

**Investigating the impact of curriculum revamping on first year
students' productivity skills**



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students' productivity skills**

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DECLARATION

I hereby declare that my Master's thesis entitled "Investigating the impact of curriculum revamping on first year students' productivity skills" is solely my own work and has been written independently with no other aids and sources than those quoted.

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DEDICATED TO C³A & MS FARZANA

**“Any good that has come to my life in last one year has
been because of your guidance and love”**

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LIST OF ABBREVIATIONS

FoICT Fundamentals of Information Communication and Technology

MOS Microsoft Office Specialist

ICT Information Communication and Technology

NUST National University of Science of Technology

SEECs School of Electrical Engineering and Computer science

BSCS Bachelor of Science in Computer Science

BESE Bachelor of Science in Software Engineering

MS Microsoft

LIST OF TABLES

Table 1 Comparison of old and revised lab Manuals for MS Word.....	34
Table 2 Comparison of old and revised lab Manuals for MS PowerPoint	38
Table 3 Comparison of old and revised lab Manuals for MS Excel.....	42
Table 4 Sample	45
Table 5 Normality Test Results - MS Word.....	49
Table 6 Mann Whitney test - MS Word.....	53
Table 7 Wilcoxon Signed Ranks Test - MS Word	56
Table 8 Normality Test - MS PowerPoint	57
Table 9 Mann Whitney Test - MS PowerPoint.....	61
Table 10 Wilcoxon Signed Ranks Test - MS PowerPoint.....	64
Table 11 Normality Test - MS Excel.....	65
Table 12 Mann Whitney Test - MS Excel	69
Table 13 Wilcoxon Signed Ranks Test - MS Excel	71

LIST OF FIGURES

Figure 1 Normality Test Plot - MS Word.....	50
Figure 2 Normality Test Plot - MS PowerPoint.....	58
Figure 3 Normality Test Plot - MS Excel.....	66

Table of Contents

Abstract.....	15
Chapter 1: Introduction.....	16
1.1 Background.....	16
1.2 Motivation.....	17
1.3 Purpose and Objective of Study.....	20
1.4 Problem Statement.....	22
1.5 Research Questions.....	23
1.6 Limitation of the Study.....	24
Chapter 2: Literature Review.....	25
2.1 Introduction.....	25
2.2 Computer Literacy Skills.....	25
2.3 Research in Computer literacy skills.....	27
2.4 Importance of Computer literacy.....	28
2.5 Microsoft Office and Certification.....	29
Chapter 3: Research Methodology.....	31
The Revised Curriculum.....	31
Lab manuals content between old and new lab manual.....	32
3.1 Research Design.....	42
3.2 Research Questions and Respective Hypotheses.....	43
3.3 Variables in the Study.....	43
3.4 Instrumentation.....	44
3.5 Sample.....	44
3.6 Data Collection tools.....	45

3.6.1 Qualitative data collection tool.....	45
3.6.1 Qualitative data collection tool.....	46
3.7 Data Analysis	46
3.8 Summary	47
Chapter 4: Data Analysis and Results.....	48
4.1 Data analysis and results for Microsoft Office Word	48
The main research question that this study intended to investigate was:.....	48
4.1.1. Normality Test of the responses for Experiment group	49
Control Group Vs Experiment Group Results.....	51
Data Analysis of Experiment Group	53
Introduction	53
4.2 Data analysis and results for MS PowerPoint	56
Research Question and Null Hypothesis	56
Normality Test for experiment group.....	56
Control Group Vs Experiment Group Results.....	59
Data Analysis of Experiment Group	62
Introduction	62
4.3 Data analysis and results for MS Excel.....	64
Normality Test.....	64
Control Group Vs. Experiment Group Results.....	67
Data Analysis of Experiment Group	69
Introduction	69
Qualitative Data Analysis.....	71
Focused group discussions with Students	71
In Depth interviews	73

Chapter 5: Discussion and Conclusion	76
5.1 Overview	76
5.2 Quantitative Research	76
Findings & discussions.....	76
5.3 Control vs Experiment Group.....	76
5.3.1 MS Word	77
5.3.2 MS Excel	77
5.3.3 MS PowerPoint.....	77
5.4 Experiment Group	78
5.4.1 MS Word	78
5.4.2 MS Excel	78
5.4.3 MS PowerPoint.....	78
5.5 FGDs with Students	79
5.5.1 Improvement in presentation skills.....	79
5.5.2 Improvement in Presentation Skills.....	79
5.5.3 Help in doing Assignment	79
5.5.4 Motivation Factors.....	79
5.5.5 General Feedback	79
5.6 In-depth Interviews with Lab instructors	80
5.6.1 Criteria for Designing Lab Manuals.....	80
5.6.2 Assessment Criteria	80
5.6.3 Coverage of MOS Contents.....	80
5.6.4 Perception about MOS Contents	81
5.6.5 Motivation of Students	81
6.5 Conclusion.....	81

6.6 Recommendations for practice based on this study	82
6.7 Recommendations for Future Research	83
Chapter 6: References	84
Appendices	94
Appendix A: Pre and Post Test Questions for MS Word.....	94
Appendix B: Pre and Post Test for MS PowerPoint	102
Appendix C: Pre and Post Test Questions for MS Excel.....	115
Appendix D: Interview script for Lab Instructors.....	130
Appendix E: Script for Focus Group Discussion.....	133

Abstract

Investigating the impact of curriculum revamping on first year students’ productivity skills

In the knowledge base economy digital literacy is essential for survival. Students in universities are expected to produce high quality work using productivity software e.g. MS Word, MS PowerPoint and MS Excel. The job market also gives these skills due importance and individuals are expected to have at least certain level of proficiency in using MS office tools. Therefore, there is a dire need to introduce such trainings in the first year of the studies, which enables them to be productive. Although, most of the universities have Fundamentals of ICT course in their first semester, however, lack standardized guidelines to deliver and assess productivity tools in this course. Every university follows their own criteria to integrate the use of productivity tools in these courses, thus resulting in varied competencies attained by the students. The current study focuses to revise the curriculum of the course CS100- Fundamentals of ICT, offered to first year students in National University of Sciences and Technology (NUST) by introducing Microsoft Office Specialist (MOS) certification on MS Word, MS PowerPoint and MS Excel with an aim to investigate the impact on productivity skills of these students. With a sample size of 403 students, a mixed method research paradigm is adopted with predominantly quantitative analysis through post only quasi experiment to compare the productivity skills of experiment group taught through MOS certifications against the control group that were taught through traditional labs on productivity software. The data analysis revealed significant difference in post-test achievement of experiment group students in selected productivity software (MS Word, MS PowerPoint and MS Excel) as compared to control group. Moreover, the qualitative data collected through interviews and focus group discussions from teachers, lab instructors and students also provided insights into the improvement of productivity skills through MOS certifications. Students reported that MOS certifications helped them in securing internships with leading employers during their course of study at the university, which suggests that university students can be benefitted if MOS certifications are integrated within Fundamentals of ICT curriculum.

Chapter 1: Introduction

1.1 Background

In this advance world basic principles of computer literacy are essential to survive. Ambitious employees who are more into basic skills are selected over the others (Kozinaet.al, 2012). Fresh graduates of colleges and universities are aware of basic computer skills in order to work efficiently in the field related jobs. Information and communication Technology (ICT) consider students who are well learned of computer literacy. People with high efficiency in the knowledge of Information and Communication Technology are increasingly advancing in their professional life; this also highlights the importance of Information and Communication Technology in this modern world. The fundamental skills of computer are very necessary to succeed in this advanced globalized world. A gradual learning of computers is observed during the past few years as it requires basic knowledge of computer and its applications. Moreover, while dealing with technology we have shifted from traditional ways to computerized ways. Information and Communication Technology has become more efficient and appealing compared to reading and writing skills (Kozinaet.al, 2012).

Computer literacy is defined as usage of computers with applications such as processing, data base, networking or software. Learning basic computer skills and understanding the information on daily basis is also related to computer literacy. Furthermore, it is the understanding of structure, applications, methods and learning to deal with various languages. Computers play a vital role in our daily lives to help us understand the technology and know a variety of information on internet through surfing and search, web understanding is essential to undergo the searching process. In professional life a person should remain active and proficient in order to excel and be worthy in market. Developed countries have already added computer technology in their study courses to enhance learning, while developing countries have started creating awareness among students about the importance of basic computer skills such as Information and communication technologies (ICT) in order to emerge among the advanced developing countries. This research is to develop understanding of Information and Communication Technologies among students belonging from technical schools and universities.

Moreover, Advance computer learning has shifted the education system from traditional ways of interaction and communication to online classrooms. Micro computers have taken over every individual with its multitasking features and applications. Technical community has shifted from the old physical industrial Age to the new modern Information Age (Beekman, 2005). Computers are widely introduced in schools and classrooms are well equipped by them as an integral part of studies. This new up-to-date Information age has familiarized professional ways of technology to meet the market demand. Technology is well spread in our educational system with much effectiveness, so the use of computers in classrooms will enhance the learning methods (Capron, 2004). Demand for technical usage has widely increased and technology is making our community proficient and effective with new demand in technical jobs however it is also removing the old traditional jobs around the world (Beekman, 2005).

Furthermore, parents and teachers believed that computer studies should be an important part of education as the modern world requires new and advance technology. People adopted this idea of technical awareness among students as technology helps in everyday life and became an essential part of our community so, education should reflect technical learning (Beekman, 2005). In order to deliver technical education teachers had to adopt these skills and learn the new applications to teach and train students with computer knowledge. Moreover, schools were required to make themselves capable enough to hire computers and establish labs and provide all technical sources. Initially schools in Thailand lacked such resources to provide students with technology and the Ministry of Education (MOE) faced serious problems to deal with (Borton, 2003). According to United States Ministry of Education students who readily use computer applications are more motivated, confident and solve problems easily (Robertson, 1987).

In addition, Thailand gradually improved in technology providing students with individual computers in order to enhance their study and learning. Teachers also were benefitted with the technical help of gaining information and storing data plus analyzing it (Jones, 2004).

1.2 Motivation

Every country such as United States, Thailand uses computers and its applications as an essential part of studies as well as job requirements. Technical schools where advanced quality education is delivered, students are made to learn and practice basic computer skills such as research work, map study, word documents, emails and presentations so they know the usefulness of various

applications in studies. Traditional ways of making assignments with textbook research and writing on paper with pen are all the old ways to study. However, internet has connected people and brought new ways of research and gaining information to achieve better educational purposes with maximum interaction with computers. So, to be enriched with computer technologies a person should be taught basic skills since childhood, to have better efficiency among teachers and perform best in professional job as well (Richards, 2017). Technology has also become a vital part of education, multimedia and internet has opened new ways of technology and they best contribute towards education of children (Smith, 1997). Technology has increasingly changed our world as it shifted from industrial time to the new information age and this transition has an impact on our work and in our lives (Beekman, 2005).

Moreover, students learned computer skills on the basis of interest in various activities such as games, word document; this was termed as self-efficacy. Self-efficacy was how students responded and encouraged themselves (Bandura, 1997). Self-efficacy defined as a belief that the student can face the given challenge and succeed. It includes task performance where students capabilities are observed, vicarious experience is to help students learn how to perform a task by a sample assignment, verbal persuasion is to give confidence to students by persuading them in order to perform a task and be successful however teachers can play a vital role in this kind of self-efficacy, physiological reaction is to judge students response before during and after the given assignment (McCade, 2006). A positive response towards self-efficacy can help students be more energetic and complete the given task (Pajares, 2002). World economies excessively use computer technology in business, jobs and market. Society increasingly needs the use of computers skills in jobs in order to meet the requirements. However, information illiterate people were a drawback to the modern society; universities changed their teaching patterns to overcome the problem (Breivik, 1992). Students who were more efficient and proficient in information technology were the ones who were more acceptable towards the challenges and survive in a competitive society (Dougherty, 1999). This resulted in technology being more competitive towards achieving success (Leu, 1999). The most efficient people in technology can tell how technology has changed their lives and what impact it had on them (Long, 2004). Demand for computer proficient workers increased in the market, companies need more competent people to increase their work production (Long, 2004).

In Addition, Davis observed that word processing, presentation and spreadsheet were the most important in computer literacy. Job requirements were to be proficient in database, online search, mails and internet usage. It was also noted that by taking the computer introductory course students became more active and proficient in learning the skills (Davis, 1997). Gender distribution on the basis of computer usage shows that males use Internet for fun activities such as games while females use it more for study purposes. The use mobiles, mails and messages more frequently done by females (jackson, 2008). A study proved that old age people tend to learn and perceive technology more easily compared to young generation as they have strong ability of perception and memory so in work environment proper training of old age workers can be beneficial for the technical work (Reed, 2005). Strauss and Howe named the old age group as millennial, he noted that they are good with visuals, multitasking and communication (Howe, 2000). Millennial also use self-efficacy to search for information on internet (Fields, 2005).

Furthermore, Globalized world promotes educational economy and technology filled countries. Students across the world should be provided with technological advancements to learn, adopt and succeed. It will motivate them to face challenges, gain opportunities and compete in the work industry (Jones, 2004). Introducing educated workers and customers will automatically improve economy in the developing countries (Borton, 2003). Workers are required to learn technical skills in order to survive in the job as demand for learned abilities in computers is ever increasing with time (Roblyer, 2000). To have a global recognition people have accepted the importance of technology and how the relations of communication more through the boundaries to create more economical and social relations (Douglas, 2000). Computers were mainly used for research in universities for the military purpose, later the network system was expanded to other research institutions as well. These computers were operated by teachers, students and administration (Raddick, 1996). Future mainly depends upon how a person or an individual uses the new technology efficiently (Capron, 2004). Students rapidly used their computer skills and learning to improve their education and to learn other skills (Bafile, 2000). Excessive use of computer in schools result in excessive use of software libraries and online courses (Smith, 1997).

