overall quality

Structural Equation Modelling Results

From the AMOS output reflected in Table 3, it is clear that the model fitted the data well, and therefore the proposed model was adequate in explaining the relationship among the variables. The resulting maximum likelihood estimates are indicated in Figure 1.

Result (Default model)
Minimum was achieved
Chi-square = 29.977
Degrees of freedom = 33
Probability level = .618

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	33	29.977	33	**.618**	**.908**
Saturated model	66	.000	0		
Independence model	11	3484.801	55	.000	63.360

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.991	.986	1.001	1.001	1.000
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	**.000**	.000	.025	1.000
Independence model	.310	.301	.318	.000

Table 3: Model Fit Indices for the Combined Employee-Student Measures
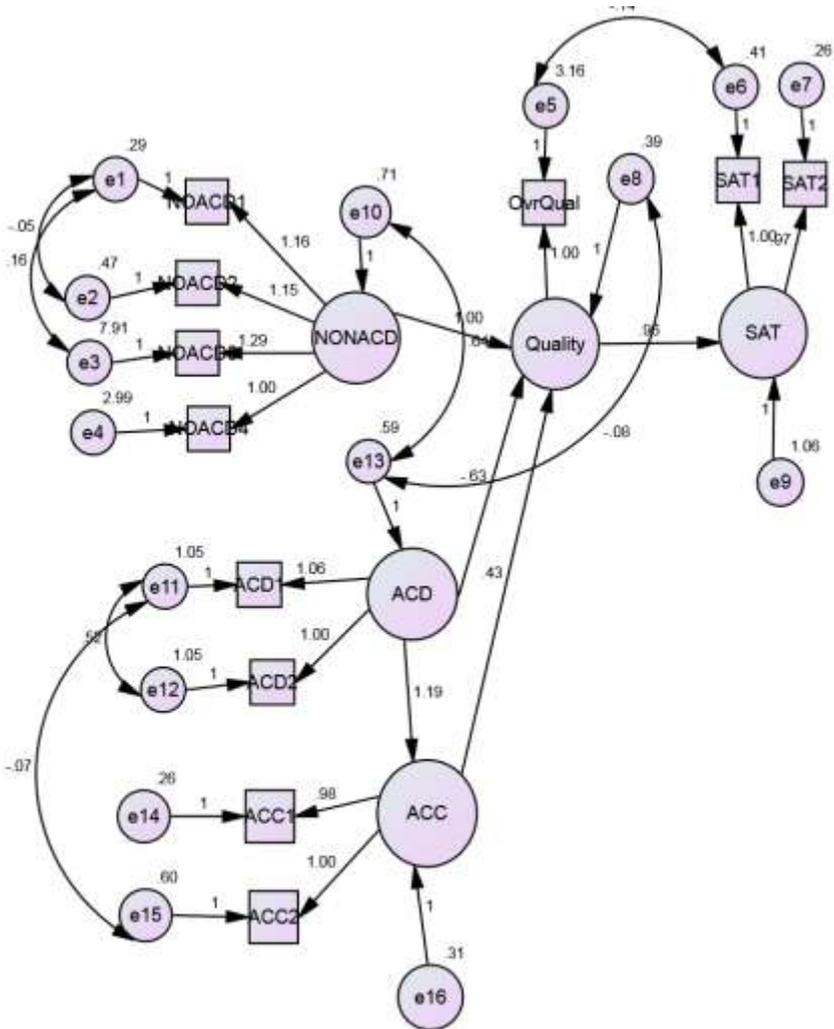
Figure 1: Structural Model for Employee-Student-Service Quality

The estimates also confirm a good fit of the data, since the chi-square value is 29.997 (Hair *et al*. 2006). The RMSEA value yielded an exact/good fit at 0.00, and the CMIN/DF was 0.908, further supporting the goodness-of-fit. The p-value (with a level of significance of 0.05) was greater than 0.05 (0.618), hence the model was declared adequate (Schumacker & Lomax 2004; Hair *et al*. 2006). Furthermore, the incremental fit measures of the two constructs, namely, university service quality and customer satisfaction and, the resultant structural models from the combined data showed a proper fit considering that the Comparative Fit Index (CFI), Relative Fit Index (RFI), Incremental Fit Index (IFI) and Tucker-Lewis Index (TLI) had values greater than 0.90 (Schumacker & Lomax 2004; Hair *et al*. 2010).

After evaluating the model in relation to the merged employee-student data, the goodness of fit results and corresponding findings of EFA, the researchers carried out an analysis on the weighting and influence of the HEdPERF service quality dimensions on perceived SQ from merged employee-student standpoint. The findings reflected in Table 4 show that, only two dimensions have a positive and significant influence on higher education perceived service quality and no empirical evidence emerged to support a positive significant influence of some HEdPERF dimensions such as reputation, understanding, and programme.

Besides, the p-value for the path co-efficient from the academic activity to the quality of service is insignificant (β = -.630; CR = -2.383; p>0.0001), indicating that academic activities do not positively affect service quality. These results therefore imply that the hypothesised relationship between the academic dimension and perceived service quality is not supported in Kenya's private higher education industry.

Dimensions and Relationships	Estimate	SE	t-value	p-value	Outcome

Quality	←	Academic	-.630	.264	-2.383	.017	Not Supported
Quality	←	Non-academic	1.000	Fixed	Fixed	-	Supported
Quality	←	Access	.435	.196	2.213	.027*	Supported
Satisfaction	←	Employee-student quality	.959	.117	8.194	***	Supported

Table 4: Summary of Significant Relationships between SQ and CS of the Employee-Student Model

*** Significant Regression Coefficient p<0.0001;
* Significant Regression Coefficient at p<0.05

On the other hand, the p-values for the path coefficients from non-academic activities (1, fixed path) and access (β = 0.435; t-value = 2.213) to service quality, were positive and significant (p<0.05), which confirms that the non-academic aspects and access positively influence service quality in the private higher education industry.

Therefore, the hypothesis that non-academic and access dimensions will significantly and positively influence perceived service quality is supported (Firdaus 2006; Owlia & Aspinwal 1996; Leblanc & Nguyen 1997; Soutar & McNeil 1996). It can be stated that support provided through administrative duties will enable employees to fulfill their work obligations, thus enabling students' to fulfill their study obligations as well. Moreover, this implies that the more attention the academic institution places on issues such as approachability, ease of contact, availability of both academic and

administrative staff and convenience, the higher the perceived SQ from the employees' and students' standpoint. These findings are consistent with Firdaus (2006) who observed that students perceive access as an important element in determining service quality in HE environments. The p-value for the path coefficient from employee-student quality to satisfaction is positive ($\beta = 0.959$; t-value = 8.194) and significant (p<0.0001), which indicates that service quality positively affects employee and student satisfaction levels in private higher education in Kenya.

This is supported by previous research (Lassar, Manolis & Winsor 2000) where the overall service quality influences satisfaction. Thus, the hypothesis that SQ impacts customer satisfaction (CS) is fully supported. Finally, by considering the effect sizes, it may be concluded that the 'non-academic' dimension has a greater impact on perceived SQ in private higher education. Thus, it is concluded that the 'non-academic' dimension of HEdPERF is the most relevant dimension in explaining perceived service quality, followed by access with a relatively lower influence on perceived service quality (Figure 2).
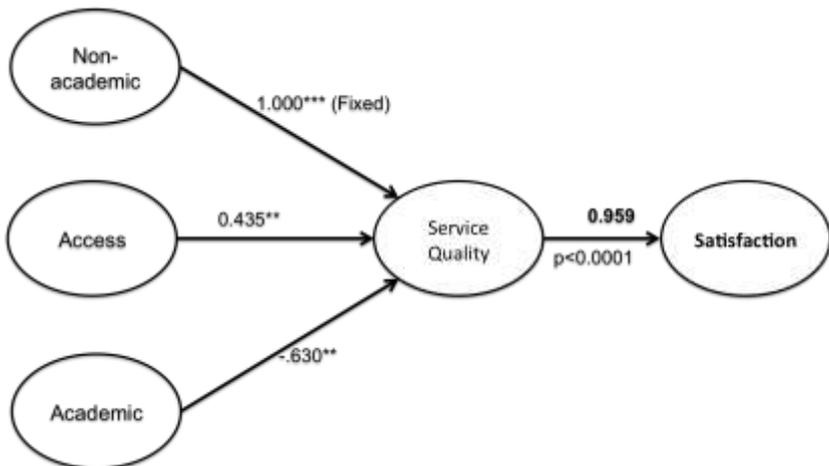

Figure 2: Employee-Student Model for Perceived SQ and CS Outcomes
** Means Significant at p<0.05; *** means significant at p<0001

Comparison of Satisfaction between Employees and Students

To test the null hypothesis, which implied that there is no significant difference in satisfaction between the students and employees (as university customers), a new variable score called satisfaction was computed by summing the facets of satisfaction. The lowest value that this variable could take is 7, while the maximum value is 49 (Field 2009). Table 5 below summarises the distribution of this satisfaction score.

	N	Minimum	Maximum	Mean	Std. Deviation
Satisfaction Score	576	7.00	49.00	37.7	6.698

Table 5 Satisfaction Score

The mean score (37.7) is greater than the midpoint of 28, meaning that the customers are fairly satisfied with the service that they receive. Further analysis entailed ascertaining if the satisfaction score varied by the type of customer, and in particular, if there is difference in satisfaction between staff and students. However, before this we done, an exploratory analysis using a box plot (Figure 3) was conducted to determine (graphically) if the difference existed.
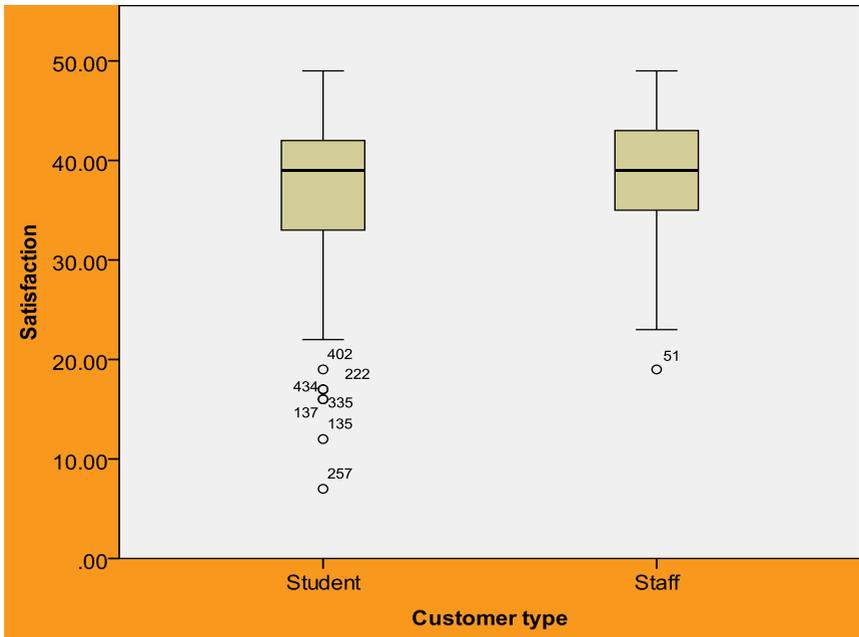
Figure 3 Satisfactions by Customer

From Figure 3 above, it is evident that although both students and employees have almost the same satisfaction score, some students had very low satisfaction, hence forming outliers represented by circles. Only one employee's score was categorised as an outlier. To check whether there is a significant difference between the students' and employees' (as customers) satisfaction, the student's t-statistical test results were calculated as shown Table 6.

	Customer Type	N	Mean	Std. Deviation	Std. Error Mean
Satisfaction	Student	450	37.5044	6.89671	.32511
	Staff	126	38.3968	5.90739	.52627

Table 6 Satisfaction Score by Customer Type

From Levene's test of homogeneity of variances results indicated in Table 7 below, the null hypothesis of equal variances between employees and students is rejected since F (4.555), p = 0.03

| | Levene's Test for Equality of Variances | | T-test for Equality of Means | | | | | |
| | F | P-value | T | P-value | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
							Lower	Upper
Equal variances assumes	4.555	.033	-1.323	.186	-.89238	.67466	-2.21749	.43273
Equal variances not assumes			-1.443	.151	-.89238	.61860	-2.11124	.32648

Table 7: Levene's test and T-test for Comparison of Satisfaction between Employees and Students

The results of the Levene's test indicated that equal variances could not be assumed and, an alpha level of 0.05 was chosen. If p > 0.05, then we fail to reject the null hypothesis while a p value < 0.05 implies significant results. The equality of means between the employees and students and the associated p-value was found to be 0.151, (which is greater than 0.05), which implies that no significant differences existed between the mean satisfaction of the employee and student groups. Although staff have a

slightly superior quality satisfaction index score ($\overline{X}$ = 38.39, SD = 5.91) than students ($\overline{X}$ = 37.50, SD = 6.89), there is no significant statistical difference between these averages. Thus, the null hypothesis is not rejected, and it can be concluded that there is no statistically significant difference in satisfaction between employees and students. The findings concur with some previous studies (De Jager & Gbadamosi 2010), where it was revealed that significant lower perceived service experience by students to what they believed to be vital in their learning centres.

The universities used in the study were all private, thus it was assumed that all employees and students in similar universities were subjected to similar conditions from a service perspective. Thus, it may be concluded that the test is not biased to any customer

Conclusion and Recommendations

The findings reveal that with reference to the service quality dimensions in this study, "access" and "non-academic" are most significant determinants of perceived SQ in the private HE institutions. It was also ascertained that the 'non-academic' dimensions contributed most towards the respondents' perception of service quality. This study did not find any empirical support for a positive and significant relationship between the academic dimension and perceived service quality in HE.

These findings provide insight to the management of HE institutions in that they may use the findings to enhance both employee and student perceptions of service quality. Therefore, a private university provider can prioritize and allocate resources and/or emphasize the non-academic quality, access quality and academic quality in order to meet "employee-students" expectations.

A limitation of the study is that it adopted a purely quantitative paradigm and was also limited to select private universities in Kenya. Therefore, the findings should be confirmed by further evidence employing a different equally rigorous methodology such as mixed methods.

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Global Benchmarks: A Human Resource Management Tool for Knowledge Management Implementation

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Abstract

This paper focuses on the strategic importance of managing and leveraging generic knowledge assets, in the form of benchmarking, for human resource management. Often knowledge assets are never located when the need arises to use them. This results in organizations incurring huge costs and efforts in "re-inventing the wheel" or grappling with the challenge of locating, selecting and applying the knowledge assets to create or sustain the competitiveness of organizations. A review of the literature is conducted in order to present an appraisal of available benchmarks for knowledge management in key international economies. It is argued that acquiring and implementing best practices is a cost effective means of adopting and using existing knowledge. The recipient of the existing knowledge must be able to select and apply best practices that add value to the organization. Best practice knowledge assets are mostly explicit in nature, and become tacit knowledge when such knowledge is applied in specific contexts.

Keywords: Benchmarking, best practices, human resource management, knowledge management, knowledge sharing

Introduction

Al-Mashari (2005:1) claims that contemporary organizations must be flexible and be able to handle rapid changes in the environment. The cost effective means of achieving this is through a process of continuous learning. In addition, benchmarking performance against the world's best practices will lead to the use of established cost effective best practices. It is through this innovation that organizations could become world class.

Implementing, adapting and learning from others best practices are not only legal and ethical, but critical for success.

This paper reviews literature on knowledge management best practices (KMBP) and provides useful benchmarks of important knowledge management processes for organizations to emulate. Key international economies have been chosen from which to extract potential benchmarks. The United States of America, United Kingdom, and broader Europe have been chosen based on their role as pioneers of knowledge management, and as economies in which knowledge management has gained an established formal place. Japan has been chosen as an inherently knowledge valuing economy which has been key in promoting the country's rise from a low-income to high-income country. India has been chosen on the basis of it being a middle income country with maturing experience in implementing knowledge management. In addition, India's role as a strategic economic partner of South Africa makes it an important comparator. The aim of this paper is to highlight lessons that may be learned from the knowledge management experiences of the aforementioned countries in an effort to establish potential benchmarks for local practices. Electronic database searches were conducted in an iterative manner during January - June 2010 to retrieve articles related to benchmarks or best practices in knowledge management in the selected countries. Search terms included "benchmarking", "best practices", "knowledge management", and "human resources". No specific keywords were required as inclusion criteria; a relatively small number of studies exist on the topic.

Benefits of Knowledge Management Best Practices

Wareham and Gerrits (1999:39) posit that organizations that seek best practices build on the experience and knowledge of other organizations rather than generating knowledge in-house. Managing knowledge resources across organizations, industries, institutional environments and diverse cultures have become a major challenge in the current organizational era.

Seeking, adapting and adopting industry best practices are not only cost effective but timely and therefore beneficial for organizations. Knowledge management best practices have become preferred methods to create, manage and transfer knowledge in organizations due to the enormous benefits and cost effectiveness.

The following important benefits of benchmarking have been identified by Auluck (2002). Benchmarking:

- Encourages organizational dialogue about the current work practices and the need to change;
- Evaluates industry best practices;
- Develops a better understanding of processes;
- Interrogates existing practices within organizations leading to innovation and exchange of ideas;
- Assists in goal setting based on objective data;
- Improves competitiveness of organizations; and
- Encourages learning and networking with leading benchmark organizations.

According to the White Paper on Knowledge Management Best Practices (2002), the following best practices have been identified for successful knowledge management initiatives.

Best Practice 1*:* Make knowledge management a natural part of the workflow;

Best Practice 2: Provide access to the most relevant knowledge available;

Best Practice 3: Obtain the support of the key managers from the top down;

Best Practice 4: Address the cultural change that knowledge management implies;

Best Practice 5: Recognize and reward the efforts of knowledge workers; and

Best Practice 6: Monitor performance and analyze results for continuous improvement.

The White Paper posits that successful knowledge management endeavours result when the six accessible and pre-existing best practices are implemented. Carpinetti and de Melo (2002:246) state that benchmarking could be conducted and applied to various sectors and functions including but not limited to human resource management.

Gamble and Blackwell (2001:51) state that the best way to institutionalize best practice is to pose the following questions:

- What do you know?

- What do you need to know?
- What is the best way of getting what you need to know?

The starting point is to enquire from managers what knowledge they need about the context of the project on hand. The follow-up question is to ascertain the best way of accessing the knowledge that is required.

Camp (1995), a leading authority on benchmarking defines the benchmarking process in terms of the following phases:

Planning: This phase identifies what to benchmark and the choice of organization to benchmark against. It is important for the recipient organization to acknowledge that its own performance in the area of study could be improved.

Analysis: This phase focuses on analyzing the data that has been collected. The analysis reveals the knowledge gaps that exist between the source and the recipient, as well as the best practice the source employs to attain superior performance.

Integration: Following the analysis phase, the recipient organization should prepare to integrate the identified best practices.

Action: Once the best practices are integrated, the recipient organization develops towards superior performance. It is necessary for continuous benchmarking and learning to maintain and improve current standards in managing knowledge.

The benchmarking phases should be regarded as templates and adapted to suit different circumstances as well as specific industries and organizations.

According to Drew (1997:427) the benchmarking process could be categorized into five basic steps as depicted in Figure 1.1. These are:

- Identify what to benchmark;
- Select the best performers in the market (benchmarking partners);
- Collect and analyse the data;
- Set performance targets, and
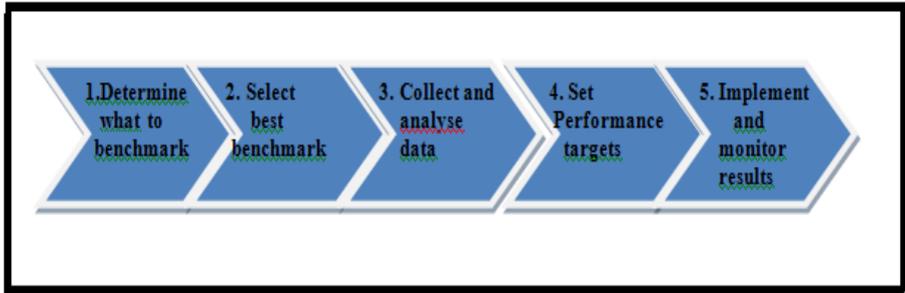- Implement plans and monitor results.

Figure 1: Generic Benchmarking Source: Adapted From Drew (1997)

Generic methods of benchmarking have been identified in business best practices (BBP) and are discussed.

Different Methods of Knowledge Management Benchmarking

Bendell *et al.,* (1993:125) differentiate between different forms of benchmarking related to knowledge management best practices. They posit that the knowledge management benchmarking will differ from situation to situation depending on the prevailing circumstances.

Competitive Benchmarking

This method of benchmarking reviews competitors that are achieving best performance results. A critical assessment is undertaken to establish the success factors that determine the competitor's outstanding performance. Due to the similarity of the competitive environment, the potential to transfer knowledge management best practices will be relatively high. However, this kind of benchmarking may be difficult to undertake, as competitors may not co-operate with sharing best practices due to competitive rivalry (Bendell *et al.,* (1993:125)

Internal Benchmarking

Organizations that have multiple departments and sites that perform similar tasks and functions can transfer best practices between the sites and departments. Improved performance is generally linked to effective methods

in performing tasks. Therefore it is beneficial to identify such methods within the organization and transfer such methodologies to employees in other sites and departments (Bendell *et al.,* (1993:125).

According to Carpinetti and de Melo (2002:244), the advantages of internal benchmarking is that the knowledge is already in the organization and available. However, the disadvantage of this method is that it overlooks competition, and encourages a narrow internal perspective.

Process/ Functional Benchmarking
This type of benchmarking reviews business practice processes in the relevant area of operation. Different organizations that offer different products or service in different markets can improve service levels by adopting best process factors (Bendell *et al.,* (1993:125).

Generic Benchmarking
Generic benchmarking focuses on the technological aspects of the process. Technology and its optimal deployment are regarded as major contributors to acquiring best practice status. Benchmarking is used to evaluate existing technology and the need for new technology implementation (Bendell *et al.,* 1993:125).

Benchmarking of Human Resource Management (HRM)
According to Lopez-Cabrales *et al.,* (2009:485), empirical studies have confirmed that the strategic management of knowledge is a key responsibility of the human resource function. They further posit that although human resource systems facilitates the development, and creation of unique knowledge amongst employees, there is no best practice for the use of human resource processes to manage knowledge.

Chasserio and Legault (2009) claim recent studies have indicated that human resource best practices are not considered important in modern organizations. In such institutions, the human resource functions have been relegated to operational procedures. This position is contradicted in research conducted by Edvardsson (2008). The findings showed that the human resource function is critical for the success of knowledge creation and sharing provided these are supported with incentives and rewards.

Rodwell *et al.,* (2000:356) argue that whilst human resource management benchmarking adopt industry best practices, this does not necessarily give institutions competitive advantage over others.

The main objective of strategic HRM to an organization is its contribution to making the organization maintain and sustain competitive advantage (Teo, 1998: 67).

Although benchmarking practices seem easy to implement, the application of its principles does pose challenges for organizations. Torrington and Hall (1996) state that benchmarking HRM is driven by the high labour costs and the potential of the human resource function to propel the organization to strategic status.

Akinnusi (2003:30) makes the following suggestions that could result in benchmarking techniques revolutionizing the human resource function:

- Human resource managers must improve their skills in strategic human resource management as benchmarking focuses on strategic rather than operational objectives.
- Human resource managers must identify and implement the best HRM practices in the relevant sectors.
- South African organizations should emulate America, Europe, Canada and Australia's example of implementing best practices in public sector HRM management.

In a study of HRM best practices undertaken by Arnolds *et al.*(2009:11), the findings showed that managers did not attach much value to the strategic importance of best practices. This finding is corroborated in a study by Lucas *et al.,* (2004) in that human resource policies and practices are not linked to the strategic objectives and moreover, a strategic human resource management approach is not reflected when designing and implementing business strategies.

In an exploratory study by the Human Resource Forum (2006), it was established that many lower and middle managers who are responsible for implementing human resource management best practices are not familiar with such practices.

Human resource managers should, therefore, embrace the challenges of benchmarking as a means to improving the pace of service delivery, especially given the poor state of human resource management in South

Africa. In this regard the world competitiveness report (2007) recorded South Africa in the last quartile against other countries in terms of human resource development and human resource management categories during the period 1998 until 2007.

Benchmarking and implementing best practice HRM policies and practices will ensure that the organization's human management will contribute to some measure in improving its ratings (Akinnusi, 2003:30).

Knowledge Management Country Comparators

An increasing number of countries have initiated knowledge management programmes within their organizations. Whilst most of these countries are developed countries, emerging and developing nations are increasingly embracing knowledge management initiatives within the human resource management function as a means of improving the quality and pace of service delivery. The 21st century heralds an organizational era that would take knowledge management to a higher level where organizations not only strengthen existing knowledge management practices but also implement knowledge management best practices to realize its optimum benefits

Japan

Japan has been the world's second largest economy for a significant period spanning 1968 until around mid-August 2010, with its profile recorded as second to the United States of America in the list of economically significant nations during this period. China is currently the world's second largest economy with Japan in third position (The Perryman Report, 2010:1).

Japan remains a leading economy, having transformed from a nation, which imitated the low-wage, low-cost goods based on Western designs to a formidable nation that manufactures high quality and reliability products in the 21st century (Little *et al.,* (2002:102).

Japan's capacity for knowledge creation is facilitated by its stable economy and clearly demarcated organizational boundaries. The stability of organizations and the zero-rated labour turnover means that organizations could effectively tap the accumulated individual and collective tacit knowledge. Japanese organizations engender close working relationships amongst employees that creates voluntary knowledge flow with relative

ease. However, internal values tend to exclude external perspectives such as Western models of social networking and self-organizing communities of practice (Ray, 1998:151).

Japanese Knowledge Management

Japanese knowledge management includes knowledge related processes in every part of the organization. Its knowledge management strategy is informed by the feedback it receives from the various channels which involves everyone in the organization. The management culture encourages all employees to participate in the planning process, which induces commitment by the employees to implement the plan on a voluntary basis (Nonaka, Toyama & Konno, 2000: 41).

Nonaka and Takeuchi (1995) advocate that the Japanese knowledge creation process place emphasis on the middle-up-down management style that is neither a "top-down" nor "bottom-up" approach, but a combination of both.

Little *et al.,* (2002:110) contend that the role of Japan's middle managers is to transform the organization's vision into a format that is practical and achievable by the operational workers. Whilst the Western world views mission and vision statements as "vague, ambiguous or even meaningless", the interpretation of vision statements in Japan is based on the understanding of its contents due to the mutual relationship between the leadership and its subordinates. This relationship creates an instinctive knowledge of what the leadership expects. This position is consolidated as subordinates could assess which options find favour with the management during the course of the working relationship. Therefore vague vision statements would be interpreted as the placement of trust on employees to implement the preferred action. In exchange, the leadership rewards the subordinates for the positive behaviour.

Japanese management practice is qualified in Harvey-Jones (1993:178) study of competing nations against a Japanese company in building a chemical plant. Each organization was required to build a similar plant and started the project at the same time. The Japanese company completed the project ahead of all competing nations. Success to knowledge management endeavours is attributed to Japanese organizations having discovered that the sources of knowledge used for innovative projects came from across the

organization, and not only the department that was dedicated to the functional responsibility. Organizations' have a tendency to store redundant information for collective organizational memory (Macdonald, 1995:557).

Porter (1990:397) points out that in Japanese organizations, employees' derive their identity by their sense of belonging to the organization and earning the respect of their fellow colleagues as a committed team member. Porter (1990:397) noted that knowledge creation in Japanese institutions is equal to or second to none.

The foregoing confirms that the success of Japan's knowledge management initiatives are influenced to a large extent by a combination of factors such as culture, senior management support, rewarding of knowledge related activities, high commitment to communities of practice and teamwork.

UK, Europe and USA

An intensive study was conducted by Harris Research, on behalf of KPMG Consulting (2003) among chief directors, finance directors, marketing directors and those who were specifically responsible for the knowledge management function at 423 organizations based in either Europe or the USA. The organizations that were chosen had a turnover exceeding US$347million a year. The reason for the choice of the sample is that it was perceived that organizations at this level have the greatest need to implement knowledge management initiatives, the capability and resources, and the potential to reap maximum benefits (KPMG Report, 2003).

The findings of the study in the KPMG Report (2003) provide a good overview of the status of knowledge management initiatives in the respective countries. A summary of the outcomes is presented hereunder:

The respondents from all countries surveyed reported that knowledge management play a significant role in improving the competitiveness of the organizations and to a lesser degree, employee development.

The participants expressed that knowledge management provide significant benefits, especially in achieving improved decision-making, quicker turnaround response to key business matters, and improved customer service (KPMG Report, 2003). Overall, most respondents stated that the organizations are better off with a knowledge management programme than those without. Respondents with a KM programme (45%) compared to those

without (63%) complained of re-inventing the wheel. 72% stated that they could access procedures for a business need within half- day compared to 55% without (KPMG Report, 2003).Of the respondents that had a KM programme, 75% perceived that greater benefits are yet to be realized from the programme. The important findings are that 75% of the respondents expected increased profits and 73% anticipated reduced costs (KPMG Report, 2003). Of the respondents, 36% indicated that the full potential of knowledge management has not been realized. The reasons cited are:

- Insufficient communication;
- Lack of integration of KM in work practices;
- Lack of time or system was too complicated;
- Lack of training;
- Insufficient benefit for users
- Lack of time to share knowledge;
- Failure to use knowledge effectively; and
- Difficulty in capturing tacit knowledge (KPMG report, 2003).

The responses reflected that organizations were not considerate of employee needs. KPMG Consulting (2000:3) claims that this is a reflection of organizations not addressing the cultural implications of KM. KPMG argues that a knowledge management programme should ideally overcome employee frustration in accessing knowledge resources. Only 33% of all respondents had knowledge policies, 31% rewarded knowledge work, and only 18% created knowledge maps that guided employees to locate available knowledge resources (KPMG Report: 2003).

In terms of staff attraction and retention strategies, only 45% of respondents whose organizations had KM programmes viewed KM as a means to attract and retain employees (KPMG Report, 2003).

The study revealed that organizations have implemented a number of technologies for KM. 93% of respondents used the internet to access external knowledge, 78% used the intranet, 61% used document management systems, 49% used decision support systems, and 43% used groupware. Whilst organizations reported extensive use of technology for KM purposes, only 16% of respondents stated that their organizations had technologies that were specifically designed to leverage KM initiatives (KPMG Report, 2003).

The survey revealed that most of the organizations did not have a fully integrated KM system. Only 53% of the respondents whose organizations had a knowledge management programme reported that KM was integral to organizational and individual processes. None of the organizations surveyed have exploited the full potential of KM initiatives (KPMG Report, 2003).

The findings of the survey reflected that there were no significant differences in the respondents' views amongst the organizations in UK, Europe and the USA (KPMG Report, 2003).

The study confirmed that knowledge management is an acknowledged strategic management tool in the countries surveyed. However, the full impact of knowledge management policies, practices and interventions are yet to be realized.

India

India's knowledge management implementation and experiences are diverse owing to its unique mixture of best and worst scenarios as stated by Malhan and Gulati (2003:211).

Retention of skilled workers in India remains a challenge because the demand far exceeds the supply. India has a huge shortage of experienced and trained middle managers to supervise employees. Much time and effort is spent on human resource administration thus very little attention is given to strategic issues (Mello, 2011:623). This is further qualified by Goyal (2006) who states that India's education system, with the exception of sectors of excellence, is failing to produce knowledge workers in critical areas of need.

It is paradoxical in that India has the state-of-the-art fastest jet planes, superfast trains and speed post mail facilities. At the same time it has bullock carts, steam engines and pigeon post facilities. It has world-class universities and research institutions but numerous schools are without basic infrastructure. It creates the world's best engineers and scientists but 45% of its population is illiterate (Malhan & Gulati: 2003).

These paradoxes pose unique and additional challenges for human resource management to ensure success in knowledge management initiatives.

Knowledge Management Challenges in India

Malhan and Gulati (2003:211) claim that India is rich in knowledge and

ideas that have been passed on from generation to generation. They caution that knowledge is dispersed and requires to be managed to yield maximum benefits. The major barrier to knowledge management is the lack of interest shown by senior management in knowledge activities. Computer and internet literacy is cited as a further barrier. However, current studies have confirmed that Internet usage has improved significantly.

According to a NASSCOM (2003) Survey, only 1.2% of the population in India uses the Internet. Due to budgetary constraints and the time spent on the internet, restrictions are placed on its usage. The University of Jammu is cited as an example, where a slow speed Internet facility is made accessible to a limited number of employees for a specified four hours a day. The lack of ICT infrastructures in higher educational institutions in India poses significant problems for knowledge management processes and activities. Electricity power outages are cited as another growing problem for knowledge management due to the irregular and intermittent disruptions in knowledge related activities. However, the Government of India and private businesses have shown commitment to addressing these challenges (NASSCOM Survey, 2003).

While previous studies showed slow progress in Internet usage since the introduction of the internet in India in 1995, current statistics confirm that India has an active internet population of 52 million users with a 2600% growth of users since 2000. This represents 5.2% of India's population and this is expected to grow to 10% by 2015. Whilst 58% of the internet users are in the 19-35 age group, 78% of this group prefers the internet to television for entertainment and information (Gupta, 2010).

Kumar (2009) states that the increasing capabilities of the Internet offer significant opportunities to expand access to quality knowledge resources to different sectors and the diverse communities in India. The internet has tremendous potential to create interactive knowledge experiences that have previously not been possible.

A major thrust for knowledge management in India was propelled through the establishment of the National Knowledge Commission (NKC) in 2005. This Commission's responsibility is to build excellence in the education system to meet the knowledge challenges of the twenty-first century (Press Information Bureau, 2005).

According to the NKC Report (2007) the success of the knowledge

economy relies to a large extent on enhancing access to education, and a most effective way to achieve this objective is through broadband internet connectivity.

Griffith University and BML Consultancy evaluated some of India's knowledge management best practices through a survey.

Best Practices Knowledge Management India Survey: Griffith University and BML Consultancy

The Griffith University and BML conducted a study of knowledge management practices in fortune 100 companies in India during 2002. The research study investigated the importance of knowledge management and the acceptance of KM strategy in the Indian fortune 100 companies. The relevant findings of the survey to this study have been extracted and are reported as follows:

Knowledge Management: A Key Strategy

The respondents were required to indicate whether they had a KM programme in their organizations. 75% of the respondents recorded that they had or were considering a KM programme. 19% had no programme in place but were familiar with the programme benefits. 6% did not have a programme and were not aware of its existence nor the benefits that it could offer the organization (Griffith University & BML Survey, 2002).

Benefits of a KM Strategy

The majority of the respondents acknowledged the potential benefits of knowledge management. The respondents identified KM to contribute significantly in improving revenue growth (94%), competitive advantage (94%), employee development (81%), and cost reduction and improved productivity (69%) (Griffith University & BML Survey, 2002.)

Threats to Knowledge Management Implementation

The respondents identified potential threats to the successful knowledge management programme implementation. The highest risk was the conversion of tacit knowledge to explicit knowledge (73%). This was followed by lack of knowledge (68%), re-inventing the wheel (62%), and

information overload (55%). Failure in knowledge management implementation was also attributed to inadequate communication (62.5%), not integrating knowledge management practices in daily tasks (62.5%), no personal benefits (43.5%), and lack of senior management support (37.5%) (Griffith University & BML Survey 2002.)

Cultural Implications of Knowledge Management

The findings revealed that the organizations surveyed did not understand the cultural implications of knowledge management. This is accentuated by the fact that the knowledge management activities that focused on cultural factors did not get good ratings. The factors that were rated included the creation of knowledge policies (31%), rewarding knowledge work (44%) and lack of organizational commitment (6%) (Griffith University & BML Survey, 2002.)

Knowledge Management as a Technological Solution

The survey discovered that the organizations were very advanced in the use of technology, but failed to exploit its full potential. Very few respondents declared that their organizations implemented technologies specifically for knowledge management programmes. 87.5% of the respondents used the internet to access external knowledge, 75% used the intranet, 62.5% used document management systems, 50% used decision support systems, and 25% groupware (Griffith University & BML Survey 2002.)

The overall findings concluded that most organizations in India do not have fully integrated knowledge management programmes. 31% of the respondents indicated that their organizations were in a position to integrate knowledge management in the organizational and individual processes. 23% of the organizations use knowledge management procedures and tools as they acknowledge its benefits. 19% of the organizations do not see the relationship between the importance of knowledge management and organizational goals. 8% of the organizations indicated that they have implemented knowledge management across the organization inconsistently (Griffith University & BML Survey 2002).

The findings confirm that whilst India made progress in knowledge management initiatives, there is a lot of room for improvement. With appropriate interventions and senior management support, knowledge

management will no doubt become a strategic tool for the organizations in India in the future.

Conclusion

The international knowledge management best practices demonstrate a wide range of knowledge management implementation challenges. However, important common threads also emerge which creates learning opportunities for organizations, which are in the infancy of their knowledge management journey. A key observation is the linkage between the human resource function of an organization and knowledge management. Viewing knowledge management as a critical component of human resource management at the strategic level is a theme that emerges strongly in experienced knowledge management organizations. As a strategic tool, knowledge management is able to accrue the support of senior management as well as the allocation of resources required for the implementation of a knowledge management programme. The motivation for this shares a common source in the view that knowledge management contributes to the primary strategic focus of human resource management, which is to aid the organization to maintain and sustain competitive advantage. The economic motive for establishing knowledge management activities is identified as a key driver of its increasing popularity. The concept of an ever-evolving process of innovation being at the centre of business sustainability is an important impetus to keep knowledge management as a strategic tool. The potential exists for senior management and human resource managers at all levels to acknowledge employees a critical knowledge asset and not as a cost to the organization. This view allows for all employees to be valued as knowledge bearers and sharers, and will contribute to the creation of an environment in which all employees function as knowledge ambassadors. Additionally, knowledge sharing and knowledge transfer must be made integral to the institution's human resource management strategy. This is important if a knowledge valuing culture is to be generated and fostered within an organization. A corporate culture that empowers individuals within a knowledge friendly environment supports networking and encourages knowledge sharing across the organization. In doing so, communities of practice and teamwork are reinforced as favourable behaviours. Consideration may also be given to incentivising and rewarding

knowledge related activities through formal mechanisms. Likewise, formal mechanisms should be implemented to systematize knowledge management processes. Such a system – whether predominantly human or electronic – should guide the identification, capturing and diffusing of important information within the organization. The distinct benefits of KM benchmarking leads to improved pace of service delivery, a corporate knowledge sharing culture, optimal use of existing organizational knowledge resources, and development of world class organizations through the formation of a knowledge management best practices directory.

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E-Learning in Place of Face-to-face Lectures: An Exploratory Study of Students' Perceptions

Irene Govender
Menzi Mkhize

Abstract

E-learning has emerged as an essential system in higher education. In an era of technological advancement the move to online learning is inevitable as students are becoming more technically knowledgeable. Based on the Theory of Reasoned Action (TRA) the objectives of this study are to explore students' perceptions towards e-learning as a replacement for face-to-face lectures in the discipline of Information Systems and Technology. A mixed methods approach was utilised. Questionnaires were employed as the primary source of data. A sample of 60 students from the IST discipline shows that both e-learning and face-to-face lectures were considered relevant for different forms of subject matter. Additionally, it was found that most students valued face-to-face lectures in contexts that require a common understanding of cognitively higher level of learning, and students valued e-learning for the convenience and ease of use. These findings also suggest that students have different learning styles and therefore researchers should take into consideration instructors' competence in instructional pedagogy in e-learning. Instructors should, likewise recognize that e-learning may be perceived differently by students. Based on these findings, implications for theory and practice are explained.

Keywords: instructional pedagogy, theory of reasoned action, traditional and online learning, e-learning.

Introduction

The search for more effective means of and access to learning in higher education has generated wide interest in e-learning. Most institutions are integrating online learning systems in the delivery of lectures and facilitation of learning such as Duke University; the Georgia Institute of Technology;

the University of California, the University of Illinois, University of Washington; University of Edinburgh, and the University of Toronto. Used in a broad sense, in this study e-learning refers to instruction that is performed via any electronic means such as the Internet, Intranets, multimedia platforms or Learning Management Systems (LMSs). There are varied reasons for institutions turning to e-learning; a number out of financial necessity or the need to be up to date with the developing online pedagogy (Nam, 2009). A bid for increased student numbers is a strong contributing factor to the use of e-learning, which creates a competitive advantage for certain universities. Bouhnik and Marcus (2006) summarise succinctly the four main advantages of e-learning: freedom to decide when to learn, lack of dependence on the time constraints of the lecturer, freedom to ask questions and the accessibility to the course's online materials at students' own choice. Amidst the advantages postulated in most studies, what remains vague is whether the positive perceptions of e-learning gained in one area of instruction necessarily transfer to others.

Despite the well-recognised advantages of e-learning, there are potential disadvantages that are linked to an overall aspect of e-learning, which is decreased face-to-face interaction. Some of these disadvantages cited in Elearning-Companion (2011) are instances when technical glitches occur, that is when the technology fails to serve its purpose, the loneliness that e-learning which may negatively impact students' zeal to learn and in some cases employees who are reluctant to accept degrees or qualifications obtained online.

Teaching methods have been leaning towards learner-centred methods, which are appropriate for e-learning and away from teacher centeredness for a long time (Rambe, 2012). In this context, the limitations of the resources as observed by practitioners inhibited this changing trend. Large lecture classes remained in universities more so because of their resource efficiency rather than their pedagogical effectiveness. E-learning has gained popularity among universities over the years mainly for the resource efficiency achieved. Numerous studies point to the relevance of e-learning at universities (Moore, Camille & Gaylen 2011; González & Medina 2012).

It has to be noted, however, that while the rate of transition to e-learning is increasing, this movement have not affected all disciplines and faculties

equally – the shift to e-learning is increasing at different rates in different settings.

Students have been observed to attend lectures irregularly or in certain cases not at all; and instead use online tools for information such as the LMS that is used in the University. In this context, it is pertinent to consider students' views of e-learning as well as of face-to-face lectures in light of having access to digital media. The uniqueness inherent in this study is the choice of IST participants who are well positioned to be amenable to digital media communication. Their perceptions are of particular value as compared to other studies with a more general student population. The objective of this article is to determine the perceptions of e-learning by students in the University as opposed to face-to-face lectures.

