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.

Keywords: Career opportunities and choices, Computer proficiency, Education and Computer usage, Ethics and Informatics, IS concepts and IT Applications, Lack of IT skills, Prior Computer Knowledge, Progress of ICT, Web-based services.

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%

Total	Count	145	27	172
	% 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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