1.3 Purpose and Objective of Study

Students who have learned typing assignments and preparing presentations in universities are more active and confident in front of teachers and their performance level is also boosted up. Such an efficient performance level can only be achieved with word processing knowledge and presentation skills, which can be learned through workshops and various programs, which include basic methods and structures, offered to students during educational development in institutes (Richards, 2017). Online websites are available with word processing information, they teach with the help of tables, pictures, and charts which seems to be quite difficult with paper and pencil but computers have made it quite easy and less time requiring (Richards, 2017). Education system and work market are under huge pressure of technology. It was clear that the use of computers will be under crucial stages to achieve success (Gressard, 1984). Teachers have changed the course context keeping in mind the increasingly growing technology. (Brumley, 1993). Along with basic computer skills, communication skills have also become an important part of exhibiting computer skills (Hugstad, 2004). Computers became an essential part of everyday life as students started typing on computers instead of typewriters, farmers use computers to know the market prices, parents use as an educational source for their children, employees in markets use to excel in their particular job (Capron, 2004).

Moreover, According to Southern Association of Colleges and Schools students gain information through the use of computers in their institutions and learn the significance of such applications (schools, 2010). Literacy skills for college students may vary according to Kalin, Dettori and Steinbach; thus student's ability is measured through a challenge test or by clearing the introductory classes held in colleges to check computer competencies (kalin, 2006). However, Students with technical learning still lacked specific skills; in order to have a valuable gain from the introductory class students should learn more advance applications and skills in computers to have successful jobs in market (VanLengen, 2009).

Burniske defined computer literacy with its two types functional which includes reading and writing techniques with no problem solving methods and secondly critical literacy which actually defines interpretation of information and presenting it with ability of problem solving techniques. Researchers consider critical literacy with computer literacy. In class rooms teachers often mix the traditional ways with new technology to deliver information, and teachers move around the

basic application rather than making use of skills in the course study. Burniske says training instructors is necessary in order to gain literacy in the course study (Burniske, 2000).

In Addition, Childers said computer literacy is different than computer proficiency as proficiency deals with learning the information and literacy deals with the understanding and the skill to adapt computer technology (Childers, 2003). It was said that the computer literacy course should prefer the use of technology rather than the studies; the other thing is that computer concepts should be the basic thing added in the course and lastly computer course should play a vital role in other studies as well. Researchers found teachers have to find the actual requirements of the students and the instructors expected much more from student's performance. Topics such as word processing, programming, spreadsheet and database were selected as most important to study. Students need to realize the importance of computer skills in course study and later in career as well. Both teachers and students agreed that application of information and knowledge for better results is very necessary (Keith, 1994).

Halaris and Sloan explained literacy with four levels named as computer awareness, literacy, proficiency and expertise. Awareness deals with basic understanding of computer language and role of computer on society, literacy deals with the use of applications and how to apply them along with collecting various information, fluency deals with developing computer programs and solving problems related to applications, expertise deals with computer experts (Sloan, 1985).

Furthermore, Mason and Morrow distributed the computer literacy into two stages; awareness and competence. Awareness was how an individual use technology in daily life and how it affects him. Awareness covered course study of computer history, ethics, security, development, economic issues, legal issues and communication issues. Competence is related to individual use of software, hardware, internet tools and applications. Students who successfully excelled in both the stages have effectively learned the computer literacy course (Morrow, 2006).

The purpose of this study about computer introductory and competency courses was to check students learning and improvement while studying this particular course. Study was done to observe any change in study with age or gender difference or any variation in test taken by the three college campuses. Technology mold student's life towards the betterment and strongly affects their personality (Leu, 1999). People get more benefitted with information and useful knowledge with the help of technology as it enhances the study system too. Moreover, teachers

are given special trainings and learning's to teach their students more effectively in backward areas too, preparing students to function perfectly in their professional life (Davis, 1997). Students are motivated to attain long term learning process and face the challenging environment in order to have a better experience of life (ACRL, 2004). Basically the main aim is to provide computer learning and teaching is to know how to use internet through various activities (Ferrell, 2003). Study related to computer competency is to have a research on teacher's mentality and thinking of the literacy skills of under graduates of different universities. The research was also to check the competency of technology in professional life and how much it is beneficial, to notice the change among students before and after entering college or universities with the amount of computer proficiency in them.

1.4 Problem Statement

Information and Communication technology has given students excessive and much more favorable chances to become capable to quality learning and to make better innovations through graphs, maps, text, audio and multicolor images (Ajmal, 2011). Millennium Development Goals were set at the Millennium summit in September 2000 where leaders of the world adopted UN Millennium Declaration where it was assured to reduce poverty internationally and to set time target of 2015 (Millennium project, 2017). Its target in the project was to provide circumstances for people to have quality education accessibly. United States in UN Summit 2015 assured that by the year 2030 education will be wide spread with classes to have better learning at any stage of life.

However, such surveys of computer proficiency make us more enthusiastic to enable our schools with computerized classes and enriched devices for quality learning among students (Burett, 2014) (werner, 1996). Many countries of the world are still unable to use computer skills and are unaware of the basic technology, apart from being aware of the benefits of computers in studies. Either, these countries don't take computers seriously or they are not funded well to afford such technology. In both the ways these under privileged countries are wasting their time and energy and forced to do the 'Donkey work' (Ogiegbean, 2005). We should utilize the use of technology as we are provided with this opportunity to avail in our lives and get more benefits and have well wishes for the under privileged countries to have such opportunities in education to make their lives easy by the efforts of Europe.

We should test student's assessment skills before introducing the computer course to observe his or her perception of concepts in assessment. However, researchers find another problem to face which says if students pass the basic assessment computer course but still we fail to notice his capabilities and perception of mind (Grant, 2009). Mainly four factors affect computer learning is the lack of computers, no access to the use of internet, no particular information present in the particular language and no efficient computer teachers. Class rooms are provided with computers to facilitate students, this was aided by the Ministry of Education (konantakool, 2000). According to Davis students were more occupied with information rather than the basic skills (Davis, 2002). Computer in classes are well equipped with lectures, books, discussion and notes. Such students have more reliability to succeed and shift from learning to operate in the jobs. Computer competency study actually guide teachers in schools to understand the benefits of computers and how to use these skills during work.

In SEECS, NUST, CS-100: Fundamentals of ICT is taught to the first year students as a compulsory subject. But as per the learning outcomes of this course, content is not as such defined. Teacher develop the lab manuals based on the previous lab manuals or based on their own understandings. Many public universities offer the same course to the first year students but all the universities are not on the same page. There is a need to design a course in such a way that may be made as part of their curriculum and that would be helpful for our students for their future work.

1.5 Research Questions

The aim of this study is to investigate the impact of revamping of CS-100: Fundamentals of ICT” course curriculum on student's productivity skills including MS Word, MS PowerPoint and MS Excel. Hence the consequent research question is:

What is the impact of revised FoICT curriculum using MOS certifications on Students' MS Word, MS PowerPoint and MS Excel productivity skills?

1.6 Limitation of the Study

The survey of computer competency was limited by the students admitted to the introductory classes in the college. Moreover, it was limited by the teachers participating in the survey of three community colleges. Furthermore, computer competence survey didn't add the students who participated in the Computer Competency Exam, so this study was limited.

Moreover, less time span was given to students to practice the following applications and few tasks were chosen to test students instead of extensive research so the test shows much variation. So, advance word tasks are to be conducted to show research studies. Microsoft Office was selected for assessment of computer course; students may find difficulty in attempting MS Office compared to other applications. Results will differ if we choose a different application to test student's computer skills (Murphy, 2009).

The study of computer proficiency was limited by the teachers of various universities. It shows us the perceived notion of the computer skills among undergraduate students of a university. It will help us to set the syllabus course of computer students. Web based survey known as online checking or research shows us a different response of students. However, this study comprises of both written survey and online survey as well.

Chapter 2: Literature Review

2.1 Introduction

Information Technology in a globalized world has made great advancements over the time to make our lives better and advanced to meet up the social pressure and demands. IT has taken over every department whether its health or food, we are changing for a better modern world. In United States computer skills are highly important among workers in order to be among the advanced economic prosperity. Daily connection with computers is a basic necessity (Nelson, 1999).

Computers, software, hardware and communications are all applications in Information Technology which are the vital aspects in our lives (H, 2000). Employees with abilities of skills in the field of technology are of high demand (Aminco, 1998). Information Technology is used in the organizations as well as homes, universities and other educational institutes (Lin, 2000, 1998).

Moreover, Wisconsin Indianhead Technical College (WITC) appreciate technology and aim to provide quality education in order to have a bright future of their students and sort out all the modern world issues for them so they compete with confidence and modify Information Technology skills for them (College, 2000).

In Addition, computer literacy is a capability to understand and successfully transfer the skills to others as well. It relates to understand the distinction between word processing and database or between spreadsheet and disk drive. It is to know the abilities of computer and its proper usage (Morgan, 2004). How to operate a computer skillfully and effectively is termed as an important part of education, manual skills of book keeping and administration are now considered as “IT skills” of data base, word processing and spreadsheet (Reffell and Whitworth, 2002).

2.2 Computer Literacy Skills

Technical literacy is a capability of a person functioning single handed or in group utilizing systems and resources to test information in any way and further utilize that knowledge in communication or problem solving (Instruction, 1998).

Computer literacy is to have a basic proficiency in all the computer applications like word, MS office and database. Such knowledge and abilities are important for individuals in a society. Computer proficiency is introduced in education in North Carolina where students are assigned to pass the basic skills test in order to know of the advanced technology. High schools in United States introduce basic computer skills course among the new students in order to make them familiar to the technology and prepare them for the future assessments, presentations and further employments (Keengwe, 2007). According to studies if students are literate in computer usage then such courses will be removed from the curriculum (Clariana, 2005). Such act of basic computer literacy is to have a better standard of studies and to make them proficient in their performance.

Research in computer literacy is based mainly on teaching and learning to meet the standards. Moreover, technology helps us to gather facts and give reasoning and learn competitive ways to excel in life. Computer study provides us students with active learning skills to perform in the environment, the technical skills make the students face the challenges of life lays a foundation of developing the skills until they become proficient and then leads to lifelong learning with advancements. They involve various activities and are essential for each individual student to learn. Such technology is taught in groups to boost the learning method and achieve more successfully.

Moreover, universities of United States offer basic computer courses or they hold examinations to test students previous knowledge and learning from the past experience of education. Students may also be offered to optionally select courses and get proficiency in all basics. Universities also assessed students with online tests of their concepts and to check their performance and abilities. As a result of the research in technology it was noticed that students had less knowledge of basic computer concepts and skills, so introductory courses were given which include Information system (IS) and Information Technology (IT) (Morgan, 2000).

In Addition, computers and technology work to make our work easy and less of a burden. Earlier, huge piles of processing and information's could increase the work load. Nowadays, with larger speed and efficiency has made processing an easy task to perform compared to the manual processing. Due to telecommunication technology computers are now easy to operate and reachable (Aina, 2004). Information Technology's vast advancements result in training

workers with the new computer skills to boost their learning in organizations to handle various computer related tasks (Tyner, 1998).

Furthermore, teachers should have a high proficiency in training the computer skills to have an effective learning (Halpin, 2000); (Hirschubhul, 1994). Technical knowledge is a basic demand in jobs for teaching staff as they should be efficient in modern skills, so they can convey skillful knowledge for students as well (College, 2000).

2.3 Research in Computer literacy skills

In North Carolina students are made computer proficient from eighth grade until they complete their graduation diploma to completely learn all basic skills and practically use them in studies. A positive approach is observed among students as they perceived the study in the best way (Thomas, 1999).

Furthermore, educational institutions have arranged a computer-qualifying test named as Education Testing Service (ETS) to assess the literacy rate among students. This is to train students according to market demand and new advanced technology. Apart from mails, letters and sending files students are to be efficient in dealing with the technical problems as well (Young, 2004).

In Addition, another development in IT industry was made by Thomson Pragmatics has designed a basic assessment in the computers consisting of concepts, computer dictionary etc. Test will be in the form of different choice questions which will help in placing students in various courses offered in the universities (Gaber, 1994).

According to UW-Stout survey fresh entry of students was tested with basic literacy knowledge and their aptitude towards computers, it was noted that students had familiarity with computers and word processing compared to other applications (Smith & Furst-Bowe (1993) and Larson & Smith (1994).

Moreover, Information Technology when taught with other subjects and is much more learned and practiced (Halpin, 2000).

2.4 Importance of Computer literacy

Technology is rapidly taking over the world's largest industries and it covers the vast fields of medicine, food, armed forces. Employers are to be proficient in the use of computer skills practically and to operate the technical applications smartly. This industry is on high demand of experienced graduates who deal with the instruments effectively (technology, 2004). Computers have globally connected the whole world and have a positive approach to the future. Computer technology in this modern world links the consumers with the producers to give us the better understanding of the applications (McCoy, 2001).

Information and technology literacy works on evolving competence level and performance among students till grade twelve according to (Instruction, 1998). According to a survey in United States females use technology for word processing and males use for problem solving and programming (Weidman & Cain, 1999). Eventually females in higher studies are less likely to select Information Technology fields (Cetron, 1997). Regardless of the difference young students are keen to learn technology and applications no matter what is the age or gender (Clarke, 1998). But, the presence of computers and their use doesn't justify the competence of literacy skills (Monroy, 2000).

In organizations computers are the basic necessity of work, employers should be skilled with computer literacy in order to carry out different duties and operate. Computers are used in all the field of work to reduce the work force and lessen the burden. University graduates are fulfilled with technical education and learning to be more productive and effective (Johnson, Bartholomew, & Miller, 2006). Computer skills are essential in the study course for graduates to have a better understanding and for good evaluation. This research highlights how students mind perceive the skills and analyze them.

(Monroy, 2000) says computer competence in applications is not complete for literacy. As computer literacy doesn't only include word processing but many other skills are to be acknowledged. However, non-conventional students or those who dislike technology may not take interest in computers.

Moreover, (Philips, p. 2001) says modified form of skills is in demand as the features and new functions are introduced in IT field so the training procedures also evolve with time. Companies

and employees should change the ways of work and become more efficient in new methodologies of work.

Technology is to search, discover and utilize the data as well as to spread the knowledge not just the applications of instruments (Fulton, 1998). According to (Clyde, 1997) technology is dependent on how students utilize the instruments and capable enough to operate the various tools such as Hardware requires the use of keyboard and mouse; System information deal with DOS, windows and network. Software information deals with mails, internet and word processing.

Technology had advanced to online communication level where students use the class website to communicate, read, discuss and make assignments (Lauren Matacio, 2011). College libraries are also facilitated with online service; they deliver mails, online articles, due loans and notices. Students can undergo reading articles, search stuff and ask questions through website (Terry D. Robertson, 2011). Beside this, students are getting more focused on internet for any search and information such as the use of Google and websites rather than books and articles (Wellesley College, 2011).