The article is organised as follows: The next section presents the literature review followed by the methodological approach. Thereafter the results of the study are presented according to the TRA model. Finally findings are discussed and some implications for e-learning are proposed.

Overview of Literature Pertaining to e-Learning as an Educational Tool

According to Ramayah, Ahmad and Lo (2010) the increased use of the Internet have led to the adoption of e-learning, a convenient and efficient method for learning and delivery of essential knowledge to students. In an era of technological advancement, students expect an enhanced learning experience through the use of all forms of information and communications technology. E-learning is considered mandatory by some academics and students.

The design and management of the learning environment determines the quality of the content in e-learning which learners consider valuable.

It is argued that if it is the quality of the service or system that leads to it being perceived as useful, then it will be a predictor of the behavioural intention of utilising the e-learning system. Liaw (2008) claims that understanding learners' attitudes towards e-learning is indeed important – as it can assist instructors in facilitating improved usage of e-learning by students – and its effects on their academic performance. In a related study Yaghoubi, Mohammedi, Irvani, Attaran and Gheidi (2008) assert that

students who have engaged themselves in e-learning courses are generally optimistic about their experiences.

In addition to the above, the learning environment has a significant impact on students' perceptions of the type of learning they prefer. Singh, O'Donoghue and Worton (2005) assert that an e-learning environment presents students with an enhanced learning experience as compared to a more conventional learning environment. Furthermore, they describe e-learning environments as releasing the time limitation which traditional learning imposes upon students. Despite this benefit, Smart and Cappel (2006) hold that learning in an online environment requires tremendous self-discipline and motivation. They argue that this is so when students participate in online units as autonomous, self-study units, as opposed to participating as a group of online users. Liaw (2008:865) stresses the significance of four elements related to e-learning environments, namely: "environmental characteristics, environmental satisfaction e-learning activities, and learners' characteristics". In addition, he claims that communication in e-learning environments between the learner and instructor or learner and peers – whether synchronous or asynchronous – will generate more interaction allowing students to share and obtain information from various sources.

There are differing results regarding e-learning in various studies. For example, Paechter and Maier (2010) found that although students recognised the benefits of e-learning environments, they preferred face-to-face learning for a common understanding of the material and for the interpersonal relations that could be established. In other words, they found that the use of face-to-face lectures was suitable for the development of skills or conceptual knowledge of the subject matter while e-learning was suitable for the development of skills in self-regulated learning. In his case study of perceptions of e-learning, Journell (2010: 69) found that most participants felt that "e-learning was best suited for information transmission ... rather than active or social learning". González and Medina (2012) affirmed this finding when they found that interaction among students in web-based distance education was lacking, a state of affairs, which has serious consequences for effective learning. Teachers are encouraged to establish this aspect of interaction.

Singh *et al*. (2005) caution universities in making a decision to replace conventional teaching methods with e-learning environments. Various learning styles and the diverse background of student population must be taken into consideration. Karagiannopoulou and Christodoulides (2005) in their study have shown that students' behaviour towards e-learning and their academic outcomes are affected by the teaching and learning environment which also involves numerous interrelated components such as teaching methods and assessments. Ginns and Ellis (2007) explored other factors that affect the quality of learning outcomes such as types of teaching-learning environment and students' perceptions of the teacher-learning environment. While the cost-effectiveness of e-learning and the benefits of the hype that e-learning triggers are factors to consider, students' views and perceptions of e-learning cannot be minimised.

Despite the popularity of LMSs among universities, some academics have been averse to engage with the system or with technology in general. Often reluctance is defended when lecture content is considered private, censored or interactive (Gosper, Green, McNeill, Phillips, Preston, & Woo 2008). Studies published and anecdotal evidence indicate that the main issue of concern to some academics is that online lectures could possibly reduce live lecture attendance (Chang 2007). On the other hand, Gysbers, Johnston, Hancock and Devyer (2011) argue that if everything is online why should students attend lectures? They found that the "perceived added value from attending an engaging live session" was a factor that contributed to lecture attendance (Gysbers *et al*. 2011:34). In an earlier study, Goldsmith, Snider and Hamm (2010) claimed that students identified online learning as socially rewarding and therefore see it as a means for preparing students as future leaders. As far as achievement is concerned, Gürsul and Keser (2009) have found in their study of a Mathematics education course, students achieved better results in the online course than on the face-to-face course. Yet, in a separate study Delaney, Harmon and Ryan (2011) advocate that lecture attendance matters for grades.

It is essential to understand the reasons for continued student lecture attendance or non-attendance and, in particular, their perceptions of e-learning – where this mode of delivery works or conflicts with face-to-face learning.

In the current study a preliminarily investigation focussing on students' perceptions of e-learning and face-to-face Information Systems and Technology (IST) lectures was performed. The study was guided by the following set of research questions:

1. What are the perceptions of students towards face-to-face lectures or instruction?
2. What are students' perceptions of e-learning?
3. How do both perceptions compare with regard to choosing one or the other?

In trying to answer these questions, the theory of reasoned action (TRA), proposed by Ajzen and Fishbein (1980) was used as a framework for this study. This framework is introduced in the next section.

Conceptual Framework

Based on students' perceptions of e-learning in comparison to face-to-face traditional learning, the study uses the Theory of Reasoned Action (TRA) as a conceptual framework to determine their intention to choose one or the other mode of delivery. The Theory of Reasoned Action (TRA) suggests that there are two main predictors of intention: attitude toward such behaviour and subjective norms. The theory states that a person's behaviour is a function of one's attitude and of how one thinks other people would view them if they performed the behaviour (subjective norm). A person's attitude, combined with subjective norms, forms his/her behavioural intention. In short, the theory consists of three constructs, namely: attitude, subjective norms, and behavioural intention.

It is not sufficient knowing whether an individual performs an action or the frequency of that action; what is also important is knowing why an individual performs or does not perform the action, what determines their choice of action and what and how external variables influence their decision. TRA is a generalized model to answer these questions. Many empirical studies in diverse situations have used the TRA (Sheppard, Hartwick, & Warshaw 1988) to gain insight to the contributing factors of human behaviour or action. In this study the TRA is used to determine students' preferences regarding their preference to face-to-face lectures and or e-learning.

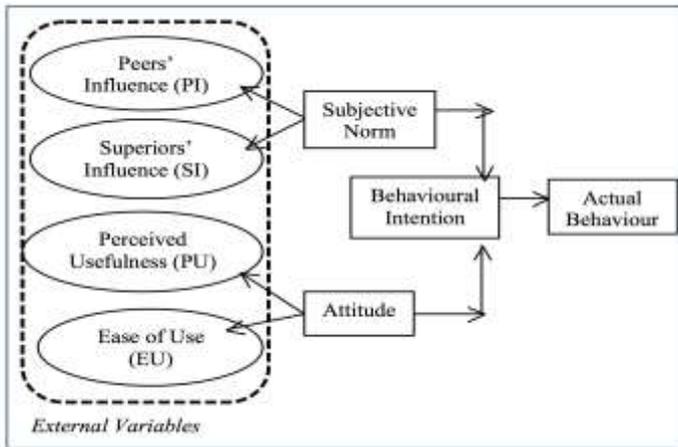Figure 1 below indicates the generalised TRA model used in this study.

Figure 1: Theory of Reasoned Action framework
(adapted from Azen and Fishbein, 1980)

Method
The study employed a mixed methods approach and is exploratory in nature.

Participants
The target population for this study was Information Systems and Technology (IST) second and third year students. The choice of participants was based on the fact that both groups were exposed to some form of e-learning since all courses in the IST department made use of the existing learning management system, *Moodle* as well as other forms of e-learning such as virtual worlds (for example the use of *SecondLife)*. More importantly, it was mandatory for all courses in the IST discipline to use the existing LMS, unlike other disciplines. A purposive sample of 60 participants was used. All 60 participants completed and returned the questionnaire in 2010.

Data Collection Instrument
The primary source of data collection was a questionnaire. The questionnaire comprised sections A and B. Section A elicited demographic

information such as age group, gender, race and residence, and Section B consisted of items using a 5-point Likert-type scale. The items were adapted to relate them to student views of and attitudes towards face-to-face lectures and e-learning. Section B included some open-ended questions, each of which afforded opportunities for write-in comments.

Data Analysis
The data was captured and coded using a statistical analysis package SPSS. Descriptive and inferential statistics were performed. In addition, the write-in comments were analysed manually to determine common key themes which helped to validate some of the quantitative results.

Limitations of the Study
The research was conducted with a specific set of students to determine their perceptions toward e-learning and face-to-face lectures, and therefore may not be generalizable to all students. Due to time constraints it was not possible to use a larger sample of the entire student population.

Data Analysis and Findings
Demographic Analysis
In this study there was no significant difference in the variables gender and age regarding students' perceptions or acceptance of the use of e-learning systems. The majority of the participants (96.7%) were in the age group of 18-25 years. Most students in this age group made use of the e-learning tools. As far as the variable gender, is concerned, 84% of females made use of the e-learning system and 89% of males were using the e-learning system consistently, suggesting that males and females do not differ in terms of using e-learning tools as compared to earlier studies. This insignificant difference could be attributed to the fact that both males and females in the same age group of 18-25 years are equally exposed to all forms of digital media in the context of the this course.

Analysis of Students' Views
Participants indicated their level of agreement to each of the statements related to face-to-face lectures and e-learning. Using a 5-point Likert-type

scale, values for the responses were assigned as follows: Strongly Agree (SA) (5), Agree (A) (4), Neutral (N) (3), Disagree (D) (2), and Strongly Disagree (SD) (1). Means and standard deviations were calculated for each statement as well as the sum of the frequencies of "agree" and "strongly agree". Each item was classified into the pre-organised constructs as indicated in Figure 1: namely, perceived usefulness (PU), perceived ease of use (PEOU), Superior's influence (SI), peers' influence (PI), and behavioural intention (BI), these in turn were grouped according the constructs of the TRA model, that is, attitude, subjective norm and behavioural intention.

In the next sections the perceptions of face-to-face lectures and e-learning, are examined and then a comparison of both are made with respect to the TRA model.

Students' Perceptions of Face-to-face Lectures
Student responses to the question "how often do you attend lectures" are reflected in Figure 2. The graph in figure 2 represents the frequency of lecture attendance by the IST students at lectures.
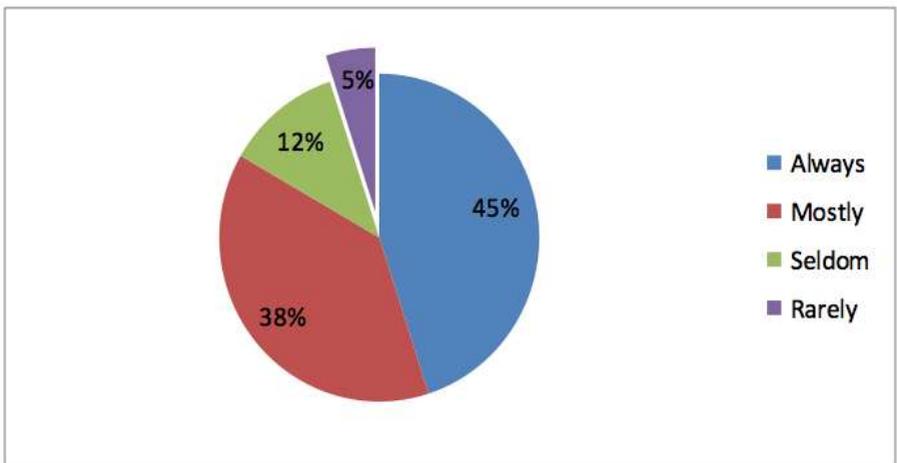

Figure 2: Lecture Attendance

The majority of students (83 %) either always or mostly attended lectures. Only 5% of students rarely attended the lecture. Despite the fact that there are e-learning systems and tools available, students do attend lectures.

In the open-ended questions some insights were revealed about students' views of lectures. Some quotations are given below in support of the positive feedback for attending lectures.

> *I prefer to listen to a lecturer and ask questions for clarification if need be.*

> *You don't feel alone when trying to grasp the difficult sections when in class together.*

Students' views with regard to face-to-face lectures are represented in Table 1 below:

Table 1: Perceptions of face-to-face lectures

	Items	Mean	St Dev.	A/SA
1 (PU_1)	Lectures explains concepts clearly and in depth	3.60	0.94	67%
2 ($PEOU_2$)	I'm comfortable with attending lectures	3.68	0.98	70%
3 ($PEOU_2$)	I rely more on lectures for studying and understanding my work.	3.01	1.08	45
4 (PU_2)	Lectures provide enough support for the Course	3.13	1.06	42
5 (SI)	Parents/Family put pressure on me to attend lectures/tuts (RC)[1]	2.78	0.64	5%
6 (BI_1)	Attendance is vital if I want to achieve good grades	3.73	0.91	63%
7 (PU_3)	The subject is difficult and complex to learn without help and guidance in class	3.30	1.04	40%
8 (PU_4)	I am genuinely interested in the subject	3.06	1.13	45
9 (BI_2)	It is not necessary to attend lectures if you have access to Moodle or any e-learning system. (RC)[1]	3.60	1.03	62%

The response mean scores of most items in table 1 above are greater than or equal to the mean (3.00), which suggests that in general students were positive about the lectures and saw the need for lectures. Items 1 and 2 indicate a positive inclination towards face-to-face lectures. However, items 3 and 4 show less than 50% of students depended totally on lectures. A closer examination of the data indicates that 40% and 32% of students were neutral about items 3 and 4 respectively. This implies that they could not decide whether lectures were enough to support them or not. Item 5 was re-coded since if attending lectures were compulsory then it should count as a negative for face-to-face lectures. Most notable, is the response to the item "attendance is vital if I want to achieve good grades". The motivation for attending lectures cannot be overstated when grades are an issue – 63% of the students felt strongly about improving their grades by attending lectures.

Items 7 and 8 are specific to the subject at hand and therefore cannot be viewed as a general characteristic of all lectures. It should be pointed out though, that the data suggests that a higher cognitive ability required of a course seems to be more suitable to face-to-face interaction, which is in keeping with Paechter and Maier's (2010) study. Item 9 was re-coded to yield a positive leaning towards face-to-face lectures. There was an overwhelming agreement to attend lectures even when they had full access to all materials online. While students' differentiated learning ability has not been considered in this study, it is vital to take cognisance of students' views, which generally are insightful and cannot be disregarded.

When students were asked about the aspects that they valued most in lectures, a clear majority (71.1%) felt that clearer explanations and immediate response to their questions in the lecture stood out as the most important aspect for them in face-to-face lectures. About 18.3% of the respondents viewed guidance for test and examinations as the most useful component that face-to-face lectures provided and only about 8.3% felt that lectures are time consuming which could be used effectively when studying individually.

The correlation matrix approach was applied to examine the convergent and discriminant validity. Table 2 shows the results of correlation analysis which indicate the smallest within-factor correlations for face-to-face lectures as: perceived usefulness = 0.81, perceived ease of use = 0.88, superior's influence = -0.78, and behavioural intention = 0.86.

Table 2: Face-to-face Correlation Matrix of external variables and BI variable

	PU1	PEOU1	PEOU2	PU2	SI	BI1	PU3	PU4	BI2
PU1	1								
PEOU1	0.952823	1							
PEOU2	0.884669	0.895417	1						
PU2	0.855438	0.857742	0.904473	1					
SI	-0.62192	-0.6495	-0.78981	-0.70837	1				
BI1	0.868698	0.879181	0.877795	0.857742	-0.73889	1			
PU3	0.81117	0.856045	0.903389	0.899034	-0.7437	0.856045	1		
PU4	0.861888	0.867066	0.936139	0.944373	-0.71021	0.850271	0.891498	1	
BI2	0.925374	0.93894	0.884379	0.859594	-0.67586	0.93894	0.874013	0.859842	1

Students' Perception towards e-learning

Clearly, the external variables, perceived usefulness and perceived ease of use, both of which subsume the items that have been grouped to fall into these variables, are significant with regard to the behavioural intention, construct, that is, to attend lectures. In other words the construct, attitude, which is made up of PU and PEOU, does influence behavioural intention. There is a strong positive correlation between attitude and BI.

However, the construct, subjective norm (superiors' influence in this case) has a negative bearing on BI. Forcing students to attend lectures by parents will not necessarily have the desired effect if students are not ready to attend lectures.

Participants indicated their level of agreement to each of the statements related to e-learning. Students' views with regard to e-learning are represented in Table 3.

Table 3: Perceptions of online learning

	Items	Means	STDEV	A/ SA
1 (PU₁)	e-Learning is more powerful means of learning than more traditional methods.	3	0.71	25%
2 (PU₂)	e-Learning can be used as a supplemental instructional tool.	4.03	0.66	80%
3 (PU₃)	I feel that e-learning does not necessarily provide face-to-face interactions between lecturers and learners (RC) [1]	1.603	0.85	3%
4 (BI₁)	In my view, e-learning is more effective for teaching and learning in higher education than books and other printed materials.	4.43	0.92	85%
5 (PU₄)	I think e-learning does *NOT* have noteworthy values for human societies in general (RC) [1]	3.56	1.12	50%
6 (PU₅)	I think e-learning does *NOT* offer educational/instructional values in higher education (RC) [1]	3.7	0.83	68%
7 (PU₆)	I like the idea of having both e-learning systems in place and the face-to-face lectures	4.15	0.65	50%
8 (P I)	My friends who learn using e-learning find it very convenient.	3.76	0.53	72%
9 (BI₂)	There is enough material provided online to study on my own	3.55	1.03	57%
10 (PEOU)	I find the e-learning system to be easy to use	4.16	0.61	88%

While most items scored a mean of three and above, suggesting that students are not averse to e-learning, there are notable aspects that need highlighting. The first item has a mean of exactly 3 indicating that most students were neutral about e-learning being more superior than face-to-face lectures. Fifty percent of the participants were neutral regarding e-learning

as compared to face-to-face lectures. This could be interpreted as students having had different experiences with online courses – some positive and some negative. Items 2 and 7 are really two sides of the same coin. There is overwhelming support to have e-learning in place, together with face-to-face lectures. Only 20% of the respondents were neutral about items 2 and 7. A clear majority (80%) of students agreed or strongly agreed to have e-learning as well as face-to-face lectures.

Students agreed that there was not enough face-to-face interaction between the instructor and students (item 3), which may be regarded as a negative view of the e-learning system. This item alone suggests that students desire the physical interaction of face-to-face learning. It is not surprising that this interpretation is corroborated by the common themes highlighted in the write-in comments (responses to open-ended questions) quoted below:

> *You don't get to see or know most of the students taking the class online. You do feel alone and not able to ask a question in the discussion forum for fear that I might look silly.*
> *Sometimes, e-learning is better when you don't have to learn technical stuff, like programming etc." With technical stuff you need to have someone there to discuss it live.*

The fourth item in the table indicates that students clearly find it easier to obtain material from the web or some form of online material to be made available. This could be due to having it stored conveniently on the server for easy access as opposed to having printed material to be filed physically. Anecdotal evidence suggests that many students are reluctant to read their textbooks and rely heavily on the slides that are made available online.

Items 5 and 6 were both coded to reflect the positive aspect of e-learning. Both items have positive inclination towards e-learning with means of 3.56 and 3.70 respectively. Students also observed the benefits of e-learning when their peers used the system (item 8). This observable benefit served as encouragement to them to use the system, if not already using the system.

Most respondents (86.7%) made use of e-learning systems frequently. Off those respondents who used e-learning system frequently, 56.7% of

them felt that e-learning tools (Moodle) made available sufficient material for them to be able to study on their own (item 9). These students would most likely fall in the category of independent learners.

Table 4 shows the results of correlation analysis which indicate the smallest within-factor correlations for e-learning as: perceived usefulness = 0.86, perceived ease of use = 0.84, peers' influence = 0.64 and behavioural intention = 0.73.

Table 4 indicates that there is a strong correlation between the items that contribute to the construct, attitude and the intention to use and accept the e-learning system. Of the seven attitude indicators only four (PU1, PU2, PU6 and PEOU) of them appear to influence the choice of using the e-learning system.

The indicator, peers' influence, appears to contribute to student subjective norm and therefore affect the choice of e-learning system positively confirming the TRA model.

A further confirmation of the intention to use the e-learning system is suggested by the question, "would you prefer to study at your place of residence if you had full access to e-learning tools?", about 58.3% of the responses were positive while the other 41.7% felt that attending lectures was important for them even if they have full access to e-learning tools.

What has been shown clearly in this study is that both modes of instruction are valued within the context of the discipline of IST. While a few students would prefer one or the other, it is possible that these students have different learning styles that instructors should cater for.

Table 4: e-Learning Correlation Matrix of the external variables and BI

	PU1	PU2	PU3	BI1	PU4	PU5	PU6	PI	BI2	PEOU
PU1	1									
PU2	0.63159	1								
PU3	-0.66103	-0.35219	1							
BI1	0.731362	0.46814	-0.92167	1						
PU4	-0.86177	-0.6032	0.632707	-0.71115	1					
PU5	-0.19893	-0.38716	0.325996	-0.27467	0.231533	1				
PU6	0.59645	0.264154	-0.21525	0.296041	-0.53365	0.072227	1			
PI	0.647565	0.329709	-0.58277	0.585408	-0.75865	-0.25559	0.266862	1		
BI2	0.785205	0.541729	-0.57097	0.614437	-0.83541	-0.17618	0.424813	0.698983	1	
PEOU	0.844678	0.589111	-0.57625	0.687718	-0.74252	-0.12115	0.582127	0.460635	0.718648	1

Discussion

The results show that both modes of instruction are acceptable to students. In the present environment of digital media and communications technologies there appears to still be a demand for and an affinity towards face-to-face lectures. There may be many reasons for this; one that has been researched for a long time is the influence of learning styles exhibited by the different students. Similarly, there is no doubt that e-learning is valued tremendously by the students. Since e-learning is already an essential part of our present-day learning environment, instructors have to understand and use it to its full potential. It must be noted, however, that one of the key findings regarding the perceptions of e-learning was students' strong desire for interaction among students during e-learning. However, 58.3% respondents agreed that they would prefer to study on their own if they have full access to e-learning tools. In this case, however, it would appear that students do value e-learning over face-to-face lectures. This research has shown that there is no overwhelming preference for one or the other mode of instruction. What has been shown clearly in this study is that both modes of instruction are valued within the context of the discipline of IST. While a few students would prefer one or the other, it is possible that these students have different learning styles that instructors should cater for.

One of the limitations in this study is that lecturer or instructor perceptions were not considered regarding the use of e-learning as opposed to face-to-face lectures. Additionally, the way the course was managed or designed online may have influenced students' perceptions of e-learning. Of-course if lecturers are averse to e-learning then students' experiences will be affected negatively.

Conclusion

This study sought to determine the perceptions of students regarding their views of e-learning as a replacement to face-to-face lectures. It has been shown that students valued both modes of teaching and learning– e-learning and face-to-face lectures. The results are consistent with Delaney *et al.* (2011) and Gysbers *et al.* (2011) findings.

The main contributions of this study are twofold. First, it successfully uses an adaptation of the original TRA to examine the students' perceptions and behavioural intention regarding e-learning and face-to-face lecture

attendance. The findings explain that both perceived usefulness and perceived ease of use have important influences on behavioural intention to use e-learning and to attend face-to-face lectures. Second, this research reveals that interaction is vital for effective learning to take place and that students differ in their learning styles. Before considering implications for instructors, we should note two limitations of this study. Firstly, this article presents the findings and their implications obtained from a single study that targeted a particular student group in the university. Thus, caution needs to be taken when generalizing these findings to other student groups. Second, the course may not have used sound pedagogical principles in implementing the course as a fully online course thus inevitably subject to negative perceptions. These findings have several implications for instructors of both e-learning and face-to-face lectures. Instructors, should recognize that the same e-learning systems may be perceived differently by students and then improve student behaviour by improving the techniques of e-learning and the processes by which they are realized. Since students have become generally more independent learners and more dependent on digital devices, it would be wise to develop self-regulated or student centred learning, which e-learning embraces. If students still continue to attend face-to-face lectures even as e-learning grows in their scope and accessibility, their reasons must be understood and teaching/learning methods adjusted and modified in order to provide a richer learning experience. It should also be pointed out that what is valid about the relationship between lecture attendance and on-line materials for one discipline may not be valid for another. Certainly, this association may even vary from instructor to instructor. If personal interaction is vital to a specific course then what we need to extract is the added value of the face-to-face lecture and seek to build on this aspect.

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E-Learning in Place of Face-to-face Learning

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An Empirical Investigation into the Social Impact of Information Systems at a Tertiary Institution in a Developing Country

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Abstract

This study explores the problems that exist when society interacts with Information Systems (IS). IS brings expected and unexpected implications that may include social, environmental and IS failures. The problem is that these systems were developed without taking into consideration the impact of IS on its users. The organisation that is studied is North West University, Mafikeng Campus. A quantitative research approach was used for this study. Results indicate that a small number of the respondents were involved in the planning and development of the NWU IS and because of this, the social impact of users was not taken into account. The study suggests some guidelines that can be followed by developers of the university's IS when developing and implementing IS in future.

Keywords: Information Systems, Information Technology, Social informatics, socio-technical systems, social context, technology adoption, user acceptance, user involvement.

Introduction

Technology always replaces certain activities that are normally done by people and these people are later exposed to the changes that technology brings (Lubbe, Singh & Hall 2007). It is noted that IS resultantly brings expected and unexpected implications on users including their social environment. IS is described as the transformation of human activities that follow the implementation, use and adoption of computers in different types

of organisations (Davenport 2008). Lubbe and Bopape (2012) regard them as technologies that are used in the creation, retrieval, manipulation, processing, interpretation and transmission of data to gain knowledge and facilitate communication In addition, these IS provide support, contribute and facilitate the creation of a good working environment for users in organisations. However, the designers of IS focus on the daily operations of users in organisations rather than their social context. This results in unsuited applications, difficult to use and failure of IT systems.

This study is therefore grounded in the philosophy of social informatics. According to Lubbe and Bopape (2012), social informatics is the body of research that examines the design, uses and consequences of ICT in ways that take into account their interaction, institutional and cultural contexts. This study investigates the degree of involvement of the users of IS at a tertiary institution during the development of these systems.

North West University (Mafikeng Campus) has several systems that are used by lecturers and students. Some of the systems are efundi and Groupwise that are used as a communication tool and for providing teaching and learning materials. Efundi is used for writing tests and quizzes, submitting assignments and projects, communication between lecturers and students by sending messages and to upload and download study materials. Groupwise is used for sending and receiving emails to and from lecturers, and they can also submit their assignments and projects.

The study is about cooperation between developers and users in ICT. The rest of the paper is as follows: A brief background to the problem and the problem statement is given, literature review is discussed next, then the methodology and the results are discussed last.

Background to Problem Statement

Mafikeng Campus is one of the three campuses that merged in the year 2004 to form North West University (NWU 2010). The other campuses are Potchefstroom Campus and Vaal Campus. All three campuses use systems that are very useful to the students who enrol at these campuses as well as their lecturers.

The systems that are used by students and lecturers may be developed in house and some can be bought off-the-shelf, customised to suit local needs and implemented. At times, this is all done without asking the users

what they require the systems to be like and how information should be put in these systems. This brings difficulties in the adoption and use of the systems by the intended users. The input of users during development and implementation can increase the ease of use. This will lead to the improved acceptance of the systems and their success as obligatory passage points among users.

Problem Statement

As stated earlier, the focus of this study is on the Mafikeng campus with approximately more than 10 000 students enrolled for the 2011 academic year. The University has various IS that are used by the students and lecturers as a means of communication and also for students to access information and resources for their modules. Not all students are familiar with these IS. They therefore struggle to locate the information that could help them with their studies.

It is stated that the systems may have been designed and developed without the students' input. The links that have the relevant information are placed where it's not easy to find. Students access study materials, type assignments and submit the assignments electronically and also some write quizzes and tests using some of these systems such as efundi, and GroupWise.

The problem may not only lie with the lack of user involvement in the design and implementation of IS, but also with inherent users' resistance to change. There is a barrier between ICT developers and users that prevent developers to ask users from contributing towards the design and development of new systems or the upgrading of existing systems. The next section looks at the extant literature in the field social informatics and related disciplines.

Overview of the Literature

The following keywords were used to search for information on Google Scholar, Journals of Information Science and a database called ScienceDirect: IS, socio-technical systems, IT, user acceptance and technology adoption, social context, user involvement.

Reform in Society

The information society is described as the society that is shaped by the power and assistance of information and communication technologies. But the information society faces problems of attaining levels of ensuring access to all with the newest ICT (Gökalp 2010). The information society has been aided by Information Technology (IT) that affects social, cultural, economic and political fields that lead to an increase in the production and effectiveness of economic development (Gökalp 2010). He also states that the information society development shows increases in different things including developments in science and technology.

In the past two decades, the information society has witnessed major technology development changes. These changes were in the form of the Internet and advancements in computers. These changes among other things reformed the education and other sectors of society (Demirci 2009). Demirci also notes that new technology is not quickly distributed in society as it follows a slow process that consists of a cycle of actions that are of a different nature and phase. This technology, that has affected economies all over the world and helps in the development process of socio-economic environments, is the backbone for the modern information society (Gökalp 2010). However, while it is ubiquitous and pervasive, the role of technology has also been ever-changing and this is what is discussed next.

The Changing Role of Information Technology

Reddy (2006) state that the definition of educational technology is the systematic application of human and technological resources in the teaching and learning programmes. An application that can be used as a creator, processor, analyser and transmitter of data can be called IT (Reddy 2008). The education sector's aim is to make use of IT as a tool that provides students with information (Reddy 2008).

The traditional classroom method whereby teachers stand in front of students and teach using chalk, eraser and textbook is fast being replaced by information technology (Demirci 2009). In some areas, technology has changed the teaching methods in that teachers do not explain every aspect of each lesson. Therefore, students inquire, and solve problems by accessing information from different sources (Demirci 2009). Technology also introduces a new way of learning and an understanding of different things

which were not clearly understood in class. For example, the use of PowerPoint presentations enables teachers to enhance explanations with graphics that enable understanding and increases the semantic content of the presented material. It also provides students with more knowledge content that improves students' argumentation and problem solving skills. (Reddy 2006; Gökalp 2010; Kaffash *et al.* 2010). Using technology, the development of online educational content repositories is made possible (Kim & Bonk 2006).

Introducing technology in classrooms mixes the views of instructors when it comes to the role of technology (Buerck, Bagsby, Mooshegian & Willoughby 2011). Buerck *et al.* (2011) state that instructions that are online provide a balance between instructors' and online support. Online resources can be developed to support course management tools that come with the IT educational platforms mentioned earlier.

As Teimoornia, Hamidi, Jomeh, and Foroozesh-nia (2011) contend, innovation of schools and services that are provided to community can be done by the contribution of ICTs. They continue that ICT is one of the elements that have played a part in the changes that have been witnessed in the education sector and it is also contributing to the innovation of the existing society. An outcome that stems from education is that IT is shifting the responsibility of learning to learners (Teimoornia *et al.* 2011). They argue that there should be approaches that the education discipline can use to integrate ICT into education systems. These approaches should encourage the use of IT in, among other things, improving students' problem solving and critical thinking skills, learning and understanding of theirs and other peoples' culture, language, and history.

Social Context
According to Lubbe and Bopape (2012) different social settings in organisations makes the use of technology far more complex than technological determinants. They continue by stating that the organisational culture, the environment in which IS operates is mainly examined in social informatics. This field places the social context of a system at its centre. Lubbe and Bopape (2012) state that social context does not refer to some abstract 'cloud' that hovers above people and IS. Rather, it refers to a specific matrix of social relationships. Social context can therefore be

regarded as an interactive relationship between various communities through the use of IS that is simplified for easier use. They further allude that the participation of IS occurs in social context and it is influenced by a variety of practices and some non-technical issues. The process of designing and developing systems has to consider the involvement of present and institutional users (Lubbe & Bopape 2012).

Socio-Technical Approach

Socio-technical method is defined as an approach to design that considers human, social and organisational factors, as well as technical factors in the design of organisational information systems (Baxter & Sommerville 2011). This ensures the capturing of technical as well as the softer organisational aspects of systems. The idea behind socio-technical approach is that the development and design of systems should consider technical factors and social factors that influence the functioning of computer-based systems. Baxter and Sommerville (2011) further describe socio-technical systems as those that involve a complex interaction between humans, machines and the environmental aspects. They identified four key features of socio-technical systems as: Parts that depend on each other should be included in systems, external environmental goals should be adopted by systems, there exist different design options, so systems are able to achieve their goals and the performance of a system depends on social and technical subsystems. In developing socio-technical systems, Baxter and Sommerville (2011) recommended the formative approach as a method because it can predict the types of functions a system can do.

User Acceptance

Ellis, Hughes, Weyers and Riding (2006) describe learning technologies as a technology tool that is used to assist students in achieving their educational goals. They note that these technologies are used as a part of a teaching approach. They also note that learning technologies introduced a way in which students can interact with learning on-line and emphasize that these technologies' function is to help solve problems in time and distance.

Certain technologies are focused on learning and some are focused on improving other existing technologies for different purpose than learning (Ellis *et al.* 2006). By introducing learning technologies to universities, it

brings a whole new experience on learning and teaching (Ellis *et al*. 2006). According to Van Raaij and Schepers (2008), for a virtual learning environment to become accepted and used, it depends on the extent at which students accept and use the e-learning systems.

With distance and time between students and their learning facilities, a digital system may assist with educational courses (Van Raaij & Schepers 2008). They wrote that educational courses become successful depending on how students accept and use e-learning systems. People's intensions influences the behaviour on how they will accept a system, these will show how willing people are to try and use the systems.

They also argue that an attitude can be defined as a person's negative or positive evaluation of performing the target behaviour. The attitude of any individual towards something influences the behaviour of that individual towards the use of new technology (Van Raaij & Schepers 2008). They state that the functionality of the new technology can trigger the intensions of an individual to use that new developed technology. Some individuals are not willing or encouraged to try out new technology because they are afraid: to look stupid, of losing important information, or making mistakes (Van Raaij & Schepers 2008). The reuse of knowledge gathered from other familiar systems can encourage users to adopt a system. The discussions above have highlighted several issues that are pertinent to the adoption of e-learning systems in organisations. Using this discussion as a lens, questions may be answered while investigating the adoption and use of these systems at NWU, Mafikeng Campus.

Research Questions

The social impact of IS still remains a vital but grey issue. The following are issues that will be discussed in this paper.

- To what degree were the users of the NWU Mafikeng Campus IS involved during the adoption of the e-learning systems.
- To what degree did they participate in the development and/or implementation of these systems?
- How can user involvement and participation be related to IS success?
- What kind of social factors should be an influence to the development of IS?

These questions will be addressed below but first the paper will address the research methodology adopted for this study.

Research Methodology and Design

Buerck *et al.,* (2011) describe social informatics as a research study that focuses on the relationship among the ICTs and their existence in a social context. This research study looks at how involved humans are during ICTs development. The questionnaires used consist of three parts. Part one is the permission to use the response, part two is about personal details of the student and part three focuses on the social impact of information systems at a tertiary institution. These questionnaires were filled by students who are doing their honours in the Faculty of Commerce and Administration at the Mafikeng Campus of North West University.

Population and Sample Size

The population for this study consisted of honour students of the FCA at NWU. The sample included students who are doing honours and use the NWU information systems to help them with their research and other modules. And this study focuses on those who can be able to give the relevant answers. The sample size consisted of 113 honours students' of the Faculty of Commerce and Administration who did their honours degree in 2011. The students were selected because they could easily be reached resulting in cost and time. The data was collected through questionnaires. The questionnaires were given to honours students as a hard copy because it was easier to hand out as well as collect them. The data was summarised on a statistical spreadsheet and analysed through the use of Excel.

Data Analysis

This section discussed the Respondents' biological data such as gender, age, marital status, highest qualifications, years of service and occupational status is individually presented.
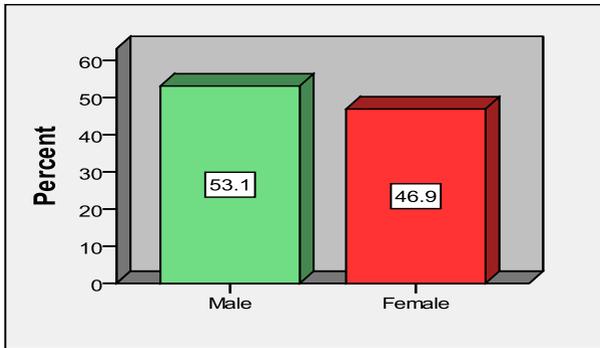
Figure 1 Gender of respondents

The study did not limit the respondents to only males or only female. The figure above shows that the study has more male respondents (53.1%).
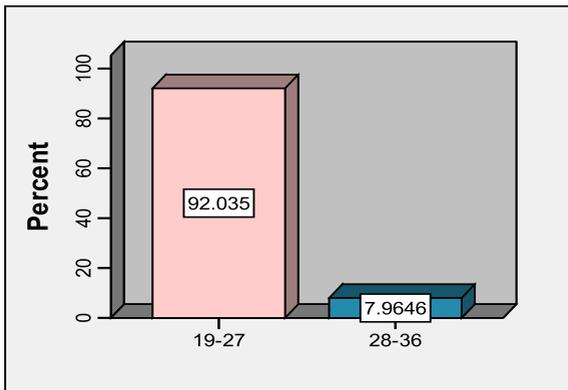

Figure 2 Age groups

For the successes of IS, it is important to include the age group that falls within the younger generation because they show more interest in IS than other age groups. Figure 2 reveals that the most dominated age group (19-27) is 92.04%. Hence the result of measuring and rating the IS of NWU can be used to produce guidelines best for the development of IS in future using this group.

Cross Correlation
The results are summarised below.

Table 1 Gender and age group Cross tabulation

| | | | Age group | | |
			19-27	28-36	Total
Gender	Male	Count	53	7	60
		Expected Count	55.2	4.8	60.0
		% within Gender	88.3%	11.7%	100.0%
	Female	Count	51	2	53
		Expected Count	48.8	4.2	53.0
		% within Gender	96.2%	3.8%	100.0%
Total		Count	104	9	113
		Expected Count	104.0	9.0	113.0
		% within Gender	92.0%	8.0%	100.0%

There is a relationship between gender and age group although this relationship is different from age group to age group. In Table 1 more males (55.2%) are aged between 19 and 27 years. This means that younger users should be part of development groups. Chi square tests were carried out to find out whether there were certain IS that some respondents knew more off. Pearson's and the likelihood chi square tests are shown as 2.392 and 2.546 respectively.

Table 1 Chi-Square tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.392[a]	1	.122
Continuity Correction [b]	1.436	1	.231
Likelihood Ratio	2.546	1	.111
N of Valid Cases	113		

Their corresponding probabilities are 0.122 and 0.111. Comparing these probabilities with the 5% significance level leads to the acceptance of the null hypothesis that there is no association between gender and age groups of respondents when it comes to the development of IS.

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Table 2 Awareness of NWU IS

	Frequency	Percent	Valid Percent	Cumulative Percent
University website	38	33.6	33.6	33.6
eFundi	42	37.2	37.2	70.8
Groupwise	20	17.7	17.7	88.5
All the three	12	10.6	10.6	99.1
eFundi and Groupwise	1	.9	.9	100.0
Total	113	100.0	100.0	

Technologies can be applied in many ways such as improving learning in universities and to modify existing technologies used for teaching (Ellis *et al.* 2006). The introduction of learning technologies in universities introduces a new experience on learning and teaching (Ellis *et al.* 2006). Hence when students are aware of the systems they can make their learning much easier. Most of the respondents were aware of more than just one IS.
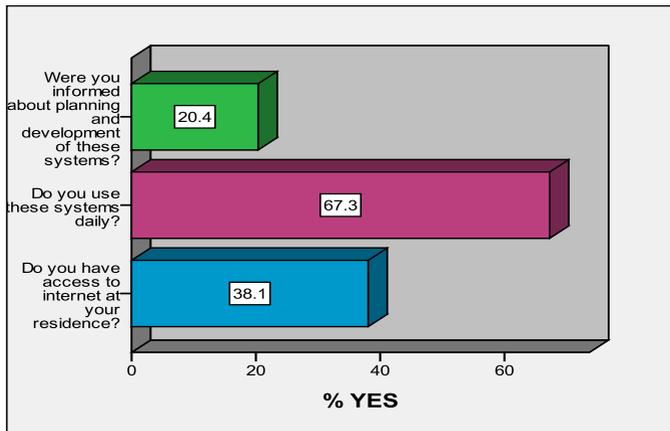
Figure 3 Responses to question as listed on the figure

Van Raaij and Schepers (2008) state that the behaviour of a person can encourage that person to try new technology. A system's functionality can influence a person to make use of technology elements (Van Raaij & Schepers 2008). Students use the university IS because the functionalities help them in their studies. Figure 3 shows the respondents reaction to the questions. As a result, respondents use the systems daily.

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Table 4 Knowledge of using these systems

	Frequency	Percent	Valid Percent	Cumulative Percent
A little	23	20.4	20.4	20.4
A lot	48	42.5	42.5	62.8
Very good	41	36.3	36.3	99.1
No	1	.9	.9	100.0
Total	113	100.0	100.0	

The importance of knowledge can be measured on how NWU IS is satisfactory for its users. Table 4 shows that 36% of the respondents know well how to use these systems. The result shows that respondents can use these systems.

Table 5 Primary method of accessing these systems

	Frequency	Percent	Valid Percent	Cumulative Percent
At home	4	3.5	3.5	3.5
At NWU	93	82.3	82.3	85.8
At work	12	10.6	10.6	96.5
Internet cafe	1	.9	.9	97.3
At home and NWU	3	2.7	2.7	100.0
Total	113	100.0	100.0	

Table 5 indicates the method of accessing these systems; 3.5% of the respondents access them at home, 82.3% of the respondents access them at NWU and 10.6% access it at work, 9% access them at an Internet café.

Table 3 Involvement in planning and development of IS

	Frequency	Percent	Valid Percent	Cumulative Percent
Not at all	101	89.4	89.4	89.4
At the beginning	8	7.1	7.1	96.5
At the end	4	3.5	3.5	100.0
Total	113	100.0	100.0	

Gökalp (2010) states that there are two components that are found in the system development participation, user involvement and user participation. They note that user participation is referred to the user behaviour, assignment and activities that users contribute to the development of a system. Also user involvement is referred to as a subjective psychological state reflecting the importance and personal relevance that a user attaches to a given system (Gökalp 2009). When users are included during development and implementation of systems they can use it.