In addition, students find issue in searching for authentic websites as they get mixed up with advertisements and actual fact data due to lack of knowledge and awareness (Graham & Metaxas, 2011).

2.5 Microsoft Office and Certification

In the worldwide job market, Microsoft Office Specialist is the primary tool companies use to validate the proficiency of their employees in the latest productivity tools and technology, helping them to select job candidates based on globally recognised standards for verifying skills. The results of an independent research reveal that business with certified employees are more productive as compared to non-certified employees and that certified employees bring immense value to their jobs. Around 91% of hiring managers consider certification as part of their hiring criteria. It was also estimated that more than 50% of today's jobs require technology skills and that tis number is growing every year. Moreover, the certified professionals report that they make 5.4% more than their non-certified co-workers

There are many types of certifications Microsoft was providing in early years like (Council, 2004) had connected with IT field also involving Microsoft and Cisco system to acknowledge the assessment methods, to make sure the research work and its performance is well designed to perform in IT jobs. Computer Driving License provides proper diplomas to ensure computer learning with excellence; it focuses on areas such as hardware, processing, software and operating systems (Moore, 2002).

Furthermore, online assessment was designed by SAM (Skills assessment Manager) working with Microsoft to assess both the students and the workers on the basis of efficient usage of Microsoft applications and software applications. SAM provides certain certification training to the students as it is highly in demand nowadays. In Georgia, Robinson college of Business applied SAM 2000 in their course of study for freshman's and graduates to evoke them with literacy skills (Donald, 2004).

In Addition, Online software assessment designed tests which included basic skills as well as software skills. Research proves that organizations need workers with critical pondering skills (Meisinger, 2004). Software skills are also as important and highly required according to (Kinnersley, 2001). Educational Testing Service in 2006 used both the concepts to prepare an online test that will assess on effectiveness and also on the IT abilities (Young, 2004).

Excel also originated an online assessment with the help of Skills Assessment Manager also known as SAM XP it checks the learner's capability of performing on applications of Microsoft Office. It was officially applied in America and the users were awarded with Microsoft Office User Specialist Certification.

Chapter 3: Research Methodology

The focus of this research is to investigate the impact of integrated curriculum (based on Microsoft office specialist training) on the freshmen students of NUST. It aims at designing the curriculum which is world wide accepted and implemented by integrating Microsoft Office Specialist (MOS) training to develop standardized core competencies of freshmen students for Microsoft Office Productivity suite, that would improve their efficiency in future semesters as well employability chances within the industry.

Higher Education Commission (HEC) has introduced a compulsory course on Fundamentals of ICT for freshmen, but learning outcomes related to the use of productivity tools are vaguely defined. This lack of standardization results in planning the course contents based on expertise available in the university, which eventually creates a cohort of students with a range of competencies varying from university to university. The employers may find it difficult to assess students' productivity skills from their grades achieved at various universities. Hence, there is a need to develop a standardized curriculum to gauge the core competencies of students on productivity software attained at university level.

The next section highlights the designing of revised curriculum for Fundamentals of ICT course.

The Revised Curriculum

In 2011, SEECS-NUST introduced a compulsory course called Fundamentals of ICT to first year students of CS and SE programs in compliance with HEC curriculum to meet IT productivity skills of graduate students. This course consists of theory as well as assessed lab modules. The theory part provides introduction to computer systems, operating systems, databases, networking, Internet security, etc., whereas the lab component covers basics of IT skills and computing.

For the sake of this study, an analysis of previous lab contents were carried out to identify the topics introduced in relation to productivity skills. These contents were then compared with Microsoft Office Specialist course contents for MS Word, MS PowerPoint and MS Excel. A revised syllabus was designed based on MOS training content. Table presents a comparison of lab contents of previous syllabus and the revised syllabus in relation to the three selected productivity software i.e. MS Word, MS PowerPoint and MS Excel.

Lab manuals content between old and new lab manual

Productivity Software: MS Word

Topics taught in Old FoICT labs	Topics covered in Revised FoICT Labs
Using Microsoft Word 2013	
Quick Access Toolbar Intro	Give commands from the ribbon and Quick Access Toolbar Manage Word from the Backstage view Customize program options
Creating and displaying documents	
Create a New Document	Create new blank documents Create new documents by using templates Open non-native files in Word Open PDF files in Word for editing Move around in a document Change document views Change magnification levels Split the window Show and hide formatting symbols
Inserting and editing text	
Insert Tab Text box Pictures	Enter text in a document Insert symbols and special characters Paste and append text Insert text and symbols by using AutoCorrect Select text Cut, copy and paste content
Formatting text	
Home tab Font Styles Paragraph-Bulleted and Numbering List	Apply basic formatting Format text by using Format Painter Create WordArt Apply styles to text Clear formatting and styles Set paragraph indentation and spacing Manage paragraph breaks Display content in columns
Inserting and modifying graphics	
SmartArt Graphic Working with Quick Styles Using direct formatting	Insert images from your computer Insert images from the web Modify image properties (color, size, shape)

Using Styles	<ul style="list-style-type: none"> Insert simple shapes Modify shapes Apply Quick Styles to images Apply artistic effects Apply picture effects Insert SmartArt graphics Modify SmartArt properties (color, size, shape) Position shapes and images Wrap text around shapes and images
Finding and replacing content	
Not Covered	<ul style="list-style-type: none"> Search for text Move to specific locations and elements Find and replace text Format text by using the Replace command
Creating and modifying lists	
Not Covered	<ul style="list-style-type: none"> Create bulleted, numbered, and multilevel lists Modify list structure Modify bullet characters Modify number schemes
Creating and modifying tables	
Table	<ul style="list-style-type: none"> Create basic tables Convert text to tables Set AutoFit options Insert preformatted tables Format tables Sort table data Modify table structure Convert tables to text Use table data in formulas
Creating links	
Inserting Hyperlinks	<ul style="list-style-type: none"> Create bookmarks Insert hyperlinks
Formatting documents	
<ul style="list-style-type: none"> Page Setup Page Background Watermarks WordArt SmartArt Graphic Working with Quick Styles 	<ul style="list-style-type: none"> Change document themes Change document style sets Insert simple headers and footers Insert page numbers Insert watermarks Configure page backgrounds Modify page setup

Using direct formatting Headers and Footers Page Numbers Drop Caps Using Styles	Manage page breaks Create document sections
Saving and printing documents	
Protect/Restrict Editing Language Tools	Save documents in non-standard file formats Maintain backward compatibility Save files to remote locations Modify document properties Protect documents by using passwords Configure documents to print
Inserting and managing content objects	
Insert text boxes	Insert document properties Insert built-in fields Insert text boxes Insert Quick Parts Organize Building Blocks Customize Building Blocks
Inserting and managing references	
Endnotes/Footnotes Captions Cross References Indexing Citations and Bibliography	Insert footnotes and endnotes Manage footnote locations Configure endnote formats Modify footnote numbering Insert citations and placeholders Change citation styles Insert bibliographies Add captions Set caption positions Change caption formats and labels Exclude labels from captions
Customizing program functionality	
Comments Track Changes Comparing Documents	Customize the Quick Access Toolbar Customize the ribbon Record simple macros Manage macro security Assign keyboard shortcuts

Table 1 Comparison of old and revised lab Manuals for MS Word

Productivity Software: **PowerPoint**;

Topics taught in Old FoICT labs	Topics covered in Revised FoICT Labs
Using Microsoft PowerPoint 2013	
Intro to ribbon Intro to Home Tab	Exploring the user interface Opening and closing files Using views to navigate through presentations Changing to view in color/grayscale
Create and save presentations	
PowerPoint Templates Create and save a presentation as a template Create a PowerPoint template	Creating blank presentations Creating presentations by using templates Modifying presentation properties Importing text files into presentations Importing online documents into presentations Maintaining backward compatibility Saving presentations as web pages Packaging presentations for CD
Format slide content	
Design Tab Intro	Applying styles to slides Modifying slide backgrounds Changing page setup options Applying formatting and styles to text Changing text to WordArt Inserting hyperlinks Creating bulleted and numbered lists Creating multiple columns in a single shape
Manage slides	
	Modifying slide order Inserting section headers Hiding slides

	Deleting slides Inserting transitions between slides Managing multiple transitions Modifying transition effect options
Display images on slides	
	Inserting pictures on slides Resizing images Cropping images Applying effects Applying styles
Display shapes on a slide	
Photo Album	Inserting shapes Creating custom shapes Applying styles to shapes Resizing shapes Modifying shape backgrounds Applying borders to shapes Aligning and grouping shapes Displaying gridlines
Display business diagrams on slides	
SmartArt Insert SmartArt Add/Delete/Move Shapes Change Style/Color of SmartArt Graphic Change Orientation of SmartArt	Converting lists to SmartArt Adding shapes to SmartArt Changing color of SmartArt Moving text within SmartArt shapes Reversing the direction of SmartArt elements
Display tables on slides	
	Creating tables Importing tables from external sources Applying table styles Modifying number of rows and columns
Display charts on slides	
Elements of a Chart Create a Chart Apply Predefined Chart Layout/Style	Inserting charts Importing charts from external sources Creating and modifying chart styles Modifying chart type Adding legends to charts Modifying chart parameters

Play audio and video clips	
<ul style="list-style-type: none"> • Inserting Video and Audio Clips <p>How to Insert a Sound File</p>	<p>Linking to external media Setting start/stop times Setting media options Adjusting media window size Trimming timing on media clips</p>
Configure animations	
<p>Animations tab Intro</p>	<p>Applying animations to shapes Applying animations to text strings Adding paths to animations Modifying duration of effects Modifying animation options Configuring start and finish options Reordering animations Using the Animation Pane</p>
Configure presentation themes and templates	
<p>Insert text boxes Slide Show tab Intro View tab Intro</p>	<p>Modifying presentation themes Applying slide masters Adding new layouts Modifying existing layouts Adding background images Controlling page numbers Inserting headers and footers Adding slide layouts Duplicating existing slides</p>
Collaborate on presentations	
	<p>Merging multiple presentations Reusing slides from other presentations Viewing multiple presentations Setting track changes Modifying options for track changes Discarding changes from specific users Managing comments</p>
Prepare and present slide shows	
<p>Slide Show tab Intro</p>	<p>Creating custom slide shows Configuring slide show options Rehearsing timing Configuring slide show resolution</p>

	Using Presenter View Navigating within slide shows Annotating slide shows
Distribute presentations	
	Proofing presentations Checking for accessibility issues Checking for compatibility issues Setting handout print options Printing selections from presentations Printing presentations in grayscale Printing speaker notes Removing presentation metadata Marking as final Compressing media Embedding fonts Restricting permissions Encrypting presentations with a password

Table 2 Comparison of old and revised lab Manuals for MS PowerPoint

Productivity Software: **MS Excel**

Topics taught in Old FoICT labs	Topics covered in Revised FoICT Labs
Using Microsoft Excel 2013	
Change A Column's Width	Exploring the user interface Opening and closing files Setting the magnification level Changing workbook views Identifying worksheet elements Selecting cells, rows, columns, and text Adjusting row height and column width
Creating and saving workbooks	
Enter and delete data in worksheet	Creating new blank workbooks Creating new workbooks by using templates Adding values to workbook properties

	<p>Saving workbooks to remote locations</p> <p>Saving workbooks in alternative file formats</p> <p>Maintaining backward compatibility</p>
Populating worksheets	
<p>Design Tab Intro</p> <p>Copy, Cut, Paste, and Cell Addressing</p>	<p>Opening non-native files directly in Excel</p> <p>Importing files</p> <p>Appending data to worksheets</p> <p>Copying and pasting data</p> <p>Transposing columns and rows</p> <p>Using AutoFill</p> <p>Using Flash Fill</p> <p>Expanding data across columns</p>
Managing data	
	<p>Searching for data within a workbook</p> <p>Finding and replacing data</p> <p>Using the Name box</p> <p>Using Go To</p> <p>Creating named ranges</p>
Managing worksheets	
<p>Insert and Delete Columns and Rows</p> <p>Intro to View tab</p> <p>Freezing Rows or Columns</p>	<p>Adding worksheets to existing workbooks</p> <p>Copying and moving worksheets</p> <p>Changing worksheet order</p> <p>Changing worksheet tab color</p> <p>Inserting hyperlinks</p> <p>Hiding worksheets</p> <p>Inserting and deleting columns and rows</p> <p>Inserting and deleting cells</p> <p>Hiding columns and rows</p> <p>Freezing panes</p> <p>Splitting the window</p> <p>Opening additional windows</p> <p>Arranging additional windows</p>

Formatting worksheet content	
Align Cell Entries Format Numbers Change a decimal to a percent. Merge and center Change the Font, Font Size, and Font Color	Changing font and font styles Applying number formats Using the Format Painter Modifying cell alignment and indentation Wrapping text within cells Merging cells Applying cell formatting Applying cell styles Changing workbook themes
Printing workbook content	
Move to a New Worksheet	Inserting headers and footers Inserting watermarks Modifying page setup Repeating headers and footers Setting print scaling Configuring workbooks to print Printing individual worksheets Setting a print area
Creating and using formulas	
Perform Mathematical Calculations <ul style="list-style-type: none"> • + Addition • Subtraction • Multiplication • / Division • ^ Exponential 	Defining an order of operations Referencing cell ranges in formulas Utilizing references (relative, mixed, absolute) Displaying formulas Setting data validation Specifying input messages Configuring error alerts Pinpointing invalid data
Calculating data by using functions	

<p>AutoSum</p> <p>Intro to Perform Automatic Calculations</p> <p>Perform Advanced Mathematical Calculations</p> <p>Addition, Subtraction, Multiplication</p> <p>Division use at a time in calculations</p>	<p>Utilizing the SUM function</p> <p>Utilizing the AVERAGE function</p> <p>Utilizing the MIN and MAX functions</p> <p>Utilizing the COUNT function</p> <p>Utilizing the SUMIF function</p> <p>Utilizing the AVERAGEIF function</p> <p>Utilizing the COUNTIF function</p> <p>Utilizing the RIGHT, LEFT, and MID functions</p> <p>Utilizing the TRIM function</p> <p>Utilizing the UPPER and LOWER functions</p> <p>Utilizing the CONCATENATE function</p>
<p>Managing data by using tables</p>	
	<p>Converting tables and ranges</p> <p>Applying styles to tables</p> <p>Changing sort order</p> <p>Sorting data on multiple columns</p> <p>Filtering records</p> <p>Defining titles</p> <p>Banding rows and columns</p> <p>Removing styles from tables</p> <p>Adding and removing cells within tables</p> <p>Removing duplicates</p> <p>Inserting Total rows</p>
<p>Creating and managing charts</p>	
<p>Charts group</p>	<p>Creating charts</p> <p>Positioning charts</p> <p>Resizing charts</p> <p>Applying chart layouts and styles</p> <p>Adding chart legends</p> <p>Modifying chart parameters</p> <p>Adding data series to charts</p> <p>Switching between rows and columns in chart source data</p>
<p>Simplifying data presentation</p>	
<p>Insert Tab</p> <ul style="list-style-type: none"> • Sparklines 	<p>Using Quick Analysis</p> <p>Applying conditional formatting</p> <p>Inserting sparklines</p> <p>Inserting subtotals</p>

	<ul style="list-style-type: none"> Creating outlines Collapsing groups of data in outlines
Inserting and creating graphics	
<ul style="list-style-type: none"> Create borders Add background color Work with Long Text 	<ul style="list-style-type: none"> Inserting images Positioning objects Creating text boxes Creating WordArt Creating SmartArt Adding borders to objects Adding styles and effects to objects Changing object colors Modifying object properties
Customizing program functionality	
	<ul style="list-style-type: none"> Managing macro security Recording simple macros Assigning shortcut keys Customizing the Quick Access Toolbar

Table 3 Comparison of old and revised lab Manuals for MS Excel

After redesigned, the new syllabus was implemented by integrating it in FoICT labs on weekly basis. There were total of 3 labs for each module i.e. MS Word, MS PowerPoint and MS Excel respectively, hence altogether there were 9 labs dedicated for the use of productivity software. Each lab consisted of 3 hours, in which students were provided the guided instructions and facilitation to perform the assigned tasks related to the lab. After the completion of assigned tasks, students were to take a certified MOS exam for each module.

3.1 Research Design

The purpose of this study is to examine impact of revised ICT course curriculum by integrating Microsoft Office Specialist Certification on core IT productivity software (MS Word, MS PowerPoint, MS Excel) commonly used in universities and work places. Hence, the study adopted a mixed method research approach with predominantly quantitative analysis using post-test only quasi experiment research design. The experiment group students of Fall 2016 batch of

Computer Science and Software Engineering at NUST were exposed to revised FoICT curriculum including MOS certification on MS Word, MS PowerPoint and MS Excel, whereas, the previous year batches of Fall 2015 from Computer Science and Software Engineering departments was considered as the control group who were taught the FoICT labs using lab manuals prepared by the instructors.

3.2 Research Questions and Respective Hypotheses

The primary research question of this study is:

What is the impact of revised FoICT curriculum using MOS certifications on Students' MS Word, MS PowerPoint and MS Excel productivity skills?

The subsequent hypotheses to answer the aforementioned research question are:

H1: The revised FoICT curriculum significant impact on student's word processing skills

H₀1: The revised FoICT curriculum has no significant impact on students Word processing skills

H2: The revised FoICT curriculum significant impact on student's PowerPoint presentation skills

H₀2: The revised FoICT curriculum has no significant impact on students' PowerPoint presentation skills

H3: The revised FoICT curriculum significant impact on student's spreadsheet processing skills

H₀3: The revised FoICT curriculum has no significant impact on student's spreadsheet processing skills

3.3 Variables in the Study

As discussed earlier, the focus of this research thesis is to see if there are any improvements in basic computer skills of the students. For this purpose, we have selected Experiment Group & 2015 students. The Experiment Group were given basic Microsoft office certification training and their improvement is measured by pretest and posttest approach. For the Control Group, we have collected the data of skills in IT productivity tools (MS Word, MS PowerPoint, MS Excel) and then it was compared with posttest results of 2016 batch (EE & CS). Therefore, the variable

for this study is the result of survey questions. Since, in this study we are not segregating the population based on gender or on other criteria therefore, there are no other variables in this study.

3.4 Instrumentation

This study employed Microsoft office specialist kit's content to design the survey for measuring the improvement in students' performance. For the Experiment Group students, we have applied pretest survey and then based on the contents of Microsoft office specialist kit, special trainings sessions were delivered to the students. It is important to mention here that for this study we have checked the skills of students only in MS Word, MS Excel & MS Power Point. Separate surveys were designed for each of above mentioned packages. After the delivery of trainings to the students, the same survey is used to collect the posttest data from the students.

3.5 Sample

In the population of this study there were five sections from batch of 2016 which were the part of Experiment group while there were five sections from batch of 2015 which were part of the control group. Both groups were taking FoICT course in their first semester. Control and experiment both groups had students from Software and Electrical Engineering department.

Following table shows the details of Experiment group and control group

Groups	Batches	No. of students enrolled on FoICT Course
Control Group	BESE 6A	40
	BESE 6B	43
	BSCS 5A	39
	BSCS 5B	44
	BSCS 5C	41
Experiment Group	BESE 7A	44
	BESE 7B	42

	BSCS 6A	37
	BSCS 6B	36
	BSCS 6C	38
Total:	403	

Table 4 Sample

For each section instructor administered the pretest and posttest survey to those students who were in those selected five sections. A total of 396 students participated in this study. Out of this total there are 203 students from the batch of 2016 and 193 students from 2015 batch. The Experiment Group is enrolled in their first computer literacy course whereas; the Control Group has studied this course a year ago.

3.6 Data Collection tools

3.6.1 Qualitative data collection tool

The data collection process for CS and SE batch of 2016 was based on almost three months' time duration. For 2015 batch it took almost 5 weeks. Online tool" Google form" used in the study to collect the responses. google forms have the beauty that we can develop multiple choice questioners and can have the option to make sections of questions of different numbers. Along with it there is an option to create Excel Sheet of those responses. In this way students only need to sign in using their Email ID provided by the university and there would be no need of installing any software. Google forms also show the summery of responses in terms of Pi chart with description. Google forms also provide the opportunity to see quickly how many students are done with completing the test or survey and also it gives one-time chance to fill the form from one email address so chance of fake responses was minimized. Data collection process also included the MOS trainings for each MS office module. Three sections of Computer Science and two Sections of Software Engineering department from SEECs has participated in the study. They all were enrolled in FoICT course. MOS trainings were conducted in SEECs labs. Each Module of IT productivity tools has been covered in three lab sessions. MOS trainings were delivered using the Lab manuals prepared by me. Total of nine lab manuals developed for training purpose. Lab manuals were developed from taking material from Microsoft office instructor material based on the common career technical core standards. CCSS standards were tried to maintain in our lab manuals as well. Apart from that three pretests and three posts tests

were also prepared for those five sections who were taking FoICT course. The survey for MS word consisted of 106 questions divided into 15 sections. The number of questions in MS Excel's survey is 114 and they are divided in to 14 sections. The PowerPoint survey has a total of 106 questions and these are divided in to 15 sections. These questions were developed from taking material from Microsoft office instructor material based on the common career technical core standards. CCSS standards were tried to maintain in Pre and Posttests as well.

3.6.1 Qualitative data collection tool

The research study has implemented data collection tools (IDIs and FGDs) to collect data. This data has helped us to find out the impact of redesigned curriculum on student's learning. These tools have helped in finding the reaction of Lab instructors about this redesigned curriculum. Following is the brief abstract of the tools we have used in research study;

Interview questionnaire for Lab Instructors

Generic questionnaire based on research questions were created to know the Lab instructors' perceptions/opinion about that redesigned FoICT curriculum. The questionnaire developed for Lab instructors included differentiation in the convectional and redesigned lab manuals for MS office tool kit. It has also covered the queries related to student's learning and motivation in their MS office tools usage skills. Questions were asked in multiple ways to collect rich data.

Focused group discussions with students

A questionnaire script based on research questions were created to conduct FGDs. Script included the debate provoking questions related to MOS trainings included in FoICT course.

These discussions were held to get the feedback from Experiment group. The focus group discussion sessions conducted with 4 groups of students. Each group was consisted of 5 students.

3.7 Data Analysis

As discussed earlier this study is based on the score of pretest, posttest and survey score of batch 2015. For the analysis of this data standard research strategies are implied. IBM SPSS version 20, a software package for data analysis, was used to analyze the data. Hypotheses for research questions are evaluated at a confidence interval of 95% (.05). The statistical tests used in this data analysis are non-parametric tests because the data could not pass the normality test. Mann

Whitney test is used for comparing the score of batch 2016 & 2015 and for comparing the score of pretest and posttest we used Wilcoxon test. The description of both these tests is given below: Data analysis is done by applying two tests Mann –Whitney U test and Wilcoxon test using SPSS Software (A data analysis tool).

The Mann Whitney U test is applied to measure the difference between the Post test results of Experiment group of 2016 batch (CS, SE) and control group of batch 2015 (SE, CS). Another reason for using Mann Whitney test is, because data could not pass the normality test which is applied on SPSS. Mean ranks for each section were compared to deduce results.

The Wilcoxon signed-rank test is used to compare two sets of scores that come from the same participants. This can occur when we wish to investigate any change in scores from one-time point to another, or when individuals are subjected to more than one condition.

The Wilcoxon signed rank test is a statistical test used for comparing the pre and posttests of the same group. This test is useful when there is a need to identify any change occurs after applying some trainings or techniques on the same group. For applying the Wilcoxon signed procedure there are certain assumptions for this test which need to be fulfilled. Our data is meeting the assumption #2 of the Wilcoxon signed-test i.e. our independent variable is based on Matched pairs. There is a single subject in present in both groups i.e. Electrical Engineering and software engineering students of batch 2016.our first related group is comprised of the freshmen of batch 2016 who are enrolled in Electrical Engineering and computer science group. While the same group has been gone through the post test.

3.8 Summary

In this 3 chapter, research methodology is discussed. In which it is discussed that what kind of research designed is used along with discussing the participants of the study. This Chapter has also covered the research questions and the related hypothesis and the process involved in data collection. The study has included 5 sections of CS and SE department from SEECS, NUST. These all sections were register in FoICT course. Next chapter includes the data analysis and results of the study.

Chapter 4: Data Analysis and Results

The data collected for this research is based two data types Qualitative and Quantitative. Quantitative data is based predominantly on post-test scores from 403 students enrolled in Fundamentals of ICT course during 2015 (Control group) and 2016 (Experiment group). The data included firstly, the mean ranks and significant values within experiment group after comparing the pre and post tests of experiment group (2016 batch) and secondly, comparing post test scores of the control group (2015 batch). The tests were administered through google forms and were based on the MOS content derived from MOS syllabus. Each experiment group student had to complete pre-tests as well as post-tests based on MS word, MS Excel and MS PowerPoint. The control group students were asked to fill in post-tests only for MS Word, MS Excel and MS PowerPoint to make post-test comparison with experiment group.

Qualitative data was collected from the interviews of the Lab instructors who had conducted FoICT labs in last 2 to 3 years. Moreover, three Focused Group Discussions (FGDs) were also held with five to seven students in each group who had attended MOS trainings.

The study was guided by a main research question against which three hypotheses were generated as mentioned in next section. The quantitative data was analyzed using SPSS statistical software whereas, thematic analysis was performed on qualitative data gathered through IDIs and FGDs.

4.1 Data analysis and results for Microsoft Office Word

The main research question that this study intended to investigate was:

What is the impact of revised FoICT curriculum using MOS certifications on Students' MS Word, MS PowerPoint and MS Excel productivity skills?

The consequent hypothesis is:

H1: Revised FoICT curriculum has a significant impact on student's word processing skills

H01: There is no effect of revamped curriculum on student's basic IT productivity skills especially in MS word.

Before selecting the appropriate test for significance, the assumption of normality was proved as follows:

4.1.1. Normality Test of the responses for Experiment group

In order to check the normality of the data we have applied the normality test. The results show that our data is not normally distributed because sig level is less than 0.05 MS Word. The detailed results of normality test for MS word is given below;

Descriptive			Statistic	Std. Error
	Mean		168.9538	2.97390
	95% Confidence Interval for Lower Bound		163.0885	
	Mean	Upper Bound	174.8192	
	5% Trimmed Mean		167.7308	
	Median		163.0000	
	Variance		1724.591	
Total	Std. Deviation		41.52819	
	Minimum		96.00	
	Maximum		275.00	
	Range		179.00	
	Interquartile Range		60.00	
	Skewness		.444	.174
	Kurtosis		-.522	.346