Table 6 shows that 89% of the respondents were not involved in the planning of the NWU IS. It can be concluded that the IS reflect bad on social relationship of the users. Users need to participate in the planning and development.
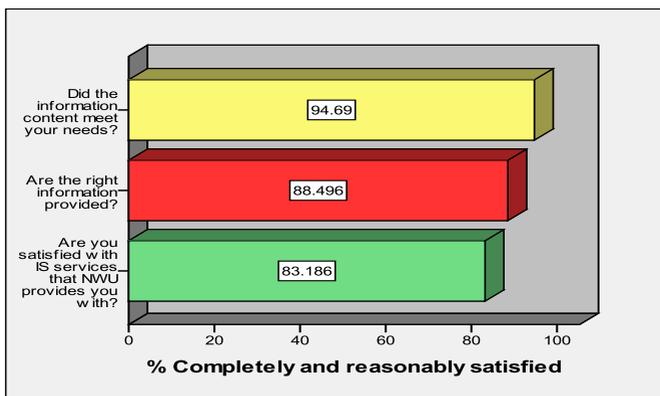
Figure 4 Response to satisfaction

Reddy (2008) note that when the IS management is effective, the outcome of this was that the users respond positively on satisfaction on the usage of the system and show a better level performance on IS. This means that when the IS provide users with the right information the users are satisfied about the information they are getting from the IS and they are also satisfied with the IS services that NWU provides the students with. Figure 4 reveals that 94.69% of the respondents confirm to be reasonably and completely satisfied that the IS content meet needs.
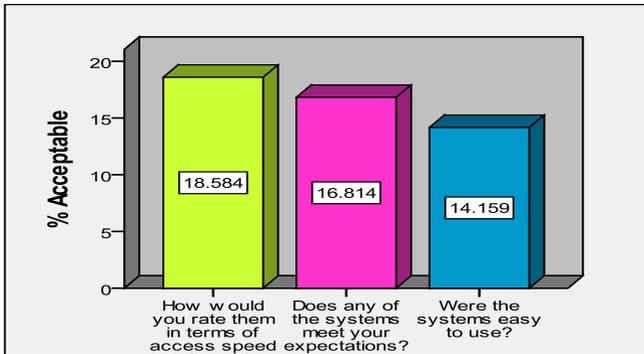
Figure 5 Responses to questions as listed in the figure

Respondents confirmed that the rate of speed is acceptable.
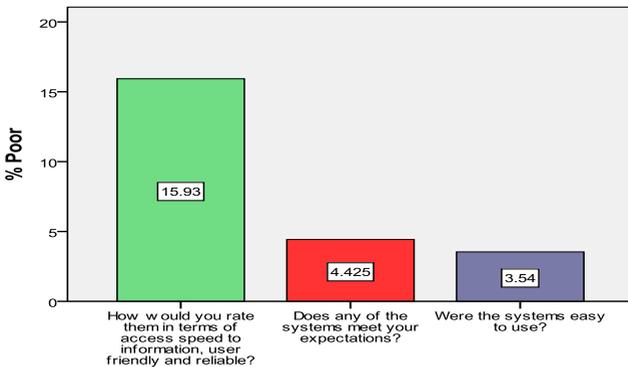
Figure 6 Response to question listed in the figure

Figure 6 indicates that 15.93% of respondents confirm that the systems are poor in terms of access speed.

Table 4 Satisfaction of IS services that NWU provides

	Frequency	Percent	Valid Percent	Cumulative Percent
Completely satisfied	5	4.4	4.4	4.4
Reasonably satisfied	89	78.8	78.8	83.2
Not satisfied	16	14.2	14.2	97.3
Completely unsatisfied	3	2.7	2.7	100.0
Total	113	100.0	100.0	

Table 7 shows that only 4.4% of the respondents are completely satisfied while 78.8% of the respondents are reasonably satisfied. This indicates that most respondents are just reasonably satisfied with IS services that NWU provide.

Table 5 Rating of NWU systems in terms of access speed to information, user friendliness and reliability

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	18	15.9	15.9	15.9
	Good	69	61.1	61.1	77.0
	Excellent	5	4.4	4.4	81.4
	Acceptable	21	18.6	18.6	100.0

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	18	15.9	15.9	15.9
	Good	69	61.1	61.1	77.0
	Excellent	5	4.4	4.4	81.4
	Acceptable	21	18.6	18.6	100.0
	Total	113	100.0	100.0	

Reddy (2006) writes that how IS perform can be determined by capabilities that it provide the organisation with when making decisions. They state that IS quality plays an important aspect when IS elements are evaluated. The benefits of IS elements play a role when the IS is providing them with services (Reddy 2008).

On this question, respondents were asked to indicate how fast or slow do the systems work and their user friendliness. They had to rate them on whether they were poor or good, but the level of rating is high on the rating that the systems were actually good. The table above shows that 15.9% of the respondent's rate the access speed to information as poor while 61.1% of the respondents rate it as good.

Table 6 Right information met user's needs

	Frequency	Percent	Valid Percent	Cumulative Percent
Completely satisfied	7	6.2	6.2	6.2

Reasonably satisfied	93	82.3	82.3	88.5
Not satisfied	9	8.0	8.0	96.5
Completely unsatisfied	4	3.5	3.5	100.0
Total	113	100.0	100.0	

The table indicates that 6.2% of the respondents are completely satisfied with the information that the systems produce, 82.3% indicated that they are reasonably satisfied, 8.0% indicated that they are not satisfied and 3.5% indicated that they are completely unsatisfied with the information that the systems produce.

Table 7 User's systems expectations met

	Frequency	Percent	Valid Percent	Cumulative Percent
Poor	5	4.4	4.4	4.4
Good	83	73.5	73.5	77.9
Excellent	6	5.3	5.3	83.2
Acceptable	19	16.8	16.8	100.0
Total	113	100.0	100.0	

The table above shows that 4.4% of the respondents indicate that the expectations of the systems have been poorly met, 73.5% indicate that their expectations are met.

Davenport (2008) explains voluntary involvement of users as a principle that users have towards a system being developed that their participation is personally relevant and important. The users who volunteer may be interested in the development of certain systems being developed. Van Raaij and Schepers (2008) state that an individual can be willing to try new improvement and that person can be said that he or she is a theoretical risk taker. Nearly thirty nine percent of the respondents are willing to be involved a little while 43.4% of the respondents are willing to be involved a lot. Therefore, it shows that most respondents are willing to be involved.

According to Lubbe and Singh (2009), the knowledge that users have can improve the quality of IS because the IS will consist of functions that are needed for certain systems. User knowledge refers to how users understand technical factors of system so that when the systems are being developed the user's contribution can be precise towards system development (Lubbe & Singh 2009). The question required knowing how respondents felt about their opinions; whether they think their input is worth value on the quality improvement of the NWU IS. The results show that 45.1.9% of the respondents think their opinion would improve the quality of the IS a little, 50.4% think their opinion would improve the quality of the IS a lot. Therefore, it shows that most respondents think their opinion would improve the quality of the IS.

The next question investigated the kind of problems respondents could have when using these systems. The systems are not fully non-problematic, 53.1 % of the respondents indicate that they have experienced little problems when using the systems, whereas 19.5% have experienced lots of problems. IT has changed on how teaching can be done today and this technology is utilised for teaching. Therefore, students solve problems by accessing information on different problems (Demirci 2009). This question wanted to establish the satisfaction of information that users receive when they use systems. The results show that 8% of the respondents are completely satisfied while 86.7% are reasonably satisfied.

Some users are not willing to try new technology because they are afraid of being seen as stupid, losing important information, or making mistakes. This is in agreement with Van Raaij and Scheepers (2008). This is the case when a user was not involved in the development and implementation of these systems. The outcome reveals 75.5% shows that the

systems are easy to use. Almost 58% of the respondents would like the systems to be redesigned/modified a little.

Lubbe and Bopape (2012) state that computer literacy is the user's level of understanding as well as knowledge that they have concerning the use of computers. They note that if users have knowledge about computers, it would make it easier for the developers and users to communicate and users would understand several computer abbreviations and terms. They also argue that if users are computer literate, they would understand which functions of a system can be developed. In this study most of the respondents are advanced users and they responded positively of how a system addresses their needs and how fast the systems are. Thirty-four percent of the respondents responded they were skilled while 52.2% responded were advanced.

Lubbe and Singh (2009) state that IS is seen as a tool that can help the users to carry out certain work. When the work of the user's increases, they have a positive reaction on IS functionalities. User satisfaction can therefore be achieved when the number of support users need from IS is in line with IS planning and services (Lubbe & Singh 2009). They note that dissatisfaction of users can be seen when there is not enough support from IS. More than 73% of the respondents were satisfied of how the systems address their social needs. Respondents showed that 56.6% use efundi and 41.6% use Groupwise.

Measures of Association

There is relationship between IS and access to Internet. Amongst the people who have access to Internet, 50% use it to access university website, 26.2% for efundi, and 25% represents those who use it to have access to GroupWise. Though some students use the Internet for efundi or Groupwise individually, some of them collectively use the Internet to have access to both efundi and Groupwise. The Pearson and Likelihood ratio tests results show the critical value of these statistics at 5% level of significance and 4 degrees of freedom is 9.488. The test statistics for these two tests are 9.975 and 10.361 for Pearson and Likelihood ratio respectively. Since these test statistics are greater than the critical value, the null hypothesis that there is no association between IS and access to Internet is rejected.

Table 11 Measures of association

		Value	Approx. Sig.
Nominal by Nominal	Phi	.297	.041
	Cramer's V	.297	.041
	Contingency Coefficient	.285	.041
N of Valid Cases		113	

As shown in Table 11, three association measures have coefficients of 0.297 and 0.285 for Phi, Gramer's V and Contingency coefficient respectively. The measure of association with a coefficient ranging between 0.1 and 0.3 implies that the association/relationship between the variables is weak. According to Reddy (2006), IT is a tool which can be utilised to create, process and analyse data and it can be a tool that the education sectors can make use of in schools and universities to provide students with information and this study does not support it.

In all respondents that use the systems daily, 71.1% uses the university website, 64.3% uses efundi, and 85.0% uses Groupwise. The Pearson and Likelihood ratio tests have a critical value at 5% level of significance and 4 degrees of freedom of 9.488. The test statistics for these two tests are 10.034 and 10.250 for Pearson and Likelihood ratio respectively. Since these statistics are greater than the critical value, the null hypothesis that there is no association between IS and the daily use of the systems is rejected.

Table 12 Measures of association

		Value	Approx. Sig.
Nominal by Nominal	Phi	.298	.040
	Cramer's V	.298	.040
	Contingency Coefficient	.286	.040
N of Valid Cases		113	

As shown in Table 12, two association measures have coefficients of 0.298 and 0.286 for Phi, Gramer's V and Contingency coefficient respectively. According to the measure of association, a coefficient ranging between 0.1 and 0.3 entails that the relationship/ association between the variables is weak. This means that there is weak association between IS and the daily use of the systems. So the NWU IS is being used daily and this can increase the success of the systems.

There is little relationship between IS and the informing of planning and development of IS. Amongst the people who were informed of planning and development of IS, 18.4% indicates that they were not informed at all on the university website, 23.8% indicates that they were not informed at all on efundi, and 15.0% indicate that they were not informed on Groupwise.

Reddy (2008) note that in the process of IS development, end-users involvements can be useful because end-users provide better specifications and requirements making sure that the relevant systems are developed. The results show there is a relationship between IS and the involvement of planning and development of IS. Amongst the people who were involved in the planning and development of IS, 89.5% indicates that they were not involved at all on university website, 88.1% indicates that they were not informed at all on efundi, and 95.1% indicate that they were not involved on Groupwise.

Table 13 Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	29.627[a]	8	.000
Likelihood Ratio	10.164	8	.254
N of Valid Cases	113		

Table 13 indicates the Pearson and Likelihood ratio tests results. The critical value of these statistics at 5% level of significance and 4 degrees of freedom is 9.488. They both tested 29.627 and 10.164 for Pearson and Likelihood ratio respectively. The test statistics resulted in greater value than the critical value, therefore the null hypothesis reveals that there is no association between IS and the informing of planning and development of IS then it is rejected. It is then concluded that there association between these two variables as also shown.

Conclusion and Managerial Guidelines

In previous sections of the paper it has been pointed out that the study falls within the field of Social Informatics. In a community, IS can be difficult to use. Therefore, the study focused on finding guidelines that would involve the community to be part of the development of IS.

The study looked at the present systems that NWU has and how these systems affect students. The systems were developed and implemented without the input of users. The research questions were used to find out how the community is affected by these systems and whether they were involved and if they would want to participate in future developments of NWU IS.

Summary of the Project

Technology replaces certain activities and many people are exposed to the changes that technology brings (Lubbe and Singh 2009). The results of this is that IS has expected and unexpected implications on users including social

environment. Most organisations are exposed to IS and it has become one of the most important tools that can help students and lecturers do their work. It has become difficult for users of IS to interact with these systems because they were not included in the development of the systems. User participation can play a role in the development of IS because developers can identify what the user's needs are and how they can reach those needs. To a certain extent, some users are willing to be involved and they feel that their input can add value.

The NWU IS that were investigated are, efundi (used as a communication tool as well as for electronic learning), Groupwise (used for communication) and the University Website (used for many things such as searching for books, accessing the university library and finding articles for research purposes).

Amongst other things discussed in the literature review was the involvement of users as well as the participation of users in the development of IS. It highlighted the importance of user participation and involvement during the development and implementation of IS. It also discussed the downfalls of user involvement and participation in IS development being that some users do not actually know what they want and sometime they want certain functions that are not necessary for a certain systems. The next section addresses the research questions raised above.

What is the Impact of IS Within NWU?

Lubbe and Bopape (2012) note that using IS as a communication tool affects the social relationships of those using it. Also, these systems assist the users with their studies. The results indicates that 82.3% of the respondents access these systems at NWU; this means that most of the respondents do not have Internet access to access these systems at their homes or residences and they need to access the system to get study materials, information of next classes, tests or quizzes and communicate with their classmates or lecturers.

To what degree are the users of the NWU Mafikeng Campus IS involved and participate in the development and/or implementation of these systems?

User participation is referred to as the user behaviour, assignment and activities that users contribute to the development of a system. User involvement is referred to as a subjective psychological state reflecting the

importance and personal relevance that a user attaches to a given system (Teimoornia *et al.* 2009). In the results it is indicated that 89.4% of the respondents were not involved and/or even participated in the development and/or implementation of the NWU's IS at all.

As a result, user involvement is required but it seems that users of the current NWU systems were not involved or those who were involved did not contribute to a full extent. If the users that were involved had given much input, the systems were not going to cause too much impact on the users that are currently interacting with them. Users were forced to accept the systems as they are because they cannot be change and most users were willing to be involved if the systems were to be modified or changed.

How can user involvement and participation be related to IS success?

Lubbe and Bopape (2012) state that if IS's success can be measured by user participation and satisfaction in the development of systems, then IS's success relates to user and it would mean that user participation is necessary for IS's success. User involvement and participation can be related to IS in terms of the success of systems. The success of IS is not just determined by the developers but also its users. To measure how IS relate to user involvement and participation the satisfactions of users can be determined therefore to show that they relate to measure the success of IS. The results show that 78.8% of users are reasonably satisfied with the IS services that NWU provide. As a result, the IS of NWU is reasonably successful although they were not involved.

What kind of social factors should be an influence to the development of IS?

The following are the characteristics that users have which can influence the success of the systems when they are being developed: User participation, user involvement, user willingness and user's computer literacy. User participation is described as the participation of users that is active and substantive towards the process of development. User involvement can be described as considering the inputs and suggestions of potential user of the system during their development process.

User willingness is defined as users that would like to be part of the development process and they know that their inputs can add value on the system's success. The results indicate that 43.4% of the respondents are willing to be involved in the development of NWU IS. This shows that not a lot of users have the interest to be involved and make a difference concerning NWU IS. User's computer literacy is described as the user's level of understanding as well as knowledge that they have concerning the use of computers (Lubbe & Bopape 2012). The results show that 52.2% of the respondents are advanced regarding the use of computers. Table 4.18 shows that 73.5% of the respondents are satisfied that the IS is addressing their social needs.

Guidelines

The guidelines that follow are given to tertiary institutions that plan to develop and implement IS or they have IS as a tool that students and lecturers can use:

- Based on these results, it indicates that only 73.5% of the respondents regard the systems as good and 5.3% regard them as excellent. It can only mean that the needs of users were not considered. In this case the guideline would be that even if the users do not understand, their needs should be taken into consideration.
- The theory state that social context can be stated as an interactive relationship between various communities through the use of IS that is simplified for ease of use. Therefore, the IS that users use affects their social aspects therefore when these systems are to be implemented, the impact should be taken into account
- Lots of users are willing to participate and they feel that their input can be worth more value in the development and implementation of IS when it is built for their use. This guideline is supported by the results which indicate that 43.4% of the respondent are willing to participate a lot and 38.9% of the respondents indicates that they are minimally willing to participate in the development and implementation of the systems
- For the IS to be successful it would require the users to participate and be involved positively in IS development and implementation. Based on the theory the involvements of end-users provide accurate

specifications and requirements to make sure that the relevant systems are developed and provide user ownership in IS and promote empowerment. This means that the involvement of user can result in the success of IS.

- The use of best practice is not enough; therefore the needs of the users have to be taken into account. It is important to know how the user requires the system to function; the theory explains that end-users can provide accurate specifications and requirements for a system.

- The theory state that the classroom method whereby teachers stood in front of students has been changed by technology. This means that effectiveness of IS is one of the things that add value to education, but it has the ability to impact enormously on the community that uses it. As a result, before the implementation of whichever IS this should be taken into consideration.

Conclusion

The study's focus was to investigate social impact of IS at NWU. In the investigation, the most vital parts were investigations on the user involvement and participation. The two can help to measure the success of systems because they provide inputs that are necessary for the functions of any system that can be developed and implemented.

It can be concluded that IS has an effect on social relationships because it has the power to change how other relationships are structured because they use these system. The relationships include peers, students, lecturers and friends. Most users were reasonably satisfied with the current systems but in future their needs should be considered as well as their inputs when developing and implementing new or upgraded system.

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Views about Information Systems among North West University Mafikeng Campus Management, Administration and Law Students

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Abstract

This paper reports the results of an investigation into the social differences between IS and non-IS students at NWU, Mafikeng Campus. It explores knowledge about IS by determining the level of computer knowledge and interaction, and other facts. These items influence students' choices between taking IS as a field of study and may increase career awareness of IS. It is assumed that students must have acquired computer knowledge (concepts) and computer skills (application) as they pursue their career. The problem is that non-IS students are not knowledgeable of computer hardware and software and would struggle. A quantitative research approach was used for this study. The findings in this study show that factors influencing students' choices from not taking or going into informatics field of study were related to higher salary and lower level of computer literacy. Students are also not informed of an IS career due to the lack of career orientation. The IS department should provide marketing strategies to increase IS career awareness.

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Introduction

The use of Information Technology (IT) has become pervasive in 21st Century society (Topi *et al.,* 2010). According to these authors it is increasingly required of the workforce to be skilled in the use of IT. It furthermore is expected of employers to have a command of aspects of IT that before was handled by an organisation's centralised computing services unit. Topi *et al.,* (2010) also emphasise that while many organisations provide some user training in IT, graduates who have an in-depth understanding of the opportunities IT capabilities can help their organisation would be in a stronger position compared to others without this understanding. Therefore, a strong, Information Systems (IS) programme can benefit all students at university and provide benefits to non-majors who desire competence in IT and its application to their areas of interest (Topi *et al.,* 2010).

This research project is investigating how students from the law discipline differ from Information Systems (IS) students concerning the use of Information Communication Technology (ICT). Thus, it is assumed that students must have acquired both computer knowledge (concepts) and computer skills (application) in high school or through personal experiences. The NWU therefore introduce computer courses to assist IS students and non-IS to gain computer knowledge to pursue their careers. As an IS student is knowledgeable in computer hardware and software, s/he, therefore can be able to format a computer by loading operating systems (OS), and disassembling and assembling personal computer (PC) if damaged or crashed due to high voltage of current, without consulting IT experts. But a non-IS student would struggle to do this. The reason being that the non-IS student is lacking IT skills. For this reason, non-IS students' need to attend computer course that includes both IS concepts and IT software applications.

Research Questions

The literature review highlights various factors that influence student differences of IS. These factors were formed into research questions.

- What reasons do non-IS students have for not taking IS as a field of study and work?
- What factors encourage students' choice to enter the field of IS?
- What strategies can IS department employ to increase awareness about IS / IT related careers amongst non-IS students?

Literature Review

According to Cloete (2011) some of the challenges identified are: gender, culture, race, maturity, prior exposure, influences and job market conditions. He further explained that as a result of a literature review, gaps will be identified and a proposed solution will be concluded and in the form of a summary with recommendations to further research in this field (Cloete 2011). Agarwala also stated that, based on other researchers, there is no doubt that some studies have proven that socio-cultural, economic, and political changes does affect the career choices of IS students (Agarwala 2008).

Knowledge about IS

Topi *et al.,* (2010) stated that IS as a field of academic study began in the 1960s, a few years after the first use of computers for transaction processing and reporting by organisations. They further assert that as organisations completed the use of information processing and communication technology to operational processes, project management, decision support, and enterprise and industry strategy, the academic field also grew in scope and depth (Topi *et al.,* (2010) who also state that IS is important to problem detection, scrutiny, and for making decision. The importance of IT and IS to organisations and the need for well-educated professionals in the field is the basis for a strong link between educational programmes and the professional community of IS practitioners (Topi *et al.,* 2010).

The number of students enrolling for computer related courses at universities has decreased worldwide since the late 1990s and a similar trend has been noted in South Africa (Alexander, Holmner, Lotriet, Matthee, Pieterse, Naidoo, Twinomurinzi, and Jordaan 2011). Student enrolments, however, appear to have stabilised in the United States and Canada since about 2007 (Alexander *et al.,* 2011). Alexander *et al.,* (2011) note that the increasing reduction in the number of new graduates, alongside with the current and indicated shortages of skilled professionals is noticeable in almost all computer related fields. However, it has been noted with alarm, not only by academics at universities, but also by officials in various state bodies in many countries of the world (Alexander *et al.,* 2011). The impact of lower student numbers has resulted in some universities reducing academic teaching and research positions in Computer Science and IS departments, and even goes as far as the closure of such departments. This is

in contrast with the situation where such departments were flourishing and, were often considered to be the faculties in which they were located. In the Institutes of Technology, which were crucial to the start of Ireland's high technology boom, competition to enter IS has been falling steadily (Alexander *et al.,* 2011).

They also mentioned that there is agreement that shortages exist, the impact of the ICT skills shortage on the economies of countries is less easy to quantify, according to Alexander *et al.,* (2011) both directly and indirectly, to national economies. The direct component is made up of revenues generated by the development of hardware and software as well as services related to advising and assisting clients in the implementation and use of computer systems. The indirect component involves the informed, efficient and effective use of computers in business, government and civil society. Several agencies, such as the European E-Skills Forum, e-Skills UK, the Australian Government Department of Communications, IT and the Arts, and the South African IS, Electronics and Telecommunications Technologies Sector Education Training Authority (ISETT SETA) have been tasked with a detailed assessment of the ICT skills shortage and were asked to provide proper initiatives to address the issues faced by this IS / IT skills shortages (Alexander *et al.,* 2011). The sudden and severe downturn in the global economy since the second half of 2008 is likely to have a major impact on university computer related course enrolments and the demand for ICT skills. However, both aspects are difficult to predict and have not been taken into account in this research (Alexander *et al.,* 2011).

Technological developments have made computer simulations more feasible for promoting enhancing adaptive learning in students, as computers can provide visualisation of dynamic phenomena. When new information is presented, inexperienced students generally experience a heavy cognitive load (Park *et al.,* 2008). They went further to say that this cognitive load has a negative effect on the process of acquiring new Information instructional techniques that reduce working memory load are required. Accordingly, students with low prior knowledge levels may benefit from a learning programme that includes a low interactive simulation, since it allows them to overcome perceptual limitations (Park *et al.,* 2008).

Scott *et al.,* (2009) stated that students are concerned with what their overall career will be like after they graduate. General lack of knowledge about careers in the IS field is an issue that influenced their decision-making.

However, little research has been done to investigate social differences between IS and non- IS students.

Diversity

The influence of culture and gender on perceptions of IT studies and careers was developed after the investigation into the effects of gender and culture on the perceptions of IT careers (Nielsen, Von Hellens, Greenhill, Halloran, Pringle. 1999). Its aim is to better understand IT as a career and study choice, and determining the factors, which lead to students social differences (Nielsen *et al.,* 1999). Cloete (2011) states that the constructs include the cultural background, gender, life history, value of computer skills and individualism/collectivisms. Cloete (2011) emphasises that the cultural background refers to language barrier and regional differences and went further to state that gender distinguishes diverse perceptions held by males and females towards IT in general.

Felder and Brent (2005) stated that those students who leave technical curricula are essentially the same as the distributions of those who stay in. While many of those who drop out do so because of academic difficulties, many others are good students who leave because of dissatisfaction with their instruction, a fact made according to the researcher, quoted by the researchers. The problem is that there are no two students that are alike (Felder and Brent 2005). They have different backgrounds, strengths and weaknesses, interests, ambitions, senses of responsibility, levels of motivation, and approaches to studying (Felder and Brent 2005). Teaching methods also vary (Felder and Brent 2005). Some instructors mainly lecture, while others spend more time on demonstrations or activities. Hence, the three categories of diversity that have been shown to have important implications for teaching and learning are differences in students' learning styles (characteristic ways of taking in and processing information), approaches to learning (surface, deep, and strategic), and intellectual development levels (attitudes about the nature of knowledge and how it should be acquired and evaluated). Learning styles are characteristic cognitive, affective, and psychological behaviours that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment (Felder and Brent 2005).

The concept of learning styles has been applied to a wide variety of student attributes and differences. Some students are comfortable with

theories and abstractions, and others feel much more at home with facts and observable phenomena. However, some prefer active learning and others lean toward neither introspection nor verbal explanations. One learning style is neither preferable nor inferior to another, but is simply different with different characteristic strengths and weaknesses. A goal of instruction should be to equip students with the skills associated with every learning style category, regardless of the students' personal preferences, since they will need all of those skills to function effectively as professionals (Felder and Brent 2005).

On the approaches to learning, students may be inclined to approach their courses in one of three ways (Felder and Brent 2005). Those with a reproducing orientation tend to take a surface approach to learning, relying on rote memorisation and mechanical formula substitution and making little or no effort to understand the material being taught. Those with a meaning orientation tend to adopt a deep approach, probing and questioning and exploring the limits of applicability of new material. Those with an achieving orientation tend to use a strategic approach, doing whatever is necessary to get the highest grade they can, taking a surface approach if that suffices and a deep approach when necessary (Felder and Brent 2005). At the highest developmental level normally seen in college students (but not in many of them), individual students display thinking patterns resembling those of scientists and engineers.

Career Orientation and Opportunities

Orientation provides a guide to action, and hence is similar to an attitude, which has a cognitive component (a set of beliefs about the career), an evaluative component (a sense of what would be a good career or a bad career for oneself), and a behavioural component (an action tendency or a predisposition to behave in certain ways, Agarwala 2008). In the globalising Information Age, ICT skills are becoming widespread and are considered a prerequisite to securing professional employment in much of the world. Particularly in regions with developing or transitioning economies, ICT skills are expected to pave a path out of poverty, or at least to provide a primary step toward securing higher-paying jobs (Walton *et al.,* 2009).

Cloete (2011) stated that acquiring qualified IS / IT personnel are a critical challenge facing organisations today. IT has spread across various sectors of commerce and society, and has therefore led to the current

shortage of IT professionals (Rettenmayer *et al.,* 2006). The IT Association of America a few years ago forecast the shortage of more than 800 000 IT persons. They assert that employment statistics provided by the Bureau of Labour Statistics, employment levels in the computing and IS fields will continue to grow over the coming years, males and females having different perceptions of the IS profession (Rettenmayer *et al.,* 2006). Most students do not have a guide when enrolling into a certain programme due to insufficient information; hence there is the need for career orientation (Agarwala 2008). However, there are two kinds of orientation, the protean (new career orientation) and the conventional (traditional organizational orientation). Core protean values are freedom and growth, and the main criteria of success are subjective (intrinsic/psychological success) and not objective (extrinsic/material). A protean career orientation reflects the extent to which an individual adopts such a perspective to their career (Agarwala 2008).

A conventional career orientation defines career success in terms of measurable objective factors such as salary, recognition, or number of promotions. The core value of conventional career orientation is advancement. Even though career success has been researched extensively since the 1950s, the study of subjective and objective career success did not start until 1988, and until 2002, none of these studies involved collecting the participants' own (subjective) view of their measures of career success (Cloete 2011)

Information Systems

According to Lubbe and Bopape (2011) IS in the various technologies applied in the creation, acquisition, storage, organization, dissemination, retrieval, processing, manipulation, interpretation, transmission of information to accumulate knowledge and expedite communication. IS refers to hardware as well as software, the latter also known as Applications (Apps). Agarwala (2008) describes how individuals relate to others and to society, and represents the degree to which they are emotionally and cognitively attached to a particular network of individuals. This includes direct person-to-person networks and the social media. Research examining the differential role of peers, colleagues, mentors, and managers in career decision-making is limited. Related research suggests that there is a positive relationship between collectivism and family relatedness, and individualism and peer relatedness (Agarwala 2008).

Professional Self-Efficacy

Self-efficacy refers to how confident an individual is in his/her capability to perform task; it is closely linked to self-confidence (Papastergiou 2009). Self-efficacy was introduced by Papastergiou (2009). Since then the theory has been applied by many researchers, not only in humanity discipline but also in other areas such as in educational, and technology (Papastergiou 2009). Among others, in this theory they stated that different people with similar skills or the same person under different circumstances might perform poorly depending on fluctuations in their beliefs of individual efficacy. This theory also acknowledged that humans have different capabilities (Papastergiou 2009). They found that self-efficacy of male and female students did not differ substantially.

Peker and Pamuk (2009) furthermore elaborate on self-efficacy, which is one's belief in her/ his capacity to perform a specific task. Individuals may weigh their skills and capabilities prior to performing certain actions or activities. If individuals have high self-efficacy for carrying out certain activities, they are more likely to attempt doing those activities. On the contrary, if individuals have low self-efficacy for carrying out some activities, they are less likely to attempt doing those activities. However, Self-efficacy is also defined as one's ability to mobilise the motivation, cognitive recourses, and courses of action needed to meet given situational demands. In addition, computer self-efficacy has a major impact on an individual's expectations towards using computers. Individuals who do not believe in themselves as computer users are less likely to use computer. Therefore, a teacher's level of computer self-efficacy is a good sign of his/her integration of technology into instruction (Peker and Pamuk 2009).

Previous research generally indicated a correlation between computer self-efficacy and computer experience. Similar to computer experience, some researchers studied how computer training affects computer self-efficacy and they found a positive correlation between computer training and self-efficacy level. To this end, training in technology or computer-related courses are very important in order to provide pre-service teachers with the essential skills and knowledge for integrating technology into teaching as well as to strengthen positive attitude towards computers (Peker and Pamuk 2009).

Computer Usage and Interaction among Students

Developments in ICT use are taking place against a knowledge base that suggests students lack confidence in their use of computers and are initially intimidated when ICT is introduced as a learning media (Moule 2003). There is also a suggested gender and age bias, with women and those of greater maturity being seen as less secure in the use of ICT. Additionally, it is suggested that research considering computer use has tended to focus on institutional effects or issues related to staff, rather than the student perspective (Moule 2003). Thus, this research aimed to access and present student experiences (Moule 2003). Phillips notes that skill requirements change over time for any profession and professional positions in organizations that work extensively with computer technology change almost yearly (Wallace and Clariana 2005).

Lubbe and Bopape (2011) stated that computer literacy is the users' level of comprehending as well as knowledge that they possess concerning the usage and interaction of computers. They further stated that if users have little piece of knowledge about computers, it would make it easier to be able to further more with their pursuit for IS career. If users are computer literate, they would understand which functions of a system, the terms, and abbreviations that they can comprehend and apply when necessarily.

Technical and Managerial Skills

Buarki *et al.,* (2011) suggested that there was a need to improve students' ICT skills, since it has become a centre point of the twenty-first century LIS education. The respondents came from 46 ALA accredited LIS programmes and 33 programmes approved by the National Council for Accreditation of Teacher Education-American Association of School Librarians (NCATE-AASL), aged 18 to 25. The results indicated the highest level of technology competency as using tools such as, instant messaging and emails it was recommended that students should be required to use these technologies in assignments and understand the value of networking with lecturers and librarians using these technologies (Buarki *et al.,* 2011).

This will eventually produce graduates with better ICT skills and enable them to be employed in different information settings. They will be able to perform their daily routines more easily, search different databases, use various automated systems and even adopt new ICT as it emerges. Having a variety of ICT skills and knowing how to utilise them will also make them to

be able to continue their higher education and supply them with skills needed by employers. Furthermore, the use of technologies as a medium on instruction will prepare graduates to use different ICT technologies and to work as professionals. It is for this reason that IS students should possess ICT skills that are required in higher institutes (Buarki *et al.,* 2011).

Social Factors Influencing IS Career Choices

The two main factors leading to a student's decision to major or enrol in IS as a field of work or study includes, higher salary expectations and opportunity for greater work. The social differences, attitudes and perceptions that students have of IS / IT also influence their choice thereof as a career. Furthermore, in the study of Cloete (2011) he identified three social differences of IS / IT careers. The stereotypical IT programming nerd, IS / IT is a career for males and finally IS profession is only technically oriented.

The social differences between IS students and non-IS are not uniform. There are influencing factors that the literature review has identified and they are outlined below. These revolve around gender, racial, prior exposure and experience (Cloete 2011). For gender influences, generally the view is that awareness of IS / IT is low amongst females and that this is a key factor in the formulation of attitudes towards IS in general (Cloete 2011).

The number of degrees obtained in computer related courses has decreased since 1985, and has decreased at a faster rate for women than for men. The percentage of women in the United States obtaining computing degrees declined from 32.5% in 1980 to 28% in 2000 with similar figures in Australia evidenced by a decline in females enrolling for IS courses from 48.1% in 1994 to 32% in 2003 and a further drop to 21.97% in 2005 (Cloete 2011). He showed that only 55% of females were familiar with IS compared to 72% of male respondents. Female students feel that they are not appropriate candidates for computer related courses and choose alternate commerce courses such as accounting or finance.

These differences are attributed to the low expectation that levels society has of women, and to the male-dominated stereotype of technical careers (Cloete 2011). The literature also highlights that differences of IS skills differ by gender. Male students tend to rate themselves as having higher IS skills than females, indicating a difference in the confidence levels of using IS. Females have also been found to use IS for word processing as opposed to problem-solving as used by males. However, according to a study

by Cloete (2011) males and females were found to have similar differences about IT work, and are conscious of the integration of technical systems, social and managerial components in the IS field.

In the case of racial influences, students from previously disadvantaged racial groups generally face greater barriers to education and career success than others. These include barriers such as poverty and limited access to IT. Such racial inequality exists not only in the availability of technology but also in the way technology is used, from using it as a tutorial supplement to using it for programming. This accessibility of technology and the lack thereof are often correlates with racial background and the barriers faced by the different racial groups (Cloete 2011). Higher education institutions need to consider how the digital divide will affect or disadvantage students. The actual level of technology access should be monitored to alleviate the tension associated with using IT to attract students with limited access to the technology (Cloete 2011).

There is currently little research to support the notion that age diversity exists in the technology field (Cloete 2011). He asserts that maturity influences, IS / IT use, but is based more on social contact than on reality (Cloete 2011). Conversely, a study was conducted and the research found no difference in the job performance of IS professionals as they matured. Cloete states that some conclusions on differences can be drawn with regards to age. In addition, he stated that maturity seems to support age, with an advanced uncertainty avoidance and emphasis being put on job security (Cloete 2011).

Ethics and Informatics

According to Thomas and Ahyick (2010) the IT industry is continuing to change and grow. Society is becoming more and more reliant on IS in all aspects of life, thus increasing the risk of negative impact due to the unethical use of IT (Thomas and Ahyick 2010). The ethical issues facing information professionals today are more challenging than ever before. Ethics are being put to new tests because of these evolving and emerging technologies. The fundamental changes in our society and the equity or inequity within it are also causing ethical beliefs to be challenged further. As the use of technology increases and technology advances, the scope of ethical dilemmas continues to change and the number of issues that require ethical decisions multiplies (Thomas and Ahyick 2010).

Some of the major issues in IT that have created much debate include privacy, security, hacking, intellectual property, copyright, government and employee monitoring, freedom of speech on the Internet, computer and internet crimes, and the tools used by perpetrators to commit them. Graduates needed to be prepared to work ethically in this ever-changing environment. Thomas and Ahyick (2010) note that outcomes required for the Accreditation of Computing Programmes are related to ethics, namely: an understanding of professional, ethical, and social responsibilities; and an ability to analyse the impact of computing on individuals, organisations and society, including ethical, legal, security, and global policy issues.

Many of the ethical issues associated with computers and the internet are the old ethical problems presenting themselves in new media. Privacy has always been an issue, but now that databases have become more prevalent and data is easily accessible the issue of protecting people's privacy is more important. They state that the issue of freedom of speech has made ethics and informatics more complex with the use of the Internet. People are finding new ways to avoid copyright issues and perpetrate crimes (Thomas and Ahyick 2010).

Research Methodology

A questionnaire was used to acquire primary data; and secondary data was drawn mostly from organisational annual reports, company magazines and available literature in the academic field. For the purpose of this study a questionnaire was used as the data gathering tool in order to determine the social differences between IS students and non IS students. The target population was based on the honours students in Commerce and Administration and Law Faculties. This usually allows the collection of quantifiable and qualitative data and also allows for the analysis of this data to determine patterns and relationships. The questionnaire was on word document (Oates 2006).

The population size for this study was 222 of students of NWU. A sample was derived from that population. It included students who are doing honours in the Faculty of Commerce and Administration and Law. The stratified sample size was 172, consisting of 80 students from the Faculty of Commerce and Administration who are doing their honours degree in 2012 and 92 students from the Law Faculty.

The data was collected through the use of questionnaires. The questionnaires were given to the selected honours students of the faculties of Commerce and Administration and Law in a hard copy to make it easier to hand out as well as collect back. The data was summarized on a statistical spreadsheet, and analysis of data was done through the use of Excel. The Department of Statistics at the University was consulted on the statistics used in the study.

Data Analysis and Results

The successes of IS / IT, it is essential to take into consideration the age group that falls within younger generation, the reason being that they show more interest in IS / IT than other age groups. However, the older generation age groups are not interested in IS / IT, one of the reasons may be the fact that they cannot comprehend due to their old age or feel pressured or threatened at work when new technologies are introduced or even when they have to use IS / IT in their daily operations.

Table 1: Composition of the sample

Faculty	Population	Sample	Distributed	Response
Commerce & Admin.	102	80	80	80
Law	120	92	92	92
Total				172

Table 2 reflects that out of one hundred and seventy-two (172) respondents, 8% were aged between 18-20 years, 60% was aged between 21-24 years and 30% was aged between 25-30 years. The majority of the respondents, aged between 21 -24 years, meaning that majority of honours students in the NWU (Mafikeng Campus) from the Faculties of Law and Commerce and Administration, indicated that a vision of NWU as an institution is to produce graduates.

There is a pronounced gender bias, with a low percentage of women enrolling for IS / IT computer-related courses, worldwide (Alexander 2011). Some Studies have revealed that social and cultural influences are pertinent for all researches into this gender issue (Alexander 2011). In this project, there is a lower percentage of males compared to Alexander's theory. Out of

172 respondents, 43% were male, and the remaining 57% were female. As no preference was given to sex, the sample breakdown is considered as a fair representative of the demographics of honours students in the Law and Commerce and Administration faculties. This may be due to the fact that this study was combining honours students from the Faculty of Law and Commerce and Administration in determining the difference between IS students and students in other programmes. From the result, 48.8% where female and 51.2% are male. It shows that male respondents are more in the Faculty of Commerce and Administration as compared to the Law Faculty. The aim was to combine students from Commerce and Administration and Law faculties.

The result shows that at 55.8% females constituted the largest gender group in the sample, while at 41.9% male and 2.3% represent the least dominated title. Hence this may be as a result of combining honours students in Law and Commerce and Administration faculties. A hundred and seventy two respondents (172, (15.7%)) were between 5-6 years and have more academic year experiences as compared to (84.3%) that were between 3-4 years. However, the targeted academic year for any students doing honours ranges from 3-4 years. Anything outside this could be attributed to lack of adequately qualified students in the course or the NWU, Mafikeng Campus. Out of 172 respondents, (53.5%) are found in Law Faculty with the degree in LLB; (46.5%) were derived from Commerce and Administration with a degree in B.Com.

IS students should be able to communicate information, and to produce documents electronically by the use of computers and communication technologies. The IS / IT skills involve using office applications such as word, Excel and others (Buarki *et al.,* 2011). In determining the level of computer literacy, out of 172 respondents, the result revealed that (7.0%) were very good, (25.0%) were good, and (32.6%) were fair. This means that some of the respondents (57.6%) indicated that they had prior computer exposure. These figures were expected to increase as the candidates are post graduates students from the Law and Commerce faculties and should have acquired some kind of knowledge on IS. In addition to this study, the statistics agree with Buarki *et al.,* (2011) that IS / IT has attracted IS and non-IS students due to its role and importance in institutions.

Cross-Correlations for Demographic Variables

It is essential to get the basic ideology about the relationship between biological variables. This analysis is intended to investigate respondents against other demographics in relation to their gender. Table 2 below confirm previous results.

Table 2: Gender and age group cross tabulation

			Age group				Total
			18-20	21-24	25-30	31-40	
Gender	Female	Count	11	57	28	2	98
		% within Age group	84.6%	55.3%	53.8%	50.0%	57.0%
	Male	Count	2	46	24	2	74
		% within Age group	15.4%	44.7%	46.2%	50.0%	43.0%
Total		Count	13	103	52	4	172
		% within Age group	100.0%	100.0%	100.0%	100.0%	100.0%

Table 3 reflects 145 students whose year academic revealed between 3-4 years range from 86 of them are females. However it is noticed that out of 27 respondents, students between 5-6 years were 12 female students.