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
gtotal	.079	195	.005	.971	195	.001

a. Lilliefors Significance Correction

Table 5 Normality Test Results - MS Word

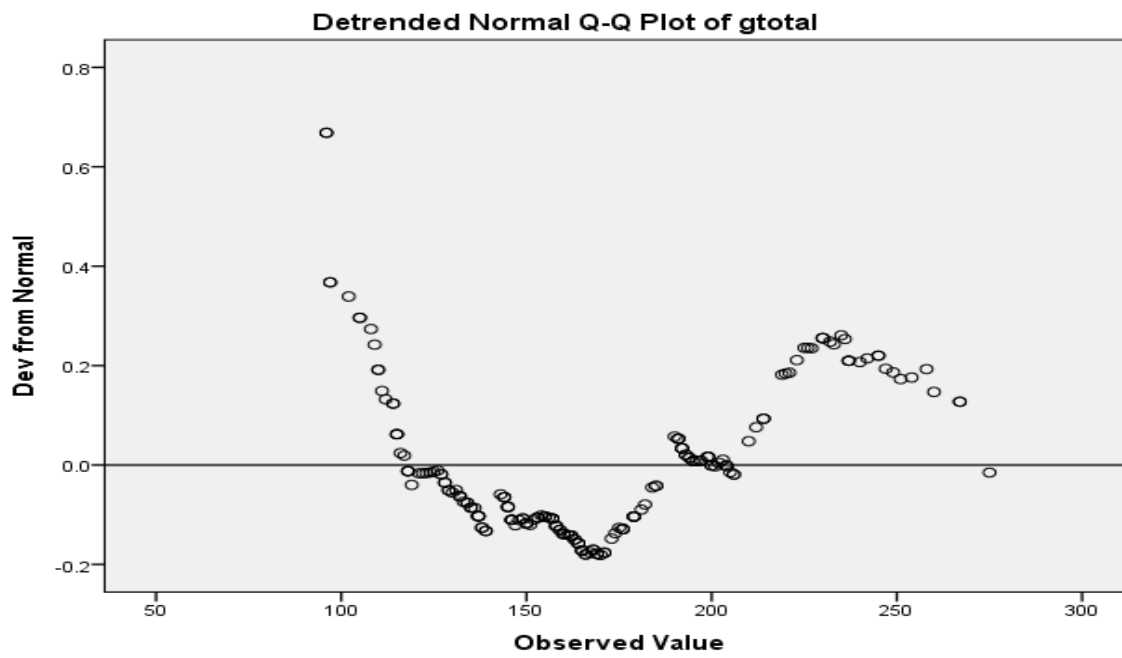
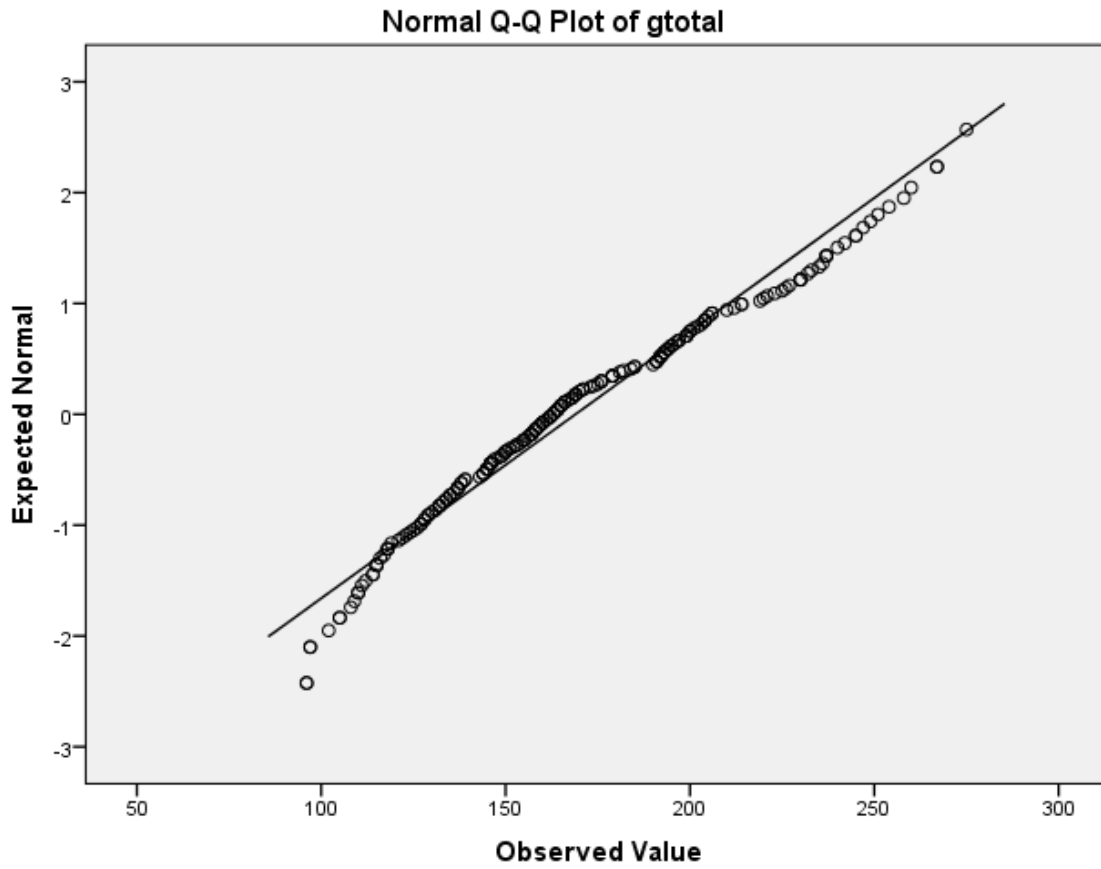


Figure 1 Normality Test Plot - MS Word

The normality test on the above data shows that the data is not normally distributed. As the value of significance is less than 0.05.

As in both the cases data is not normally distributed, so the non-parametric test will be applied

Thus we have applied the non-parametric test on the combined data of control and experiment group. Mann Whitney test is applied to compare the mean ranks of the data.

Control Group Vs Experiment Group Results

As we have discussed in the research methodology section, the word survey based on the Microsoft office specialist curriculum is consist of 15 sections. In all the sections we have compared the mean rank of control group students with experiment group students. As shown in the below mentioned table in section 1 the mean rank of control group is 164.89 and experiment group is 233.5. Similarly mean rank for section 2,3,4,5,6 –till 15 is as we can see in below mentioned table the mean rank of experiment group is higher than the control group mean rank. However, in section in S4 and S7 this is not the case. In these sections the mean rank of control group is more than experiment group.

We have applied the Mann Whitney test on control and experiment group data. As the results are shown in the below mentioned table. The Z value of all the sections is less than 0.05. But in section 7 the value of Z is greater then 0.05 which means there is no significant difference between the performances of control and experiment group. However, as we have seen in the mean ranked value table the value of section 4 is also higher than the value of experiment group. However, Mann Whitney results shows that there is significant difference between the performance of control and experiment group. but it is revered in order as per our hypothesis.

TEST Results				
	Name	N	Mean Rank	Z value (Mann Whitney Test)
S1:	Control Group	203	164.89	0.000
	Exp Group	193	233.85	

	Total	396		
S2:	0	203	182.82	0.000
	1	193	214.99	
	Total	396		
S3:	0	203	165.19	0.000
	1	193	233.53	
	Total	396		
S4:	0	203	209.59	0.026
	1	193	219.54	
	Total	396		
S5	0	203	187.06	0.000
	1	193	210.53	
	Total	396		
S6	0	203	177.83	0.000
	1	193	220.24	
	Total	396		
S7	0	203	207.37	0.89
	1	193	214.47	
	Total	396		
S8	0	203	159.43	0.000
	1	193	239.60	
	Total	396		
S9	0	203	177.59	0.000
	1	193	220.49	
	Total	396		
S10	0	203	181.88	0.000
	1	193	215.98	
	Total	396		
S11	0	203	166.74	

	1	193	231.91	0.000
	Total	396		
S12	0	203	168.28	0.000
	1	193	230.28	
	Total	396		
S13	0	203	155.85	0.000
	1	193	243.36	
	Total	396		
S14	0	203	150.45	0.000
	1	193	249.04	
	Total	396		
S15	0	203	148.89	0.000
	1	193	250.68	
	Total	396		

Table 6 Mann Whitney test - MS Word

Data Analysis of Experiment Group

Introduction

The Wilcoxon signed-rank test is used to compare two sets of scores that come from the same participants. This can occur when we wish to investigate any change in scores from one-time point to another, or when individuals are subjected to more than one condition.

The Wilcoxon signed rank test is a statistical test used for comparing the pre and posttests of the same group. This test is useful when there is a need to identify any change occur after applying some trainings or techniques on the same group. For applying the Wilcoxon signed procedure there are certain assumptions for this test, which need to be fulfilled. Our data is meeting the assumption #2 of the Wilcoxon signed-test i.e. our independent variable is based on Matched pairs. There is a single subject in present in both groups i.e. Electrical Engineering and software engineering students of batch 2016. Our first related group is comprised of the freshmen of batch

2016 who are enrolled in Electrical Engineering and computer science group. While the same group has been gone through the posttest.

Wilcoxon Signed Ranks Test

Ranks				
		N	Mean Rank	Z Value
t1 - s1	Negative Ranks	16 ^a	42.13	.000
	Positive Ranks	165 ^b	95.74	
	Ties	12 ^c		
	Total	193		
t2 - s2	Negative Ranks	24 ^d	53.38	.000
	Positive Ranks	156 ^e	96.21	
	Ties	13 ^f		
	Total	193		
t3 - s3	Negative Ranks	37 ^g	58.70	.000
	Positive Ranks	102 ^h	74.10	
	Ties	54 ⁱ		
	Total	193		
t4 - s4	Negative Ranks	25 ^j	48.98	.000
	Positive Ranks	135 ^k	86.34	
	Ties	33 ^l		
	Total	193		
t5 - s5	Negative Ranks	21 ^m	52.88	.000
	Positive Ranks	151 ⁿ	91.18	
	Ties	21 ^o		
	Total	193		
t6 - s6	Negative Ranks	20 ^p	35.53	.000
	Positive Ranks	166 ^q	100.48	
	Ties	7 ^r		

	Total	193		
t7 - s7	Negative Ranks	21 ^s	43.76	.000
	Positive Ranks	156 ^t	95.09	
	Ties	16 ^u		
	Total	193		
t8 - s8	Negative Ranks	13 ^v	28.19	.000
	Positive Ranks	175 ^w	99.43	
	Ties	5 ^x		
	Total	193		
t9 - s9	Negative Ranks	8 ^y	33.81	.000
	Positive Ranks	159 ^z	86.53	
	Ties	26 ^{aa}		
	Total	193		
t10 - s10	Negative Ranks	15 ^{ab}	37.73	.000
	Positive Ranks	175 ^{ac}	100.45	
	Ties	3 ^{ad}		
	Total	193		
t11 - s11	Negative Ranks	22 ^{ae}	46.93	.000
	Positive Ranks	161 ^{af}	98.16	
	Ties	10 ^{ag}		
	Total	193		
t12 - s12	Negative Ranks	15 ^{ah}	24.80	.000
	Positive Ranks	167 ^{ai}	97.49	
	Ties	11 ^{aj}		
	Total	193		
t13 - s13	Negative Ranks	12 ^{ak}	20.71	.000
	Positive Ranks	177 ^{al}	100.04	
	Ties	4 ^{am}		

	Total	193		
t14 - s14	Negative Ranks	11 ^{an}	26.86	.000
	Positive Ranks	177 ^{ao}	98.70	
	Ties	5 ^{ap}		
	Total	193		
t15 - s15	Negative Ranks	9 ^{aq}	22.61	.000
	Positive Ranks	175 ^{ar}	96.09	
	Ties	9 ^{as}		
	Total	193		

Table 7 Wilcoxon Signed Ranks Test - MS Word

4.2 Data analysis and results for MS PowerPoint Research Question and Null Hypothesis

What is the impact of revised FoICT curriculum using MOS certifications on Students' MS Word, MS PowerPoint and MS Excel productivity skills?

H2: Revised FoICT curriculum has a significant impact on student's PowerPoint processing skills

Ho2: There is no effect of revamped curriculum on student's basic IT productivity skills especially in MS PowerPoint

Normality Test for experiment group

In order to check the normality of the data we have applied the normality test. The results show that our data is not normally distributed because sig level is less than 0.05 for MS PowerPoint. The detailed results of normality test for MS PowerPoint is given below

Descriptives

		Statistic	Std. Error
	Mean	178.0000	3.85249
	95% Confidence Interval for Lower Bound	170.4023	
	Mean Upper Bound	185.5977	
	5% Trimmed Mean	175.1889	
	Median	167.0000	
	Variance	2923.816	
power	Std. Deviation	54.07232	
	Minimum	103.00	
	Maximum	309.00	
	Range	206.00	
	Interquartile Range	78.00	
	Skewness	.696	.173
	Kurtosis	-.224	.345

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
power	.083	197	.002	.941	197	.000