Table 3: Gender and Academic year Cross Tabulation

			What year are you in academically?		Total
			3-4 years	5-6 years	
Gender	Female	Count	86	12	98
		% within What year are you in academically?	59.3%	44.4%	57.0%
	Male	Count	59	15	74
		% within What year are you in academically?	40.7%	55.6%	43.0%

		Count	145	27	172
Total		% within What year are you in academically?	100.0%	100.0%	100.0%

Female students are well represented in academic years between 3-4 years, 86 (59.3%) and between 5-6 years 12 female respondents. On the other hand, the male respondents between 3.4 years were 59 (40.7%), and 15 male's students between 5-6 years. One of the Mafikeng campus's objectives is to produce young graduates in a record time. The respondents between 3-4 years reflect that the students were consistent with their academic performance as compared to those between the 5-6 years who have repeated modules that delayed them.

Table 4: Gender and Degree Cross Tabulation

			Select your Degree		Total
			BCom	LLB	
Gender	Female	Count	39	59	98
		% within Select your Degree	48.8%	64.1%	57.0%
	Male	Count	41	33	74
		% within Select your Degree	51.2%	35.9%	43.0%
Total		Count	80	92	172
		% within Select your Degree	100.0%	100.0%	100.0%

Generally, IS / IT, is mostly male dominated who is perceived to be technically oriented compared to women (Agarwala 2008). In this study, it is revealed that females are more represented. It may be that combining both faculties could have led to low percentage of men in IS degree which is different from Agarwala (2008)'s theory. Table 4 above reveals that 39 respondents from B.Com and 59 respondents in LLB were females from both. Male respondents ranged from 41 in B.Com and 33 males from Law Faculty.

The Reasons non-IS Students Gave for not Taking IS as a Field of Study

Respondents were asked questions about factors that prevent students from taking IS as a major. The response's "agree and strongly agree" are merged to represent agree or affirmative and the response's "disagree" and "strongly disagree" are merged to represent disagree or negative. The majority of students agree (59.3%) that they would choose IS as a field of study.

Table 5: Would you choose IS as a field of study?

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	102	59.3	59.3	59.3
Disagree	70	40.7	40.7	100
Total	172	100	100	

The factors that influence career choice, as described by him, include: salary, job security and working conditions (extrinsic); and potential for achievement, career growth, recognition and the job itself (intrinsic). Students within the IS field show particular interest in using new and innovative technologies in their careers (Cloete 2011). In order for recruiters to attract and attain graduate-level IT students, they need to consider extrinsic and intrinsic factors.

The two main factors leading to a student's decision to major in IS as a field of work or study includes, higher salary expectations and opportunity for greater work. The social differences, attitudes and perceptions students have of IS / IT also influence their choice thereof as a career. In determining the reasons that non-IS students have for not taking IS as a field of study, respondents were asked if they would choose IS as a field of study. From the illustration above (Table 5), it was revealed that out of the 172 respondents, (59.3%) majority strongly agreed and the remaining respondents disagreed. It shows that the majority of students would choose IS as a field of study or work.

Table 6: Do you think Information Systems is a difficult programme?

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	78	45.3	45.3	45.3

Disagree	94	54.7	54.7	100
Total	172	100	100	

Most respondents indicated that the IS / IT programme is a difficult course for one to be enrolled in. The results (reflected in Table 6) show that 78 (45.3%) agree; 94 (54.7%) disagreed. Cloete (2011) identified three social differences of IS / IT careers. The stereotypical IT programming nerd, IS / IT is a career for males and IS profession is only technically oriented. The social differences between IS students and non-IS are not uniform. There are various influencing factors that the literature review has identified. These revolve around gender, race, prior exposure and experience (Cloete 2011). The results revealed that (56.9%) respondents state that IS is gender dominated, where females are in the majority (57%). Although, IS is a male dominated field, according to Cloete (2011) in this study, 56.9% indicated that IS is female dominated.

Table 7: Do you enjoy working in front of computer screen for long hours?

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	87	50.6	50.6	50.6
Disagree	85	49.4	49.4	100
Total	172	100	100	

Wallace and Clariana (2005) noted that expectation of computer literacy is a burden and an opportunity. The specific technology installed in any office or institution is constantly changing with sophisticated functions. Even though computers have become easier to use over time, their continually advancing capabilities and the increasing variety of available functions and features result in a consistent need for more training. In determining the level of computer literacy Table 7 above reveals that 87 (50.6%) agree and 85 (49.4%) disagree. This means that about half of the respondents (50.6%) indicated that they had prior computer exposure and that they enjoyed working in front of computer screen for long hours. This response was expected to increase as the candidates are post graduates students from the Law and Commerce Faculties and should have acquired some have kind of

knowledge relating to IS. Moule (2003) indicated that studies of computer usage and interaction among students show lack of confidence in their use of computers amongst the mature students.

Table 8: The reason non IS students have for not majoring in IS field

	Choose IS as a field of study	IS is a difficult programme	IS is a gender-dominated field	Working in front of a computer screen for long hours
I strongly disagree	37.8	54.7	56.9	49.4
I strongly agree	59.3	54.3	43	50.6

Factors that Encourage Students' Choice to Enter the Field of IS
Cloete (2011) identifies in his Two-Factor Theory of Intrinsic and Extrinsic factors that influence career choice include: salary, job security and working conditions (extrinsic); and potential for achievement, career growth, recognition and the job (intrinsic). Most students enrol into IS programmes because of the benefit they presume that the programme would offer to them after completion

Table 9: Do you think that IS course is a course that one gets a higher salary?

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	117	68	68	68
Disagree	55	32	32	100
Total	172	100	100	

From Table 9 it is clear that the majority of the students agree and that IS course is a type of course after which one gets a higher salary. 172 respondents, 117 (68%) agreed.

Table 10: Would you say that students enrolled for IS because they wanted people to respect them?

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	38	22	22	22
Disagree	134	78	78	100
Total	172	100	100	

The factors that influence students' career choice could be attributed to respect (Table 10). Students want to be respected and recognised in their various fields of study. Out of respondents, (78%) consisting of 134 respondents disagreed.

Table 11: Is it easy to be admitted as an IS student?

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	103	59	59	59
Disagree	69	40.1	40.1	100
Total	172	100	100	

The demand for IS / IT degree in top leading universities has also been declining since 2005, it was easier to enter a degree programme in IS at university or higher institution. The fall was because some courses were accepting all candidates with the minimal entry requirements (Alexander *et al.,* 2011). The results revealed that 103 (59%) agreed and 69 (40.1%) disagreed as shown in Table 11 above.

Table 12: Do you think that IS is a type of course meant for people who know how to use computer?

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	83	43.1	43.1	43.1
Disagree	98	56.9	56.9	100
Total	172	100	100	

The outcome (reflected in Table 12) reveals that 43.1% of the respondents think that the IS course is meant for people who are familiar and conversant with computer.

Table 13: Have you used computers before?

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	152	88.4	88.4	88.4
Disagree	20	11.6	11.6	100
Total	172	100	100	

Lubbe and Bopape (2011) define computer literacy as the users' level of understanding as well as knowledge that they have concerning the use of computers. They asserted that if users have little of knowledge about computers, it would make it easier to be able to further their pursuit for an IS career. If users are computer literate, they would understand which functions of a system, the terms, and abbreviations can be used to comprehend and apply. In this study respondents have a computer background and they can respond positively to computer interaction. As reflected in Table 13 out of 172 respondents that were asked about "Have you used computer before", 152 (88.4%) responded that they are skilled.

Strategies the IS Department can Employ to Increase Awareness about IS / IT-related Careers among Non-IS students

The number of students enrolling for IS / IT computer related courses at universities has decreased substantially worldwide since the late 1990s and a similar trend has been noted in South Africa (Topi *et al.,* 2010).

Table 14: Have you heard about the course called IS / IT?

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	170	98.8	98.8	98.8
Disagree	2	1.2	1.2	100
Total	172	100	100	

In this study, the case is different, and out of 172 respondents, 170 (98.8%) agreed (refer Table 14).

Table 15: Are you aware that North West University, Mafikeng Campus offers computer literacy classes?

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	151	87.8	87.8	87.8
Disagree	21	12.2	12.2	100
Total	172	100	100	

The NWU, Mafikeng Campus has introduced computer literacy courses to assist IS students and non-IS students to gain computer knowledge to pursue their careers. Table 15 above illustrates that this majority agree and are aware that NWU strives by all means to ensure that students acquire both computer knowledge (concepts) and computer skills (application) in high school or through personal experiences. Out of 172 respondents, 151 (87.8%) are certain.

Table 16: During your first year career orientation, were you informed about IS / IT before you registered for the course that you are in?

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	73	42.4	42.4	42.4
Disagree	99	57.6	57.6	100
Total	172	100	100	

Agarwala (2008) notes that there are two main type of career development or orientation processes that involve new career orientation and convention that deal with traditional organisational orientation. He emphasise that protean career is that type of career orientation that is accomplished proactively by candidates which is known as self-driven in accordance with their personal value as compared to organisational rewards (Agarwala 2008). Table 16 above reflects that, out of 172 respondents, 73 (42.4%) agree and 99 students (57.6%) disagreed. The result shows that

42.4% of students indicated that they were informed about IS / IT during the time they registered into their current course that they are in. This shows that Mafikeng Campus lacks career exposure for the upcoming candidates. Career orientation is something that needs to be considered as to ensure that most freshman students are guided in the right direction. The IS / IT Department are vital to the strength of an IS programmes. Hence, IS / IT faculty needs both academic training and practical experience (Topi *et al.,* 2010).

There must be enough staff members to provide course offerings that allow the students to complete a degree in a timely manner. The interests and qualifications of the faculty must be sufficient not only to teach the courses but also to plan and modify the courses and curriculum (Topi *et al.,* 2010).

Table 17: Would you agree that there is a need for students to know more about IS / IT before they register into NWU?

		Frequency	Percent	Valid Percent	Cumulative Percent
	I strongly agree	88	51.2	51.2	51.2
	I agree	68	39.5	39.5	90.7
	I disagree	13	7.6	7.6	98.3
	I strongly disagree	3	1.7	1.7	100.0
	Total	172	100.0	100.0	

Table 16 states that 57.6% of students were not aware of IS / IT as a field of study during their first year career orientation. However, it is indicated (Table 17) that the majority of students are lacking behind due to the fact that they were not informed, Table 17 also confirmed that out of 172 respondents, 88 (51.2) and 68 (39.5%) totalling (90.7%) of students who agree that there is a need for students to be well informed about IS / IT course programmes before they registered at NWU, Mafikeng Campus.

Table 18: Would marketing influence your choice to take Information Systems?

		Frequency	Percent	Valid Percent	Cumulative Percent
Response Options	I strongly agree	54	31.4	31.4	31.4
	I agree	74	43.0	43.0	74.4
	I disagree	28	16.3	16.3	90.7
	I strongly disagree	16	9.3	9.3	100.0
	Total	172	100.0	100.0	

Table 18 above provides answers regarding career orientation strategies that could be put in place to increase awareness of IS / IT related careers amongst non-IS students.

Table 19: To increase career awareness

	Have you heard about the....?	Are your aware that NWU....?	During your first year career…?	Would you suggest that…?	Would marketing influence your…?
I strongly agree %	98.8	87.8	42.4	90.7	74.4
I strongly disagree %	1.2	12.3	57.6	9.3	25.6

Table 19 above shows that the majority of students (98.8%) agree to question 1 in Table 19, (87.8%) respondents in question 2 in Table 19 also reflected in Table 15. But question 3 in Table 19, reflects that 57.6% of students disagreed. About 90.7% agree to question 4 and question 5 (74.4).

Correlations

For the purpose of this study, correlations that are above the absolute value of 0.8 are considered. The s-value is the probability that the current result would have been found if the correlation coefficient would have been zero.

Table 20: Correlation ranges

Small	0.1 to 0.5
Medium	0.5 to 0.8
Large	0.8 to 1

The correlation between "do you think that IS is a type of course meant for people who know how to use computer" and "what year are you in academically" is 89%, a positive but weak correlation. According to the criteria set above, those correlations that are above the absolute value of 0.8 are considered to show a strong relationship. The significant (2-tailed) value is shown as 0.243, which is > 0.08. The correlation is not statistically significant since it is >0.8. This suggests that years of gender do not have significant impact on age group. The gender bias or dominant is not a determinant of whether respondents are positive or negative about the social differences between IS and non-IS students.

The correlation between "is it easy to be admitted as IS student" and "age group" is -85%, a negative and weak correlation between the two variables. According to the criteria set above, those correlations that are above the absolute value of 0.8 are considered to show a strong relationship. The correlation is not statistically significant since the significant (2-tailed) value is shown as 0.269, which is more than 0.08. Therefore it can be deduced that there is no significant linear correlation between the two variables. This suggests that "is it easy to be admitted as IS student" does not have significant impact on age group. "Is it easy to be admitted as IS student" is not the determinant of whether respondents are positive or negative about the social differences between IS and non-IS student.

The correlation between "would you say that students enrolled for IS because they wanted people to respect them" and gender is – 93%, a negative and weak correlation between the two variables. According to the criteria set above, those correlations that are above the absolute value of 0.8 are considered to show a strong relationship. The correlation is not statistically

significant since the significant (2-tailed) value is shown as 0.224, which is more than 0.08. There is no significant linear correlation between the two variables. It can be proposed that students enrolled for IS because they wanted people to respect them and gender is not a determinant as to whether respondents are positive or negative towards the differences between IS and non-IS student.

The correlation between "would you choose IS as a field of study?", and "what year are you in academically" is -85%, a negative and weak correlation between the two variables. According to the criteria as set above, those correlations that are above the absolute value of 0.8 are considered to show a strong relationship. The correlation is not statistically significant since the significant (2-tailed) value is shown as 0.270, which is more than 0.08. There is no significant linear correlation between the two variables. This could be that, "would you choose IS as a field of study," does not have significant impact on, "what year are you in academically". In addition to that, it is not the determinant of whether respondents are positive or negative about IS and non-IS students differences.

The correlation between "do you enjoy working in front of computer screen for long hours" and "select your degree" is 98%, a positive and weak correlation between the two variables. According to the criteria set above, those correlations that are above the absolute value of 0.8 are considered to show a strong relationship. The correlation is not statistically significant since the significant (2-tailed) value is shown as 0.199, which is more than 0.08. The correlation is not statistically significant since it is >0.8. There is no significant linear correlation between the two variables. This suggests that "do you enjoy working in front of computer screen for long hours" does not have significant impact on "select your degree". In addition, it is not the determinant of whether respondents are positive or negative about IS and non-IS students differences.

The correlation between "would marketing influence your choice not to take IS" and "do you enjoy working in front of computer screen for long hours" is 80%, a positive and weak correlation between the two variables. According to the criteria set above, those correlations that are above the absolute the value of 0.8 will be considered to show a strong relationship. The correlation is statistically significant since the significant (2-tailed) value is shown as 0.298, which is more than 0.08. The correlation is statistically significant since absolute 0.8. There is significant linear correlation between

the two variables. This could suggest that "would marketing influence your choice not to take IS" does have significant impact on "do you enjoy working in front of computer screen for long hours". In addition, it is the determinant of whether respondents are positive or negative towards the social differences between IS and non-IS students.

The correlation between "during your first year career orientation, were you informed about IT information Systems before you registered for the course that you are in" and "Is it easy to be admitted as IS student" is 91%, a positive and weak correlation between the two variables. According to the criteria set above, those correlations that are above the absolute value of 0.8 will be considered to show a strong relationship. The correlation is not statistically significant since the significant (2-tailed) value is shown as 0.235, which is more than 0.08. The correlation is not statistically significant since it is >0.8. There is no significant linear correlation between the two variables. It could be suggested that "during your first year career orientation, were you informed about IS / IT before you registered for the course that you are in" does not have significant impact on "Is it easy to be admitted as IS student". In addition, it is not the determinant of whether respondents are positive or negative about IS and non-IS students differences.

The correlation between "have you used computer before" and "would you agree that there is a need for students to know more about IS / IT before they register into NWU" is 81%, a positive and weak correlation between the two variables. According to the criteria set above, those correlations that are above the absolute value of 0.8 are considered to show a strong relationship. The correlation is not statistically significant since the significant (2-tailed) value is shown as 0.294, which is more than 0.08. The correlation is not statistically significant since it is >0.8. There is no significant linear correlation between the two variables.

The correlation between "have you used computer before" and "would marketing influence your choice not to take IS" is 80%, a positive and weak correlation between the two variables. According to the criteria set above, those correlations that are above the absolute the value of 0.8 are considered to show a strong relationship. The correlation is statistically significant since the significant (2-tailed) value is shown as 0.920, which is more than 0.08. The correlation is statistically significant since absolute 0.8. There is a significant linear correlation between the two variables. This could be

suggested that, "have you use computer before" does have significant impact on "would marketing influence your choice not to take IS". In addition, it is the determinant of whether respondents are positive or negative towards the social differences between IS and non-IS students.

Discussion of the Results

In revealing the factors that encourage students to enter into IS / IT related courses reference was made to Cloete (2011) Two-Factor Theory of Intrinsic and Extrinsic factors. The factors that influence career choice, as described by him, include: salary, job security and working conditions (extrinsic); and potential for achievement, career growth, recognition and the job itself (intrinsic). Most students enrol in IS programme because of the benefit they presume that the programme will offer them after completion. In reference to Table 9, majority of the students agree and do think that IS course is a type of course which leads to a higher salary when employed confirming Cloete's Two-Factor Theory of Intrinsic and Extrinsic factor. Of a total of 172 respondents, 25 (14.5%) strongly agreed, 92 (53.5%) agreed and 49 (28.5%) disagreed, and finally, 6 (3.5) strongly disagreed. This means that higher salary influences students' choices in IS course.

While Table 13 talks about level of computer literacy, Lubbe and Bopape (2011), agree that computer literacy is defined as the users' level of understanding as well as knowledge that they have concerning the use of computers. They stated that if users have little of knowledge about computers, it would make it easier to be able to go further with their pursuit for IS career. If users are computer literate, they would understand which functions of a system, the terms, and abbreviations can help to comprehend and apply them when necessarily.

In this study the respondents have advanced knowledge of computer and can respond positively to computer interaction. Out of 172 respondents that were asked about prior knowledge of computer, 152 of (88.4%) responded that they are skilled.

Findings from the analysis have indicated (Table 15) that the majority (74.4%) of students concur that students have heard of IS / IT courses and are aware that NWU offers computer literacy classes, but are not informed about IS / IT which is the top career field anyone would want to be in. It is essential that Mafikeng Campus implement marketing strategies and policies to help improve the level of IS / IT career through suitable career

development programmes. Table 18 shows that marketing would influence students choice in taking IS / IT as a major.

In conclusion, many positive and negative factors influencing students in not taking or going into IS / IT field of study include factors and related to higher salary, low level of computer literacy to list but few. Career orientation, marketing strategies not only from the university as a whole but also directed to IS faculty members to be involved in the development of IS students by providing training and career awareness are needed.

Summary and Recommendations
Answers to Research Questions
The factors that influence career choice, as described by him, include: salary, job security and working conditions (extrinsic); and potential for achievement, career growth, recognition and the job itself (intrinsic). In addition, students within the IS field show particular interest in using new and innovative technologies in their careers (Cloete 2011).

What are the reasons non-IS students have for not taking IS as a field of study and work?
As illustrated above in Table 5, the majority of students agreed (59.3%) that they would choose IS as a field of study, 40.7% stated otherwise. Table 6 shows information to determine whether respondents, would say that IS / IT programme is a difficult course for one to be enrolled in. Table 6 also indicated that 15 (8.7%) strongly agreed, 63 (36.6%) agreed and 76 (44.2%) disagreed. In Table 6 (54.7%) of the respondents indicated that the majority of students agreed that IS / IT is a difficult programme. This is one of the main reasons why non-IS students have not been taking IS as a field of study and also the fact that IS / IT is gender dominated.

Out of the 172 respondents, 14 (8.1%) strongly agree, 60 (34.9%) agree and 57 (33.1%) disagree. Previous results indicated that 56.9% of respondents concurred that IS is a gender-dominated field of study, which is female with a percentage of 57%. Although IS is a male dominated field according to Cloete (2011)'s theory but in this study, only (56.9%) indicated that IS is female dominated. This could also be as a result of combining both faculties in the NWU, Mafikeng Campus.

What factors encourage students' choice to enter the field of IS?
Referring to Table 9, the majority of the students agreed that IS is a type of course that helps one to get a higher salary when employed, which confirms Frederick Herzberg's Two-Factor Theory of Intrinsic and Extrinsic factors. In determining the factors that encourage students' choice to enter the IS field, out of a total of 172 respondents, 25 (14.5%) strongly agreed, 92 (53.5%) agreed and 49 (28.5%) disagreed. This means that higher salary influences students choices in IS course. It is also established that some of the factors that encourage students' choice to enter into IS / IT are that it is easy to be admitted into the programmes and the other factor is that students had prior computer knowledge. Lubbe and Bopape (2011) stated that computer literacy is defined as the users' level of understanding as well as knowledge that they have concerning the use of computers. They both stated that if users have little piece of knowledge about computers, it would make it easier to be able to go further in their pursuit for IS career. They further argued that if users are computer literate, they would understand which functions of a system, the terms, and abbreviations can help to comprehend and apply them when necessary.

In this study the respondents have advanced knowledge of computers and they can respond positively to computer interaction. Out of 172 respondents that were asked about, (have you used computer before", 152 (88.4%) respondents responded that they are computer skilled.

What strategies could the IS department employ to increase awareness about IS / IT related careers among non-IS students?
The majority of respondents (74.4%) concurred that students have heard of IS / IT courses and are aware that NWU offers computer literacy classes, 74.4% respondents that they are not informed about IS / IT courses. IT course is the top field of career any one would desire to major in. The response shows that it is very essential that Mafikeng Campus introduce or implement marketing strategies and policies because it is proven that marketing would influence or help improve the level of IS / IT career through suitable career development programmes. Table 18 demonstrates that marketing would influence students choice in taking IS / IT as a major. Table 19 answered the questions individually by analysing career orientation strategies that could be put in place to increase awareness of IS / IT related careers amongst non IS students.

It is demonstrated that the majority of students ranging from (98.8%) agreed to question 1 where students were asked, "have you heard about the course called IS / IT". In Table 19, 87.8% students agreed regarding question 2 where respondents were asked if they are aware that North West University Mafikeng Campus offers computer literacy classes in Table 19. But question 3 in the Table 19, reflected that 57.6% of students disagreed, while 90.7% agreed to question 4, and question 5 with (74.4%). The remaining responses are in the minority. Table 19 has proven that strategies should be implemented to foster awareness of IS / IT career as a field of study.

Limitations

Every study has a set of limitations (Ellis and Levy 2009). While the social difference between IS and non-IS students was examined to have a broad picture, an empirical and in-depth analysis was limited when evaluating the three NWU campuses. In order words, this study is focused only on honours students from Commerce and Administration and Law Faculty in Mafikeng Campus in the North West Province.

Conclusion

The study focused on investigating the social differences between IS and non IS students in the NWU. The investigation highlighted the importance of students' involvement with computer usage and interaction. However, it is expected that students must have acquired both computer knowledge (concepts) and computer skills (application) in high school or through personal experiences before being admitted into NWU Campus. This will assist candidates to pursue their careers successfully.

The project also looked at knowledge of IS in its entirely to develop strategies to be employed to increase career awareness of IS / IT courses related to the campus, as well as factors that encourages or reasons non IS students have for not pursuing IS / IT as a career field of study. The North-West University (Mafikeng Campus) as an institution of higher learning should put more emphasis on orientation development programmes to assist the upcoming candidates to be able to make right choices or decisions regarding IS / IT courses.

It could be concluded that respondents agreed that they were not informed about IS / IT courses. In South Africa, IS / IT is one of the top fields of career any one would desire to major in. The respondents agreed

that it is crucial that Mafikeng Campus implement marketing strategies and policies as it is proven that marketing would influence and improve the level of awareness of IS / IT career through the use of career development programmes.

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Preparedness of Nurses at Hospitals to Utilize a Paperless Environment

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Abstract

The embracing of Health Information Technology (HIT) by hospitals is viewed as one mechanism to mitigate the ever-growing healthcare supply and demand gap, reduce medical errors, increase efficiency, improve quality of care and automate business processes. This has led to many hospitals investing large sums of money in the hope that HIT can help hospitals achieve this goal. The problem, however, is that similar to other industries that have undertaken this journey towards embracing Information Technology (IT), hospitals have not been very successful and have not achieved the expected benefits of IT. One of the major contributing factors to the high failure rate of IT implementation within the healthcare sector is user acceptance. The reason for low user acceptance can be attributed to HIT being a disruptive technology that changes the existing work procedures and processes. The main objective of this study was to determine the preparedness of nurses to adopt a paperless environment and to determine if the nurses were equipped with the necessary skills to be able to function within a paperless environment. A quantitative approach was used to gather information from a private hospital within the eThekwini municipality in KwaZulu-Natal. Hundred and sixty questionnaires were handed out and a total of 102 questionnaires were successfully answered giving the researcher a response rate of 64%. The findings indicate that both perceived usefulness and perceived ease of use by nurses are enablers to HIT usage while resistance to change is an inhibitor to HIT usage. The findings also indicate that both related knowledge and perceived compatibilities have a positive effect on the perceived usefulness and perceived ease of use respectively.

Keywords: E-Health, Technology Acceptance Model, Perceived Use, Perceived Ease of Use, Electronic Medical Records, Paperless Environment, Disruptive Technology

Introduction

The Institute of Medicine (IOM) note that each year preventable medical errors cause between 44000 and 98000 hospital deaths and over 770000 people are hurt or worse even die in hospitals due to undesirable drug prescriptions worldwide (Columbus 2002). In today's health care information systems nurses work independently without being aware of the patients' prescriptions or adverse drug reactions determined by fellow colleagues. In order to minimize medical errors, increase the efficiency of medical records and enhance the methods of communication, the health care sector needs to embrace Information Technology (IT).

Why then is the adoption rate of IT, which appears to be very meaningful and core to hospitals, been incredibly slow over the past few years? More precisely why do nurses resist embracing IT in hospitals? Could the resistance of IT be directly related to the perceived usefulness of IT by nurses in hospitals? Does the perceived ease of use of IT increase the potential use of IT by nurses? These are some of the questions that need to be addressed in ensuring that future systems are better designed and accepted by the target population and functionally stable.

The primary reasons for addressing these issues are to help ensure future hospitals that intend to embrace the journey towards becoming paperless are better equipped. On a much broader spectrum, the study also addressed the preparedness of nurses to utilize a paperless environment and can also be extended to other organizations that are moving towards being completely paperless environments.

Literature Review and Conceptual Framework

IT Potential in Hospitals

The health care sector is under "tremendous pressure to address a host of system ills; medical errors, rising costs, inconsistent quality, inefficiency, declining clinician job satisfaction, and mounting staffing shortages" (Johnston *et al.* 2002). However, IT has the potential to address some of the issues and improve the quality and efficiency of health care. The potential of IT in hospitals has been promoted as having tremendous promise in improving the quality of care, efficiency of nurses in hospitals and reducing costs. Throughout the world, many hospitals are embarking on the journey of IT adoption with the specific goal of improving patient care (Aldington 2007). This journey of IT adoption is exemplified in the study by Adeleke *et*

al. (2014) where they indicate that IT in hospitals has the potential to provide relevant information, improve the quality of care and improve the timeliness and accuracy of required health information.

"Advances in information technology can provide the foundation for important improvements in hospitals, such as more cost-effective monitoring and follow-up of patients beyond health care centers and dynamic, optimal targeting of specific sectors of the population for special education, screening, and early treatment where necessary" (Reddy 2001). The technology available in the health care sector today ranges from online prescriptions to Electronic Medical Records (EMRs) to incredibly fast Intranets that provide real time analysis of a patient's condition (Columbus 2002). With all of these technologies available to the hospitals the next step would be to use these technologies to not only improve the access to health care and health care information but also to ensure that it is delivered with the highest quality. Most processes in a hospital system can be done electronically and the next generation of IT in health care is the realization of paperless hospitals.

IT Inhibitors in Hospitals

Amongst all the public institutions, the one that stands out as the most in need of improved information systems are hospitals. This is primarily due to the fact that they deal with people's lives on a daily basis (Samaha 2003). Technological advancements in the form of enterprise resource planning applications, electronic patient records and newly capable clinical applications have spurred many health care executives to use IT as an engine for institutional change" (Samaha 2003). The problem, however, is that similar to many other industries, hospitals have also been plagued with IT projects that fail, IT implementations that do not meet up to stakeholders expectations and IT projects that do not get accepted by its intended audience thereby leading the project to failure (Samaha 2003).

Even though there have been several advances in information technologies such as electronic medical records, use of hand held devices, automated business processes, clinical decision support systems and real time access to medical information, there will always exist barriers that prevent acceptance of these technologies (Jimison 2008). Some of these barriers include computer phobia, resistance to change, computer literacy, lack of industry standards and training, human and social barriers and the

significant costs associated with IT implementations (Jimison 2008 & Sockolow *et al*. 2014). These barriers more often than not require nurses in hospitals to change the manner in which they conduct their daily activities and the manner in which the organization as a whole operates (Mokgabudi 2006 & Hung *et al*. 2014). Finally a common inhibitor amongst many IT implementations in hospitals within the last decade has been the lack of interoperability between organizations through IT systems (McGeorge *et al*. 2013). This lack of interoperability has resulted in inadequate information exchange, lack of technical standards and increased implementation costs which results in a shortage of the implementation of new IT systems (McGeorge *et al*. 2013). Given these inhibitors, the preparedness and acceptance of nurses to utilize IT systems is key to unlocking the potential of paperless hospitals.

Paperless Hospitals

Many hospitals throughout the world have attempted or are in the process of attempting the voyage to a paperless environment which is made possible by electronic medical records (EMR), fully integrated health information systems and other improved clinical technologies (Carr-Bains & de Lusignan 2003). Vezyridis *et al*. (2011) in their study of paperless hospitals used the emergency department to implement a system called Emergency Depart-ment Information System (EDIS) and showed that the current paper based information system was not adequate for tracking patients moving between hospital departments, lacked proper record keeping and was unable to quickly and easily access customer information. The study found that going the paperless route helped nurses easily store and retrieve patient information, improved the department's ability to track patients and assisted the nurses in coordinating activities.

"Improvements in information flow technologies, supportive national and local policies, as well as a motivated practice can contribute to the successful integration of computers and subsequently move many hospitals forward towards becoming paperless" (Carr-Bains & de Lusignan 2003). Carr-Bains and de Lusignan (2003) highlighted the following reasons as to why hospitals should move towards being paperless:

- Mitigate problems with transferring data from medical records

- Easier to query for patients information in an electronic format rather than a paper based format
- Reduced administration cost of manual paper work
- Improved efficiency
- The use of email and other electronic communication mediums reduce telephone expenses and faxes
- Enhanced security and confidentiality technologies for patient information.

IT Adoption in Hospitals

Many hospitals have invested large sums of money in the hope that information systems will improve the efficiency and quality of work, reduce medical errors and reduce administrative costs. However, similar to other industries that have undertaken this journey towards IT implementation in order to realize the potential of IT, hospitals have not been very successful in its IT implementation and hence have not achieved the expected benefits (Carr *et al.* 2006). According to Emam and Koru (2008), more than 50% of software projects are cancelled resulting in significant amount of investments made by organizations being lost. Lack of senior management involvement and scope changes contributed to 33% of software projects being cancelled while the main contributing factor still remains a lack of acceptance of the systems by its intended audience (Emam & Koru 2008). According to Westbrook and Braithwaite (2010), "Health professionals must embrace ICT as a "disruptive technology" that will produce significant changes in their roles and responsibilities and lead to real health reform with new, innovative models of health care delivery." A "disruptive technology" is a technological innovation that alters existing work procedures and processes leading to a radical transformation of the current landscape of a particular industry. Disruptive technologies can change traditional patterns of work and enable less IT skilled employees to carry out more IT related work tasks in less expensive ways (Christensen *et al*. 2000). This potential for disruption make health professionals to view HIT in a negative light resulting in a lack of acceptance.

Hence, a major stumbling block to the successful adoption of IT in hospitals will always be user acceptance. The Technology Acceptance Model (TAM) developed by Davis *et al.* (1989) suggests that perceived usefulness and perceived ease of use are the two determinants of IT usage in any

workplace. The reason being is that end users want to use a system that will benefit their work but at the same time not cost them a lot of effort. Therefore this study made use of TAM and integrated it with the model created by Bhattacherjee and Hikmet (2007) to determine the perception and preparedness of nurses to utilize a paperless environment.

Technology Acceptance Model (TAM)

In the field of information systems research, TAM is seen as one of the leading theoretical models in explaining system use. Davis *et al.* (1989) developed the technology acceptance model (TAM) which is intended to explain the acceptance or lack thereof of IT by its users. The TAM model consists of perceived usefulness (PU), perceived ease of use (PEOU), while behavioural intention to use (BI) and attitude towards (AT) are also used in the model to explain actual system use (U). Figure 1 is the original TAM diagram created by Davis (1989) and indicates that PU impacts on the behavioural intention to use and PEOU impacts on both PU and behavioural intention to use.
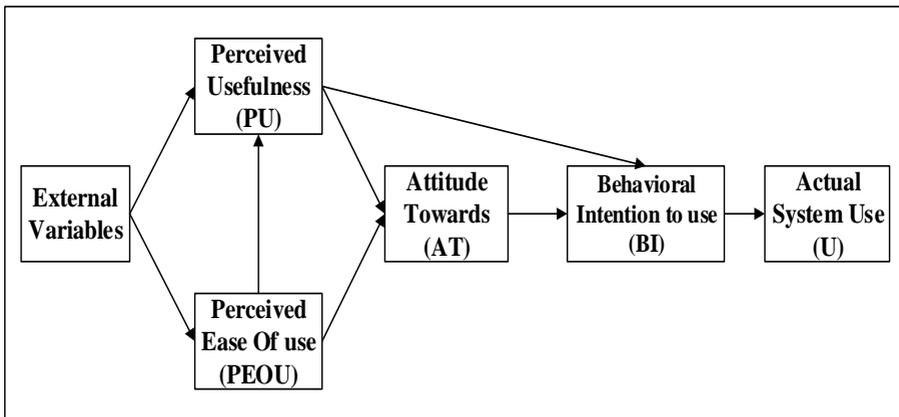
Figure 1: Original Technology Acceptance Model (Davis 1989)

Many researchers such as Raghupathi and Tan (2000), Parente and Dunbar (2001), Parente and Van Horn (2003) and Adlington (2007) have explained and demonstrated the potential that IT can bring to the healthcare sector are in abundance. However, research explaining reasons for resistance towards information technology and explaining the effect that resistance has

on information technology usage is few and far between. One possible reason for the abundance of such literature could be attributed to the fact that research models such as TAM, UTAM and TAM2 focus exclusively on the users positive factors of IT usage, while ignoring the negative factors that attribute the lack of system usage (Davis *et al.,* 1989).

The research model created by Bhattacherjee and Hikmet (2007), addresses the enabling factors for system usage but unlike the TAM model also addresses the inhibiting factors of system usage. The research model concludes that information technology usage considerations in a target population of potential users are determined by measuring the enabling and inhibiting factors of systems usage simultaneously. In the research model, the inhibitors are defined as negative factors that adversely affect systems usage when present. Figure 2 depicts the research model created by Bhattacherjee and Hikmet (2007), which bridges the gap between usage and change resistance of IT in an integrated model.
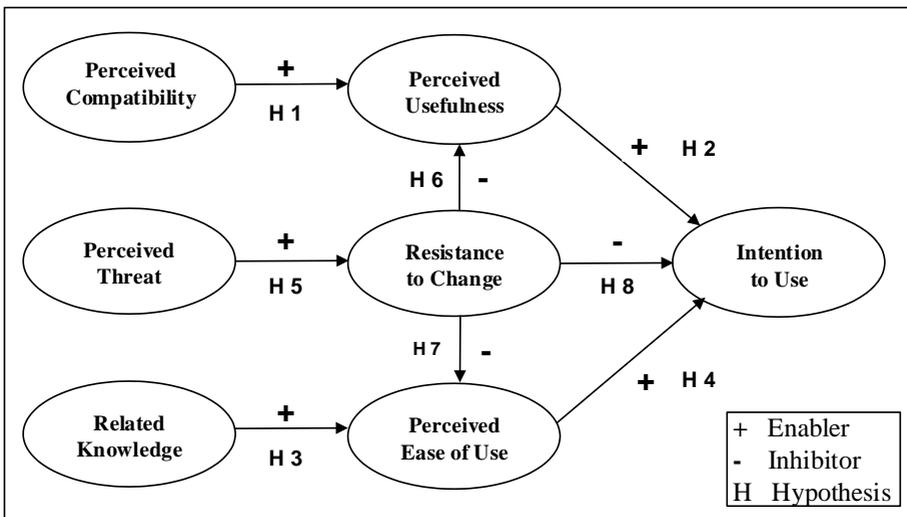
Figure 2: Research model used in study (Bhattacherjee & Hikmet 2007)

Hypotheses
It can be argued that if a system cannot cater for a health care practitioner's needs then the system cannot be perceived to be useful to that health care

practitioner's. Therefore, in light of this argument the H1 hypothesis is as follows:

H1: The perceived compatibility of HIT by nurses is an enabler to their perceived usefulness of HIT usage.

Perceived usefulness suggests that people will want to use the system because it will be of some benefit to them, and vice versa if no benefit is actually seen in the use of the system people will not see the usefulness of the system. Therefore, the H2 hypothesis is as follows:

H2: The perceived usefulness of HIT by nurses is an enabler to their intention to use HIT.

A major stumbling block of many system implementations is the lack of insight given to the relevant nurses of the systems. Research has shown that without having prior knowledge or familiarity with a certain technology, nurses find a lack of purpose for that technology. Therefore, the H3 hypothesis is as follows:

H3: Related Knowledge of HIT by nurses is an enabler to their perceived ease of use of HIT.

The minimum requirement for a system that is implemented to be perceived as easy to use is to be able to achieve the same results as before but with less effort. Therefore, the H4 hypothesis is as follows:

H4: The perceived ease of use of HIT by nurses is an enabler to their intention to use HIT.

There are several explanations as to why nurses feel threatened by information technology. Bhattacherjee and Hikmet (2007) note that people resist change if they expect it to threaten the status quo, such as a potential loss of power or control over strategic organizational resources. Therefore, the H5 hypothesis is as follows:

H5: *The perceived threat of HIT by nurses is an enabler to their resistance to use HIT.*

The introduction of HIT in hospitals is implemented to improve both the quality and efficiency of health care delivery. Changes are not necessarily easy to achieve in any sector and in the health care sector with the potential

life and death situations, changes might be particularly hard to achieve. A lack of knowledge of the benefits that HIT brings normally tends to be an enabler for the resistance to IT and leads to limited HIT usage. Given that resistance is clearly a contributing factor to the usage of HIT; the H6 and H7 hypotheses are as follows:

H6: Nurses' resistance to change is an inhibitor to their perceived usefulness to use HIT.

H7: Nurses' resistance to change is an inhibitor to their perceived ease of use to HIT.

One of the main objectives of the study was to determine the reasons many nurses resist IT. Therefore, the final hypothesis, H8, is as follows:

H8: Nurses' resistance to change is an inhibitor to their intention to use HIT.

Data Collection and Analysis

The study was conducted by doing census sampling of nurses from a private hospital within the eThekwini municipality in South Africa. A quantitative approach was used for the collection of data in the study and the research instrument used was a questionnaire comprising of Likert scale closed ended questions. The data was then captured and analyzed using SPSS 17.0 for Windows.

The reason for choosing the nurses as participants was because a large number of nurses use clinical applications on a daily basis in order to deliver comprehensive health care to the patients. In using this population of participants the researcher was able to determine the preparedness of the nurses to utilize a paperless environment and empirically validate the research model used in the study. One hundred and two nurses answered the questionnaire out of the 160 nurses invited to participate in the study.

Of the 102 nurses that answered the questionnaires 31.37% of the respondents were aged between 30 to 39 years old and 24.51% were aged between 20 and 29 years old. The results also indicated that 43% of the respondents were Indian and 17% were African. The remaining 40% of the respondents were made up of Whites, Coloureds and Asians.

Cronbach's coefficient alpha (CCA) test was used to determine the reliability of the measurement instrument. The Cronbach's coefficient alpha normally ranges between 0 and 1 and the closer the alpha is to 1 the greater the reliability is of the questionnaire.

Table 1: Cronbach's coefficient alpha

Section	CCA	Number of questions
Perceived Compatibility	0.953	5
Intention to use HIT	0.876	11
Perceived Usefulness	0.985	4
Perceived Ease of Use	0.546	4
Related Knowledge	0.793	2
Perceived Threat	0.975	4
Resistance to change	0.944	4

The calculated Cronbach's coefficient alpha that is less than 0.5 is deemed unacceptable (Cooper & Schindler 2001). Table 1 indicates that the Cronbach coefficient alpha's calculated are greater than 0.5 meaning that the questionnaire was a reliable instrument to measure and quantify the research model used in this study.

The factor analysis was justified by using the Kaiser-Meyer-Olkin (KMO) test. The greater the value of the KMO test is, the greater is the justification for a factor analysis to be conducted. Table 2 illustrates the results received from the KMO test for each section of the questionnaire.

Table 2: KMO adequacy

Research Model Component	KMO Adequacy	Bartlett's Test of Sphericity		
		Chi^2	df	Sig.
Perceived Compatibility	0.814	661.584	10	0.000
Perceived Threat	0.706	835.149	6	0.000
Related Knowledge	0.500	57.540	1	0.000
Perceived Usefulness	0.811	800.397	6	0.000
Resistance to Change	0.639	612.502	6	0.000

Perceived Ease of Use	0.751	369.652	6	0.000
Intention to use HIT	0.830	1354.867	55	0.000

A KMO adequacy measure of greater than or equal to 0.500 was achieved for all the questions in the questionnaire indicating that an adequate correlation does exist among the questions to justify the factor analysis. Thereafter a measure of sampling adequacy (MSA) for the individual questions in the questionnaire was performed. For each of the dimensions tested from Table 2, the MSA for each question was greater than the 0.5 ($\varepsilon >= 0.5$) which justified factor analysis being conducted for the data that was collected.

Hypothesis testing was conducted using Partial Least Squares (PLS). In determining the individual path coefficients of the research model the adjusted R^2 was calculated using the PLS algorithm. The enabling or inhibiting factors of the research model were the dependent variables and the affected factor was the independent factor. Table 3 illustrates illustrates the extracted latent factors.

The PLS model indicates that the cumulative X variance and the cumulative Y variance is the percent of variance in the X variable and Y variable, respectively which are accounted for by the latent factors, of which in regression is interpreted as the cumulative R^2. The last column in the table is the adjusted R^2 table which actually penalizes for model complexity. All of the R^2 values in Table 3 are greater than 0.05 ($R^2 > 0.05$) indicating that the dependent variables are positive in nature indicating that the independent variables can be used to determine the dependent variables. This relationship is further illustrated by Figure 3 which examines each of the individual path coefficients (β) for the hypothesis tested in the research model.

The research model used in the study attempted to bridge that gap by understanding the reasons behind the lack of user acceptance of HIT in the health care sector thereby preparing future organizations that want to implement a paperless environment. In validating the research model the next step was to examine the strengths and significances of individual paths in this model. The path coefficients were calculated using PLS and then mapped to match the hypothesis in Figure 2.

Table 3: Adjusted R^2

Hypothesis	Statistics				
	X Variance	Cumulative X Variance (R^2)	Y Variance	Cumulative Y Variance (R^2)	Adjusted R^2
H1	.123	.123	.145	.145	**0.136**
H2	.958	.958	.184	.184	**0.175**
H3	.799	.799	.093	.093	**0.084**
H4	.698	.698	.193	.193	**0.185**
H5	.930	.930	.199	.199	**0.191**
H6	.847	.847	.207	.207	**0.199**
H7	.830	.830	.117	.117	**0.108**
H8	.837	.837	.019	.019	**0.009**
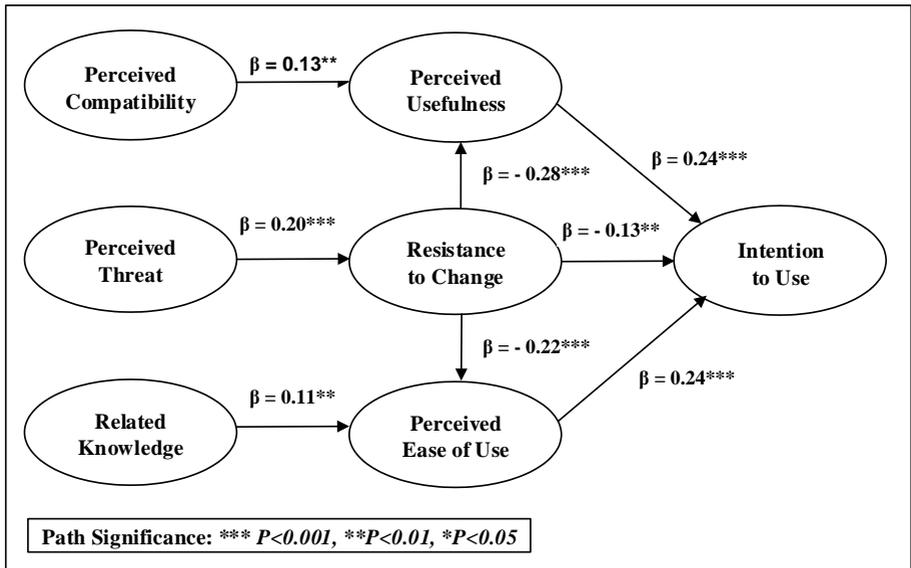
Figure 3: Path Coefficients of research model

In exploring the findings of the individual path coefficients, the research study strongly indicated that all eight of the hypothesized paths in the proposed research model were significant at *P*<0.05. Three of the path coefficients, related knowledge to perceived ease of use, perceived compatibility to perceived usefulness and resistance to change to intention to use HIT, were all significant at *P*<0.01, while the remaining five path coefficients where positively significant at *P*<0.001 as illustrated in Figure 3. The directionality of each individual path, either negative or positive was hypothesized in the research study and contributed to the support of the proposed research model.

Perceived compatibility of HIT by nurses was predicted positively by perceived usefulness ($\beta = 0.13$, *P*<0.01) providing empirical support for hypothesis H1. This supports the research expectations illustrating that perceived compatibilities is an enabler for perceived usefulness. The path coefficient from perceived usefulness to intention to use HIT was positive ($\beta = 0.24$, *P*<0.001) and supported the hypothesis H2 that perceived usefulness is indeed an enabler for intention to use HIT. The findings also supported the research model in testing positively for hypothesis H4 which indicated that an additional enabler for intention to use HIT is perceived ease of use. The path coefficient tested positively with a result of ($\beta = 0.24$, *P*<0.001). This was further elaborated by Bhattacherjee and Hikmet (2007) in their study by stating that HIT can only be perceived as useful if it provides some benefit to the nurse and can only be perceived as easy to use by being able to accomplish the same task as previously done with less effort.

Resistance to change had a negative effect on intention to use HIT with a path coefficient of ($\beta = -0.13$, *P*<0.01) and tested positively for hypothesis H8, thereby supporting the argument that resistance to change is an inhibitor to intention to use HIT. In a study conducted by Bhattacherjee and Hikmet (2007) they concur with this finding by noting that if the level of change is a significant one and given that humans naturally have the tendency to oppose change, this would potentially lead to many users resisting the change which would eventually lead to a lack of HIT usage.

The findings also support the initial research expectations that resistance to change is an inhibitor to both perceived usefulness and perceived ease of use. Both hypothesis H6 and H7 tested significantly negative with path coefficients of ($\beta = -0.22$, *P*<0.001) and ($\beta = -0.28$, *P*<0.001) respectively, providing strong support for H6 and H7. More often than not the lack of

perceived usefulness and perceived ease of use of HIT can be attributed to the lack of training or lack of understanding of the HIT.

Therefore, if the nurses resist the technology they would also perceive HIT as not useful or easy to use. Perceived threat was tested positively to have a strong and positive effect ($\beta = 0.20$, $P<0.001$) on resistance to change and supported hypothesis H5 while hypothesis H3 was also tested positively with a path coefficient of ($\beta = 0.11$, $P<0.01$) confirming that related knowledge is an enabler for perceived ease of use.

Discussion

The findings from the study indicated that the perceived compatibility of the current HIT available at the hospital to the nurses was aligned with their daily activities. This means that the nurses felt that the technology provided to them would enable them to go about performing their daily activities but does not necessarily mean that the nurses will be comfortable using the technology. The study also found that a minority of the respondents indicated that the current systems at the hospital provided the nurses with the information they needed and in a format that they were accustomed with. This could possibly be attributed to another finding from the study which indicated that 44% of the nurses have not received formal training on the HIT at the hospital. A lack of knowledge of a particular system by the nurses generally decreases their willingness to use HIT (Bhattacherjee & Hikmet 2007).

Ammenwerth *et al* (2003) indicated that many IT implementations fail primarily because the nurses are dissatisfied with the system. Therefore, it is important to ensure that when implementing an HIT into a paperless environment the current system compatibilities are taken into consideration. The success of a paperless environment within a hospital not only depends on the economic benefits but also the actual use of the system by its intended audience. The HIT implementation could be within budget and timeframe allocated for the project and could also have helped reduce the administrative workforce previously required for manual work. However, if the information technology is not going to be perceived as useful by the intended users then the technology can be deemed a failure.

Many HIT systems that are built do not take into consideration the current capabilities of the nurses and HIT systems designed by the vendor which may sometimes force the clinical staff to change their way of working

to accommodate the new system (Bhattacherjee & Hikmet 2007). This, therefore, leads the nurses to perceive the HIT implementation as not being useful to them as it would require much more effort from their perspective to conduct daily activities. The ripple effect of nurses not perceiving HIT as useful is that it would lead to a lack of usage of the system which could potentially lead to the project failing.

The minimum requirement would be that the nurses should still be able to perform the same functionality as they could previously perform with less effort. The research model indicates that perceived compatibility is an enabler to perceived usefulness. Therefore, the managers and executives at the hospitals that want to implement a paperless environment should ensure that the IT vendor will be tasked with the responsibility of doing the implementation and ensuring that a thorough analysis is done of the current compatibilities of the system.

Advances in HIT at hospitals includes the use of electronic medical records, use of hand held devices, automated business processes, clinical decision support systems and real time access to medical information. However, despite these advances in HIT there remains many barriers to the use of these technologies in our hospitals. The researcher's findings indicated a strong resistance by the nurses towards the usage of HIT in a paperless environment. More than 60% of the nurses indicated that they would be resistant to working in a paperless environment while 20 % of the respondents have a neutral perspective on the HIT in a paperless environment. Therefore, in order for the organization to pursue the journey towards becoming a paperless organization, these barriers need to be identified, quantified and then overcome.

One of the main resistance barriers is the acceptance of HIT by nurses. The acceptance of information technology by the relevant nurses in the hospitals is of the highest importance in order to increase the adoption of HIT, so that the transition towards a paperless environment is done seamlessly. Kripanont (2007) states that the satisfaction of the information technology by the nurses is essential to the actual survival of the system. A large number of HIT implementations that have either failed or been plagued with difficulty are those which the nurses are dissatisfied with (Ammenwerth *et al*., 2003). The high number for this failure rate can be attributed to the lack of acceptance of the system by the intended users because the system was built without taking into consideration the manner in which the nurses

go about their daily activities. Clinicians perceive HIS as both disruptive and inefficient because of the mismatch between their daily work procedures and how it is implemented by HIT (Karsh *et al.*, 2010). According to Georgiou *et al* (2007) HIT radically changes people's work procedures and roles and this change is viewed by many as a threat to day to day tasks that enable the optimal functioning of an organization.

Resistance barriers have a direct impact on the nurses' intention to use HIT. Therefore, measures need to be put in place to ensure that nurses are not resistant towards the HIT. These measures include, but are not limited to, are:

- Ensure that the nurses feel that they are a part of the implementation so they do not feel threatened by the technology
- Nurses' existing work routines and practices must be taken into consideration to ensure that that the new HIT implementation adapts accordingly
- Nurses are made aware of the potential benefit that the HIT would bring to them and the patients and how it can be used to assist the nurses with their work and also make their work easier. If this is achieved then the nurses would perceive the HIT as both easy to use and useful.
- Availability of computers together with continuous training and support must be provided to the nurses so that they become experts at the system
- Security and confidentiality measures of patient information must be put in place to ensure that the nurses view the HIT as a secure system and also so that the nurses do not use the HIT for malicious intent.

The study was limited to nurses who would interact with the clinical applications in a paperless environment on a daily basis to conduct their activities. This study was undertaken in an environment where there exists a lack of related knowledge pertaining to the benefits of HIT and, in certain circumstances, where HIT is perceived as a threat. Such circumstances could be an inhibitor to information given by the respondents when answering the questionnaire. The researcher was also limited to staff at one private hospital

which meant that the sample population was relatively small. A larger sample size would have increased the reliability of the findings of the study.

Future research should be undertaken that does a comparison between nurses from both private and public hospitals in order to measure the preparedness of those hospitals to pursue the journey towards becoming a paperless environment. Additionally, the research model used in the study indicated that the enablers for HIT usage are perceived usefulness and perceived ease of use. There may be other factors such as availability to technology, IT support, IT infrastructure and cultural backgrounds that could be enablers or inhibitors to HIT usage that can be the subject for future research. The study also used perceived threats as being an enabler of resistance to change. Future research should be also conducted on other enablers of resistance to change such as change management, fear of loss of control, power and status and the HIT users' psyche. The study has alluded to the fact that resistance to change is a major problem for any organization intending to perform an HIT implementation. Therefore understanding the contributing factors of resistance to change by nurses and then overcoming these factors are essential in contributing to a successful HIT implementation.

Conclusion

This study applied the TAM model with the framework for technology acceptance by nurses to study the preparedness of health care professionals to utilize a paperless environment. The findings of the study indicated that a positive perception pertaining to the ease of use and perceived usefulness of clinical applications in a paperless environment enables increased acceptance of HIT while a negative perception pertaining to the ease of use and perceived usefulness of clinical applications in a paperless environment positively influenced resistance to change. The study also illustrated that an enabler for resistance to change is if the technology is perceived to be a threat, however, other contributing factors to the resistance to change such as the fear of technological obsolescence, high cost of technology and lack of requisite knowledge which are primarily sociological, cultural and organizational factors, rather than technological factors were not taken into consideration. It therefore empirical to point out that the responsibility for providing an environment that encourages the adoption of IT by healthcare professionals in hospitals is not only limited to the IT engineers but should

also be extended to management to make sure the exiting work processes are aligned with the new HIT system.

The perceived usefulness of a HIT system is not only related to system compatibility, but also influenced by the trustworthiness of a system (Hung *et al*. 2014). The perceived usefulness of a system can be further enhanced by performing detailed tests on the actual system and ensuring that the system is compatible with the work requirements of the nurses. This would result in the output of the HIT system being trusted by the healthcare professionals. Finally, the model showed that related knowledge and compatibility of HIT by the nurses are positive enablers for the perceived usefulness and perceived ease of use of HIT.

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Evaluation of Information System Service Quality in a South African Governmental Department

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Abstract

The research project was undertaken to investigate the effective usage of Information Systems (IS) and Information Technology (IT) in the Department of Economic Development, Environment, Conservation and Tourism (DEDECT), taking into consideration other factors impacting on service delivery in the Department and their challenges. The survey was confined in the DEDECT Provincial office and at middle management respondents with access to IS equipment and tools. A sample of 25 respondents was selected. The collected data was presented in frequency tables and graphs. The main findings of the study reveal that there is a strong correlation between service delivery and the IS infrastructure in the department and encompassing other factors which may include perceptions of clients, support systems to IS and the capabilities of the IS operators. It is therefore imperative that the various arms of government start working smartly and effectively by using IS and IT to increase productivity. At the end of this article, several general strategies are put forward as possible solutions to achieve this goal.

Keywords: Information Systems, IS success, Information Technology, Middle managers, Reliability, Service delivery.

Introduction

The DEDECT, situated in Mafikeng, is the provincial office with branches in the three districts elsewhere in the North West Province. The offices are linked to one electronic technology like telephones, networked computers, and fax machines, just like any other department in the province. The

objective of linking all these departments is mainly to facilitate internal communication, quick information exchange between offices as they go about serving their clients in order to fulfil their official mandate.

The purpose of this contribution is to report the results of our research on the effective use of IS in this department and observe the other related issues including challenges encountered. The need to investigate the effective use of IS in the department would lead to client satisfaction and within the department the ability to produce tangible deliverables more quickly (Service delivery). The literature used in this study comes from journal articles, different websites and literature from relevant scholars on the subject.

Background

This study focuses into the operations of the Department of Economic Development Environment Conservation, and Tourism (DEDECT) in the Provincial office based in Mafikeng in the Northwest Province of South Africa. The offices are based in a building rented from the North West Development Corporation, which happens to be one of the department's agencies among other parastatal organisations operating in North West Province.

The DEDECT is one of the smaller departments in the province and has about a total of about hundred and five employees, including those in the districts. However, this number includes even people who do not use computers. It is also expected that the number of employees will increase in the near future as the government seeks to try and increase all the positions. The use of IS therefore is an integral part of the Department with almost every office equipped with a Desk top computer or Desk top which is used to generate reports and communicate with other Departments and other organisations through the intranet and the internet. All Departments in the province are linked to one main central server but with each individual Department having its own departmental server managed by a small team of IT personnel to attend to internal IS and IT problems. This article focuses on the before-mentioned small team within the department and seeks to gauge their service delivery as well as to identify problem areas with regard to service delivery. It then comes up with possible recommendations on improving the services in case of any shortfalls.

Problem Statement

A well placed and organised IS system is required in an organisation if it is to be utilised to its full potential, and includes a number of components. Park and Kim (2005) explain that IS are implemented within an organisation for the purpose of improving the effectiveness and efficiency of that organisation.

The importance of IS affords that the effective and responsible use and management of the information technologies is important for managers, professionals, and other knowledge workers in today's internet worked enterprises. IS plays a vital role in the e-business and e-commerce operations, enterprise collaboration and management, and strategic success of businesses that must operate in an Internet work global environment (Sachenko 2011).

The DEDECT has to collaborate with other partners such as Cipro to register business enterprises and Tourism South Africa to process Tourism related issues with partners in towns as well as overseas. These Systems have to be properly put in place and managed by capable trained staff to make them more effective. However, the current status in this department might not be the ideal situation, given the fact that service delivery generally is at its lowest ebb in South Africa as a country, as evidenced by the cry from the public as alluded to by Zuma in 2011. It is therefore with this status quo that this study seeks to investigate.

Other issues that are problematic to be investigated in this department are the usage of computers or IS by staff members, their competency levels in using them, Reliability of the network system, or IS in the department as well as IS support within the department, Satisfaction of the clients of the department as consumers of the product was also looked at.

Literature Review

Assessment of IT Usage

In the IS field, as early as 1992, Delone and Mclean developed a model for measuring IS success model containing six constructs namely:

- System quality
- Information quality
- Use of IS

- User satisfaction
- Individual impact and
- Organisation impact

Since then, the IS success model has been tested by many researchers (Landrum *et al.* 2010). While IT has greatly improved the way organisations provide services to customers, the high capital investment and expenditure is a big hindrance to many and raises serious management concerns in the industry. In the past, performance measures, which were mainly financial, were used to assess the performance of IT departments but these measures were later found to have some serious shortcomings when used to measure service performance of IT departments (Kang & Bradley 2002).

From a user's perspective, a mobile device is not only a tool for communication but also a tool for commerce. In this context, the emphasis of mobile carriers' strategy has shifted from traditional telecommunications service to value- added m-commerce service. According to *iResearch*, a marketing research firm in China, mobile value-added service market in China increased from 54 billion Yuan in 2004 to 100 billion Yuan in 2006 (Lu *et al*. 2009).

The most important and influential instrument in measuring service quality has been SERVQUAL developed by Parasuraman *et al.,* (1988). This instrument contains 22 items and has been widely used for measuring service quality in marketing. It features five service dimensions namely; reliability, responsiveness, assurance, tangibles, and empathy. Customer expectations about the provided service results in the customer's perception of service quality (Landrum *et al.* 2006).

Technology Acceptance Model Constructs
It is of fundamental importance to understand and measure logistics service quality (LSQ) and incorporate a framework Technology Acceptance Model (TAM) to assess logistics information technology use and model of LSQ. The logistical service quality provide an interesting contrast to earlier TAM research with respect to the relationship of the two main TAM constructs of perceived ease of use (PEOU) and perceived usefulness (PU) of information technology with intentions to use information technology tools (Bienstock *et al.* 2008).

One would ask if service quality is an antecedent of service satisfaction and whether the customer satisfaction acts as a mediating factor between service quality and behavioural intentions and hence strengthening the prediction of the latter. Based on the model constructs and previous research, a survey instrument using a seven –point Likert scale for each of the construct components was developed (Udo *et al.* 2010). The model for business quality used in this paper consists of four constructs:

- IS work quality
- IS user quality
- Business integration quality, and
- Business quality

To sustain a high business quality requires high quality both in terms of IS work quality, IS user quality and business integration quality (Salmela 1997). The procedure of specifying the domain construct should specify the domain of the construct, argues Churchill a researcher from the late 1970's as this helps comparisons of ideologies exact, and this delineates what is included in the definition and what is excluded in the definition (Smith, 1999). Despite the considerable published research relative to the measurement of the relationship between the service quality and customer satisfaction constructs, consensus concerning these issues has not emerged (Brad *et al.*, 2002). This work explores service quality constructs and associated indicators for assessing service quality performance and the relationship between resident satisfaction and service quality in the condominium management sector (Kuo *et al.* 2011).

Effective Logistics Services

Bienstock *et al.,* (2008) refer to adequate IT support logistic service as one of the most critical components in the provision of effective supply chain management field which has since become very prominent in the business world these days. This has resulted into pressure being put on managers to measure the performance of IT departments (Kang & Bradley 2002).

The Service Quality Model (SERVQUAL) model uses both client and supplier perspective to find the expectation and perception gaps between respondents. A gap analysis is used where it represents the mathematical

difference between the assessment of performance perception and expectations for the service required by each respondent (Roses *et al.* 2009). Effective logistics services also encompass quality in an organisation where it is explained as quality excellence, quality value, quality conformity to required specifications, and to meeting customer expectations (Gorla *et al.* 2010).

The relationships between service quality and its dimensions suggest a reflective model. Other researchers (Parasuraman *et al.* 1985/ Brad & Cronin 2002) propose a formative perspective; others suggest both reflective and formative perspectives. Researchers do not have a consensus on this, Martinez and Martinez (2010) proposes therefore that the philosophical framework be adopted for developing the service quality models is not specified for the aforementioned researchers.

Quality

Quality and how quality must be measured are discussions that rage on amongst academics over the years. There are different models of describing quality and the accepted models are those that have a multidimensional service quality conceptualisation that it is inherently linked to the measurement of consumer quality perceptions. Therefore, service quality models offer a frame work for understanding what service quality models offer a framework for understanding what service quality is and how to measure service quality in each proposed concept (Martinez and Martinez 2010).

The e-Government service quality (e-GovSqual) dimension is made up of six service quality dimensions. These are; information quality, security, communication, website aesthetics, website design, and access. These factors are not necessarily within the government circles alone these days but in the private sector as well (Kaisara & Pather 2011).

Quality has been regarded as driver of competitive strategy and many frameworks have been developed and there are still different perspectives on how quality is conceptualised and operational. There is no universal all–encompassing definition or model of quality, the quality constructs is very broad and includes many components such that including all in one model would render it ineffective (Wang & Liao 2008).

The operationalisation of service quality over the years has been led by

the research of academics in the likes of (Piccoli *et al.* 2009) SERVQUAL scale, where they suggested that service quality should be represented as the difference or "gap" between service expectation and actual service performance. In other words the GAP paradigm implies that service performance is equal to or greater than the expected level of service (Brad *et al.* 2002).

Service organisations are continuously endeavouring to improve their quality of service because it is of paramount importance to them for business success. The core driver in this respect is the customer service aspect, which is still vital to a service Organization. This status quo has brought about the urge to research in this important direction (Bharati & Berg 2005).

Service quality is important across all industries and it is appreciated for its role, of bringing about customer loyalty and other benefits. This situation calls for a reliable instrument to measure information quality. SERVQUAL has been applied to various settings and different users but criticized for its weak reliability and validity. Modified versions of SERQUAL have only used its performance measure or SERVPERF (Landrum *et al.* 2007).

Hernon and Nitecki (2001) point out that in some evaluations of libraries the concepts of service quality satisfaction and service quality are used interchangeably, even though the two are not necessarily the same. In any case there is no general consensus on the definition of the two given concepts or whether they may be treated as two separate constructs or a single construct (Roszkowski *et al.* 2005).

Quality may be highly influenced by functional rather than technical dimensions, but may not be independent of each other. The variability in the tangibility of a service and the presence of the customer in its production frequently make it hard to define the boundary between process and outcome dimensions, but process and outcome may be regarded as a single dimension (Smith 1999).

Even though service quality is so important and popular, it is however an elusive abstract to measure and therefore extra effort is required to establish a valid measure. Service quality is rather an exclusive and abstract concept as a result of its intangibility and inseparability of production or consumption. There are therefore a number of different approaches suggested regarding how to define and measure service quality (Lee *et al*. 2011).

Service quality research has been dominated by studies conducted in the context of consumer services, and fewer studies have been conducted addressing business-to-business services. In the current body of research, the dimensions that are service quality are based on in terms of measurements are typically derived from the SERVQUAL scale or one of the variants based on it (Woo & Ennew 2005).

SERVQUAL and Other Constructs

SERVQUAL is a model that is used by many scholars and practitioners to measure service quality even though it has over the years attracted a lot of discussions and criticism regarding its quality and in terms of its effectiveness and accuracy. Some scholars note ambiguity in the definition of expectation measurement (Kuo *et al.* 2011). Service quality represents an ongoing concern for academics and practitioners. While application of ordinary SERVQUAL and SERVPERF have provided positive results in service quality research, these instruments are not focused on the information service area, even if some researchers suggest that service quality is included as an information success measure (Landrum *et al.* 2010).

To examine the applicability of the SERVQUAL instrument in IT setting, many empirical studies adapted the concept of service quality and SERVQUAL to measure the performance of IT service. They took into consideration whether the use of differences in scores of corresponding dimensions of tangibility, reliability, responsiveness, empathy and assurance would be applicable in the IT setting (Kang & Bradley 2002).

Although SERVQUAL has been used successfully in the various industries like insurance services, Library services, information systems, healthcare settings, bank service, hotel services, and many more, there still is a problem with conceptualization and operationalisation of the SERVQUAL scale, especially with regard to applying it five generic SERVQUAL dimensions across the industries (Ladhari 2010).

Defining of service quality revolves around the idea as a result of the comparison that customers make between expectations about a service and perception of the way the service is rendered and in developing the 'Gaps' model, some researchers use the generally accepted psychometric procedures that have resulted in the operationalisation of the service quality instrument SERVQUAL (Wilkins *et al.* 2007).

In their effort to develop and refine a valid but reliable scale for measuring physical distribution service quality, some researchers like Bienstock *et al.,* (2008) initiated an integration of logistical and marketing quality measurements literature. In refining the five dimensional SERVQUAL scale of tangibles, responsiveness, empathy, reliability, and assurance, Parasuraman *et al.,* (1988) (interviewed and surveyed retail consumers of repair and maintenance, retail banking, long–distance telephone, securities, brokerage and credit facilities and services (Bienstock *et al.* 2008).

Landrum *et al.,* (2009) decided not to include variables related to the tangible dimension of SERVQUAL because of findings earlier by other researchers that the tangible dimension was relatively less important to information system customers and suggested its removal from the list.

It is envisaged that the concept of service quality can be applied to measure the performance of IT Kang and Bradley (2002). Generally IT service quality is developed based on the service quality "gaps model". Going a step further, this study looks at the practicality of the use of SERVQUAL and the performance of an IT department using a modified version of the three-column- format SERVQUAL. Other researchers like Cronin and Taylor conducted studies across four industries, developing and testing a performance based measure known as SERVPERF. Other researchers however argued that SERVPERF had superior productive power but had rather inferior diagnostic power because it provided less information (Gonzalez *et al.* 2005). To arrive at a reliable measurement of system service quality, more than three SERVQUAL responses to a system were collected from system users and employed as a mean for each system. This research tries to extrapolate the results of marketing research concerning customers' perceptions of service quality and IS/IT research as to employees' perceptions of service quality (Lai 2006).

SERVQUAL may have been used in a wide variety of services but several difficulties have existed regarding the conceptualization and operationalisation of the SERVQUAL scale. Questions have been posed on the use of the five generic dimensions in several service industries resulting in requests of adaptations to be made on the SERVQUAL model (Ladhari 2010). This study presents and validates a model of e-Government systems success based on the Bhararti and Berg (2005) updated IS success model. In

this model, the multidimensional and interdependent nature of G2C of e-Government systems success is measured (Large & Konig 2009).

The conceptualization and measurement for the service quality construct has been dominated by the use of the SERVQUAL scale introduced by other research. This tool employs a pair of 22- item scales each identical, with the exception that the service providers are assessed on perceived performance including consumer expectations regarding the level of service to be received (Brad *et al*. 2002).

Paulins (2005) argues that exploring customer IT service quality in the government by determining whether customer service expectations are being met is of essence and reason for this work. The study seeks to find out if customer categorizing is based on appearance, status in society, or other related facts. SERVQUAL may not be met with enthusiasm as a measure of service quality in government and other sectors such as retail, but its application in this work is exploratory as differentiating trends are sought.

Studies of service quality experienced that there are certain aspects, which result in creating customer perceptions, which will ultimately lead to customer satisfaction or dissatisfaction for that matter. This will eventually lead to the customers behaving or reacting in a certain manner toward the IT services by customers (Udo *et al.* 2010).

It should be noted that IS success has previously been product oriented and that the IS department was not just a product provider but also services. With the escalating part of the IS budget being diverted to the IS services, there is more emphasis now being turned to the service dimension. The SERVQUAL instrument has been validated and is being used in this IS context (Gorla *et al.* 2010).

SERVQUAL evaluates service quality using a questionnaire containing 22 items divided into five dimensions of tangibles, reliability, responsiveness, assurance, and empathy. These elements evaluate both the expectations for agreed services and the perceptions of services previously provided between the clients and suppliers (Roses *et al.* 2009).

Service quality has become an integral part of the success of all Organisations. Hence it is very important to use a completely reliable instrument to measure the impact of information quality, and in this case the most common instrument to use at hand is the SERVQUAL despite the criticism levelled against its reliability and validity (Landrum *et al.* 2007).

The "gap" concept also supports the SERVQUAL instrument created by Parasuraman and his colleagues as a generic measure of service quality in the various sectors of the service economy. It is reasonable to assume that the concerns and dissatisfaction raised regarding SERVQUAL are also pertinent to other components such as LIBQUAL (Roszkowski *et al*. 2005).

Even if SERVQUAL is widely used by academics and practitioners, it has been criticized for its lack of sophistication methods, design of methods, and assessment. However these attributes may be achieved by using alternative methods such as the use of assessment studies (Oztekin 2011).

Parasuraman *et al.,* (1988) presented service quality as a multi–dimensional construct and SERQUAL as an instrument for measurement of quality across service industries and they came up with ten factors as the dimensions on which consumers of services evaluate quality regardless of the nature of the service.

The concept of e-service is not only a combination of the words electronic and service but it entails defining what e-service quality is, identifying its underlying dimensions and determining how it can be conceptualized and measured. Investigations and research in different settings and service industries are continuing on e-services using SERVQUAL or WEBQUAL and no conclusive results or study has come up yet strictly confining itself to the portability of such an instrument (Hernon & Calvert 2000).

Tylor offered a theoretical justification for discarding the expectations portion of SERVQUAL in favour of the performance measures included in the scale. The term they referred to as performance only measures also known as SERVPERF. This is based on only consumer's perception of performance of a service provider as opposed to the difference between the consumers' performance perceptions and their performance perceptions (Brad *et al.,* 2002). This analysis of the SERVQUAL therefore leaves no doubt that this model needs to be researched more as there are a lot of unresolved issues concerning it. These include the need for further research on expectations, as well as the elaboration of gap issues underlying factor structure.

Classification of IT Services
Classification of IT services is a term used to describe the heterogeneous

range of intangible products and activities that are a challenge to explain in simple terms. These services may include enterprise, horizontal, and, vertical applications. Other services will encapsulate activities such as application upgrades, technical support, virus protection, data security, consulting, integration and staff training (Lu *et al.* 2009). Jackson and Humble (1994) suggest that any IT initiative should start defining themselves by listing what services these currently offer, whether it is developing, operations, help-desk, or consulting and then consider the essence of each service offered and listen to customers comments and views gauging their perceptions of value and contribution. This customer information should be used to assess if the service itself is to the customers satisfaction.

Service quality may be divided into two generic functional service dimensions: technical relating to what is offered and functional referring to how the service is provided. These two dimensions would also be applicable in the determination of quality in the nature of service rendered by an organisation (Woo & Ennew 2005).

The services that were used in the development of SERVQUAL are very different to goods retailing. It may be that consumers use different criteria to evaluate and classify competing goods, retailers who sell a mix of goods and services than they use to evaluate retailers that are primarily service organisations. Classification of services are closely associated to service quality and describe related potential constructs of perceived service quality and identify ten potential overlapping constructs which include, tangibles, reliability responsiveness, communication, credibility, security, competence, courtesy and access all dimensions which have a role in the classification of the services provided in the IT industry (Vazquez *et al.* 2001).

An Effective IT System

Previously IT sections were basically and primarily secondary support structures to other Departments such as sales, finance, and customer services but this trend now has changed. IT is now an independent standalone providing internal services to work units and divisions (Kang & Bradley 2002).

To enhance effective use of IT, the Internet has to bring different innovative means of operations to be effective. This has resulted in one

aspect of the identifying of what are called application service providers. These are generally new small businesses which usually deliver services through the Internet and coordinate with network providers, software vendors and consultants the key motivating fact being to reduce the cost of purchasing, installing, and maintaining software and related hardware (Lu *et al.* 2009).

The purpose of this work is to examine the effectiveness of IS sourcing from the perspective of service quality and maintenance efforts. The integration of outsourcing with the context of effective operation is vital in IS but this concept should be understood well to avoid problems in system management and maintenance (Park & Kim 2005).

The performance of a product and service is directly linked to the effectiveness of a system and is normally expressed by the satisfaction in marketing literature. The direct influence of performance on satisfaction can be reasoned to be more satisfied with an offering has the ability to offer consumers what they need or desire (Kim *et al*. 2011). Customers continue to demand better services through the internet as governments and Organizations develop systems to deliver these services, a need arises to evaluate efforts that among other things asses the effectiveness of the e-government and organizational systems in use (Wang & Liao 2008).

An example of an effective system would be the Hilton on Q system, which is a prototypical example of a network-based customer system. This is a computerised information system, which delivers service to a customer either directly via a browser, or cell phone or indirectly through a service representative or agent accessing the system (Piccoli *et al.* 2009).

In e-Government structures, most users' willingness to adopt e-government services depends on the perceived quality of services provided through offline channels because the business users prior interactions with the government through offline service channels shapes their belief, confidence and trust (Lee *et al.* 2011).

Managing costs is an important aspect affecting IS and has a direct impact on effectiveness. IS quality can be argued on the basis that it is a prerequisite for achieving organizational benefits through information systems and IS work quality and user quality are required to ensure that the IS are actually designed and used in a way that would benefit the business (Salmela 1997).

In e-Retailing vendors provide online self-service facilities to customers for improved service effectiveness and cost efficiency. This has to be done by seeing to it that major issues in service delivery and design are attended to as client's desires and intentions to use a self-service depend on their perceived performance of online customer and organisation interface (Ding *et al*. 2011).

The impact of IS on employee performance has a direct influence on the quality of service provided. Decision effectiveness and efficiency of task completion, as a measure of speed completion have been used with different variations in research studies (Bharati & Berg 2005). Basing on research done previously, the attribute of system quality may are grouped into two broad categories; the system features from the designer perspective referred to as the system flexibility and the system features from the end users perspective called the system sophistication (Gorla *et al.* 2010).

The success of software development depends on the criteria of functionality, quality and timeliness. The software is specifically developed to perform a function, unless this function is executed successfully and effectively, the purpose of the software development is defeated (Kim *et al.* 2011).

Quality and effective is a subjective notion and can be defined in many ways. Three interrelated perspectives define scope of quality. The first is the conformance to the requirements based on the customer expectations. The second is the perspective of fitness for use as determined by the customer and the perspective of willingness to pay based on what the customer can get out rather than what the supplier puts in all contribute to effectiveness (Yeo 2009).

Service performance is however the result of service quality perceived by the internal customer not by the purchaser. Therefore, it is essential to measure the quality perceptions of internal clients' and establishes the fit between the service expectations and the service perceptions (Large & Konig 2009).

The Public Sector

Governments have also embarked on major ICT investments in an attempt to take advantage of the benefits of the Internet and extending channels by which services are provided to their respective clients. However, with the

increasing reliance on ICT's the main challenge confronted by the public sector is how to evaluate the success or effectiveness of their ICT investments (Kaisara & Pather 2011).

A study of a public health care delivery system carried out had contrasting results as employee assessments of service quality were lower than those of their customers and unexpectedly employees with professional training had less congruent assessments than other employees (Roszkowski *et al.* 2005). Prior e-Government research has paid much attention to e-government service from the supplier side –the government while the user side of e-government has been overlooked even though some effort to study individual citizens has been attempted (Bharati & Berg2005). Few studies examined the factors that influence businesses in the decision to adopt e-government services in their transactions with government (Lee *et al.* 2011).

It is therefore important to measure the success of government to client e-government systems from the citizen's perspective. Few studies have been conducted to investigate e-government systems; this study seeks to provide an empirical test in the context of government to client e-Government.

Research Questions

Some of the questions that were posed in the research project on which this paper is based, focus on issues of efficiency:

1. Are the Information systems in the Department able to be used to their full capacity?
2. Are there any technical improvements required to be done on the IS systems?
3. Are the staff members conversant with operating and managing the departmental Information System?
4. Are the customers of the department satisfied with the quality, efficiency of the service they get through the IS systems from the Department?
5. How can the IS related weaknesses be rectified?

Research Methodology

This section outlines the methods that were used to collect the required information from respondents. Research is basically a process of identifying problems that cause systems (including the technologies that are used as

tools to operate such systems) to malfunction, after which the researchers have to derive general research questions from sub-problems, and expand those questions into more detailed questions to use in a research instrument like a questionnaire (in the case of quantitative research) or an interview schedule (in the case of qualitative research) in order to collect, analyse, and interpret data to provide solutions to the problems that were identified (Klopper & Lubbe 2012).

Some of the most pertinent questions that arose for this research to be initiated were those probing about whether the IS&T in the Department are being used to their full maximum capacity. The aim is also investigate if there were any technical improvements required to be done on the IS systems in the department.

Respondents and Data Collection

A quantitative approach to data gathering and analysis was employed in this project, entailing the use of questionnaires to determine IS&T-based service delivery in the head office of Department of Economic Development, Environment, Conservation, and Tourism in Mmabatho in the North West Province.

The target population for respondent selection is the IS users in the department. Twenty-five questionnaires were distributed to the middle managers in the department who depended on IS&T on a daily basis to do their work. The respondents returned all twenty-five questionnaires, so that the survey can be characterised as a census.

The Department of Economic Development is one of the smallest departments in the North West Province and not all its employees have access or use the IS&T equipment in their offices, the focus was on the main office in Mmabatho where the survey was conducted. The participants were people who depend on IS and have been using this equipment for more than two years and are therefore well conversant and have the ability to make a fair judgement of services. Printed questionnaires were distributed to the participants in their offices.

Research Results and Analysis

In this section we discuss the research findings. The survey addressed specific questions, which were asked, and the analysis was done tailored on

the application of Pearson correlation coefficient and p-value. In its nature the Pearson correlation coefficient method correlates all listed variables with each other and indicates which of the resulting relationships are statistically significant.

Demographics

Questionnaires were distributed to all 25 middle management employees in the provincial office of the Department of Economic Development in Mafikeng, all of them regular IT users. All the twenty-five distributed questionnaires were completed and returned by the respondents. Of the 25 respondents, as figure 1 shows, 56 % were female, and 44% were male. These percentages indicate that the majority of employees in middle management in the Provincial office of this Department are female. The nature of the research was on service delivery and did not directly focus on gender issues but the IS users and beneficiaries in this case. The respondents were employees of the department male and female.

The age range of the twenty-five respondents was between the mid-twenties to the late fifties. The graph in figure 1 clearly depicts their age range distribution. It is clearly a mix of relatively new employees in the Department and those that have been in employment for a while and are in their fifties. However the majority are under the age of forty.

Figure 1: Ages of Respondents
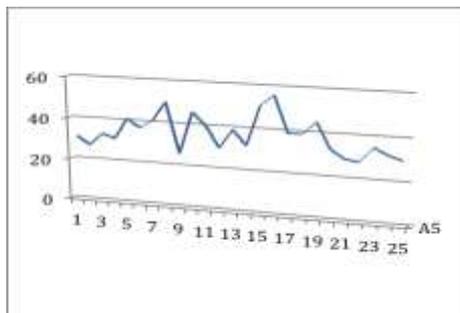
The respondents' area of origin was probed to determine where each of the respondents grew up. This was to establish the extent to which exposure

was experienced with regard to Information Systems. It is commonly known in South Africa that the rural areas have more challenges and less IS infrastructure than the urban areas. The information gathered in the survey showed that most of the respondents originated from the rural areas at 64% while people originating from the urban areas were in the minority at 36% only.

This Department at this level comprised of people of the African descent. This means that all the respondents were Africans giving us a result of 100% Africans. This question sought to establish the classification of the respondents regarding their status in the Department whether they were academic, employees or student/interns working in the department. The results showed that of all the respondents, only 4% of the employees were academic; another 4% worked in the capacity of student interns and the majority as ordinary employees at 92%, completing the 100%. This is indicated in Table 1. Three interrelated perspectives define scope according to Yeo (2009). The first is the conformance to the requirements based on customer expectations, and then the perspective of fitness for use determined by the customer and perspective of willingness to pay based on what the customer can get rather than what the supplier puts in, all this contributes to effectiveness of the system.

Table 1: The status of employees

	Frequency	Percent
Academic	1	4.0
Student\ Intern	1	4.0
Employee	23	92.0
Total	25	100.0

The essence of this question was to find out how long or when the respondents had been making use of some if not all of the most common IS equipment. They were expected to state when they had been introduced to using IS in their lives as tools for work or carry out required tasks. The respondents indicated that none of them were ever exposed to the use of IS while in primary school but 28% indicated that they started using IS in high

school, followed by 32% in tertiary and the majority of the respondents said they were exposed to IS when they started working and comprised of the remaining 40%.

The e-Government service quality dimension is made up of six service quality dimensions. These are information, quality, security, communication, website aesthetics, website design, and access, which are not only found in the government only but also in the private sector. (Kaisara and Pather, 2010) therefore exposure of the respondents to IS equipment is not only in the DEDECT environment.

Figure 2: Exposure to IS tools by respondents
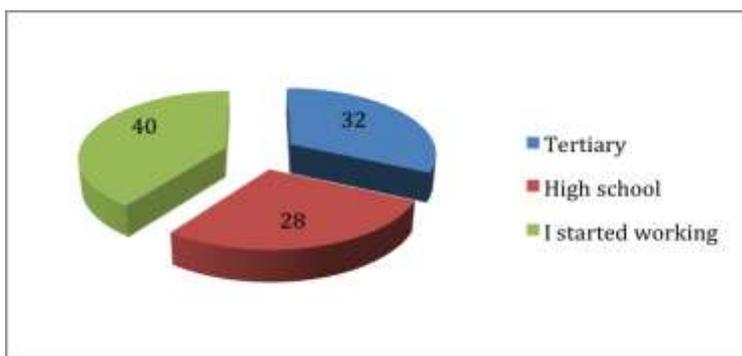
Service Quality

The IS service quality and delivery of the department was scrutinised, taking into consideration the flow of information within the department amongst staff members and the interaction of the departmental staff with their clients in providing the mandated services the department is expected to deliver. Only 4% of the respondents strongly agreed that the service quality and delivery services were of very high quality in the department while the other 4% just agreed with the statement. However 56% disagreed with this statement and 36% strongly disagreed with the statement saying that the quality and service of the IS in the department was not of high quality.