a. Lilliefors Significance Correction

Table 8 Normality Test - MS PowerPoint

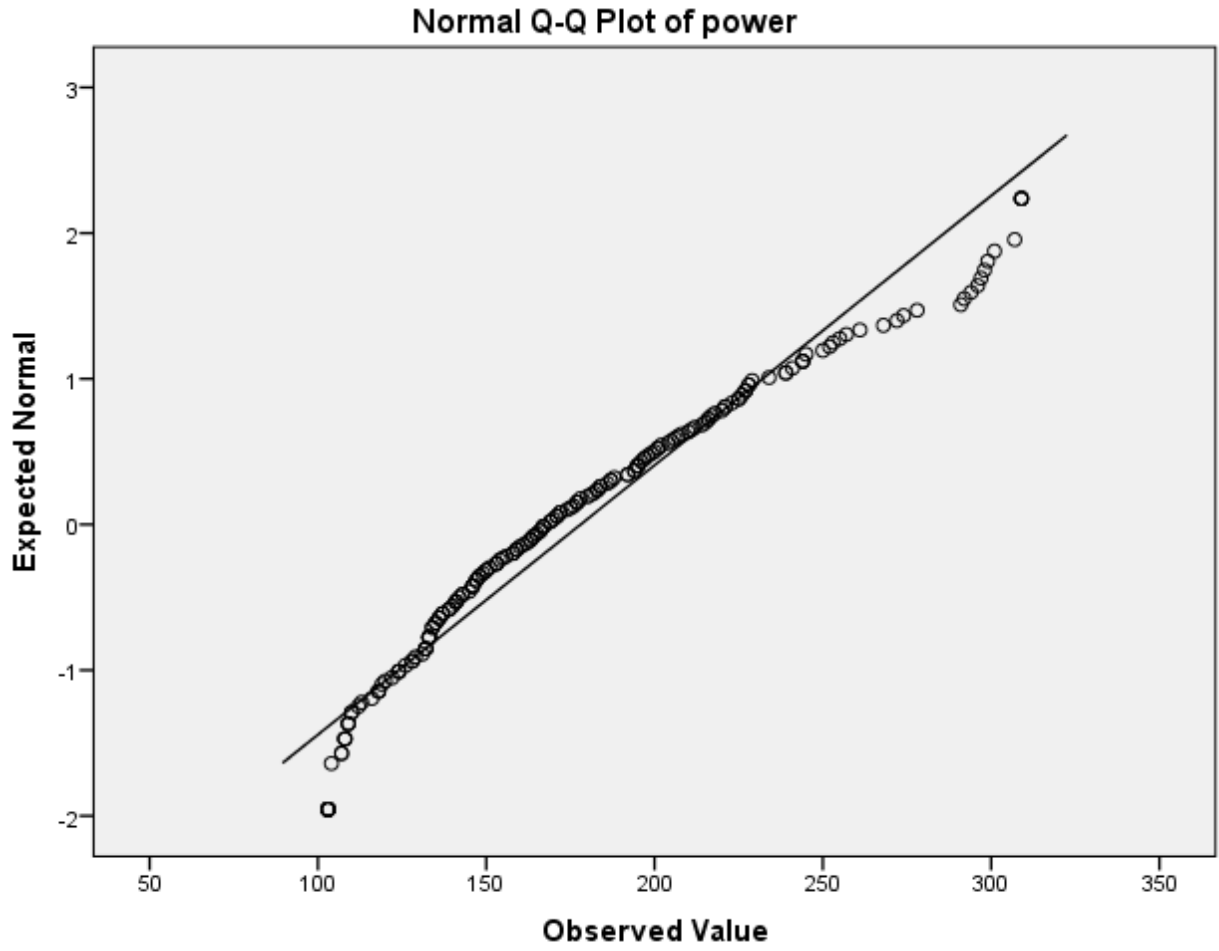
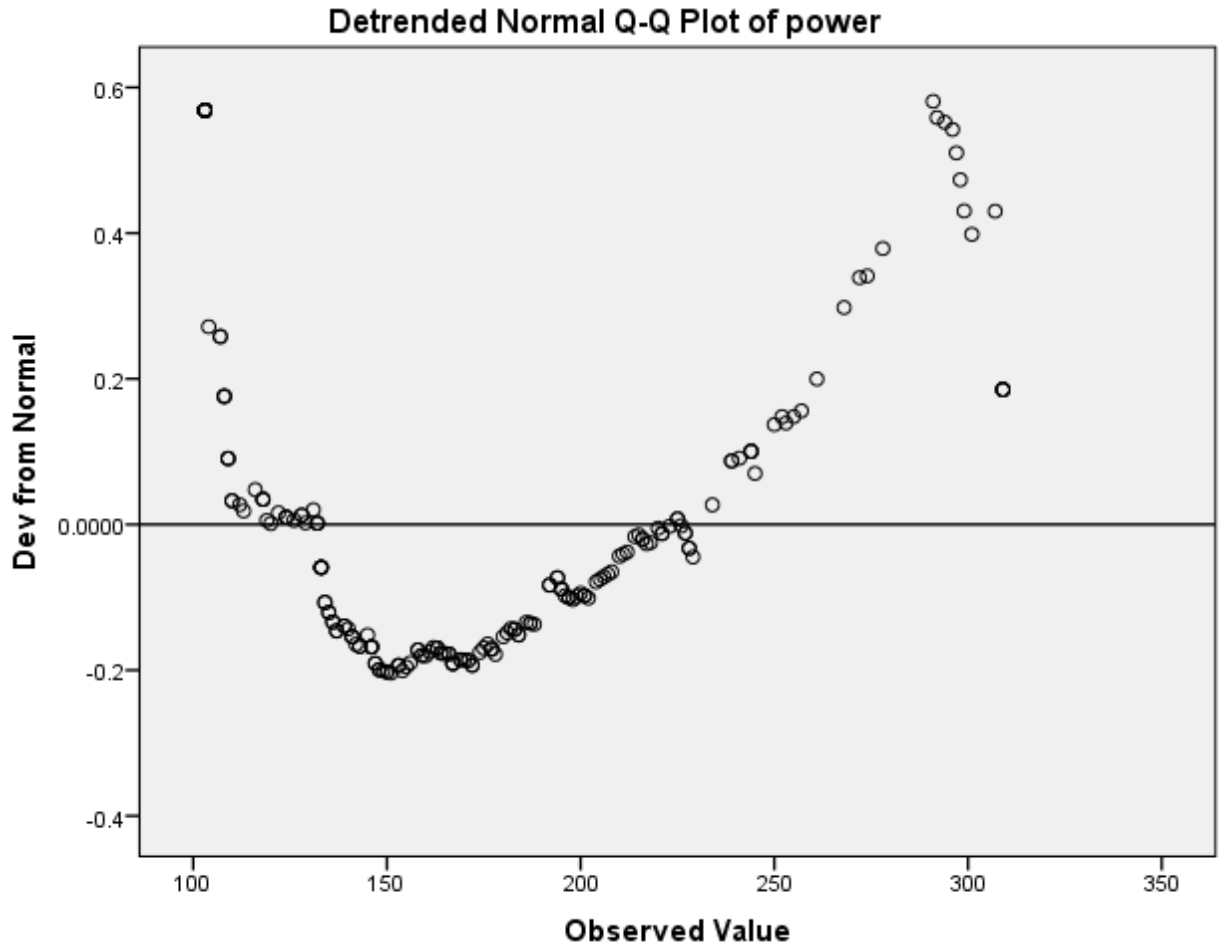


Figure 2 Normality Test Plot - MS PowerPoint



Control Group Vs Experiment Group Results

Microsoft PowerPoint Survey is based on the curriculum taken from Microsoft Office specialist curriculum. It was consisted of 15 sections. Each section is based on the use of PowerPoint. In all the sections mean ranked of control group is compared with the the mean rank of experiment group students. As shown in the below mentioned table in section 1 the mean rank for experiment group is 234.56 and for control group is 170.86. It shows the difference of 64.5. Similarly, for all the sections from section 1 to section 15, overall the mean rank is higher for experiment group. This is supporting the hypothesis

We have applied the Mann Whitney test on control and experiment group data. As the results are shown in the below mentioned table. The Z value of all the sections is less than 0.05. It means

there is no significant difference between the performances of control and experiment group. However, as we have seen in the mean ranked value table the value of section 4 is also higher than the value of experiment group. However, Mann Whitney results shows that there is significant difference between the performance of control and experiment group. but it is reversed in order as per our hypothesis.

Stats Test Results				
	Name	N	Mean Rank	Z Value (Mann Whitney Test)
s1	0	206	170.86	.000
	1	197	234.56	
	Total	403		
s2	0	206	144.29	.000
	1	197	262.35	
	Total	403		
s3	0	206	158.58	.000
	1	197	247.41	
	Total	403		
s4	0	206	148.15	.000
	1	197	258.31	
	Total	403		
s5	0	206	179.95	.000
	1	197	225.05	
	Total	403		
s6	0	206	144.22	.000
	1	197	262.42	
	Total	403		
s7	0	206	128.14	.000
	1	197	279.23	

	Total	403		
s8	0	206	152.69	.000
	1	197	253.56	
	Total	403		
s9	0	206	141.40	.000
	1	197	265.37	
	Total	403		
s10	0	206	140.17	.000
	1	197	266.65	
	Total	403		
s11	0	206	133.60	.000
	1	197	273.52	
	Total	403		
s12	0	206	145.53	.000
	1	197	261.05	
	Total	403		
s13	0	206	137.59	.000
	1	197	269.36	
	Total	403		
s14	0	206	137.11	.000
	1	197	269.85	
	Total	403		
s15	0	206	126.93	.000
	1	197	280.50	
	Total	403		

Table 9 Mann Whitney Test - MS PowerPoint

Data Analysis of Experiment Group

Introduction

The Wilcoxon signed-rank test is used to compare two sets of scores that come from the same participants. This can occur when we wish to investigate any change in scores from one-time point to another, or when individuals are subjected to more than one condition.

The Wilcoxon signed rank test is a statistical test used for comparing the pre and post tests of the same group. This test is useful when there is a need to identify any change occur after applying some trainings or techniques on the same group. For applying the Wilcoxon signed procedure there are certain assumptions for this test which need to be fulfilled. Our data is meeting the assumption #2 of the Wilcoxon signed-test i.e. our independent variable is based on Matched pairs. There is a single subject in present in both groups i.e. Electrical Engineering and software engineering students of batch 2016.our first related group is comprised of the freshmen of batch 2016 who are enrolled in Electrical Engineering and computer science group. While the same group has been gone through the post test.

Wilcoxon Signed Ranks Test

		Ranks		
		N	Mean Rank	Z Value
t1 - S1	Negative Ranks	15 ^a	52.50	.000
	Positive Ranks	155 ^b	88.69	
	Ties	27 ^c		
	Total	197		
t2 - s2	Negative Ranks	13 ^d	41.54	.000
	Positive Ranks	174 ^e	97.92	
	Ties	10 ^f		
	Total	197		
t3 - s3	Negative Ranks	17 ^g	50.82	.000
	Positive Ranks	161 ^h	93.58	
	Ties	19 ⁱ		
	Total	197		

t4 - s4	Negative Ranks	9 ^l	40.33	.000
	Positive Ranks	178 ^k	96.71	
	Ties	10 ^l		
	Total	197		
t5 - s5	Negative Ranks	10 ^m	59.80	.000
	Positive Ranks	139 ⁿ	76.09	
	Ties	48 ^o		
	Total	197		
t6 - s6	Negative Ranks	17 ^p	31.12	.000
	Positive Ranks	167 ^q	98.75	
	Ties	13 ^r		
	Total	197		
t7 - s7	Negative Ranks	5 ^s	17.40	.000
	Positive Ranks	179 ^t	94.60	
	Ties	13 ^u		
	Total	197		
t8 - s8	Negative Ranks	8 ^v	48.25	.000
	Positive Ranks	166 ^w	89.39	
	Ties	23 ^x		
	Total	197		
t9 - s9	Negative Ranks	6 ^y	15.17	.000
	Positive Ranks	183 ^z	97.62	
	Ties	8 ^{aa}		
	Total	197		
t10 - s10	Negative Ranks	10 ^{ab}	15.60	.000
	Positive Ranks	179 ^{ac}	99.44	
	Ties	8 ^{ad}		
	Total	197		

t11 - s11	Negative Ranks	7 ^{ae}	24.71	.000
	Positive Ranks	179 ^{af}	96.19	
	Ties	11 ^{ag}		
	Total	197		
t12 - s12	Negative Ranks	7 ^{ah}	33.57	.000
	Positive Ranks	175 ^{ai}	93.82	
	Ties	15 ^{aj}		
	Total	197		
t13 - s13	Negative Ranks	8 ^{ak}	17.88	.000
	Positive Ranks	183 ^{al}	99.42	
	Ties	6 ^{am}		
	Total	197		
t14 - s14	Negative Ranks	8 ^{an}	17.00	.000
	Positive Ranks	180 ^{ao}	97.94	
	Ties	9 ^{ap}		
	Total	197		
t15 - s15	Negative Ranks	8 ^{aq}	12.75	.000
	Positive Ranks	184 ^{ar}	100.14	
	Ties	5 ^{as}		
	Total	197		

Table 10 Wilcoxon Signed Ranks Test - MS PowerPoint

4.3 Data analysis and results for MS Excel

Normality Test

In order to check the normality of the data we have applied the normality test. The results show that our data is not normally distributed because sig level is less than 0.05 for Excel. The detailed results of normality test are given below;

Descriptives

	Statistic	Std. Error
Mean	178.3046	3.86137
95% Confidence Interval for Lower Bound	170.6894	
Mean Upper Bound	185.9197	
5% Trimmed Mean	174.0795	
Median	176.0000	
Variance	2937.305	
excel Std. Deviation	54.19691	
Minimum	114.00	
Maximum	342.00	
Range	228.00	
Interquartile Range	75.00	
Skewness	.904	.173
Kurtosis	.628	.345

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
excel	.118	197	.000	.918	197	.000

a. Lilliefors Significance Correction
Table 11 Normality Test - MS Excel

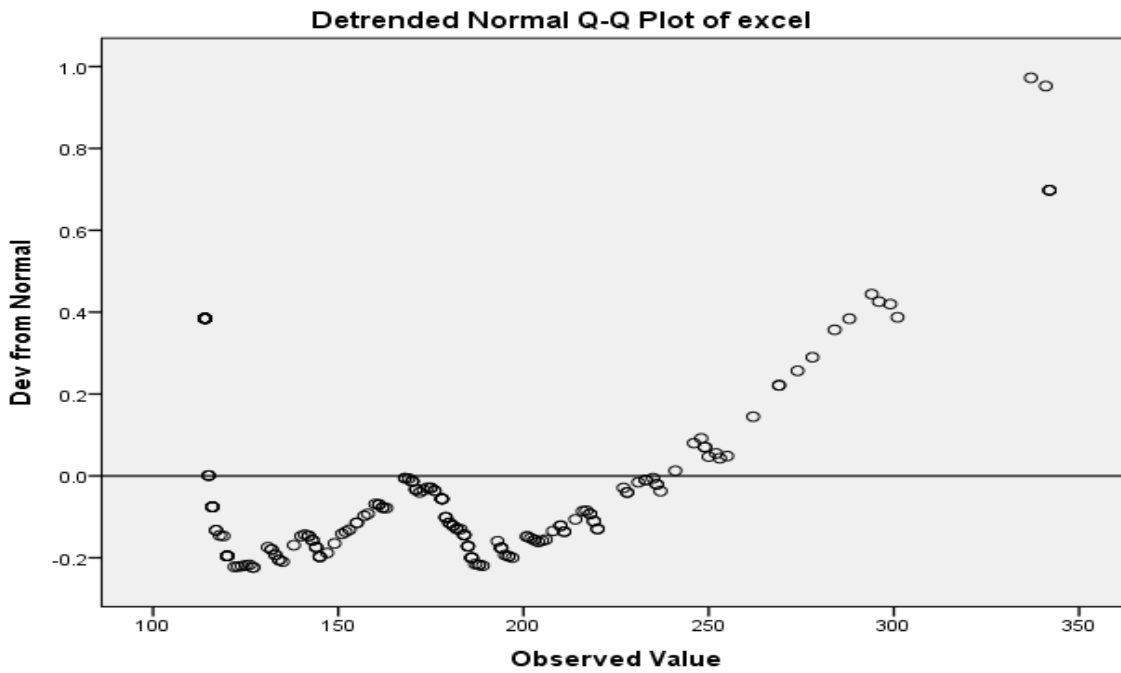
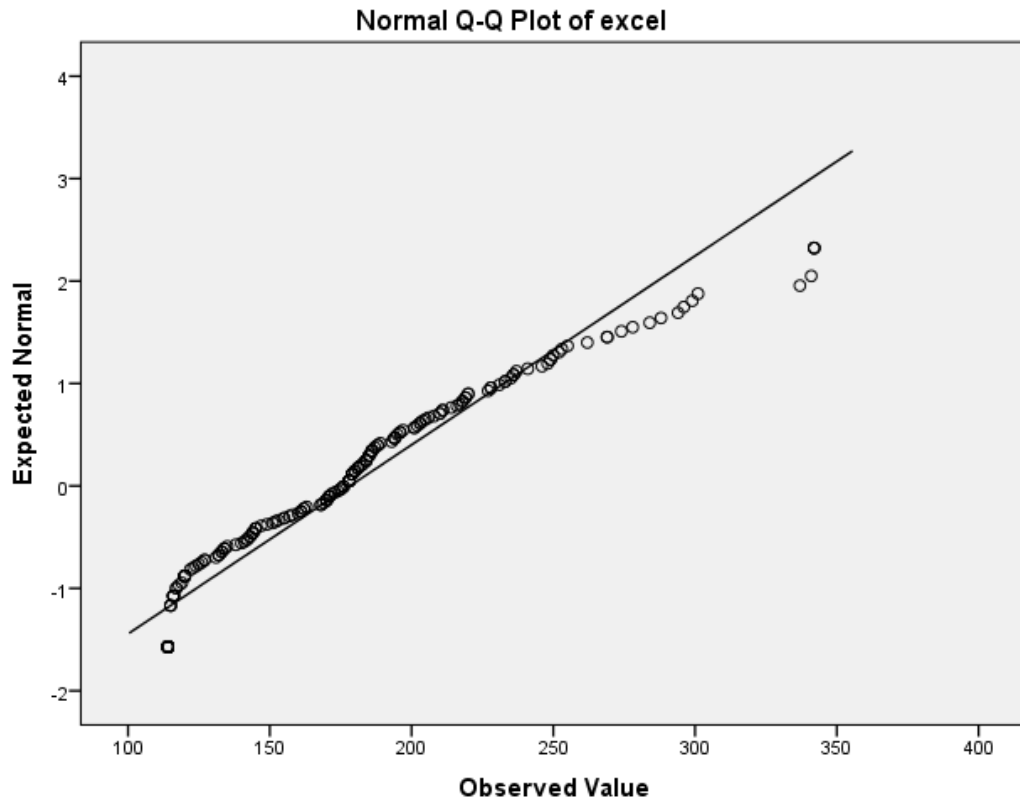