Martinez and Martinez (2010) state that there are different models of describing quality and the accepted models are those that have a multidimensional service quality conceptualisation that is inherently linked

to the measurement of the consumer quality perception. On information flow, none of the respondents could agree that the information flow and was accurate and quick in the department, as 72% of them said they disagreed with the statement, 20% strongly disagreeing, while 8% of the respondents agreed with the statement saying information flow was accurate and flowed quickly.

The respondents were further probed to find out if they worked effectively with IS in their Department, but the results showed that 44% strongly disagreed they did, 40% just disagreed, and 16% agreed they did. Service quality will have a direct link to the success or failure of an organisation (Yeo 2009).

Table 2: Service quality and delivery

	I Strongly agree %	I agree %	I disagree %	I strongly disagree %
The IS service quality and delivery of services is of very high quality in the Department.	4	4	56	36
Information flow is accurate and quick in the department.	0	8	72	20
Do you believe, you work effectively with IS in your Department?	0	16	40	44

Respondents were asked on whether honest when interacting and dealing with their Clients. This would determine the impact on the outcome rating of the department by the clients where service delivery was concerned. According to table three, 4% of the respondents did not want to answer this question posed to them. The majority of 72% confessed to being honest at all times when dealing with clients.

Piccoli *et al.,* (2009) state that the different functions of the IT systems is a process where a network of software applications that manage and coordinate the work flow activities designed to enable end to end client services as this determines how service delivery takes place.

Table 3: Honesty in dealing with clients

		Frequency	Percent
Valid	I'm always honest	18	72.0
	I'm honest most of the time	3	12.0
	I'm honest sometimes	1	4.0
	I'm never honest	2	8.0
	I do not want to answer this question	1	4.0
	Total	25	100.0

It was also important to establish the type of clients and projects the respondents were servicing in the department and judge if it would have an impact on the results. It was then established that the vast majority comprising of 88% of the respondents were servicing all types of clients that is small, medium, and big while only 12% of the respondents were servicing medium size projects and clients. The quality of services will have a bearing on the number of clients into the department and, the quality of service depends on evaluation by the consumer (Vazquez *et al.* 2001).

It was necessary to establish the condition of the IS infrastructure as perceived by the respondents in the department. They were required to state if the infrastructure of IS in the department was good enough to sustain their needs in terms of service delivery when doing their work. Table 4 shows that only 20% of the respondents in the Department agreed that the infrastructure was good enough for them but 40% disagreed and another 40% strongly disagreed with the statement. Department will achieve network completeness when customer expectations have been met through proper network infrastructure (Piccoli *et al.* 2009).

Table 4: Good infrastructure

	Frequency	Percent
I agree	5	20.0
I disagree	10	40.0
I strongly disagree	10	40.0
Total	25	100.0

Wang and Liao (2008) state that customers continue to demand better services through the internet as governments and organisations develop systems to deliver these services, a need arises to evaluate efforts that that among other things asses the effectiveness of the e-government and organisational systems in use. The DEDECT results from the respondents are however not positive as most of them stated that the Infrastructure in the department was not good enough.

The respondents capacity and capability to comprehend IS had to be put into perspective so that their judgment would be relied on regarding the valuation of services and in executing certain decision associated with service delivery, quality, and condition of IS in the department. Table 5 shows that most of the respondents (64%) said they understood the functions of IS components moderately and 16% said they understood IS components very well and lastly 20% are the one who did not know anything about IS. This would give us a fair result because the majority would be in a position to make a good judgment or decision concerning IS.

Table 5: Understanding IS components

	Frequency	Percent
Very well	4	16.0
Moderately	16	64.0
Don't know anything	5	20.0
Total	25	100.0

The capacity of respondents to be in a position to use IS equipment plays a vital role as this would assist in the delivery of quality services to their clients. It would be also be of use in identifying the areas where improvement is required in Oder to improve service delivery. Capability of using IS equipment and tools could be a major hindrance to service delivery.

This survey therefore set out to scan the capabilities of the people in the department, so as to have an idea of the status quo. According to Table 6 of the 25 respondents surveyed, 7 turned out to be very good at using IS tools and this translated into 28%. The bulk of the respondents were moderate users at 68% and only 4% were very poor. This in essence was a good result, in terms of the use of IS equipment.

Table 6: Ability to use IS equipment / tools

	Frequency	Percent
Very good	7	28.0
Moderate	17	68.0
Very poor	1	4.0
Total	25	100.0

While the staff in the department have their own issues with regard to capacity and capabilities of handling IS gadgets, there are certain procedures that need to be addressed by an IT support unit in the department. Its job is to correct mistakes and set up the IS equipment in such a way that they can be operated by the rest of the staff in carrying out their duties. Other services will encapsulate activities such as applications upgrades Virus protection, data security, consulting staff training (Lu *et al.* 2009). The DEDECT has such a unit in place and this survey took the initiative to find out how they performed in terms of supporting and solving problems related to the IS within the department. The respondents were asked to rate the swiftness of the support team in attending to problems. The results were down as shown in Table 8. More than 50% (56%) of the respondents said that the support team responds slowly to IS problems while 12% reckoned the team is not responsive at all. Respondents that stated that the team responds at a moderate pace were 28% and only 4% said the response was quick.

Table 7: The IS technical team in the department

	Frequency	Percent
Responds very quickly to IS problems	1	4.0
Responds Moderately	7	28.0
Responds very slowly to IS problems	14	56.0
Is not responsive at all	3	12.0
Total	25	100.0

The respondents were further subjected to questions, which probed into service delivery, and problems that affected them in operating IS equipment. All respondents did use IS tools to service clients but at different levels and different rates. Table 8 outlines the respondents' responses and the questions fielded to them. The results are in percentages.

Table 8: Service delivery and quality

Research Question	A bit	Somewhat	Neutral	Not at all
Do you think IS can improve service delivery?	48%	36%	16%	0%
Have you ever encountered hardships using IS equipment at work?	48%	32%	16%	4%
Do you use a Computer and telephone to offer services to clients?	40%	48%	12%	0%
Do you think it is possible to service clients with office IS equipment ONLY?	20%	24%	12%	44%

The level of satisfaction of the services rendered to the clients of the respondents was further probed. The questions were however posed to the

respondents to find out in their opinion, and based on their assessments as the people dispensing the services to their clients, what the clients thought of them. Most of the respondents, according to table nine,52% believed that only some of their clients were satisfied, while 48% said their clients were not satisfied. Other researchers have developed models which measure both customer expectations of service based on what customers believe it should be like based on their perceptions (Kang & Bradley 2002).

Table 9: Client satisfaction

	Frequency	Percent
Some	13	52.0
No	12	48.0
Total	25	100.0

The logic in finding out whether the IS was to gauge the respondent's seriousness in utilizing the tools of IS and their comprehension thereof. The results as table 10 shows were such that, most of the respondents agreed that good IS services in the department were not effective, 20% strongly agreed with this sentiment, 36% agreed 20% disagreed and 24% strongly disagreed. This meant that the majority did agree that the department's IS were not effective. In e-government structures, most users' willingness to adopt e-government services depends on the perceived quality of services provided through offline channels (Lee *et al.* 2011).

Table 10: Good IS are not effective in this department

		Frequency	Percent
Valid	I Strongly agree	5	20.0
	I agree	9	36.0
	I disagree	5	20.0
	I strongly disagree	6	24.0
	Total	25	100.0

Correlations

This is a technique used in research statistics to analyse relationships between variables. It relates two variables together (Gray 2009). In statistics, dependence refers to any statistical relationship between two random variables or two sets of data. Correlation refers to the statistical relationships involving dependence. The aim of this section is to establish if IS infrastructure, service quality, and the use of IS equipment by the respondents is has a correlation with service delivery by the DEDECT.

In this study a number of concepts were put forward to the respondents to get the views on these concepts, the data was analysed and they had certain implications. The values that were taken into consideration were those that were positive and higher. According to the data collected, there were also variables with a negative lower results indicating that some of the concepts were not correlated but these were not discussed in detail as the focus of interest was in those with a positive correlation in this case.

An example of such concepts with two variables was: Do you believe you work effectively with IS in your Department? This was in comparison to the statement that: we have a good IS infrastructure in the Department. This yielded a result of 0.488% meaning that there is a strong correlation between having a good IS infrastructure and working effectively due to this infrastructure. This was a positive result indicating that respondents would work effectively if the infrastructure was good.

The correlation between service delivery and client satisfaction with services from the department was 0.578%, a positive correlation between the two variables according to the criteria prescribed by the concepts of correlations. The relationship is strong and this means that the clients will react and respond to the services rendered by the department. This result is above 5%, which is positive.

The data correlation result from the between service quality and delivery of service variables is 0.578 %positive two tailed, which is well above 5%, representing the fact that when the respondents deliver high quality IS services to the clients, the impact on the clients is that they get satisfaction from the services rendered by the department. It is closely correlated and has a direct impact on the clientele of the department. This is a positive aspect for the department as service quality will produce good service delivery and bring a positive impact to the department taking into

consideration that customers continue to demand better services through the internet and organisations continue to evaluate assess the effectiveness of e-government and organisational systems (Wang & Liao 2008).

Conclusion and Recommendation

In this section, the detailed results of the research using statistical methods have been provided. Tables, graphs and stats were used to present the results of the survey, and data analysis was also presented as part of the section. Data analysis is important as it assists in understanding the various elements and contents of collected data. This is done through investigating the interpretations of the concepts involved, variables or constructs.

Customer satisfaction of services from the department was also found to be closely correlated to the very high quality of IS services in the department. The ability to operate IS equipment in the office by the respondents in turn also had an impact on working effectively in the department. The use of IS technology also posed some challenges in terms of satisfying customers as this is correlated quite strongly.

Summary

Generally government departments are hard at work to try and improve ICT by investing a lot of resources in this sector in an attempt to take advantage of the benefits of the Internet and all IS in general to the benefit of their respective clients in the form of services rendered. The increasing reliance on ICT's including IS has brought about the challenge in the public sector of how to evaluate the success or effectiveness of the ICT investment to determine if there is any return on investment through these efforts by the different public sector entities (Kaisara & Pather 2011).

This research was aimed at identifying the problem areas in the department of economic development through the respondents who are all IS consumers and users within the Department. These areas would cover the perspectives of the user (respondents) and the external beneficiaries of the services based on the users opinions.

This study revealed that service delivery is closely correlated to logistical issues regarding IS infrastructure, handling capacity, user capability, customer evaluation of the services received from the department, and quality. The proper use and addressing of problem area regarding these

aspects will ensure the effective use of IS systems in any Organisation and hence improve service delivery including the DEDECT.

Kaisara and Pather (2011) state that e-government research was confined to e-government service from the supplier side only while the user side of e-government was overlooked but that trend seems to be changing for the better in recent times as more efforts by many researchers are taking the initiative to address this problem.

Response to Research Questions

The findings of this research in relation to each research question are discussed. Each question is followed by a discussion of the findings relating to that question.

Are the IS in the Department able to be used to their full capacity?

Salmela (1997) states that the quality of Information Systems can either influence the cost of information processing or it can influence the content quality and reliability of the information that users actually while using the system. It is therefore imperative that the IS infrastructure in the Department is maintained in good order and the users are in a position to obtain the necessary skills of handling and managing all the IS equipment that is found in the Department.

Where there is lack of capacity it should be provided in the form of capacity building. This will result in having a budget for such activities, to be made available but it is return on investment, as the exercise will result in the use to full capacity.

When respondents were asked to state their levels of understanding IS components it was found that 64% of the respondents said they did understand the components moderately while 16% said they did so very well and 20 % replied by saying they did not know anything regarding IS components. This phenomenon addresses the utilisation of the departmental IS to full capacity and in this case, only 16% percent of the respondents can achieve that.

Are there any technical improvements required to be done on the IS?

Brady *et al.,* (2002) state that an initial concern with any research is the reliability and validity of the measures used to operationalise the constructs of interest. Service quality is operationalised using Servperf model to the superiority performance based measures and will be used to measure service quality (Kuo *et al*. 2011).

The data results in this research conclude a very conclusive response to this question. The respondents were asked if the IS service quality and delivery of services was of very high quality in the Department to which the 56% disagreed and 36% strongly disagreed giving a total of 92% respondents completely disagreeing with the statement. This means that only eight percent agreed with the statement. This clearly indicates that there has to be some technical interventions made to the IS in the DEDECT given the outcome of these statistics.

Are the staff members conversant with operating and managing the departmental IS?

The respondents in the department were probed in terms of their ability and capacity to operate IS in the work place. This question would theoretically explain the service level delivery aspects in general.

Piccoli *et al.,* (2009) classify four basic service systems as, transactional, executive, basic and process handling. All these processes are supposed to be carried out by officials in the course of their daily duties.

The research results reveal that just under a third (28%) of the respondents reported that they were very good in using IS equipment, and that just over two-thirds (68%) of them said they were moderately good. This investigation adapts the procedures from popular measuring instrument analysis for exploring quality indicator and additionally the structure equation analysis confirms service competence and service performance reliability, which are dimensions of quality (Lu *et al*. 2009).

Given these statistics, it means the majority are just moderate while the minority at 4% are very poor or not conversant in operating the IS in the department. It is therefore vital that the DEDECT takes measures to improve

the abilities of the majority who are moderate to bring them very good and to capacitate the 4% who are very poor. This is significant because there is a strong correlation between ability to operate IS equipment/ tools and service delivery by the department.

Are the customers of the department satisfied with the quality, and efficiency of the service they get through the IS of the DEDECT?

Roses *et al.,* (2009) state that SERVQUAL evaluates services using a questionnaire based on twenty two items which are categorized in five dimensions of; tangibles reliability, responsiveness, assurance and empathy. It should be noted that these elements also evaluate both the expectations for agreed services and the perceptions of services previously provided between the clients and suppliers.

The respondents were requested to state if their clients were satisfied with their services or not. The most frequent response to this was: "Some of them" (52%), while the rest of them (48%), replied "No." This result did not exhibit a very strong discrepancy in this case. Showing that there is a lot of uncertainty amongst the respondents in the service they render to their clients.

This uncertainty is brought about because of the different individual interpretations of and perception of service delivery thereby posing a challenge to the general concept. This may explain why other researchers have developed other models which measure both customer expectations of service delivery based on what customers believe it should be like, relating it to individual perceptions (Kassim & Bojei 2002).

How can the existing IS related weaknesses be rectified?

According to Park and Kim (2005), the rapid technological trends are hard to keep up with; therefore to meet these rapid changes and remain relevant and reliable, certain IS activities such as maintenance may be out sourced to external vendors.

Concern for the clients is the key to achieve reliability and success say Jackson and Humble (1994). This concern has to be addressed in the

following questions from a service provider's perception; who are the clients that need the service, and what kind of services that they require, giving detail to aspects like quality of services they require, in what quantities, where and as in when do they need the service. Other areas that we need to keep alert about are the trends needed by the customers.

The needs of clients are not static but dynamic and change with time. Therefore it is very important for service providers to keep monitoring and observing these changes, so that the services of the department may be adjusted to suite the times at the same pace in the quest to satisfy the customer's needs as they arise. While pursuing objectives, it is also important to seek innovative ways of how we provide those needs most effectively and reliably. The DEDECT however does have two options of external vendors in some cases and also an internal service centre, which seeks to attend to technical challenges with in the departmental confines.

Limitations of the Project

This research project mainly focused on the IS systems that are operated in the Department of Economic Development Environment Conversation Tourism and did not cover much of the external support system which is centrally operated in the Province for all government Departments. Beneficiaries such as the SMMEs and other beneficiaries were mentioned as they are the clients but not in detail, however most of this study will concerned itself with the operations within the Department, and deal with the employees, their calibre, needs of individuals and how they respond to challenges.

This is a provincial office based in Mafikeng with branches at the district level in the three districts of Bojanala, Kenneth Kaunda and Ruth Mompati, and may include data and other information from the district offices as their systems are linked. Scrutiny was be on weak and negative points in the value chain so that the Department may be in a position to put mitigating measures in place, as well as the positives so that these are up held or improved with the objective of satisfying the consumers or clients who will mainly be employees in this case.

Managerial Guidelines

From the results of this study the following guidelines are given to the DE-

DECT if they are to improve and enhance their service delivery incorporating quality, promptness, user friendly IS tools and maintain a satisfied clientele base. Improving the DEDECT IS infrastructure and upgrading, while carrying out a comprehensive staff audit on IS capability to establish the rate and level of IS use and educational level. An effective logistics service also encompasses quality in an organization where it is explained as quality value, quality conformity to required specifications, and meeting customer expectations (Gorla *et al.* 2010).

Implementing staff further Training of IS support staff in the use if IS equipment and tools including problem shooting of IS. A continuous monitoring and evaluation process of the IS equipment in the DEDECT regarding the reliability and relevance of the IS. Quality has been regarded as a driver of competitive strategy and many frameworks have been developed and there are still different perspectives on how quality is conceptualised and operationalised. This will include training to improve quality and service delivery (Wang & Liao 2008).

To see to it that customer surveys are done so as to measure client satisfaction from time to time so that client needs are established and also identified, in terms of demand and to seek the best cost effective ways of providing required services and recognising the new trends. Kim *et al.,* (2010) state that early research evaluated IS performance from a perspective of quality of the system itself such as accessibility, response time, integration, efficiency, and system flexibility and quality of information such as accuracy, completeness, relevance, precision, and currency. But now IS organisations are performing the dual role of both information and service provider.

The department needs to promote IS related projects in the rural areas to facilitate early exposure of the population to IS, this is because this research has shown that the earlier people are exposed to IS, the more effective they become in working with them. This is clearly illustrated in the figure showing the percentages of people exposed to IS tools in this work. Studying and outsourcing maintenance and service quality could potentially yield results for limiting IS costs and improving effectiveness and interrogating the differences between IS types or systems to establish traits (Park & Kim 2005).

This study did not establish any preference for gender or age in the use of computers but that the earlier the respondents were to IS use in their lives the more effective they were able to work with them. In the DEDECT up to 40%, according to the collected statistics got exposed to IS only at the time they started working.

Conclusions

The findings of this survey, which sampled the IS service quality in the DEDECT in the North West Provincial office to determine the relationship to service delivery, may be summarises as follows:

1. The gender and age aspects do not have a significant impact in the use of IS equipment and tools in the DEDECT with regard to service delivery. However A good IS infrastructure will have a great influence in the manner in which the services are rendered to the customers, both internal and external.

2. A good infrastructure, meaning an infrastructure which is able to be utilised to the best of it ability and sustain all the requirements of promptness in responding to requests, processing, less hardships, reliable, competitive advantage and other dynamics will result in the effective use and operations of the Department.

3. There is an interdependence of the factors for good service delivery to be rendered and cannot be effective if done in isolation. Some of these factors will include the ability of the operators to be able to handle the IS tools with less hardships and quick response will lead to customer perceived satisfaction as a result due to the understanding of the IS components shown by the IS operator. Others may interpret this as quality service.

4. However, it should be noted that there will be hardships when working IS equipment and tools from time to time so it is vital to have support systems in place to sort these issues as they arise. There might be a possibility of out sourcing to external vendors for such problems in the event where internal resources are not available or have not enough capacity. It is evident that the DEDECT is need of capacity and complete overhaul of the IS if their service delivery is to improve and make a difference.

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The Monograph Dissertation[1] versus the Papers Approach

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Abstract
Although most universities have had the power to award a doctorate on the basis of published papers, many researchers have not taken this route to a degree. As more universities are now offering this alternative it is important to understand how this approach works and why this route is sound. It is envisaged that there will be an increasing number of researchers obtaining their doctorate by the Papers Approach.

Introduction
Before providing any comments on the topic of the monograph dissertation versus the Papers Approach to academic research it is important to note that each university has its own set of house rules and its own attitude toward this development in the way doctoral research is conducted and the results reported. This paper addresses some variations to these issues, but it cannot claim to be an exhaustive account. Furthermore, after a thorough literature search it was established that there is not yet any body of academic writing that directly addresses these issues. It is hoped that this paper will establish a debate among the members of the academic community about the providence of the two different approaches in today's academic environment.

Doctorate Degrees
Universities have a number of different routes that may be taken for the gaining of a doctorate. The approach to doctoral research, which is discussed

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[1] Although some universities try to distinguish between them the word dissertation used here is a synonym for thesis.

in this article, is described as gaining a doctorate by completing a material research project under supervision[2]. The result of this research project needs to demonstrate clearly that the research degree candidate has added something of value to the body of theoretical knowledge; also has some ability to improve practice, and that the work has been conducted to a high standard of scholarship.

There are different ways in which these two objectives may be realized and the most significant are the monograph dissertation and the Papers Approach. Most universities offer both of these routes, although the monograph dissertation route is by far the best known and is thus regarded by some academics to be the approach that offers less risk to the research degree candidate.

The Monograph Dissertation

The Monograph Dissertation is characterized by the fact that the research is reported in one book, by one author[3] and the completed work is of substantial length. The work is examined as a single entity[4] after its final completion. The structure of the monograph dissertation is six or seven chapters and that has been described in detail in Remenyi and Bannister (2012). Also see Louw and Fouché (2002). A Monograph Dissertation may be seen as one large research project. The greater part of dissertations completed in universities today are produced in this way. Many academics are not even aware of the Papers Approach to doctoral studies, although

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[2] Some universities are now allowing work that was not conducted by the research degree candidate under supervision to be included in their doctoral dissertations. The term "Professional PhD" has been coined to denote such a degree, by some universities.

[3] In certain parts of the world universities allow research degrees to be undertaken by multiple individuals who produce only one dissertation. Some academics believe that this is against the spirit of doctoral research.

[4] The examining entity is the university who appoints examiners for the purpose of evaluating the monograph.

most universities have such a degree 'on their books' i.e. their regulations permitted them to offer a doctorate on this basis.

The Papers Approach

The Papers Approach to doctoral research takes a different route because it requires the research degree candidate to undertake a number of different pieces of research that will be 'published' individually as well as being included in the final submission for the degree. Universities normally require three pieces of research work to be completed in this way, although there are some institutions that demand four or even five pieces of research. The different pieces of research need to address a common research problem and they have to display a high degree of coherence. The papers also need to be regarded as making a significant contribution to the field of study. The papers included may be seen as a portfolio of work. Most universities require from the research degree candidate, in addition to this portfolio, two narratives that accompany the presentation of the research papers. These two narratives that are presented with the portfolio are usually bound together into one book. The first narrative introduces the research problem and discusses some aspects of the literature and comments of the methodological issues involved. It is also in this narrative the ethics issues are discussed. A second narrative presents a summary and conclusion as well as limitations and suggestions for further research. Between these two narratives the papers are presented as the description of the research.

Should the Papers have been Published?

The papers need to be 'published' or near 'published'. Originally this route to the doctorate required the papers to be published in peer-reviewed journals[5]. However, over the years it became apparent that waiting for the appearance of the papers in print took too much time. Peer reviewed journals can take a number of years to process papers before they finally appear

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[5] The university will have a list of acceptable journals and the papers submitted for the Papers Approach to the dissertation will normally need to have been accepted for publication by one of these journals.

between the covers of a journal. As a result of these delays universities began to allow papers to be included in the portfolio of the research degree candidate's work which were only accepted by a journal for publication or even in some cases the papers may have only been submitted.

In general the submission of a paper to a peer reviewed academic journal is the minimum, although papers that have been internally reviewed or submitted and accepted by a working paper series are sometimes also accepted. Internally reviewed papers need to be assessed by competent internal reviewers (senior members of the School, perhaps) and as such confirmed to be of a 'publishable' standard.

Some universities require these papers to be written by the research degree candidate alone, i.e. as a single authored paper[6], while others allow co-authored papers to be included in the portfolio. When a co-authored paper is used the universities normally requires a certificate from the co-author/s to the effect that the majority of the work conducted for the papers was undertaken by the research degree candidate.

The papers in the portfolio should normally comply with the style requirements of the journal to which they will eventually be sent. They also need to comply with the maximum length of paper that the journal will accept. This is often 8,000 words.

It is not unusual to find the supervisors name as a co-author on these papers. Where co-authored papers are allowed it is sometimes required by the university that at least one solely published is included in the portfolio.

The Research Topic and the Individual Research

Having set out these two different routes to a doctorate it is important to point out it may be more appropriate to address some research topics through the Monograph Dissertation rather than the Papers Approach. It is also worthy of mention that some researchers will find the Monograph Dissertation more congenial to their mind set than the Papers Approach and of course vice versa. Besides the question of the suitability of the research

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[6] It would be unusual if there were no single-authored papers in the portfolio of research work.

topic and the researcher's own orientation there is the question of whether there is a suitable supervisor available who feels competent in assisting the researcher with the Paper Approach. There are not many such supervisors available. A rushed decision as to which approach to take, may well lead to a number of problems later in the research process.

Leading and Ending Narratives

The production of the three papers is seldom enough on its own to acquire a degree. The papers have to be accompanied by an introduction, which may be called a Leading Narrative and a conclusion, which is sometimes referred to as an Ending Narrative.

The leading and the ending narratives are material pieces of work and may constitute a considerable amount of the effort required to obtain the degree. Researchers who try to take short cuts with these important aspects of the research may find themselves being told to redo these Narratives. One essential aspect of these pieces of work is the justification as to why the Papers Approach is appropriate to the research topic being presented.

When the Leading and the Ending Narratives and the three to five papers are bound for presentation for examination they may constitute nearly as many pages as a Monograph Dissertation on the same research topic.

The Leading Narrative

The Leading Narrative effectively takes the place of the first three chapters of the traditional monograph dissertation. This narrative explains what the research problem is and why it is important. Like the Introductory Chapter in the monograph dissertation it will also state how the research has been divided among the number of papers required. The title of each of these papers and a two or three sentence description of the paper needs to be supplied. Then the literature has to be reviewed and the methodology used has to be discussed together with the ethical considerations. Examples of letters of consent and applications for an ethics protocol and other such documents can be supplied in the Appendices. There will inevitably be some overlap between what is said in this narrative and what will also need to be discussed in the individual papers as any publishable academic papers needs

to address these issues in their own right. In the interest of parsimony overlap needs to be kept to a minimum, although in these circumstances some degree of overlap will perhaps be inevitable.

The Ending Narrative

The Ending Narrative draws together the research results described in the individual papers, and argues that they may be considered as a cohesive body of research. This involves discussing the conclusions and the application of the results to practice. Limitations and future research challenges are also discussed here.

It is in this section that the research degree candidate needs to argue that the research has made a contribution to the body of theoretical knowledge and that it has application for professional or other performance in practical situations. In addition it is here that the researcher argues for the authority on which the research is based and this includes the validity, reliability and the generalisability issues.

This section of the work is of critical importance as the research has to integrate the Leading Narrative and the published papers into a convincing argument and many researchers find this a daunting challenge.

Why Undertake a Papers Approach to the Dissertation?

The Papers Approach to the dissertation is sometimes incorrectly believed to be intrinsically less demanding than the monograph dissertation. This is seldom if ever the case[7]. The three or five papers have to be assessed and are subject to examiners demanding changes. Then the final dissertation is subject to examination and different examiners may require further changes

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[7] There have been some notable exceptions to this where universities have used the Papers Approach to award degrees to Faculty members. In such cases the university has given 'academic credit' for papers written by faculty members while employed by the university.

to be made to the work[8]. The length of the Papers Approach dissertation may be in some cases a little shorter than the Monograph Dissertation, but this need not necessarily be the case.

Probably the main motivation for taking the Papers Approach is that Monograph Dissertations are seldom read by anyone other than the degree examiners. Published papers is the recognised means of communicating the results of research to the academic community and therefore the work undertaken for the degree will have a much higher probability of being seen and cited by other academics. For those research degree candidates who wish to follow an academic career these publications made be a fast track route to find a suitable academic post.

Which Route to the Doctorate Should be Preferred?

Like so many questions that are asked concerning doctoral studies there is no simple answer to whether a researcher should take the Monograph Dissertation or the Papers Approach. Both are acceptable routes and both can lead to the two requirements that need to be present for a doctoral degree to be awarded.

The Papers Approach is not at this time a popular route to a doctorate degree. This means that not many supervisors have experience in supporting a research degree candidate in obtaining a degree this way. Similarly, there is not much experience in the university system in respect to the examination of these degrees. Academics who are unfamiliar with this approach to doctoral studies have raised concerns about some of the research being published in advance of the submission of the final dissertation. They have suggested that the appearance of such papers in journals could be construed as making their inclusion in the dissertation a form of self-plagiarism. It has also been said that if the work has been previously published then it cannot be regarded as original. Fortunately these are minority views.

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[8] Of course with the Papers Approach an examiner cannot call for changes to be made to the papers if they are already published or even if they have simply been accepted for publication.

The Papers Approach to doctoral studies should not be undertaken lightly and both the research degree candidate and the supervisor need to be in agreement as to how this work will be conducted and how examiners sympathetic to this route will be found.

With regards the examination of a doctorate produced by the Papers Approach it is important to bear in mind that some academics may not feel competent to examine such a document and thus care needs to be taken with the appointment of examiners.

On the other hand it has been argued that the Papers Approach will become popular with examiners because if the final dissertation contains papers that have already been reviewed then the examiners may be inclined to think that the whole research need not be scrutinized in the same way as it would be if there had been no former review of the work.

Writing of the Papers

The writing of a paper has some similarities to the writing of a dissertation although there are a number of important differences. Although the format of a paper will largely follow that of a dissertation there is the important issue of the maximum number of words. As mentioned above, journals will normally limit submission to a maximum of 8,000 words and this can be problematic when attempting to report a significant piece of research. Nonetheless journals are frequently uncompromising about this issue. It is also important that the researcher learns the principles of parsimonious writing in order to be able to produce comprehensive and competent work of an appropriately defined length.

It is also of central importance that the researcher complies with all the style issues that the journal requires. These will be supplied by the journal and the researcher needs to bear them in mind from the outset of the writing process.

Conclusion

The Papers Approach to doctoral degrees is one way in which universities can demonstrate some innovative thinking. It can attract potential research degree candidates who find the prospect of writing one large Monograph

Dissertation daunting. However, new approaches to academic studies and the examination thereof require careful planning both on the part of the university and potential research degree candidates. This paper provides an account of some of the issues that need to be addressed.

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The Impact of the Implementation of an Enterprise Resource Planning System on a Typical Governmental Office

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Abstract

Enterprise Resource Planning (ERP) systems are part of Information Systems which organisations depend on when conducting business. An ERP system offers useful functionality in the smooth running of an organisation. This study investigated the impact on ERP implementation at SASSA North West Regional Office, a typical governmental office. It highlighted problems of the current ERP system by delineating the weakness and pitfalls. ERP systems are focused on standardisation and synchronisation of information as a result improved organisational efficiency, unfortunately problems with ERP system can create challenges and dissatisfaction among the end users, and that they fail to deliver the anticipated benefits. The findings of this study revealed that there was deficiency in ERP system; employees were worried about data loss when they use the system, found system errors, experienced difficulty in exporting data, and were not satisfied with quality of output from ERP system.

Keywords: enterprise resource planning, SASSA North West Regional Office, organisational efficiency, governmental office, implementation.

Introduction

Enterprise Resource Planning (ERP) evolved from Material Requirement Planning and Manufacturing Resource Planning in order to meet the needs of industry and was named by the Gartner Group of Stamford, Connecticut, USA in 1990. Since then the ERP market has expanded worldwide (Urban & Mashinini 2008: 224). ERP systems are often viewed as the strategic computing platform for organisations, however over 70% of ERP

implementations has been judged as unsuccessful. ERP implementation success studies typically deal with issues such as ERP project implementation problems and critical success factors. As a consequence, some effort has been spent in an attempt to identify the factors responsible for a successful ERP implementation (Wang, Shih, Jiang & Klein 2008).

Statement of Problem

The consolidation of information for national reporting purposes is frustrating and time consuming. Furthermore, the lack of timeous information due to the delays in extracting and combining the information may lead to incorrect management decisions being made. This may be detrimental for a business that runs on cost recovery only and sufficient cash flow is important for it to continue with its daily operations.

SASSA's business strategy is to align all the processes, which must include all business processes. A single business software system aligns and in turn meets the SASSA's strategic objectives. The standardisation of the business systems nationally may produce a cost savings opportunity thereby reducing costs within the long term. The process may increase the functionality and effectiveness of the business by reducing duplication of effort if the staff uses it correctly.

The intentions of this research are to assess the usefulness of ERP to SASSA North West Regional Office and establish how user friendly the system is. The problem to be investigated was to determine the impact of staff usage on the success of an ERP system in SASSA's North West Regional Office. Kansal (2006: 165) states that ERP is a socio-technical challenge that requires a different outlook from technology driven innovation. It will depend on a balanced perspective where the organisation, as part of a total system, is considered. Furthermore, many organisations adopting ERP have experienced conflict with their business strategies while some of the ERP projects are characterised by unhappy staff, delays and cost overruns (Kansal 2006: 165).

The Theoretical Framework

The review is made under certain topics that include the definition of Enterprise Resource Planning and its characteristics, the rationale used by a

business to undertake an ERP initiative, followed by ERP implementation. This is followed by a description on the conclusions that resulted from reviewing the literature.

ERP Definition

According to Jakovljevic (2000), ERP software is a set of applications that automate finance and human resources departments and help manufacturers handle jobs such as order processing and production scheduling. ERP began as a term used to describe a sophisticated and integrated software system used for manufacturing. In its simplest sense ERP systems create interactive environments designed to help companies manage and analyse the business processes associated with manufacturing goods, such as inventory control, order taking, accounting, and much more. Although this basic definition still holds true for ERP systems, today its definition is expanding

ERP Characteristics

ERP's integrated structure is supported greatly by its physical infrastructure and architecture. Jakovljevic (2005) writes that the first ERP software packages were applied in a mainframe computer environment. He further states that personal computers are nowadays powerful enough to take on some of the processing tasks that used to be performed solely by mainframes. Its growth as software has thus developed around a changing technical environment where computers have moved from its mainframe base to that of wide area networks.

Jakovljevic (2005) explains that it is impossible to devise an ERP system without a sophisticated IT infrastructure. He also comments that the system is based on a distributed relational database technology, which means that the database software must support multiple copies of a production database that are transparent to the user anywhere around the globe.

A Business Rationale for ERP

Urban and Mashinini (2008) confirm that ERP is a concept in today's business world. The term refers to a method of getting and keeping an overview of every part of the business (a bird's eye view, so to speak), so that production, development, selling, and servicing of goods and services will all be coordinated to contribute to the company's goals and objectives.

Urban and Mashinini (2008: 225) state that successful ERP implementation can provide real business benefit and sustained performance, whereas an unsuccessful implementation may have disastrous consequences. Operating costs as those associated with forms administration, data capturing, computer processing, report preparation, report utilisation, report storage, system and software surveillance are all necessary in ERP implementation. In addition Urban and Mashinini (2008: 226) explain that ERP implementation can be evaluated against a set of key performance indicators and critical success factors. ERP implementation and related change issues can assist organisations in considering the significant factors influencing the change process.

The essence of ERP is the immediate effect one transaction has on all relevant data and modules of the system. As Turbit (2003) notes, the word 'Enterprise' in ERP means that whatever happens on one area has a ripple effect in other areas. Understanding the implications of actions of one area, on other areas of the company, is not something that happens overnight (Turbit 2003).

ERP Implementation

Wu (2011) highlights that it must be noted that ERP implementations are complex and costly, even though advanced ERP systems have evolved several favourable features, such as: more wide intensive and extensive coverage, better flexibility in handling functions and web–centric application. The decision to implement an ERP system is not made lightly, it is expensive and it usually takes eighteen to twenty four months to implement from the start of the process to when the first function goes live. Attempting to implement an ERP system without sufficient funds will only lead to a negative outcome and to unhappy stakeholders and customers.

Institutions planning to implement an ERP system fail to understand the cost of ownership of such an undertaking. The cost of ownership includes not only the implementation cost but acquisition and long term on-going support as well. It includes all direct and indirect cost that might be associated with the life cycle stages of an ERP project, including its implementation, operation and eventual replacement (Babey 2006).

Boonstra (2006: 38) asserts that ERP successful implementation is urgent, since the costs and risks of these technology investments rival their

potential pay-offs. Failures of ERP system implementation projects may lead to bankruptcy. Botta-Genoulaz and Millet (2006: 204) highlight that there are reasons why a company would implement enterprise solutions: the provision of a single source of data, the potential cost reduction (maintaining old computer systems can lead to enormous costs), and the potential gain in business integration when reducing indirect costs, or more precisely, the effect on customer responsiveness and manufacturing productivity if the safes/ordering systems are not linked to the production scheduling systems.

According to Jones, Cline and Ryan (2006: 412), a successful ERP implementation requires organisation group to break the barriers of knowledge sharing. ERP systems integrate business processes across functions and units, thereby creating a divergence in the required knowledge of organisational members. ERP implementation is considered successful if it facilitates the accomplishment of a substantial proportion of its potential benefits, which may include: personnel reductions, a decrease in the cost of information technology, better inventory control, and identifiable level of return on investment (ROI), and /or an improvement in order and cash management (Wang, Shih, Jiang & Klein 2008: 1611).

The study of Tsai, Shaw, Fan, Liu, Lee and Chen (2011) suggest that successful implementation of an ERP system requires a strategic fit between the product and the organisation. The benefits of ERP depend on the clients operations, maintenance, and upgrading skills and knowledge, which can be learned, acquired and transferred from a consultant. Without external help, few organisations can implement ERP successfully.

Summary

Wu (2011: 6946) states that ERP implementation is viewed as a solution for corporations aiming to meet increased competitive pressures and globalisation. Kansal (2006) asserts that the implementation of ERP system is strategic, complex, and expensive activity to extend its scope beyond operational improvements induced by the software's functionality.

ERP is the technology that drives the reformation in the realm of economy and impacts people's life style indirectly. ERP system now is going towards a system with more coordination/collaboration, higher heterogeneity and integrity, more intelligent, operating on the level of knowledge and even wireless-enabled (She & Thuraisingham 2007).

Research Questions

The following research questions guided this study:

1. To what extent is the ERP system reliable and relevant to the job within the organisation?
2. What extent is the benefit and perceived usefulness of ERP within the organisation?
3. To what extent does the ERP project faster progress and success quality within the organisation?

Research Methodology

A survey was used for the study with the help of a questionnaire. In the survey certain specific questions were asked and the analysis was done on application of Pearson correlation co-efficient and p-value. The survey was conducted with the custodian of the ERP system in different business units within the organisation, to test the impact of implementation of ERP system at SASSA North West Regional Office.

A simple random sampling was used for the purpose of this study. The researcher's sample consisted of different departments drawn from SASSA North West Regional Office and the response rate was 80% resulting in 45 respondents.

Results According Research Questions

To what extent is the ERP system reliable and relevant to the job within the organisation?

Nicolaou (2004: 79) asserts that research indicated that successful adoption of IT to support business strategy can help organisations gain financial performance. A recent wave of ERP system adoptions promised businesses the ability to incorporate information needs of all function areas into a single system that captures event data relating operational and information needs of all business processes.

The variations in terms of ERP system reliability is slightly significant of respondents, 25 (56%) indicated that the ERP system is reliable. It was found, as Figure 1 show, that most frequent responses, 42 (94%) are worried about data loss when they use the system.
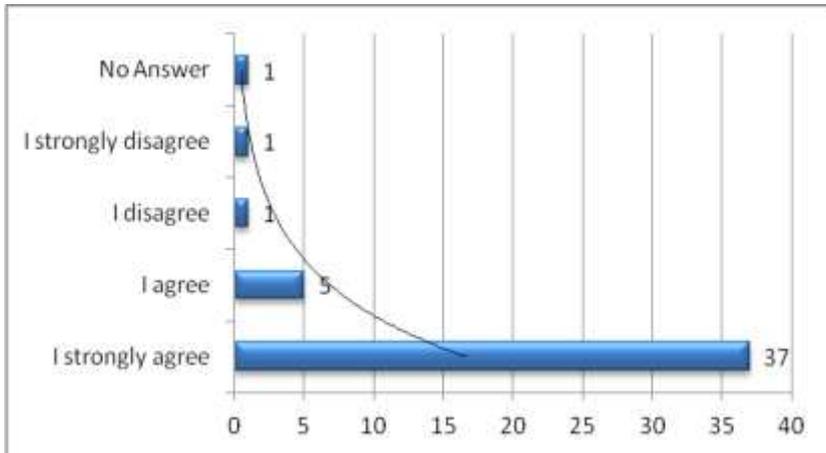
Figure 1: Do you worry about data loss when you use the ERP system?

It was found that 42 (94%) of respondents indicated that they find system errors when using ERP system. The correlation between experiencing difficulty in exporting data from ERP system or software and worrying about data loss when using the ERP system is a significant -0.722. The majority of respondents (31 or 69%) assume the ERP system usage being relevant. Twenty (44%) of respondents noted that they don't experience difficulty in exporting data from ERP system or software currently used. Based on this, it implies that employees presume the ERP system (or software currently used) inadequate.

The research concluded that respondents are not satisfied and experience challenges with the ERP system. SASSA management should explore an opportunity to ensure that the respondents are trained to be familiar with the system, to and improve the ERP system reliability and reducing possible system errors. Dowlatshahi (2005) argues that ERP systems similar to other new technologies in an organisation require training for employees to be able to use them correctly and effectively.

To what extent are the benefits and perceived usefulness of ERP within the organisation?

In order for an ERP system to become effective for organisations, massive changes must occur. An ERP system strives to increase efficiency, which is often the result of a new mode of operations or utilisation of resources (Dowlatshahi 2005).

It was found that most of the respondents (28 or 64%) assume that an ERP system increase the organisations business value and productivity. However, it was found that most respondents (36 or 82%) did not answer the question relating to ERP system improving performance and productivity. This could be blamed on the fact that most of the respondents were not certain with their response. The response is contrary to the result, where most respondents presumed the ERP can help increase company business value and productivity.