Figure 3 Normality Test Plot - MS Excel

Control Group Vs. Experiment Group Results

MS Excel survey was based on Microsoft office Specialist curriculum consist of 14 sections. Statistical data analysis tool is used to find the Mean rank of control group students with the experiment group students. As shown in the below mentioned table in section 1 the mean rank of control group is 185 and experiment group is 240,as we can see in the below mentioned table the mean rank for all the section is lower than the experiment group mean rank.

We have applied the Mann Whitney test on control and experiment group data. As the results are shown in the below mentioned table. The Z value of all the sections is less than 0.05. It shows there is a significant difference between the performances of control and experiment group. However, as we have seen in the mean ranked value table the value of section 4 is also higher than the value of experiment group. However, Mann Whitney results shows that there is significant difference between the performance of control and experiment group. This is supporting our hypothesis

Stats Test Results				
	Name	N	Mean Rank	Z Value (Mann Whitney Test)
s1	0	226	185.19	.000
	1	177	240.91	
	Total	403		
s2	0	226	165.00	.000
	1	177	264.32	
	Total	403		
s3	0	226	173.60	.000
	1	177	254.35	
	Total	403		
s4	0	226	184.89	.000
	1	177	241.26	
	Total	403		
s5	0	226	158.19	

	1	177	272.20	.000
	Total	403		
s6	0	226	186.69	.000
	1	177	239.17	
	Total	403		
s7	0	226	156.97	.000
	1	177	273.62	
	Total	403		
s8	0	226	159.63	.000
	1	177	270.53	
	Total	403		
s9	0	226	162.28	.000
	1	177	267.47	
	Total	403		
s10	0	226	152.21	.000
	1	177	279.14	
	Total	403		
s11	0	226	174.29	.000
	1	177	253.55	
	Total	403		
s12	0	226	143.27	.000
	1	177	289.50	
	Total	403		
s13	0	226	168.05	.000
	1	177	260.78	
	Total	403		
s14	0	226	151.69	.000
	1	177	279.74	
	Total	403		

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Table 12 Mann Whitney Test - MS Excel

Data Analysis of Experiment Group

Introduction

The Wilcoxon signed-rank test is used to compare two sets of scores that come from the same participants. This can occur when we wish to investigate any change in scores from one-time point to another, or when individuals are subjected to more than one condition.

The Wilcoxon signed rank test is a statistical test used for comparing the pre and post tests of the same group. This test is useful when there is a need to identify any change occur after applying some trainings or techniques on the same group. For applying the Wilcoxon signed procedure there are certain assumptions for this test which need to be fulfilled. Our data is meeting the assumption #2 of the Wilcoxon signed-test i.e. our independent variable is based on Matched pairs. There is a single subject in present in both groups i.e. Electrical Engineering and software engineering students of batch 2016.our first related group is comprised of the freshmen of batch 2016 who are enrolled in Electrical Engineering and computer science group. While the same group has been gone through the posttest.

Wilcoxon Signed Ranks Test

Ranks				
		N	Mean Rank	Z Value
t1 - section1	Negative Ranks	14 ^a	47.93	.000
	Positive Ranks	162 ^b	92.01	
	Ties	20 ^c		
	Total	196		
t2 - section2	Negative Ranks	13 ^d	37.77	.000
	Positive Ranks	165 ^e	93.58	
	Ties	18 ^f		
	Total	196		
t3 - section3	Negative Ranks	6 ^g	17.00	.000
	Positive Ranks	185 ^h	98.56	

	Ties	5 ⁱ		
	Total	196		
t4 - section4	Negative Ranks	7 ^j	19.21	.000
	Positive Ranks	179 ^k	96.41	
	Ties	10 ^l		
	Total	196		
t5 - section5	Negative Ranks	7 ^m	9.36	.000
	Positive Ranks	181 ⁿ	97.79	
	Ties	8 ^o		
	Total	196		
t6 - section6	Negative Ranks	10 ^p	19.80	.000
	Positive Ranks	178 ^q	98.70	
	Ties	8 ^r		
	Total	196		
t7 - section7	Negative Ranks	9 ^s	13.28	.000
	Positive Ranks	181 ^t	99.59	
	Ties	6 ^u		
	Total	196		
t8 - section8	Negative Ranks	3 ^v	20.67	.000
	Positive Ranks	184 ^w	95.20	
	Ties	9 ^x		
	Total	196		
t9 - section9	Negative Ranks	7 ^y	7.79	.000
	Positive Ranks	182 ^z	98.35	
	Ties	7 ^{aa}		
	Total	196		
t10 - section10	Negative Ranks	5 ^{ab}	5.80	.000
	Positive Ranks	184 ^{ac}	97.42	

	Ties	7 ^{ad}		
	Total	196		
t11 - section11	Negative Ranks	8 ^{ae}	9.56	.000
	Positive Ranks	178 ^{af}	97.27	
	Ties	10 ^{ag}		
	Total	196		
t12 - section12	Negative Ranks	4 ^{ah}	16.00	.000
	Positive Ranks	184 ^{ai}	96.21	
	Ties	8 ^{aj}		
	Total	196		
t13 - section13	Negative Ranks	11 ^{ak}	18.50	.000
	Positive Ranks	167 ^{al}	94.18	
	Ties	18 ^{am}		
	Total	196		
t14 - section14	Negative Ranks	12 ^{an}	30.38	.000
	Positive Ranks	172 ^{ao}	96.83	
	Ties	12 ^{ap}		
	Total	196		

Table 13 Wilcoxon Signed Ranks Test - MS Excel

Qualitative Data Analysis

Focused group discussions with Students

FGDs are conducted to get the feedback from Experiment group. After conducting these discussions these were summarized by creating themes for each question. Following map shows the main themes emerged from discussing each question. The thickness of the line shows the dominant theme in discussions. More dark lines show the maximum number of responses for that theme

Benefits of MOS trainings

First theme was related to the effect of MOS trainings on their assignments work, either it was related to their presentation skills, document management or on their data analysis in their semester projects, students were excited about mentioning their experience while they were implementing those trainings in their Semester Projects, around 70 -80% students mentions that MOS trainings has more effected their presentation skills.

Raeed asif one of the student from batch said:

“The MOS course helped us to fill in our assignments with correct font and size where needed. Our presentation skills had drastic enhancement after having this course”

Difficulty level

Students were asked about the difficulties and challenges they faced during MOS trainings. Most of the students mentioned that it was not that much easy but with the help of instructors and following the manuals in an appropriate way, they were able to grab the concept, around 90% said that the difficulty level was medium.

Effects of MOS

They were agreed to the point that there were no negative aspects of MOS trainings. However, these trainings and certifications were adding on to their curriculum vitae. It also has provided the sense of achievement but majority was in the favor that it has polished their skills in using MS word, MS PowerPoint and MS excel.

Pace of training

Students were asked to comment on the pace of trainings, the purpose of starting this debate was to know the pressure they were feeling while getting into completing the tasks before the end of the lab, were they felt frustrated or they were able to make it with in the assigned period. Some students in group were in the favor that there was given enough time to complete the task. It was not that much difficult to grab the concept. So over all impact was the trainings were of in medium mode.

Motivation Level

As fundamentals of ICT course is the part of the course for computer science and software engineering students

Students were asked about the motivation which takes them to MOS trainings, integrated in ICT course, some of them mentioned that by doing this the CV would be strong, few ones has also described about personal quest. Majority were motivated for certification.

Hiba Khan from BSCS department said “Our motivation was to become a certified Office user”

Motivation without certification

Students were asked about the motivation without certification. Some students had an opinion that if the certification would not be the part of trainings they might be using as an assignment. The opinion for semester project was also mentioned by the students but 90% were in the favor of MS office tools expertise if they don't have certificate.

Aysha from Software Engineering department mentioned

“The certification was definitely a plus point but even without it we would still have been motivated to take the training”

Benefits of MOS trainings

Few were agreed that best benefit of MOS training is assignment. Some student agreed were that these trainings are helpful in semester projects but 70% to 80% polished their presentation skills by using MOS trainings.

In Depth interviews

Criteria for designing Lab manuals for MS office

Few were agreed that the criteria for designing lab manuals for MS Office are other universities curriculum. Some follows MOS content but most of them mentioned that the standard guidelines they follow while designing ICT lab manuals for Microsoft office productivity tools are their own perceptions.

Miss Maryam Sajjad mentioned “I tried to design such a manual that could engage students in practicing the MS office software and help them in presenting their work in a better way”

Assessment Criteria

Practice Tasks were described by the small number of persons for the assessment of each module. After this assessment criterion was mentioned as quizzes but majority persons mentioned Assignments for each module.

Miss Irum Bhatti says “Practice tasks are given to the students. After the successful completion of the practice tasks, students are evaluated based on the set design tasks they have to perform on the runtime “

perception on including MOS certification

Strengths: Lab instructors mentioned that it’s a good idea because getting certification gives sense of achievement, Students can use these productivity tools for producing quality work.

One of the instructor explain this by giving an example, she said let’s assume a student wants to move a butterfly in PowerPoint and want that show should be realistic. These trainings will help them to gain that confidence to fly the butterfly.

Instructors has mentioned that the students cannot achieved their Self learning at this point. There are flaws in implementing MOS trainings in labs because of hang of system while taking test on Certiport but they mentioned that if flaws are removed, then it could be the best solution. One of the instructor mentioned that the evaluation would be fare as there should be strong check on students while they are performing test on Certiport. Lab instructors said that the deliverables after MOS trainings should be based on open ended question features, so students can use their own ideas.

MOS effect on Motivation Level

Collectively they mentioned that they would be able to increase the quality of their work more efficiently and it is considered from their conversation that presentable work is one of the most basic thing that generates good vibes. Miss Irum Bhatti says;

“they would be able to present their work more effectively and I believe presentation is one of the most basic thing that creates and affects your personality “

Difference between old and new manuals

Instructors has mentioned that new manuals are more detailed and having elaborated content. It has a variety from most basic to most advance. The rang was more wide and plus every thing was step by step elaborated.

Recommendation for including MOS content in lab manuals

One of the lab instructor has mentioned that the projects should be assigned to students after completion of MOS trainings, they would have made their own products using the those skills they gained after trainings. But the idea should be generated by the students. Completely guided activities can not add much to their knowledge and skills Two lab instructors has mentioned that implementing MOS content would be a good addition. If they are MOS certified, then they will be considered as professionally capable to handle small projects based on technical reports and data analysis.

One the instructor said “I rate them equally. The only difference is that they will get certified if they clear MOS exam. Rest their skills set would not be having any drastic change”

Chapter 5: Discussion and Conclusion

5.1 Overview

The main objective of this study was to find out the impact of MOS trainings for first year's students enrolled in FOICT course at SEECS- NUST. For this purpose, students Microsoft Office skills were evaluated using surveys before and after the trainings. We have also evaluated the skills of students who are in 2nd year and compared their scores with the post test score of first year students. The data has been analyzed using SPSS software using standard statistical strategies. The findings of this study are presented in the following sections. In this study we have two data sets which were used to test the hypothesis of our study. The first data set named Controlled and experiment group includes the score of 2nd year student and the post test score of freshmen students. The second data sets called Experiment group is consisting of pre and posttest score of freshmen students. Since we have used separate survey forms for MOS packages therefore, both the data sets contain the score of MS word, MS excel and PowerPoint. In this section first we will discuss the results of control and experiment group and then will discuss the results of experiment group.

5.2 Quantitative Research

Findings & discussions

In this study we have two data sets, which were used to test the hypothesis of our study. The first data set named Controlled and experiment group includes the score of 2nd year student and the posttest score of freshmen students. The second data sets called Experiment group is consisting of pre & posttest score of freshmen students. Since we have used separate survey forms for each MS office module therefore, both the data sets contain the score of MS word, MS excel and PowerPoint. In this section first we will discuss the results of control and experiment group and then will discuss the results of experiment group.

5.3 Control vs Experiment Group

As stated in the previous section control and experiment group is a data set in which we take the survey scores of 2nd year students and posttest score of freshmen students. It is important to mention here that freshmen student have went through the intervention and 2nd year

Students have studied the course of FOICT without intervention. There were three independent survey forms for MS word, MS excel and MS PowerPoint. Therefore, the results of each above-mentioned MS Office package will be discussed separately.