The majority of the respondents (25 or 59%) believe that the ERP system improve effectiveness (see Figure 2). The opposite reflection could be attributed it has a lack of experience in the use of ERP system. This implies that the respondents consider the use of ERP system effective. Dowlatshahi (2005) assert that organisations have begun implementing ERP systems to improve the efficiency and decision making processes. The aim of ERP system is to increase efficiency and profitability while simultaneously increasing the level of control a company has over its entire operations.
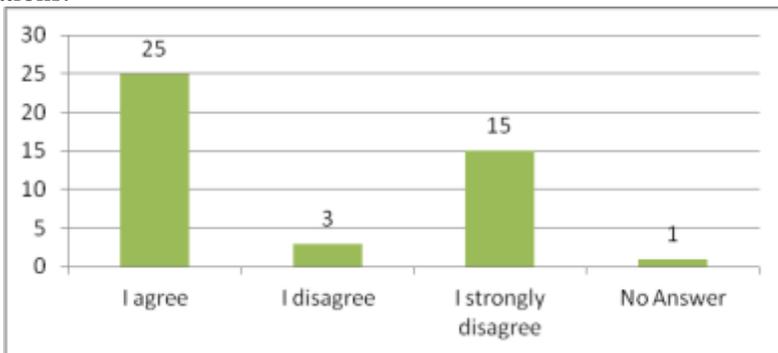
Figure 2: Does the use of ERP improve effectiveness?

Out of the sample of 45 respondents, 24 (53%) indicated that the ERP system is very useful in their job (see Figure 3). This implies that employees are certain about benefits, efficiency and effectiveness of ERP in the organisation, and perceive it being useful. Jakovljevic (2005) provides that the ERP system should be easy to use. A complex system decreases usefulness, which also make users reluctant to work with. To make the system easier, it should be carefully designed to be user friendly, considering screen design, user interface, page layout, help facilities and menus.
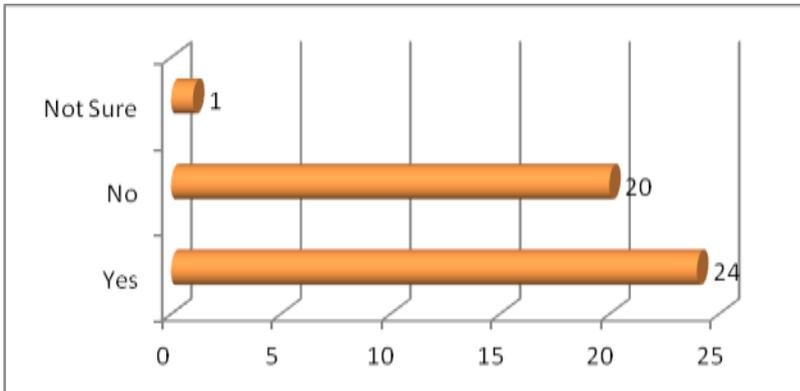
Figure 3: Is using the ERP system very useful in my job?

Out of the sample of 45 respondents, 24 (53%) indicated that the ERP system is clear and understandable. This implies employees are not clear about ERP systems. The responses could be attributed to lack of training. Tsai, Shaw, Fan, Liu, Lee and Chen (2011) suggest that when users are trained to be familiar with the ERP systems, ERP implementation will improve. Nicolaou (2004) suggests that ERP implementation were reported to be negatively affected by a lack of understanding of the system by users, inadequate training and support for end users to understand the newly adopted business processes and workflows, inadequate system testing, and inadequate communication of system objective. In addition, it was found that the correlation between the ERP system reliability and the quality of the output from ERP system is a significant -0.832.

Lastly, it was found that most of the respondents (43 or 96%) assume the ERP system have more prestige. In addition to this, it was found that the correlation between the ERP system reliability and the ERP system having more prestige than those who do not is -0.306, a negative correlation. This suggests that the respondents doubt the ERP system reliability and does not think it has more prestige.

The research concludes on this part of the research question, that respondents are satisfied with the benefits and usefulness of the ERP system. However management should explore opportunity to increase satisfaction with the quality of the ERP system. Frolick (2003) indicates that most of ERP pitfalls relate to the implementation and organisation itself, and can usually be avoided. Without proper planning and organisation, an ERP project is sure to fail. ERP software is worthless without the people to implement, use, and maintain its functionality.

To what extent is the ERP project progress and success quality within the organisation?

Tsai, Shaw, Fan, Liu, Lee and Chen (2011) assert that project management of ERP implementation is considered one of the important institutional factors that influence technology adoption in an organisation. Specifically, the role of project management in the successful ERP implementation is critical. Thus it was found that most of the respondents (25 or 56%) assumed the ERP implementation was completed on time. This implies that employees may have insufficient knowledge of ERP project implementation. In addition to this it was found that the correlation between the ERP system reliability and the consultant having led the organisation in the right direction during ERP implementation is a significant -0.832.

The majority of the respondents (34 or 76%) assume that the ERP implementation project completed within the budget. This implies that employees consider the ERP project completed within the planned budget. Babey (2006: 24) states that a realistically developed and funded implementation budget that covers all components and aspects of the project ensures a smooth process and lessens some degree of stress that ERP implementation places on staff. In addition an appropriate budget will minimise the surprises of unexpected costs and the abrupt search for funds to cover the cost.

Out of the sample of 45 respondents, 35 (78%) are not in agreement. The result could be attributed by challenges experienced by ERP system. Kansal (2006) highlights that in spite of growth in the ERP market, recent research shows growing dissatisfaction with ERP that they failed to deliver the anticipated benefits. Furthermore, Nicolaou (2004) indicate that while companies worldwide have made substantial investment in installing the ERP systems, implementations have proven to be unexpectedly difficult, and final benefits have been uncertain. Tsai, Shaw, Fan, Liu, Lee and Chen (2011) suggest that the successful implementation of an ERP system requires a strategic fit between the product and the organisation. The benefits of ERP depend on the clients operations, maintenance, and upgrading skills and knowledge, which can be learned, and transferred from a consultant.

It was also found, as Figure 4 shows that most of the respondents (24 or 53%) believe the consultant led the organisation in the right direction during ERP implementation. Thirty Four (76%) of the respondents indicated that the management reports from ERP system are very useful. This implies that employees are satisfied with management reports from ERP system. This could be attributed to usefulness of management reports generated by the use of ERP system. Boonstra (2006) states that to make the ERP system more useful, the company should focus on enhancing the quality of output during its implementation, especially in management and measurement reports.

However 24 or 53% of the respondents do not consider the quality of the output from an ERP system being high. This implies that the employees are not happy with the quality of the output from ERP system. It was also found that the correlation between the ERP system improving performance and productivity and the management report from ERP system being useful is a significant -0.764. The correlation between the ERP system reliability and the quality of the output from ERP system being high is a significant -0.832.
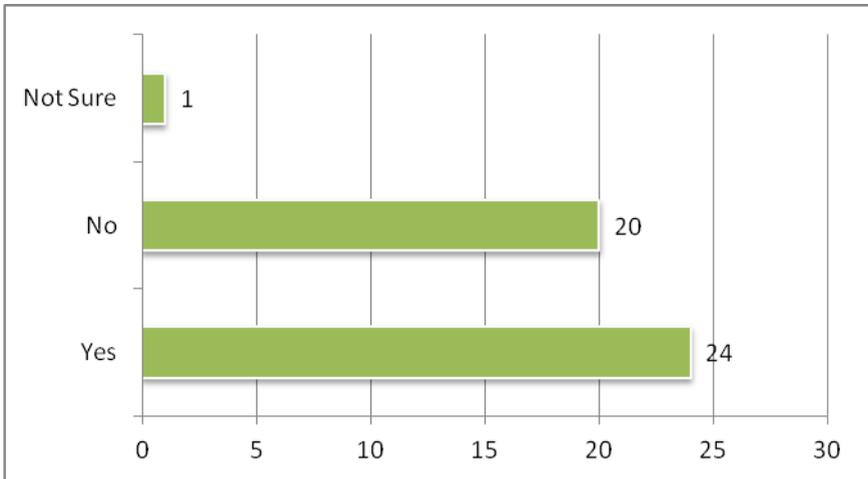
Figure 4: Do you think the consultant led your organisation in the right direction during ERP implementation?

The research concludes for this research question that respondents are satisfied with the project progress and unhappy with the success quality. Management should explore the opportunity to match ERP with company needs and improve the quality of the output of ERP system. According to Jones, Cline and Ryan (2006) a successful ERP implementation requires organisation group to break the barriers of knowledge sharing.

ERP systems integrate business processes across functions and units, thereby creating a divergence in the required knowledge of organisational members. Davenport (1998), in Botta and Millet (2006: 205), highlights that the ERP failure occurrence by two reasons: the technical complexity of the solutions that requires a great deal of expertise, and mismatch between technical specifications of the system and the business requirements of the company.

Conclusion and Recommendations

The purpose of this research was to determine the extent of the implementation of ERP system in SASSA North West Regional Office, a governmental organisation. The research identified and analysed critical

factors to be considered to ensure successful ERP system implementation, describing the developments and implementation of ERP system and analysing the developments, as well as identifying and analysing critical factors that should be considered to ensure successful ERP implementation.

The study provided an outline of ERP system implementation in terms of definitions, effectiveness and efficiency, ERP benefits, challenges of ERP, change management, ERP implementation, cost of ERP an ERP success factors. ERP implementation is viewed a crucial solution for any organisation aiming to meet increased competitive pressures and globalisation (Wu 2011). A successful ERP can be the backbone of business intelligence for an organisation, giving management a unified view of its processes. Unfortunately ERP's have a reputation for costing a lot of money and providing a meagre results, because the people who are expected to use the application do not know what it is or how it works. When ERP fails, it is usually because the company did not dedicate enough time or money to training and managing culture change issues. Faulty technology is often blamed, but eight out of nine times ERP problems are performance related (Kansal 2006: 168).

The findings of this study provide a point of departure for ERP system on the impact of the implementation of ERP system in SASSA North West Regional Office, a typical governmental entity. The study has highlighted ERP system challenges as experienced by employees. The study indicates the ERP system implementation can be identified to five major types: there is deficiency in the ERP system; employees are worried about data loss when they use the system, they find system errors when using ERP system, experience difficulty in exporting data from ERP system, and are not satisfied with quality of output from ERP system. Results highlight the need for SASSA management to explore opportunity to ensure that the employees are trained to be familiar with the system, improve ERP system reliability and reducing possible system errors.

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An Investigation of a Specific System Development Methodology for Business Process Reengineering

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Abstract

System developers in South African organisations need to recognise, recommend and appreciate the use of System Development Methodologies (SDMs) (Huisman 2004). In this age of rapidly changing technological trends which South African organisations have not been spared of, system developers are constantly trying to find new ways of doing business that align with the technological advancements. In light of this, transforming the way business is done or changing business processes is usually the ultimate solution, thereby invoking Business Process Reengineering (BPR). There is therefore a strong call to employ specific SDMs for the development of Information Systems proposed for BPR (Mavetera 2012). This paper looks at specific SDMs for BPR. As of today, existent SDMs in the computing world are believed to have been designed for the development of completely new Information Systems not systems that are being improved or reengineered. The drive behind investigating specific SDMs for BPR is basically informed by past research from BPR proponents who are concerned that BPR has serious effects on the organisational business processes (Hammer and Champy 2005, Muthu, Whitman and Cheraghi 1999 and Giaglis 2009). They advocate that BPR requires a proper system development approach to be followed if it is to succeed. This theoretical investigation further looks at the extent to which SDMs accommodate the aspect of BPR in terms of BPR characteristics and success factors within their philosophy.

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Introduction

Organisational changes influence specific business processes, thereby invoking Business Process Reengineering (BPR). Influencing business processes means that it necessitates the rearranging, restructuring, reorganisation or repositioning of business processes of which IS departments play a role (Frenzel and Frenzel 2004). BPR causes Information Systems to be re-engineered in order to accommodate the changes to business processes that would have taken place. BPR introduces new ways of solving problems through IS in the business environment (Mavetera 2012). It is noted that re-engineering of IS can be complex; therefore the process requires to be managed properly (Hammer and Champy 2005, Muthu, Whitman and Cheraghi 1999 and Giaglis 2009). In light of this, some authors have suggested the use of System Development Methodologies (SDMs) to assist with managing BPR (Huisman and Iivari 2003, Huisman 2004, Avison and Fitzgerald 2006, Mavetera and Kroeze 2010).

In this paper, major categories of existing SDMs are classified, examined and compared according to their philosophical components in an attempt to satisfy the requirements of this investigation. This categorisation is useful in helping developers to make choices on appropriate or suitable SDMs when conducting BPR. In the rest of the paper, business processes are discussed first, followed by a discussion on BPR and its characteristics. A brief on the use of SDMs during BPR which attempts to find the correlation between these two follows and the paper concludes by looking at some recommendations on the importance of SDMs in assisting with BPR.

Business Processes

A business process is a collection of related structured work activities or tasks meant to produce a specific service or product or serve a specified goal of which the activities include interleaving decision points (Frenzel and Frenzel (2004). Davenport (2006) confirms that a business process is a specific ordering of work activities across time and space or a structure for action. Hammer and Champy (2005) add that this collection of activities must take one or more kinds of input and creates an output that is of value to

the customer. Davenport (2006) also purports that transformation within the business process through engineering or otherwise, must add value to the customer. Smolander *et al.* (2000) note that a business process can clearly be distinguished by such special characteristics as: Adaptability - It must be easily changeable to suit the ever changing technological needs, Order - It must consist of activities that are clearly ordered according to the workflows of the organisation , Customer - There must be a recipient of the business process outcome, usually a customer, Value-adding - The transformation taking place within the business process must add value to the recipient and the organisation, Embeddedness - A business process cannot exist in itself, it must be embedded in an organisational structure, Cross-functionality - A business process must span across several functions within and beyond the organisation (Kettinger and Grover 2005)

Chosen business processes must focus and coordinate the organisation's activities from the top downwards, towards accomplishing the organisation's mission (Kettinger and Grover 2005). Modelling business processes begins with a thoughtful understanding of the organisation's mission, analysis of the environment, and a detailed assessment of how various business units interact (Wacher 2006). Frenzel and Frenzel (2004) further explain that business processes implement the present and the future of the organisation and they are described by such critical elements as the mission, vision and competitive advantage.

Business Process Reengineering (BPR)

Mavetera (2012) defines BPR as the fundamental radical change to Information Systems based business processes, based on incremental steps where quality is of importance. BPR is considered as a pioneering attempt to change the order of work activities or the way work is performed. BPR also involves addressing issues concerning the organisational structure, the roles of business process performers, the management system and the underlying corporate culture which holds the beliefs and values that influence everyone's behaviour and expectations (Cypress 2009). Davenport (2006) adds that BPR involves examination and change of five components of the business which include: organisational strategy - the long term goals and mission that are defined by strategic management (Harrington 2006); business processes - the procedures or tasks that users, managers and IT staff

members perform (Mavetera 2004a); technology - the use of hardware and software as well as telecommunications for the purpose of storing, transforming, retrieving and transmitting data (Gant 2002); organisation - the business as an entity (Schwalbe 2010) and lastly, culture - the specific collection of values and norms that are shared by people and groups in   an organisation and that control the way they interact with each other and with stakeholders outside the organisation (Schwalbe 2010). The next section presents BPR features and success factors required in SDMs.

BPR Characteristics and Success Factors Required in SDMs

Maul and Childe (2003) noted that the differences in BPR approaches used in organisations differ according to their characteristics which include the degree of change (either radical or incremental), the scope of the exercise (either quality led or IT led) and the focus of attention (either individual process or whole process). These are discussed below:

The Degree of Change

The degree of change is composed of two approaches, namely the radical and incremental approaches.   The radical approach is also referred to as the root-to-branch radicalism as far as business process improvement is concerned (Maul and Childe 2003). Radicalism promotes early risk mitigation by breaking down the system into mini-projects and focusing on the riskier processes first (Hammer 2008). These are believed to be the roots which must be strong enough first before branches can be developed. This approach allows planning a little, designing a little, and implementing a little (Stalk 2010). Radicalism encourages all participants who are part of the process improvement to be involved earlier on. It allows the BPR process to change with each iteration; allowing corrections sooner and puts into practice lessons learned in prior iterations (Maul and Childe 2003). It focuses on the most important processes by improving subsequent process soon after the previous one is completed.

It is noted that the incrementalist approach allows for processes to change over time rather than be improved in one huge effort (Harrington 2006). It allows processes to improve by giving enough time to the evolutionary process. It also focuses attention on stability and the belief is that only a stable foundation can support multiple additions (Maul and

Childe 2003). The incrementalist approach further allows a subset of the processes to actually run much sooner than the other processes. Interim progress is allowed to continue through the stubbing of functionality and accommodates the management of risk by exposing historical problems earlier on in the process (Stalk 2010).

The Scope of the Exercise

The scope of the exercise looks at two approaches, that is, the IT- and the quality-led approaches. IT-driven intervention views BPR as the redesign of processes to take advantage of the potential of IT (Gant 2002). This approach identifies BPR with traditional systems analysis and design and software engineering (Maul and Childe 2003). It involves developing a requirements definition, entity relationship models, normalised database, designs and eventually software solutions applying all this within existing but usually functionally-oriented organisations (Stalk 2010).

The quality led approach concentrates first on identifying the business processes, then analyses and re-engineers each process that needs improvement (Hammer 2008). Quality of the process becomes the main focus with this approach. From this perspective, IT ceases to be the focus of the analysis and design exercise and firms should delay consideration of integrated software solutions until quality BPR is complete (Maul and Childe 2003). The third and last characteristic is the focus of attention.

Focus of Attention

Like the other two characteristics discussed above, this also has two aspects, namely, the individual and the multiple views. Stalk (2010) points out that BPR intervention can vary in scope. BPR is viewed as an activity that varies from single view to multiple views. The single view involves an individual business process within a function where the idea is to improve an individual part of the business process and improvement is on a small scale (Maul and Childe 2003). The scope is usually internal, operational in outlook, low risk and addresses strategies within a particular function. The individual type of change can be regarded as mostly incremental change (Gant 2002).

The multiple approach covers all the business processes within a function. It applies the systems view principle where the organisation's business processes are tackled in consideration of the whole organisational

strategy rather than in parts (Carter 2005). Although the process is wider in scope than individual improvement, it is still essentially operational in nature. The process involves higher risk to the organisation and can be regarded as radical change (Maul and Childe 2003). The next section will give a brief on the BPR success factors.

BPR Success Factors

Kettinger and Grover (2005), in their contribution to explaining BPR, noted that success in implementing BPR is achieved through benchmarking and the use of BPR success factors such as:

- Top management sponsorship **-** top managers are the initiators of business processes. Their strong and consistent involvement is important because they are responsible for approval and allocation of required resources like funding (Schwalbe 2010).
- Strategic alignment **-** any organisation relies on its strategic goals to survive. BPR should therefore align with organisation's strategic direction (Frenzel and Frenzel 2004). The business processes should always align with organisational strategy, in order not to divert from the mission.
- Compelling business case for change **-** the business case must contain measurable objectives, meaning that the problem at hand should be clearly understood for BPR to be a success (Frenzel and Frenzel 2004).
- Proven SDM **-** the SDM that is chosen has to be well understood with a good track record and has to meet the needs of the BPR project (Huisman and livari 2003).

Effective change management **-** this addresses cultural transformation because change is not always embraced by everyone. It should be managed accordingly so that the changed business processes are supported by every stakeholder (Frenzel and Frenzel 2004).

BPR proponents argue that the BPR success factors alone are not enough to implement successful business processes, appropriate approaches are also required, hence they the use of SDMs was recommended (Giaglis 2009).

System Development Methodologies (SDMs)

Research has shown that many South African organisations widely believe that adherence to SDMs is beneficial to Information Systems development. Some organisations claim that they do not pay much attention to the concept of SDMs (Hill 2009). Other organisations report that they are gradually adapting the use of SDMs, while others claim that they have and are using them and obtaining positive results (Huisman 2004). Apart from the claims above, it is still not very clear whether the same sentiments can be passed with regards to the use of SDMs during BPR.

For the purpose of this paper, Mavetera (2012) defines a SDM as a strategy focused and recommendable process of developing or improving an Information System or part thereof, which is based on an underlying philosophy and includes the use of tools and techniques while following prescribed processes depending on the field of practice. Thus far, research has shown that various SDMs have been developed for different purposes in IS. This study aimed to partly identify specific types of SDMs that are used for BPR. The following section discusses the use of SDMs during BPR.

SDMs Use in BPR

According to past research, BPR is a process that needs to be properly planned, designed and implemented (Giaglis 2009). It is recommended that BPR should follow a particular process and make use of particular tools and techniques (Mavetera 2012). This implies that BPR should follow some sort of SDM (Muthu *et al.* 1999). Thus far research has not shown concrete evidence that address particular SDMs that target BPR (MacArthur 2004 and Smolander *et al.* 2009). However, it may be important to note that a few of the SDMs in existence which were originally developed for purposes other than BPR have often been diverted to BPR use because of some appropriate BPR characteristics that they possess (Muthu et al. 1999).

Avison and Fitzgerald (2006) devised a framework based on certain SDMs characteristics. This framework has been referred to most of the time when SDMs are considered for use or discussed. The characteristics include: a philosophy, a model, tools, techniques, outputs, products, implementation details, programming and testing as well as the field of practice for that particular SDM. These SDMs characteristics are referred to and used

differently depending on the context of the project or study (Huisman 2004, Fitzgerald and Avison 2006 and Mavetera and Kroeze 2010).

Based on this claim a collection of SDMs was identified for evaluation. The evaluation done for this study is firstly based on one of the SDMs characteristics among the ones listed above, which is the philosophy. This evaluation was to try and establish whether SDMs have any change element underlying them that makes them recommendable for BPR. Secondly SDMs are evaluated based on the BPR characteristics discussed above as well as the extent to which they satisfy the BPR success factors.

The philosophy of an SDM is a principle or set of principles that underlie the SDM. It is sometimes argued that all SDMs are a based on a common philosophy to improve the world of information systems development (Fitzgerald and Avison 2006). A philosophy covers aspects on paradigms, objectives, domains and target applications (Mavetera and Kroeze 2010). Table 1 below thus uses these aspects of a SDM philosophy to evaluate their suitability for BPR.

Table 1: SDMs evaluation based on philosophy components

SDM	Philosophy			
	Paradigm	Objective	Domain	Target
Process Oriented SDMs STRADIS YSM	Science	For the development of strategic Information Systems	Specific for problem solving	General purpose, any size of system
	Science	Specific for the development of new Information Systems	Specific for problem solving	Large organisations
Blended SDMs IE SSADM	Science	Specific for the development of new Information Systems	Planning, organisational and strategy type	large organisations

	Science	Specific for the development of any Information Systems	Specific for problem solving	Large organisations
Object Oriented SDMs RUP OOA	Science	Specific for the development of agile Information Systems	Specific for problem solving	Any organisation
	Science	Necessary for change development in cases of problems or need	Specific for problem solving	General purpose/ Large organisations
Rapid Development SDMs XP DSDM	Science	Specific for the development of new Information Systems	Specific for problem solving	Small/ Medium organisations
	Science	For organisational/ general problem solving	Specific for problem solving	Large/ Small organisations
People Oriented SDMs ETHICS KADS	Systems	Concerned with the process of change for Information Systems	Specific for problem solving	Large organisations
	Systems	Specific for the development of new Information Systems	Mainly for expert systems	Small/ Medium organisations
Organisational oriented SDMs	Systems	Concerned with the process of change	Mainly for large and complex	Large organisations

SSM PRINCE		Information Systems	problems	
	Systems	Information Systems and elsewhere	Specific problem solving	Large/ Small organisations

The evaluation in Table 1 shows that the SDMs selected have at least one element that qualifies them to be recommendable for BPR. It is also evident that all the SDMs evaluated possess one recommendable BPR characteristic in common which is IT-led since they are all for the development of IS. However, these SDMs seem to lack adequate emphasis on one or more of the crucial BPR characteristics thereby disqualifying them to be specific SDMs for BPR. It may therefore be safe at this particular stage to assume that there is no specific SDM for BPR purposes and therefore suggest that future research may need to consider developing some.

Evaluation of SDMs Based on BPR Characteristics and Success Factors

In Table 2 below, an overall evaluation of SDMs was done in order to identify their strong and weak points based on the BPR characteristics and success factors. A key is also presented with the table to explain the symbols that are used. In the key **'S'** means that the SDM strongly supports the BPR success factor in line with it, 'M' represents moderate support, 'W', means there is weak support and **'N'** means support is non-existent. The evaluation in Table 2 also shows the strongest BPR characteristic that defines a SDM. A section of recommendations is also added in the last column of Table 2 below in an attempt to recommend possible SDMs for BPR based on the BPR characteristics and success factors.

In the last column the study recommends probable SDMs for BPR purposes. An improvement can also be made to these mentioned SDMs by enhancing them with the missing characteristics and success factors as discussed for them to qualify as specific for BPR.

Table 2: Evaluation of SDMs based on BPR characteristics and success factors

SDM	BPR Success Factors				BBR Strong Characteristics	Recommendations of SDM for BPR
	Strategic Alignment	Top Management involvement	Compelling Business Case for Change	Effective Change Management		
STRADIS	S	S	N	N	Radical, IT-led	M
YSM	M	W	N	N	Quality-led, IT-led	N
IE	M	S	N	N	Radical, IT-led	W
SSADM	S	W	M	W	Incremental, IT-led	M
RUP	N	N	N	M	Incremental, IT-led	W
OOA	N	N	W	W	Quality-led, IT-led	W
XP	N	N	W	N	Incremental, IT-led	W
DSDM	W	W	W	W	Quality-led, IT-led	W
ETHICS	M	M	S	S	Incremental, IT-led	M
KADS	W	N	M	N	Quality-led, IT-led	W
SSM	S	M	N	N	Incremental, IT-led	M
PRINCE	N	N	N	N	Quality-led, IT-led	W

Key
S – Strong   M – Moderate
W – Weak   N – Non-existent

Recommendations

This section presents the recommendations to the study informed from the findings presented in the sections above. Development is more comfortable where developers believe in following a prescribed way of doing things (Mavetera and Kroeze 2010). This should be done for both new developments and for BPR. Table 2 above combines the discussions on BPR and SDMs in an attempt to find a recommendable SDM for BPR purposes.

Recommendation 1

Some issues to be considered when developing SDMs for BPR include the following:

- Stakeholder cooperation - the coming together and agreeing of the individuals involved with the business processes in combination with an energised BPR team and management is required apply their techniques to carry everyone on board

- Philosophy or the underlying assumptions – the philosophy of the SDM should strongly address the aspect of change and should be well defined and understood by all stakeholders affected and should define the scope of the BPR project and achievable objectives should be derived.
- Capture the softer side of development – the SDM should consider important aspects such as change management and other important aspects such as cultural and personality diversity, cultural mindset, attitudes as well as customer relations management.

Recommendation 2

SDMs for BPR, like any other development methodologies, should be divided into model stages as suggested below:

- **Stage 1 - Envision:** the organisation reviews their existing strategy and businesses processes and identify areas for improvement as well as technological opportunities.
- **Stage 2 - Diagnosis:** involves the creation of appropriate documentation for business processes in terms of process attributes like activities, resources, communication, roles, Information Systems and costs.
- **Stage 3 - Redesign:** business processes are then redesigned through alternatives devised from brainstorming and creativity techniques.
- **Stage 4- Reconstruction:** to assist stakeholder with change management that ensures smooth migration to the new business processes, responsibilities and roles.
- **Stage 5- Evaluation:** the new processes are monitored to determine if both organisational and Information Systems strategies were met and establish whether quality requirements were met and retrain workers on what BPR actually is.

Recommendation 3: Devising A BPR Framework from Several SDMs

The characteristics of BPR projects differ with each organisation because the business processes are different, yet existent SDMs make no distinction among BPR projects. Giaglis (2009) contributes that BPR is a multi-

dimensional tool in that it accommodates the use of several SDMs to examine processes from a holistic perspective with regards to the organisation. Instead of adapting or devising a single SDM for BPR, which will probably address specific situations only, different SDMs may be used for different BPR projects. Organisations can develop a framework based on a collection of various stages of existent SDMs that are relevant to their unique settings and then add other stages of their own provided they strictly consider the BPR characteristics discussed above. The problem with this approach however is that there is no guideline as to how adaptation decisions can be made or whether there are any controls over the changes and how well the adapted SDMs frameworks would work.

Conclusion

The success or failure of BPR lies in the good practices and measures applied into the process, more specifically the SDMs that are used to accomplish the project (Venkatraman 2009). This paper looked at specific SDMs for BPR. This was done by reviewing literature from past research on accommodation of BPR success factors and characteristics in existent SDMs. The results indicated that vagueness still remains as to the existence and use of particular SDMs for BPR.

This research is a first step in understanding the nature of SDMs in use for BPR and the extent to which they accommodate specific BPR characteristics and success factors needed for them to qualify as specific for BPR. The problem of addressing business processes in SDMs while implementing BPR, seem to be rather basic but quite difficult to address in practice.

Clemons (2000) and Mavetera (2004b) contribute that more research needs to be done on organisational regulations, attitudes, policies, and practices which may be an impediment to BPR efforts. Hammer and Champy (2005) emphasise that further contributions may be needed to the development of SDMs with a focus on BPR. The use of specific SDMs in BPR is widely touted but non-existent, therefore findings on the relationship between BPR and SDMs still remains a path to be explored.

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Educator Student Cultural Congruence as a Predictor of Academic Performance in Information Systems and Technology Education

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Abstract

The South African ICT educational landscape is as fluid and complex as the broader society it serves. Improving the quality of ICT education and skills development is critical. However, the challenges related to race and culture-based performance gaps continue to be an unavoidable characteristic of the South African educational landscape. This paper investigates the cultural factors that impact and predict ICT students' academic achievement in the context of a multicultural South African classroom. The results show that congruence factors do impact academic performance. A recommendation is for a review of teacher education with a view to ensuring that specific programmes are included that enhance teachers' abilities to relate appropriately to students of various cultures, counter the influences of deep seated prejudices and the expression of these via discriminatory teaching practices, assist educators to cultivate and nurture immediacy behaviours that are shown by research to appeal to the various students they teach, and which generally assist educators to create and maintain a higher level of affinity with their students.

Introduction

The study investigates the cultural factors that impact and predict ICT students' academic achievement in the context of a multicultural South African classroom. The research aims to contribute significantly to better

understanding and closing the culture-based academic performance gap, and to improving the returns on investment that technology education and skills development stakeholders in South Africa are able to realise.

The research conducted as part of this study investigates the impact on cognitive learning of matching educators and students in terms of race, home language and gender among first year IS&T (Information Systems and Technology) students at both a public university and a private provider of higher education in South Africa.

Research Problem

The South African ICT educational landscape is as fluid and complex as the broader society it serves. Off the back of one of the most dramatic economic meltdowns in history, ICT, like most other sectors, is facing a prolonged, slow path to recovery. The outlook is one of slow, but steady growth over the next decade and there will clearly be a need for appropriate skills to fuel the recovery of the sector (ISETT SETA, 2010). Ironically, the recent recession (and agonisingly slow recovery) has taken its toll in terms of commitment and allocation of resources to this much needed development of skills. Training budgets have been the first items to be cut as organisations struggle to traverse the financial instabilities of the times. There has arguably never been a more appropriate time for research focused entirely on improving the quality of ICT education and skills development and that does not shy away from the challenges related to race and culture-based performance gaps that continue to be an unavoidable characteristic of the South African educational landscape (ISETT SETA, 2010).

Identifying the heart of the problem, the ISETT SETA Sector Skills Plan 2011-2016 points out the real challenge South Africa has with the quality of people entering the ICT workforce, listing as some of the key weaknesses and threats to the sector the following (ISETT SETA, 2010: 60):

- "Incompetent practitioners entering the profession with worthless degrees";
- "The exceedingly poor education system available to the vast majority of young people";
- "The literacy and educational base in the country is very weak and skewed";

- "The demand for competent ICT staff will outstrip the supply".

Commenting on the ICT skills supply issues, the report laments in particular the poor quality of Black entrants to the ICT workforce from the university system, citing poor English literacy, poor life skills and a weak technical skills base (ISETT SETA, 2010).

Given the government's 85% Black employment profile target, there is a clear sense of urgency around the need to address the issues pertaining to quality ICT education and skills development and in particular those that relate to the culture-based academic performance gap. The combination of recession related skills development budget pressures, the industry's frustration with skills supply quality and demand for better quality ICT professionals makes a compelling case for ensuring that precious skills development budgets and efforts in general are focused on achieving appropriate returns on education and training investment.

The findings in this paper and the related research do not assume to provide a 'silver bullet', nor an obvious set of practical suggestions, for educators faced with these challenges of multicultural education. However, the insights gleaned contribute significantly and uniquely to a growing body of academic knowledge on this subject from which it is hoped workable solutions will emerge in time.

Research Objectives

In view of the foregoing, the study reported on in this paper is both timeous and relevant in terms of investigating the factors that impact and predict ICT students' race, home language and gender related academic performance.

The study's objective is the identification of predictable (and therefore 'controllable') ways to improve the learning experience (in particular, cognitive test performance) of IS&T students in the classroom, with a special emphasis on race, home language and gender related factors.

While there are potentially a multitude of culture related factors that could be explored with a view to maximising the returns on training investment achieved in multicultural classrooms, this study focuses on the impact on student cognitive test performance of educator student congruence (in respect of race, gender and home language specifically) in information systems and technology education.

The following research questions arise from the foregoing:

- Research question 1 (RQ1): "Does matching educator and student in respect of cultural factors impact student cognitive test performance in information systems and technology education?"
    - o Sub-question 1.1 (SQ1.1): "Does matching educator and student in respect of race impact student cognitive test performance in information systems and technology education?"
    - o Sub-question 1.2 (SQ1.2): "Does matching educator and student in respect of home language impact student cognitive test performance in information systems and technology education?"
    - o Sub-question 1.3 (SQ1.3): "Does matching educator and student in respect of gender impact student cognitive test performance in information systems and technology education?"

Theoretical Framework

Social Cognitive Theory has its roots in Social Learning Theory, which, as a documented theory of learning, dates back to the late 1800's. Albert Bandura, starting in the 1960's, has written extensively on SLT and launched the SCT in 1960 with his book "Social Foundations of Thought and Action: A Social Cognitive Theory" (Bandura, 1986).

As per Table 1, Bandura's Social Cognitive Theory (SCT) has been referred to by a number of authors as a theoretical framework for analysis of information systems and technology education research (Marakas et al., 1989, Compeau and Higgins, 1995, Alavi et al., 2002, Yi and Davis, 2003, Santhanam et al., 2008, Arcy et al., 2009, Grant et al., 2009, Saleem et al., 2011).

According to Bandura, learning has a strong social component (Social Cognitive Theory is also known as Social Learning Theory (SLT) and Observational Learning Theory (OLT)). The educator is an important player in Bandura's theory of 'observational learning' which he describes as occurring through a process he terms 'social modeling'. SCT suggests that 'observers' (students) learn from 'models' (teachers) through observation or verbal instruction, and that model characteristics and the relationship between model and observer are factors that can impact the effectiveness of the learning experience. For example, Bandura claims that the perceived

credibility of the model in the eyes of the observer can influence the extent to which the observer pays attention and therefore impacts learning, either negatively or positively. Similarly, Bandura posits that the greater the degree of perceived similarity of observer to model, the more effective the learning experience (Bandura, 1977a, 1989).

Table 1 Information Systems Research Articles Using Social Learning Theory as a Theoretical Framework

Marakas, GM, MY Yi & RD Johnson 1989. The Multilevel and Multifaceted Character of Computer Self-Efficacy: Toward Clarification of the Construct and an Integrative Framework for Research. *Information Systems Research* 9: 126-163.
Compeau, D & C Higgins 1995. Computer self-efficacy: Development of a measure and initial test. *MIS Quarterly* 19: 189-211.
Alavi, M, GM Marakas & Y Yoo 2002. A Comparative Study of Distributed Learning Environments on Learning Outcomes. *Information Systems Research* 13: 404-415.
Yi, MY & FD Davis 2003. Developing and Validating an Observational Learning Model of Computer Software Training and Skill Acquisition. *Information Systems Research* 14: 146-169.
Santhanam, R, S Sasidharan & J Webster 2008. Using Self-Regulatory Learning to Enhance E-Learning-Based Information Technology Training. *Information Systems Research* 19: 26-47.
Grant, DM, AD Malloy & MC Murphy 2009. A Comparison of Student Perceptions of their Computer Skills to their Actual Abilities. *Journal of Information Technology and Education* 8: 141-160.
Arcy, JD, A Hovav & D Galletta 2009. User Awareness of Security Countermeasures and Its Impact on Information Systems Misuse: A Deterrence Approach. *Information Systems Research* 20: 79-98.

The research conducted as part of this study seeks to answer the research questions in the light of Albert Bandura's Social Cognitive Theory

and the related constructs of observational learning, observer-model similarity, model credibility and collective self-efficacy. Figure 1 presents the research model for the study:

Figure 1 Research Model
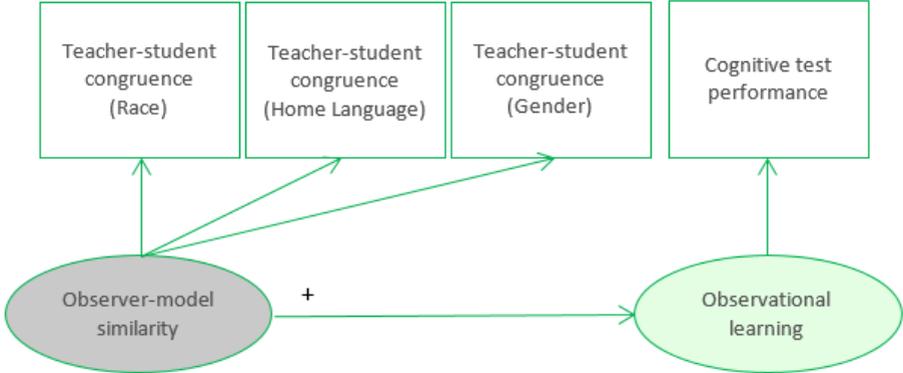
Figure 1 presents the research model for the study and describes the relationships that exist between the theoretical constructs and the respective measured variables. According to Bandura, observational learning is enhanced both when the model is similar to the observer and when the model has credibility in the eyes of the observer. As per Figure 1, the research model for this study posits that observer-model similarity as a construct affects observational learning. Observer-model similarity links to the dichotomous independent variables of educator student congruence in terms of race, home language and gender respectively, while 'observational learning' is measured in terms of the dependent variable, 'cognitive test performance'. The construct referred to as 'cultural factors' in Figure 1 links to the measurable variables 'student race', 'student home language' and 'student gender'.

Research Design
Research Sample
The research for this study was conducted using samples of ICT (information and communications technology) students from both a public and a private tertiary institution in South Africa.

Tables 2 and 3 provide the student and educator demographic descriptives for cohorts one and two:

Table 2 Student Demographics for Cohorts One and Two

	Cohort one (Institution 1)			Cohort two (Institution 2)	
	N	%		N	%
Total Students	4825	100.00		1278	100.00
Age	4825	100.00		1278	100.00
Race					
Black	2537	52.66		1003	78.48
White	175	3.63		154	12.05
Indian	2021	41.95		83	6.50
Coloured	85	1.76		35	2.74
Other	7	0.10		3	0.23
Home Language					
English	2376	49.24		476	37.25
Afrikaans	13	0.27		81	6.34
Zulu	2011	41.68		86	6.73
Other African:	425	8.81		635	49.69
Gender					
Male	2396	49.66		671	52.50
Female	2429	50.34		607	47.50

Table 3 Educator Demographics for Cohorts One and Two

	Cohort one (Institution 1)		Cohort two (Institution 2)	
	N	%	N	%
Total Teachers	20	100.0	56	100.0

Race				
Black	2	10.00	15	26.79
White	5	25.00	31	55.36
Indian	12	60.00	10	17.86
Coloured	1	5.00	0	0.00
Other	0	0.00	0	0.00
Home Language				
English	18	90.00	31	55.36
Afrikaans	0	0.00	12	21.43
Zulu	0	0.00	2	3.57
Other African:	2	10.00	11	19.64
Gender				
Male	14	70.00	30	53.57
Female	6	30.00	26	46.43

Table 4 describes the sample, which comprised two cohorts across two higher education institutions (one public, the other private):

Table 4 Cohort Comparison

	Cohort one	Cohort two
Institution	1	2
Institution type	Public Tertiary	Private Tertiary
Students (Participants in match/mismatch study)	4825	1278
Teachers (Participants in match/mismatch study)	20	56
Student respondents to S-CTSE survey	737	636
Educator respondents to T-CTSE survey	15	37
Different Modules/ Courses	48	118
Test scores (Unique student test scores in dataset)	12013	6358
Measures and instruments		
Match/mismatch effect		

Dependent variable	Student test scores
	• Raw test score • Raw test score converted to z-score (deviation of student score from class mean, divided by standard deviation) • Raw test score converted to simple deviation of student score from class mean
Independent variable	Educator student match mismatch (Race, Home Language, Gender)
Data source/instrument	Student records (class marks)
Statistical methods and models	• Generalized Estimating Equations (GEE)

Measures of Academic Performance

For both cohorts, raw student test scores for modules (courses) attended over a two-year period (2011 and 2012) were used. Thus the datasets for both cohorts comprised a number of test score, module and educator combinations per student. To standardize the data and to control for varying class difficulty levels (student scores were spread across a variety of modules and teachers), raw scores were converted to z-scores (deviation of student score from class mean, divided by the standard deviation).

Measures of Teacher/Student Congruence

A match in a given demographic is where the student and educator share the same demographic (e.g. a Black student and Black educator would be a match, an Indian student and Black educator would be a mismatch).

Data Analysis Models

Given the highly correlated nature of the datasets, the analyses of the educator student match mismatch effect on student test scores apply a Generalized Estimating Equations (GEE) model to the datasets representing cohorts one and two (Institutions 1 and 2 respectively). GEE is considered appropriate for analysing highly correlated data in a robust way, particularly where there are dependent (response) variables (in this case the student z-

score) and a number of factors and covariates that need to be tested for significant effect on the dependent variable (Cengiz et al., 2010). GEE is therefore appropriate for this analysis as there are correlations between the outcomes (i.e. the values of the student score for a student are probably correlated, as is usually the case with repeated measures).

Data Collection

For the academic performance data, the study drew on institutional records of each student's assessment results for each module for which the student had received educator led instruction during the academic years 2011/2012.

Results and Data Analysis

Educator Student Congruence as a Predictor of Cognitive Test Performance

The following analyses (Tables 5-13) present the results of applying a Generalized Estimating Equations (GEE) model to the datasets representing cohorts one and two (Institutions 1 and 2 respectively). Combined institution analyses are performed in some cases and are made possible by the standardization of student test scores using z-scores (deviations of student tests scores from class averages), allowing not only cross module comparison, but also comparison of scores across institutions for IS&T modules.

Table 5 Educator Student Match Effect on Student Test Scores (Institution 1, Race Match)

Parameter Estimates[a]							
Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	Sig.
(Intercept)	-.046	.0135	-.073	-.019	11.525	1	.001
Match (Race)	.119	.0219	.076	.162	29.693	1	.000***
(Scale)	.980						

Dependent Variable: Student Test Score (z-Score), Institution 1
*** p = significant at p<.001

Table 6 Educator Student Match Effect on Student Test Scores (Institution 2, Race Match)

Parameter Estimates[a]							
Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	Sig.
(Intercept)	-.057	.0194	-.095	-.019	8.687	1	.003
Match (Race)	.112	.0286	.056	.168	15.368	1	.000***
(Scale)	.979						
Dependent Variable: Student Test Score (z-Score), Institution 2 *** p = significant at p<.001							

Table 7 Educator Student Match Effect on Student Test Scores (Combined Institutions, Race Match)

Parameter Estimates							
Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	Sig.
(Intercept)	-.049	.0111	-.071	-.028	19.781	1	.000
Match (Race)	.115	.0173	.081	.149	44.318	1	.000***
(Scale)	.980						
Dependent Variable: Student Test Score (z-Score) *** p = significant at p<.001							

Table 8 Educator Student Match Effect on Student Test Scores
(Institution 1, Home Language Match)

Parameter Estimates[a]							
Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	Sig.
(Intercept)	-.119	.0138	-.146	-.092	74.389	1	.000
Match (Home Language)	.293	.0214	.251	.335	187.388	1	.000***
(Scale)	.963						
Dependent Variable: Student Test Score (z-Score), Institution 1 *** p = significant at p<.001							

Table 9 Educator Student Match Effect on Student Test Scores
(Institution 2, Home Language Match)

Parameter Estimates[a]							
Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	Sig.
(Intercept)	-.018	.0159	-.050	.013	1.347	1	.246
Match (Home Language)	.075	.0362	.004	.146	4.334	1	.037*
(Scale)	.981						
Dependent Variable: Student Test Score (z-Score), Institution 2 * p = significant at p<.05							

**Table 10 Educator Student Match Effect on Student Test Scores
(Combined Institutions, Home Language Match)**

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
Parameter Estimates							
			Lower	Upper	Wald Chi-Square	df	Sig.
(Intercept)	-.077	.0104	-.098	-.057	54.962	1	.000
Match (Home Language)	.226	.0179	.191	.261	158.339	1	.000***
(Scale)	.971						
Dependent Variable: Student Test Score (z-Score) *** p = significant at p<.001							

**Table 11 Educator Student Match Effect on Student Test Scores
(Institution 1, Gender Match)**

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
Parameter Estimates[a]							
			Lower	Upper	Wald Chi-Square	df	Sig.
(Intercept)	-.009	.0158	-.040	.022	.312	1	.576
Match (Gender)	.018	.0214	-.024	.060	.683	1	.408[ns]
(Scale)	.983						
Dependent Variable: Student Test Score (z-Score), Institution 1 ns = not significant at p=.05							

Table 12 Educator Student Match Effect on Student Test Scores (Institution 2, Gender Match)

Parameter Estimates[a]							
Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	Sig.
(Intercept)	.029	.0226	-.016	.073	1.586	1	.208
Match (Gender)	-.052	.0292	-.109	.005	3.206	1	.073[ns]
(Scale)	.981						
Dependent Variable: Student Test Score (z-Score), Institution 2, ns = not significant at p=.05							

Table 13 Educator Student Match Effect on Student Test Scores (Combined Institutions, Gender Match)

Parameter Estimates							
Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	Sig.
(Intercept)	.003	.0130	-.023	.028	.050	1	.823
Match (Gender)	-.006	.0172	-.040	.028	.131	1	.718[ns]
(Scale)	.983						
Dependent Variable: Student Test Score (z-Score), ns = not significant at p=.05							

Clearly, Tables 5-13 show significant match/mismatch effects for both cohorts one and two in respect of race and home language. The results for gender are not significant.

Figures 2-4 show the match effects from Tables 5-13 in the form of path diagrams.

Figure 2 Educator Student Match Effects on Student Test Scores (Institution 1)

Notes:
-Institution 1
-All paths are standardised betas.
*** = p < .001, ** = p < .01, * = p <.05, ns = not significant (p > .05)
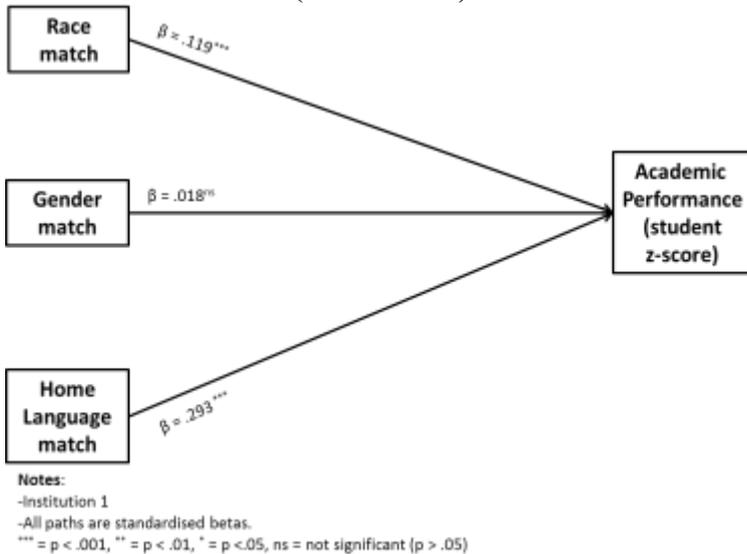
Figure 3 Educator Student Match Effects on Student Test Scores (Institution 2)
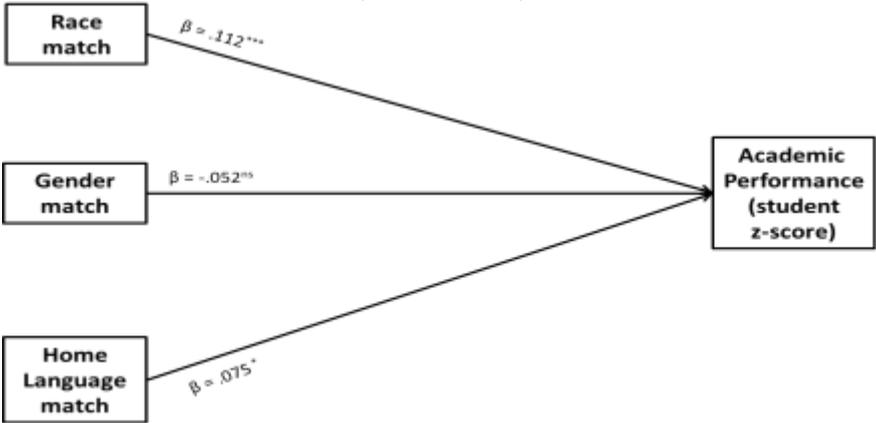
Notes:
-Institution 2
-All paths are standardised betas.
*** = p < .001, ** = p < .01, * = p <.05, ns = not significant (p > .05)

Figure 4 Educator Student Match Effects on Student Test Scores (Combined Institutions)
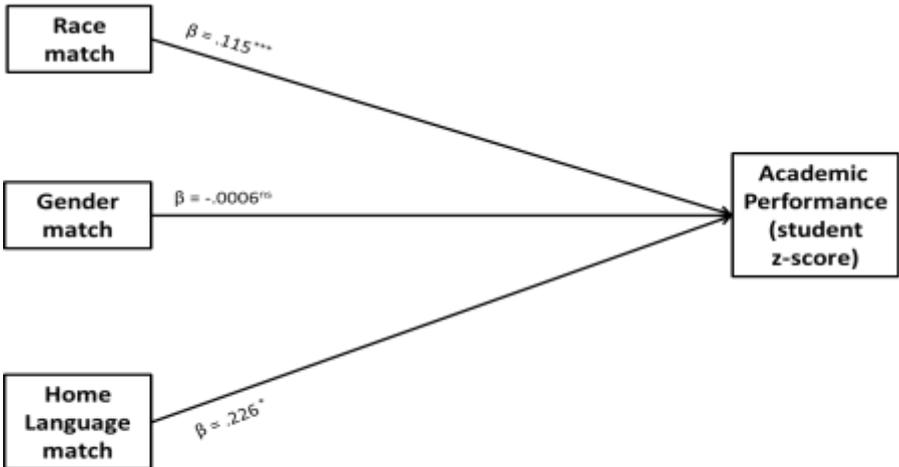
Notes:
-Combined Institutions
-All paths are standardised betas.
*** = p < .001, ** = p < .01, * = p <.05, ns = not significant (p > .05)

Table 14 presents a simple index of match analysis that shows the effects of various combinations of race, home language and gender match and mismatch. The results are ranked and show that generally higher levels of combined match for race, home language and gender appear to result in higher student test scores, whereas the more mismatched combinations produce lower ranking of students in terms of test scores.

Findings in Respect of the Research Questions
The following findings emerge from this study in respect of RQ1:

- Matching educator and student in terms of race, home language and gender significantly improves student cognitive test performance in information systems and technology education and training.

- There is a positive relationship between indexes of match (for race, home language and gender) and test score results.

The Generalized Estimating Equation based analyses show consistent and highly significant positive relationships between educator student match and student test performance.

In terms of research question 1, the results from cohorts one and two strongly suggest, therefore, that matching educator and student in respect of race, home language and gender positively impacts student cognitive test performance in information systems and technology education.

Moreover, the foregoing analyses on the match/mismatch effect suggest a positive relationship between indexes of match (for race, home language and gender) and test score results. In other words, the greater the level of match, the more positive the match effect on test scores.

					Student Test Score (z-Scores)				
Race	Lang	Gender	Number	Rank	Med	Mean	sigma	Var	Sigma bar
M I S M A T C H	Mm	Mismatch	3842	25	-.047	-.091	.100	.999	.016
		Match	4201	27	-.047	-.100	.972	.945	.015
		Total	8043	26	-.047	-.096	.985	.971	.011
	M	Mismatch	1181	10	.203	.084	.993	.986	.029
		Match	1346	7	.216	.113	.967	.935	.026
		Total	2527	8	.203	.099	.979	.959	.019
	Tot	Mismatch	5023	20	.006	-.050	1.00	1.00	.014
		Match	5547	18	.000	-.049	.975	.951	.013
		Total	10570	19	.003	-.049	.987	.975	.010
M A T C H	Mm	Mismatch	1547	16	.090	-.005	1.02	1.03	.026
		Match	2505	21	.052	-.062	.968	.937	.019
		Total	4052	17	.061	-.040	.988	.976	.016
	M	Mismatch	1633	3	.277	.173	.981	.962	.024
		Match	2075	1	.263	.189	.991	.982	.022
		Total	3708	2	.264	.182	.986	.973	.016
	Tot	Mismatch	3180	9	.157	.087	1.00	1.00	.018
		Match	4580	12	.130	.052	.986	.972	.015
		Total	7760	11	.129	.066	.993	.986	.011
T O T A L	Mm	Mismatch	5389	22	-.028	-.067	1.01	1.01	.014
		Match	6706	24	-.028	-.086	.970	.942	.012
		Total	12095	23	-.028	-.077	.986	.973	.009
	M	Mismatch	2814	6	.227	.136	.987	.974	.019
		Match	3421	4	.229	.159	.982	.964	.017
		Total	6235	5	.229	.148	.984	.969	.012
	Tot	Mismatch	8203	13	.058	.003	1.00	1.00	.011
		Match	10127	15	.058	-.003	.981	.963	.010
		Total	18330	14	.058	-.000	.991	.983	.010

Table 14 Ranked Index of Match Effect

The Findings in the Light of Social Cognitive Theory

Bandura's Social Cognitive Theory and its related constructs provide some useful insights when analysing the findings of this study in the South African context (Bandura, 1989).

For example, Bandura contends that observational learning is governed by four processes: attention span, retention processes, motor reproduction processes and motivational processes (Bandura, 1989). 'Attention span' describes an individual's ability to selectively observe actions and behaviours in the environment, and regulate the type, intensity and amount of observation that is experienced, thus impacting the effectiveness of the learning that takes place. In Bandura's model, an observer (such as a student) is more likely to be attentive to models (teachers) with whom the observer feels affinity or who are similar to the observer in some way. In addition, Bandura states that attractiveness, trustworthiness and perceived competence tend to enhance a model's effectiveness (Bandura, 1977a, 1989). The findings of this study in respect of research question 1 (RQ1 and the related sub-questions, SQ1.1, SQ1.2 and SQ1.3), appear to be consistent with Bandura's theory of attention span as a contributor to observational learning. Race, home language and gender matched students performed consistently better than mismatched students. In terms of Bandura's SCT, it could be argued that these students paid more attention to the model (teacher) due to their similarity (same race, home language and/or gender). In summary, the study finds that matching educator and student in respect of cultural factors significantly improves student cognitive test performance in IS&T education.

Conclusions and Recommendations

The GEE analyses (phase 1) above consistently show highly significant results for race and home language matched students that suggest a positive relationship between educator student match and student test scores for both cohorts two and three, as well as the combined dataset. Educator student gender match effects were not significant for the GEE analyses.

Furthermore, the results show that higher match indexes (combinations of match factors) are consistently associated with higher test score rankings for both cohorts. This effect is most obvious when looking at the combined institution data (Table 14) where the top three ranked test scores are

associated with the highest match indexes, while the lowest three ranked test scores are associated with the lowest match indexes.

The study has shown a significant positive relationship between matching educator and student (in terms of race and home language) and student test scores. Furthermore, it was shown that match index ('degrees' of match) were significant and that certain combinations of match factors were significantly related to higher test scores (in excess of 10% in some cases) for certain samples. While the literal implication that it might be better to match educator and student demographically is unlikely to be feasible in reality, it certainly does illustrate that combining a number of factors that each contribute significantly (however small the practical impact of each factor in isolation) to improved learning can result in improved return on investment (tangible or otherwise) in IS&T education and training.

Clearly, there is no lack of commitment to the cause of addressing the problems of basic education on the part of the South African government and in time the situation will improve. In the interim, the findings of studies such as this one provide useful insights that can inform current and future interventions aimed at helping university educators to more effectively work with the variety of students that are fed to them.

For example, the study suggests that certain race groups prefer to be taught by educators of the same race and that in some cases educator student racial congruence positively impacts academic performance. However, this fact does not necessarily recommend actually matching students with educators of the same race in university (or school) classrooms. Not only would this be unconstitutional, it would also be impractical. This is especially so in view of the fact that different cultures appear to respond differently to educator student congruence (for example, certain race groups may have a lower race based collective self-efficacy and therefore not react well to being taught by race matched teachers). These preferences also have to be tempered by the current reality that approximately 60% of academic staff in South Africa's institutions of higher learning are White (Department of Basic Education, 2010).

It is not immediately clear how one would reasonably accommodate this variety in student preferences. This an important issue, since government is driving to push more Black lecturers into the system (Department of Basic Education, 2010). The findings of this study that show

a significantly positive response from students to being matched racially with their educators bodes well for the future as more Black educators enter a system that comprises mainly Black students. Perhaps a more appropriate approach is to take cognisance of the international findings on immediacy and affinity (Kearney and McCroskey, 1980, Gorham, 1988, Christophel, 1990, McCroskey and Richmond, 1992, Rodriguez et al., 1996, Rucker and Gendrin, 2003). Although some of the factors influencing perceptions of immediacy and affinity relate to innate characteristics (such as race and gender), there is also evidence that immediacy behaviours that foster affinity and therefore, via a chain of impact, positively influence academic performance, can be learnt (Richmond et al., 1986, McCroskey and Richmond, 1992).

Given that congruence factors do impact academic performance (albeit differently for different race groups who share the same classroom and teachers), and given that re-segregation in response to certain race groups preferring specific races of educators is both impractical and unconstitutional, a reasonable recommendation is for a review of educator education with a view to ensuring that specific programmes are included that enhance teachers' abilities to relate appropriately to students of various cultures, counter the influences of deep seated prejudices and the expression of these via discriminatory teaching practices, assist educators to cultivate and nurture immediacy behaviours that are shown by research to appeal to the various students they teach, and which generally assist educators to create and maintain a higher level of affinity with their students. A number of international studies have investigated the effectiveness of 'multicultural pedagogy' as a means of addressing culture-based performance gaps (Allen, 2004, Tong et al., 2006). Various authors have reported the successes of multicultural pedagogy and the case of the Netherlands, which has made significant in-roads over recent decades into closing the culture-based performance gap for minority immigrants, is reason for optimism among South African educators (Rijkschroeff et al., 2005, Picower, 2009).

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e-Learning and the Reconfiguration of Higher Education – Disruptive, Innovative and Inevitable

Gary Mersham

Abstract

This first part of this paper gives a concise overview of how e-learning 'works'. The second part suggests the inevitability of more and more teaching and learning taking place in the e-learning context. It touches on some of the communication challenges academics face in moving from the lecture format to the online format and describes some of the challenges that lecturers, tutors and managers face in implementing e-learning successfully.

Introduction

This contribution is based on a paper presented at the *New Zealand Communication Association Conference 2012*, Waikato Institute of Technology, Hamilton, 26 November 2012.

I have spent the last seven years 'doing' e-teaching at the Open Polytechnic, having spent most of my 30 year teaching career in traditional face-to-face universities in several countries. As a result of this radical shift in the way that one teaches (and the way one's students learn), I was inspired to do research on e-learning from a communication perspective. Drawing on communication theory I offered alternative perspectives on understanding, describing, and scrutinising online communication and challenging educators to consider the effects of technology on the processes of online communication and interaction (for example, see Mersham 2008; 2009; Maathuis-Smith & Mersham 2011; 2012).

Purpose and Method

My purpose today is to share with you some of my experiences with e-learn-

ing as a tutor and lecturer and to briefly look at development of MOOCs. My method is based on a literature review, drawing on my own research and actual experiences over the past seven years.

One finding of my research is that teaching online has numerous definitions and perceived understandings. Terminology is inconsistent often making it difficult for teaching staff and managers to articulate the multitude of issues that arise in implementing new online courses. My own definition is that teaching and learning is the negotiation of meaning through communication (Mersham 2009).

Notably, one finds few references to e-teaching, and, as I have argued, e-learning as a term is limited, referring to only one half of the communication equation. The term 'e-teaching' has little currency.

The second important finding is that most faculty members find they spend more time on their online courses than they do on traditional courses. The multiplicity of tasks now required of academics in this area is rarely documented. Nagy et al. (2011) note that the skills required for this critical role are most usually not specified and may be of a non-disciplinary nature (Nagy et al. 2011).

Institutional management perceptions of teaching online should be more closely aligned with the reality of the workload as perceived by teaching staff within current workload models. Staff require more transparent participation and negotiation about appropriate workload models.

Below is a general list of faculty tasks. How many of these are indicated in your job description and KPI's ?

Prepare the Coursework

- Design course for on-line presentation in teams; write/edit/revise material
- Upload content to LMS/submit to QA staff before upload and respond to QA queries
- Research for updated information
- Ensure that ancillary materials are mailed (if required)
- Create discussion questions
- Write netiquette
- Set up CMS

- Prepare students for on-line study (orientation)
- Coordinate and sign off with instructional design/QA staff read materials

Present Information
- Monitor and contribute to discussion boards/forums
- Post material
- Post discussion questions

Practice and Guidance
Answer emails (responses required usually within 24-48 hours)
- Post to discussion boards
- Online live sessions (if used)
- Provide technical support
- Provide practice quizzes
- Deal with conflicts promptly
- Model effective online interaction
- Monitor progress and encourage lagging students

Testing and Assessment
- Grade assignments
- Set up online tests
- Grade tests (automatic)
- Provide feedback on assignments
- Develop test content
- Develop exams
- Assess messages in online discussions
- Test online testing process

Provide Feedback
- e-mail (responses required usually within 24-48 hours)
- Class announcements
- Discussion question responses
- Automated responses to study quizzes

- Create feedback rubric for common questions

The above tasks are often in addition to preparations for face-to-face classes

From a Practical Perspective

1. Tethered to your computer. Interface between you and the machine has become intimate and mandatory for your course management and communication with students
2. You become a participant in a (post) Industrial team model – time spent on working with colleagues (for example subject expert writers, technical editors, Instructional Designers, Educational Designers and project managers) and dealing with technical aspects means big changes to the way academics work – and a loss of academic freedom. This signifies a move from relative autonomy to team player. Independent nature of the work changes to team work.
3. More for less. Increasingly faculty management do not teach (less understanding of issues and challenges) and believe that online courses mean "more for less" and therefore should generate cost savings.

Change and Challenge

I have questioned e-learning, challenged it, and argued the opportunity of it lies in the pedagogy, and the threat of it lies in managerial administrators who see it as an industrial system, in which more revenue to gained through less work. So for example for as long as I remember contact hours, the time the lecturer spends in one to one consultation with students has always been prescribed in the list of duties or job outcomes. E-learning is has no such boundaries. In e-learning, 'consultation' becomes interaction. Email and phone calls, forum posts and notifications come in continuously, unbounded by time frames. Faculty formulae seem to avoid trying to calculate the time that attention to these communication exchanges take.

I argued in 2001 that education was one of the last bastions to avoid complete transformation by the 'digital revolution' (Mersham & Skinner 2001). The Internet is threatening to revolutionise education, as it has

already done with music, retail and journalism. Jim Whitehurst, in his recent TEDx presentation described as "the new oil that will drive the information revolution (http://opensource.com/12/10/education-new-oil-will-drive-information-revolution).

Don Tapscott, author of Wikinomics, and Grown Up Digital says that our current education system is not only not meeting the needs of our students, but its failure to adapt since its creation will be its demise.

Tapscott said, "All these kids that have grown up collaborating and thinking differently walk into a university and they're asked to sit there and passively listen to someone talking." He says new research shows that students in our classrooms now learn differently because of the world they live in and yet we are still teaching them the same way we taught people when the classroom was invented. We ask students to listen and read, and to be containers for information instead of creators.

Because online learning has much in common with distance learning, the two are have been clumped together in the literature for many years. In a similar way proxemic learning, i.e. on campus learning has remained unchallenged as face to face learning when a great deal of it really does not meet the strict definition of face to face. Today we see that online learning is increasingly part of all learning, whether at so-called face to face institutions or distance institutions, whether on-campus or off campus.

Teachers are particularly concerned about the challenges of new technologies on the traditional paradigm, and have voiced these concerns. The changes affect the very fabric of the teaching process, from the conceptualisation of a course through to its delivery and evaluation. Teaching on-line requires the teacher to move away from a role as 'the source of all knowledge' and more towards the role of mentor or guide in a constructivist approach.

Technology is now substantially all-pervasive, influencing the way teachers create and develop courses, how they deliver, assess and evaluate, and fundamentally, how they think about these processes. Mainly differences are in pedagogy and communication - constructivism, reflection, negotiated meaning, and the full exploitation of synchronic and asynchronic communication.

We can distinguish three main changes in role (Cuppola *et al* 2002). First in the cognitive role, which relates to mental processes of learning,

information storage, and thinking, the shift is towards one of deeper cognitive complexity.

In the second, the affective role, which relates to influencing the relationships and communication between students, the instructor, and the sense of belonging to a cohort (class) online requires faculty to find new tools.

Thirdly, the managerial role, which deals with class and course management, now requires greater attention to detail, more structure, and additional student monitoring.

Overall, as Cuppola *et al* (2002) indicate, faculty report changes in their teaching persona, toward more precision in their presentation of materials and instructions, combined with a shift to student centeredness, a more Socratic pedagogy, emphasizing multilogues with students and early identification of students needing support.

Why Is It Changing?

The biggest change lies with the economics. The cost of a degree is such that most of the Western world's graduates are looking at a decade or more of degree debt. There are two inflationary effects in tertiary education. Costs of attending campus degrees have spiralled upwards and credential inflation has meant higher sub minimum standards for credentialing. Bill Anderson, the University of Otago's director of distance learning says, "I think it's fair to say that with more and more people acquiring bachelor's qualifications we're seeing some credential inflation." For example, whereas teachers today require a bachelor's degree, the minimum qualification used to be a diploma, and before that a certificate. And that's not the end: there is mounting pressure for the entry point for the profession to be lifted to postgraduate level. "That might be partly an illustration of the increased standard required of teachers, but I'm tempted to think there's more to it than that" (quoted in Doesburg 2012).

Why would students or learners choose to go to university or tertiary institutions these days when so much is available online?" The answer used to be to gain a credential. E-learning is seen as an response to expensive degrees.

A Culture of Uncertainty

All changes bring uncertainty and anxiety, and the management of this change must be sensitive. Without these changes, education may be in danger of stagnation, but with them practitioners and learners will be required to quickly adapt to new knowledge, skills and modes of working. Understandably, these changes have brought with them a culture of uncertainty. Practitioners struggle to keep up with speed of change. A commonly voiced concern of faculty members about e-learning in general is that technocrats might see the courses as an easy way to replace academics with tutors, likely sacrificing academic quality in the process.

Educational managers have a key role to play in the amelioration of these fears, by providing timely, relevant and up to date information on new developments and innovations, and how these will impact on teaching and learning.

MOOCs - The Higher Education Buzzword

One of the biggest recent developments has come with the introduction of numerous massive open online courses (MOOC's) and thereby the implications of distributed learning networks for conventional higher education. One of the defining features of MOOCs are that they are offered entirely in the online mode (see Table 1 *Typical course classifications*).

Proportion of Content Delivered Online	Type of Course	Typical Description
0%	Traditional	Course with no online technology used — content is delivered in writing or orally.
1 to 29%	Web Facilitated	Course that uses web-based technology to facilitate what is essentially a face-to-face course. May use a course management system (CMS) or web pages to post the syllabus and assignments.
30 to 79%	Blended/Hybrid	Course that blends online and face-to-face delivery. Substantial proportion of the content is delivered online, typically uses online discussions, and typically has a reduced number of face-to-face meetings.
80+%	Online	A course where most or all of the content is delivered online. Typically have no face-to-face meetings.

Table 1: Typical course classifications. Source: Allen & Seaman (2010)

MOOCs tend to provoke strong feelings in the academy. Comment becomes more portentous and apocalyptic all the time. There are four main MOOC's that are cited: Coursera, edX, Udacity and iTunes U.

iTunes U, for example, offers Apple's free catalogue of hundreds of thousands of educational content items from about 1000 institutions, including four in New Zealand (University of Waikato, Southern Institute of Technology, University of Otago and University of Canterbury) are among 1000 institutions in 26 countries that make content available to anyone with a device that runs iTunes. Apple worked out before anyone else how to make money from online music sales with its iTunes Store, claims to be the largest digital catalogue of educational content.

Media coverage and commentary associated with MOOCs has been focused opening up elite brands to the masses and the idea of 'education for free'. While these are worthy principles, can they be met with the teaching and learning challenges at the heart of online courses?

There are three scenarios for teachers and learners:

- already enrolled in introductory classes using MOOCs as study aids
- using MOOCs in conjunction with classroom-based courses
- enrolling solely in a MOOC to earn formal credit

It's the last case – taking MOOCs for credit – has been the most challenging for higher education institutions, and looks set to become a "disrupter" of traditional higher education (Fain 2012).

Format War

Alliances of major US universities have been in a race to develop online courses - in a kind of academic format between edX project (Harvard brand - led) and Coursera (Standford brand-led).

So far, edX offers just a handful of mostly computing-related papers, but Coursera covers a much broader range of subjects. Among the nearly 200 papers listed on its website is everything from archaeology to animal behaviour. At the time of writing, nearly 1.5 million people have registered on the site.

edX

The edX project, a not-for-profit online learning initiative, provides courses from Harvard, the Massachusetts Institute of Technology and the University of California, Berkeley.

Education company Pearson VUE (or Pearson Virtual University Enterprises), will provide authorised test centres for the edX online courses. Pearson VUE operates in 162 countries, with more than 4,400 testing centres (including Weltec, Petone). In the forerunner to edX, MITx, an online course in electronics 155,000 students registered, 9,000 reached mid-term, 7,200 passed Among the 340 perfect scores was a 15 year old in Mongolia (BBC 2012) had been studied by more students than all the university's previous living alumni combined. In September of this year a deal between edX and Pearson VUE was announced that will allow students who have studied online to sit edX exams in supervised centres around the world, including in New Zealand., where their work can be formally tested. Students, who will have to pay a fee for this service, will be able to use test centres run by Pearson VUE.   So far, edX offers just a handful of mostly computing-related papers.

In 2013 it announced its partnership with Google to jointly develop the edX open source learning platform, Open edX, and expand the availability of the platform and its learning tools to individuals and institutions around the world. (edx.org 2013).

A rival project called Coursera was launched by academics from Stanford in California. Coursera made headlines as universities signed up to offer courses (16 institutions and 116 courses, 800, 000 students, at latest count). Courses are free, delivered entirely over the Internet, - and almost all of them are not formally accredited.

Initial evidence show that (MOOCs) work best for motivated and academically prepared students (Fain 2012). The Bill and Melinda Gates Foundation has recently announced a series of grants for the creation of MOOCs for remedial coursework. Are MOOCs, which are based on economies of scale, compatible with the personalized support students typically require to succeed?

Unintended Effects: Textbooks and Support Materials

Recently I published public relations textbook, which became New Zealand's first public relations electronically available textbook courtesy of our publisher, Pearson. In the days when print was the only option, students had plenty of free or cheap ways to get required textbooks by borrowing one from a friend, checking out a copy from the library or buy a used copy for a fraction of the price. It is even possible to rent a copy through one of several companies providing that service.

But textbooks and the latest textbook enhancements, which require individual access codes to get to bonus materials online, threaten to displace all of those alternatives. Most access codes are good only for a limited time, and once they are activated they can't be used by other students. So my students tell me that while the price of the set work textbook is around 40% cheaper than the print version, they can't on-sell it.

Buying access to online textbook supplements is more like buying a software app than a book. Once you've paid to download software for your phone or computer, you know there's no easy way to resell it.

The majority of university courses still use printed textbooks without requiring online supplements. But the use of added online materials is growing fast, raising the issue of personal data privacy.

Online Education Privacy Issues

Higher education institutions are collecting and analysing student data for economic reasons as well as learning outcomes. While it can be argued that different goals than that of online advertisers in general and presumably students are choosing to participate in an online learning environment where they know their data will be used to help them learn and provide feedback to their instructor. They also might be more used to being monitored online. Even given these unspoken rules, can anything be foreshadowed?

Will students just accept that we will now know which textbook page they read, at what time, and for how long… and potentially act on that information? Or will students eventually want more control of the data they "produce?"

New Zealand

What do these developments mean for local institutions? It seems the ever-growing costs of higher education globally is a key driver.

The University of Auckland vice-chancellor Professor Stuart McCutcheon has been quoted as saying they are well aware of the trend. But would Auckland join Coursera, as the University of Melbourne has opted to do? "I don't think we'd spurn any opportunity. But we've thought carefully about the nature of the education we offer and we've committed to research-led, primarily face-to-face education with the support of technology. At the moment, that model is viable and I think it's what our students want," McCutcheon says (Doesburg 2012).

Steve Maharey, vice-chancellor of Massey University, which has decades of experience of distance teaching and claim hundreds of thousands of extramural graduates, hints that they could get involved in a Mooc-like venture, although he doesn't expect free online courses to suddenly turn higher education on its head (Doesburg 2012).

University of Canterbury e-learning team leader Herbert Thomas says Moocs and associated developments are part of a "constantly changing" higher education environment. Canterbury is adapting by revising its use of technology in teaching – partly a response to the earthquakes – and by collaborating with overseas and local institutions on courses and qualifications.

"Moocs don't pose a direct threat to bricks-and-mortar universities […] it's not as simple as one replacing the other – is make planning a lot more complex," Thomas says. A lot of the literature suggests there might be a 20:80 split, with 20% of students wanting a full on-campus lifestyle experience at a top university and 80% of students studying online because it's cost-effective." (Doesburg 2012).

OER University

In 2011, a Times Higher Education story led with the headline "'OER university'" (open educational resources university) to cut cost of degree (Attwood 2001).

OERu aims to create "a parallel learning universe" based on freely available course content. The universities of Auckland, Waikato, Canterbury, Otago polytechnic, the Open Polytechnic of NZ, North Tech

and the Southern Institute of Technology are OER University foundation partners along with others from Australia, the United States, Canada and South Africa have also become foundation partners.

These include University of South Africa, University of Southern Queensland, University of Wollongong, University of the South Pacific, Athabasca University, BAOU (Gujarat's open university), Empire State College, Southern New Hampshire University, Thompson Rivers University, Excelsior College, Open University of Catalonia ,Thomas Edison State College, University of Glamorgan.

Wayne Mackintosh, a founder of WikiEducator , director of the Open Education Resource Foundation, and champion of the OERu argues that Universities in Australia, Canada and New Zealand are hoping to achieve "a quantum shift" in open educational resources (OERs) by launching an "OER university" (Mackintosh in Thibaut 2011).

The plan is draw together existing free online learning materials from around the world and develop new OERs to create whole degree programmes that can be studied via the Internet for free.

The project will focus on how to offer students using OERs the opportunity to earn academic credit and have their work assessed at a significantly reduced cost.

It is suggested that these degrees could cost up to 90 per cent less than a traditional qualification gained through on-campus study. Mackintosh said an OER university would help widen access to higher education in the developing world as well as helping students in the developed world faced with rising tuition fees.

He envisages the OER university developing into a "parallel" university system that could also give traditional students more flexibility.

Mackintosh believes it is "just a question of time" before other universities join the scheme.

"OER is a sustainable and a renewable resource...It is up to universities to see the opportunities and live out their vocations. Why should taxpayers have to pay twice for learning materials? We are publicly funded institutions," he said.

The OERu anchor partners have shortlisted eight university- and college-level courses to be developed as prototypes for refining the OERu delivery system:

- College Composition
- Art Appreciation and Techniques
- Regional relations in Asia and the Pacific
- A Mathematical Journey
- General and Applied Psychology
- Critical Reasoning
- Why Sustainable Practice
- Introduction to Management

Prototype courses are running in a number of founding partner institutes this year. The OER will not confer degrees as that will remain with individual partner institutions.

The problem is that learners who access digital OERs on the web and acquire knowledge and skills either formally or informally, cannot readily have their learning assessed and subsequently receive credible credentials in recognition for their efforts.

The OERu collaboration will offer courses and programmes based entirely on OER and open textbooks. Through the community service mission of participating institutions, the OERu network will open pathways for OER learners to earn formal academic credit and pay reduced fees for assessment and credit services.

NMIT has "come on board to ensure it continues to source and deliver content to learners", chief executive Tony Gray (in Neal 2012).

Mr Gray said NMIT recognised the world of tertiary education was changing quickly in terms of demand from learners and the way in which it needed to deliver to learners.

"Technology is changing and the way in which governments can fund tertiary institutes is changing. This is a way for us to concentrate on making sure we are also sourcing the very best content we can for our programmes," Mr Gray said.

OER Foundation founding director Wayne Mackintosh was in Nelson as a keynote speaker at the national tertiary learning and teaching conference. He said the cost of replicating digital knowledge was "near zero" but access was being denied to those who could not afford it (Macintosh in Thibaut 2011).

Creative Commons licensing is a central pillar of this development. It has adopted the Free Cultural Works approved licenses (CC BY and CC BY-SA) as the default for OERu courses.

Traditional Publishers and e-Learning (Pearson)

Pearson, a publishing and education company whose products include books, newspapers, and online services, announced a major acquisition on Tuesday that will deepen its commitment to becoming a major player in online education.

The company, which owns the Financial Times and the Penguin Group book publisher, paid $650-million to buy EmbanetCompass, a business that provides support services to colleges and universities that are moving their programs online. EmbanetCompass helps colleges design online programs, recruit students, train faculty members, and keep tabs on student progress through data analytics.

The announcement comes after Pearson's move last year to start a free, cloud-based learning-management system called OpenClass, a software company called Knewton to replace some of its software packages with programs that adapt to each learner with interactive tutors, quizzes, and explanatory videos.

Mobile Communication: Bring Your own Device (BYOD) and the Disappearing Desktop

The exponential and continuing growth of mobile computing, and the BYOD era is another major "disrupter" of traditional higher education. Many students are bringing to campus two or three devices a mobile phone, a tablet, and a laptop, and they may be also using a campus device at the same time. They (and staff) expect their institutions to provide ubiquitous, reliable wireless connectivity and they expect seamless connection to campus networks. Mobile communication has had two main effects. First online coursework has to be designed to be accessible across both desktop and mobile platforms applications (for example, IoS and Android, proprietary and open source) found on devices such as tablets and smartphones on and off campus. A major disconnect occurs when administrators commonly cite the need to use technology to enhance student learning as one of their top two priorities, but are not instrumental in driving the improvement and

enhancement of IT, often because of ingrained view that IT systems and policies are 'untouchable' or 'too technical' for their direct intervention on behalf of academics.

Experience at the AUT University in the BYOD era is instructive. Student demand for wireless, mobile platforms drove the process to have it implemented, conquering initial resistance by the IT department. This is commonly the case across bricks and mortar institutions around the world. The old model of top down control by the institutional Information Technology departments is being challenged. In AUT's case, one result is that since Apple has made their i-book authoring tool available for free, and the University made wireless Internet ubiquitous, AUT now boasts 700 i-books jointly authored by staff and students (Luukkonen, 2012).

Typically institutions are focusing their mobile app focus as shown in Table 2.

Primary website	40%
Learning/course management system	38%
Library catalogue and other library services	31 %
Student recruitment and admissions	23%
Administrative services for student information	22%

Table 2: Mobile app focus. Source: http://www.edtechmagazine.com

Cloud Labour

Just as businesses are turning to cloud computing instead of having their own computers and software services, "cloud labour" has the potential of delivering higher education institutions a much more efficient and productive way of servicing their needs and requirements. Indeed at the Open Polytechnic has for many years made use of short contract off-campus assignment reviewers and markers. The Internet enables the business to do without the traditional employee at all. HR interviews and staffing costs are unnecessary.

The main benefit of cloud computing is that it is frictionless and scalable. Frictionless refers to the ability to easily (and relatively inexpensively) set up the computers and software needed. Scalability refers

to the ability for cloud computing to expand or contract in line with needs. These features have been applied in the cloud labour market to give businesses flexibility.

A Global Academic Labour Pool?

The most well-known of cloud labour platforms is Amazon's Mechanical Turk which provides a platform for requesters to submit tasks that pay as little as a few cents each that can be done by qualified providers. Typical tasks that are carried out on Mechanical Turk are transcription, analysis of images, searching for information on the Internet, surveys and posting links. Other companies such as oDesk and MobileWorks are providing more skilled services including programming, sales and marketing, admininstration support and design. As with Mechanical Turk, jobs are pitched with a rate of pay.

From the worker's perspective, being part of a cloud labour force has its attractions. Finding work is simplified and it can usually be fitted into a flexible schedule and environment. The work can be done in any part of the world from any other part, increasing the availability of work. The negative of course is that workers are competing on a global marketplace and this serves to drive the rates of pay down. Web developers for example list themselves at rates as low as $10 an hour on oDesk. Along with this comes the outsourcing of issues with education, labour relations and health problems to the nations providing the cloud labour.

More for Less

About.com, asks the rhetorical question: How Will EdX Change Online Learning?" EdX courses are sure to act as an inspiration for distance learning departments that must work in a stricter budget."

OER Foundation founding director Wayne Mackintosh, in Nelson as a keynote speaker at the national tertiary learning and teaching conference, said the cost of replicating digital knowledge was "near zero" but access was being denied to those who could not afford it (Macintosh in Thibaut 2011). According to Don Kilburn, chief executive officer of Pearson Learning Solutions, the acquisition would take advantage of the trend away from print, and "As more and more schools face budget cuts, they're looking to

online education as a way to increase access, achievement, and affordability," he said. "We see this as a strong area of growth."

Conclusions

The role of disruptive innovation in educational renewal is summarised well in a recent wide-ranging Australian survey (Tynan *et al.,* 2012) that found, *inter alia*, that:

1. The workload associated with online and blended teaching is ill-defined and poorly understood. It is no longer possible to work in ways that belong to a transmission era of university teaching. As access and connectivity penetrate deeply into our personal, transactional, work and learning lives, interactivity and constructivist pedagogies must be considered routine, not 'add-ons' in teaching, and must therefore be reflected in prospective workload models which recognise the higher quantum of teaching tasks associated with e-teaching, and students' needs for a teacher to 'be there' – what is called 'online presence'.

2. Teaching workloads need to be adjusted to acknowledge the greater number of tasks associated with new technologies being incorporated into education systems.

3. Staff should be enabled to participate actively in their professional development and have their work recognised and valued within performance assessment, development and review. Institutions should ensure business processes and infrastructure are adequately resourced for this purpose.

4. Institutional management perceptions of teaching online should be more closely aligned with the reality of the workload as perceived by teaching staff within current workload models. Staff require more transparent participation and negotiation about appropriate workload models, taking into account a plethora of additional coordination tasks, e.g. online marking, management of off campus faculty. The appropriation and use of technology into curriculum requires a recasting of the role of academics within universities.

5. A re-identification of the roles and responsibilities of teachers, and their actual time using various applications and their perceived cost-benefit is

required so that universities to develop more appropriate yet efficient workload models.

6. Since almost all staff are involved in teaching online, appropriate selection criteria, probation criteria, performance indicators and a commitment to professional development in e-teaching by institutions and their staff are imperative.

7. The multiplicity of tasks now required of academics is rarely documented. Nagy *et al*. (2011) in their study of Position Descriptions for Unit Coordinators, note that of four universities surveyed, only one specified the particular skills required for this critical leadership role. Their description of the non-disciplinary knowledge (management skills, comprehensive policy content, regulations and legal matters, technical skills) now needed in unit coordination is daunting (Nagy *et al*. 2011).

8. Many Vice Chancellors and the majority of IT executives, including Bill Gates see online services supplanting physical face to face lecture formats. Others envisage a future where the campus still attracts school leavers seeking a vestigial 'university experience', through a blended education of independent learning online plus some face-to-face interactions, but where the majority of adults transact their learning 'at a distance'. The blended model remains the predominant 'delivery' mode in higher education, despite an increasing number of fully online programs.

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