5.3.1 MS Word

In this survey 193 freshmen student participated whereas the number of 2nd year student is 203. The word survey form consists of 106 questions these are divided in 15 sections. The analysis is done section wise and we have compared the mean rank of each section in respect of both the groups. The mean rank of almost all sections is higher for freshmen students except the mean rank of section 4 and section 7. Since the freshmen students have gone through the MOS training Therefore, the intervention introduced in this study i.e. MOS training resulted positive improvements in the students' skills level when it is compared with the skill level of 2nd year students. However, the mean ranks of section 4 & 7 is opposite, this is mainly because section 4 and section 7 are related to basic formatting function of MS word. Mann Whitney test yielded the z value for each section, and we have seen that the z value of all section is < 0.05 which means that there is significant difference between the skills level of both groups.

5.3.2 MS Excel

For MS Excel survey, the number of 2nd year's students are 226 and the number of freshmen student is 195. This survey consists of 104 questions and these questions are divided in to 14 sections. The mean rank analysis shows that in all the 14 section the mean rank of freshmen student is higher than the 2 ND year's students. Moreover, the z value for all the section is 0.05. This trend represents that the first year students have better knowledge of MS excel functioning as compared to the 2 ND year students. Since the 2 ND year students have not gone through the MOS training as part of their FOICT course. Although MS excel was part of their course contents however, it was not that much organized and comprehensive as of MOS training.

5.3.3 MS PowerPoint

This survey consists of 112 questions and these questions were divided in to 15 sections. The number of students participated in this survey is 206 for 2 ND year and 197 for first year. The mean rank analysis gives the similar results as of MS Excel. In all the sections, the mean rank for first year student is higher than the 2 ND year students. Moreover, z value also shows that the difference in the skill level is statistically significant. Thus, we can conclude that the introduction

of MOS training as part of FOICT course has significant impact on the skill level of MS PowerPoint on first year students.

5.4 Experiment Group

Experiment group consists of freshmen students of CS and SE. As discussed in the previous section, this batch of the student has gone through MOS training as part of their FOICT course. The MS Word, Excel and PowerPoint skills of these students were evaluated before the training and then after the training. These scores obtained were analyzed using Wilcoxon test for two related samples. The data of pre and posttest has also been analyzed section wise. The pretest score of each section is compared with posttest score of each section. The findings of this analysis are as under:

5.4.1 MS Word

There are 193 students participated in the pre and posttest. The analysis shows that in each section the number of positive ranks is much higher than the number of negative ranks and ties. Thus, it could be interpreted that the intervention introduced has resulted positively in the skills level of the students. The z value of test for each section is less than 0.05, which means that the difference in skills level is statistically significant.

5.4.2 MS Excel

The number of participants in MS Excel survey is 196. As we have done section wise analysis in MS Word, the same approach has been adopted for MS Excel as well. The positive ranks have outnumbered others in this case as well. Z value also suggests that the improvement in skill level is significant.

5.4.3 MS PowerPoint

As we have seen in the previous two cases, the number of positive ranks in PowerPoint data is also considerably high. However, we have noted that the number of negative ranks and ties are less for MS Excel and PowerPoint as compared to MS Word. This is may be due to the reason that MS Word is a common document editing/making package. However, the Excel and PowerPoint are specialized packages as compared to Word.

5.5 FGDs with Students

5.5.1 Improvement in presentation skills

The focus group discussion sessions conducted with 4 groups students. Each group was consisted of 5 students. As discussed in previous chapter a script was designed to ask questions to the focused groups. Following heading covers the replies of the students.

5.5.2 Improvement in Presentation Skills

The students have mentioned in their replies that MOS trainings have significantly improved their skills in presenting their ideas and work in more composed manner. The results of quantitative data have also showed that difference in skills levels before and after the training is significant. All the groups have unanimously agreed that this training has helped them in acquiring new skills/commands regarding MS word, MS excel and MS PowerPoint

5.5.3 Help in doing Assignment

The questions were asked from the students how MOS training has helped them in their studies. The replies from students suggest that it has assisted them in doing various class assignments and project presentations. Almost 95 % of the focus group discussion's participants replied that they are actively using the skills acquired from MOS training in MS Word and MS PowerPoint.

5.5.4 Motivation Factors

The intend of questions regarding motivation of students for MOS training was to determine if the students were motivated only because of Certification perk or if this certificate is not there then how it will effect the student's motivation for attending MOS trainings. About 80% students have mentioned that certification was key factor for their motivation. However, they have also mentioned that they would also like to participate in the training if there would be no certification involved because of the skills they have acquired through this activity.

5.5.5 General Feedback

General feedback questions were asked to check the usefulness, pace and conduct of lab sessions. The students mentioned that due to this training they have straight away something to add in their CVs. Regarding the pace of training session, they have replied that the pace was medium, however, some of them have pointed out they need more time to practices all those features covered in the training. When students were asked what was good and bad things in the

sessions, they overall rate the training sessions positive and were happy about the learning that have took place. However, they have also pointed out that they would like if this training could cover the MS Access tool as well.

5.6 In-depth Interviews with Lab instructors

In-depth interviews were conducted with Lab instructors because they are the first line managers in of lab activities. The MOS training sessions were conducted with the help of these individuals. Moreover, they are the one who are responsible for conducting labs of FoICT courses in previous years. These interviews were arranged on one to one basis and their answers were recorded on paper and on the audio as well. Following points summarize the interviews questions and their answers to those questions.

5.6.1 Criteria for Designing Lab Manuals

The first few questions were revolving around the criteria for designing Lab Manuals for the conduct of FoICT courses' lab session. Through these questions we wanted to check if there are any standard criteria for the lab manuals. The replies revealed that there are no hard core standards however; they have broader guidelines given in course outlines to follow. The course outlines only suggested covering the contents of MS Office. Therefore, the details and depth of contents of MS office to be covered in the sessions is not defined and it is up to lab instructors own perceptions and skills.

5.6.2 Assessment Criteria

Through the questions relating to assessment criteria, we want to get an idea of how assessment of skills acquired in the lab sessions is being done traditionally. The majority of Lab instructors said that they adopt a hybrid approach for assessment, which means they use quizzes, assignment and in some cases they do give students practical task to perform.

5.6.3 Coverage of MOS Contents

Since these lab instructors were assisting in conducting MOS trainings in the lab sessions. Therefore, it was a logical question to ask them how much content they cover in their own sessions as compared MOS sessions. They replied that MOS content is pretty much advance and details oriented and they generally cover the basic and medium level topics in their sessions.

5.6.4 Perception about MOS Contents

In order to check the general perception of Lab instructors about MOS contents we asked them if the addition of this content is beneficial or it is not related to the students and course objectives. The summary of their replies suggest that MOS content is very good addition and they would also like to add few things from this content in their own sessions.

5.6.5 Motivation of Students

When asked about the effects on motivation of students due to MOS addition. They replied that students have well received these sessions since they are striving for Certification benefits attached to it. However, when asked if there is no certificate involved then they were not sure how would students respond to these changes.

6.5 Conclusion

Digital productivity skills are important for students as these are not only helpful for them during the course of studies but also play a vital role in student's co-curricular and extra-curricular pursuits. Unfortunately, the students come from different backgrounds thus they lack the required skill set. To bridge this gap, universities do have basic computer literacy courses which aim to develop word processing, spreadsheets and graphics presentation skills among the students. However, due to non-availability of standard content, this course results in varied skills level among the students. This study has addressed this problem by introducing MOS contents in the curriculum. The results indicate significant improvements in the skills level of first year students. The comparison of the students trained on MOS content versus traditional content revealed that MOS content have enabled the students to gain in-depth knowledge of productivity tools. The students have also indicated that this content has helped them to improve their skills set in focus group discussions. The lab instructors suggested in interviews that MOS contents may be made part of the course for the future. It has also been noted that the availability of MOS certification free vouchers has played a key role in boosting students motivation level. Based on the results of this study we can recommend the inclusion of MOS contents in the curriculum. However, this may be investigated further that if there are no free certification vouchers how it will effect the students learning outcomes

6.6 Recommendations for practice based on this study

1. Universities like NUST would redesign their Fundamentals of ICT course by adding MOS trainings into the course and also they would get benefit from vouchers provided by higher education commission (HEC) by giving opportunities to the students to get registered and appear on CERTIPORT for MOS certification
2. This would give better satisfaction to the students who got pass the exam thus improving a student's motivation rate in FoICT module. NUST should modify the trainings and course according to the requirements of the industry and the availability of the vouchers. the MOS certification would be the essential part of passing the course,
3. Universities should always open a path to get feedback from students to improve the course quality. MOS certification should be the part of course outline, that would give an extra motivation to students. At the end of trainings and before appearing in exam on Certiport there would be a Mock exam so students get ready in advance. As we had provided video links one day before each exam. These videos were based on the pattern Certiport follows during exam. This practice can be continued in future as well. NUST and the other public universities should modify the FoICT module for the freshmen students according to the new versions of Microsoft Word, PowerPoint and Excel.
4. Students engagement and motivation should also be measured after getting a short survey after the completions of trainings. That would give bring better ideas for improving the course for the instructor.
5. As the MOS trainings are provided to prepare students appearing on Certiport for certification. In our studies we had used the vouchers provided by Higher Education Commission for certification. For future there should be joint venture between HEC and NUST or the universities who are integrating MOS in their FoICT to keep the motivation of the students high and to get it for free because actual cost of the voucher would be expensive for universities
7. This study was specifically for bachelor students of Software Engineering and computer science. It can be integrated in Electrical engineering and business studies course

6.7 Recommendations for Future Research

As the new versions of Microsoft office are launching almost every year with modified tools, researchers should do the same study but with the integration of new content into the lab manuals. Its for sure that the modified versions of MS office are advanced in use and more user friendly so the research study can be modified according to the needs and demands of the MOS training course and the demand of the industry

Chapter 6: References

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Appendices

Appendix A: Pre and Post Test Questions for MS Word

Name :
Class and Section :
Q1: I can give commands from the ribbon and quickly access toolbar 1. Confident 2. Somewhat confident 3. Need Help
Q2: I can give commands from the ribbon and quickly access toolbar 1. Confident 2. Somewhat confident 3. Need Help
Q3: I can manage Word from the Backstage view 1. Confident 2. Somewhat confident 3. Need Help
Q4: I can customize program options 1. Confident 2. Somewhat confident 3. Need Help
Q5: I can create new blank documents 1. Confident 2. Somewhat confident 3. Need Help
Q6: I can create new documents by using templates 1. Confident 2. Somewhat confident 3. Need Help
Q7: I can open non-native files in Word 1. Confident 2. Somewhat confident 3. Need Help
Q8: I can open PDF files in Word for editing 1. Confident 2. Somewhat confident 3. Need Help
Q9: I can move around in a document 1. Confident 2. Somewhat confident 3. Need Help
Q10: I can change document views 1. Confident 2. Somewhat confident 3. Need Help

<p>Q11: I can change magnification levels</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q12: I can show and hide formatting symbols</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q13: I can enter text in a document</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q14: I can insert symbols and special characters</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q15: I can paste and append text</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q16: I can insert text and symbols by using AutoCorrect</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q17: I can select text</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q18: I can cut, copy and paste content</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q19: I can apply basic formatting</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q20: I can format text by using Format Painter</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q21: I can create WordArt</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q22: I can apply styles to text</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q23: I can clear formatting and styles</p>

1. Confident 2. Somewhat confident 3. Need Help
Q24: I can set paragraph indentation and spacing
1. Confident 2. Somewhat confident 3. Need Help
Q25: I can manage paragraph breaks
1. Confident 2. Somewhat confident 3. Need Help
Q26: I can display content in columns
1. Confident 2. Somewhat confident 3. Need Help
Q27: I can insert images from your computer
1. Confident 2. Somewhat confident 3. Need Help
Q28: I can insert images from the web
1. Confident 2. Somewhat confident 3. Need Help
Q29: I can modify image properties (color, size, shape)
1. Confident 2. Somewhat confident 3. Need Help
Q30: I can insert simple shapes
1. Confident 2. Somewhat confident 3. Need Help
Q31: I can modify shapes
1. Confident 2. Somewhat confident 3. Need Help
Q32: I can apply Quick Styles to images
1. Confident 2. Somewhat confident 3. Need Help
Q33: I can apply artistic effects
1. Confident 2. Somewhat confident 3. Need Help
Q34: I can apply picture effects
1. Confident 2. Somewhat confident 3. Need Help
Q35: I can insert SmartArt graphics
1. Confident 2. Somewhat confident 3. Need Help

Q36: I can modify SmartArt properties (color, size, shape) 1. Confident 2. Somewhat confident 3. Need Help
Q37: I can position shapes and images 1. Confident 2. Somewhat confident 3. Need Help
Q38: I can wrap text around shapes and images 1. Confident 2. Somewhat confident 3. Need Help
Q39: I can search for text 1. Confident 2. Somewhat confident 3. Need Help
Q40: I can move to specific locations and elements 1. Confident 2. Somewhat confident 3. Need Help
Q41: I can find and replace text 1. Confident 2. Somewhat confident 3. Need Help
Q42: I can format text by using the Replace command 1. Confident 2. Somewhat confident 3. Need Help
Q43: I can create bulleted, numbered, and multilevel lists 1. Confident 2. Somewhat confident 3. Need Help
Q44: I can modify list structure 1. Confident 2. Somewhat confident 3. Need Help
Q45: I can modify bullet characters 1. Confident 2. Somewhat confident 3. Need Help
Q46: I can modify number schemes 1. Confident 2. Somewhat confident 3. Need Help
Q47: I can create basic tables 1. Confident 2. Somewhat confident 3. Need Help
Q47: I can convert text to tables

1. Confident 2. Somewhat confident 3. Need Help
Q48: I can set AutoFit options
1. Confident 2. Somewhat confident 3. Need Help
Q49: I can insert preformatted tables
1. Confident 2. Somewhat confident 3. Need Help
Q50: I can format tables
1. Confident 2. Somewhat confident 3. Need Help
Q51: I can sort table data
1. Confident 2. Somewhat confident 3. Need Help
Q52: I can modify table structure
1. Confident 2. Somewhat confident 3. Need Help
Q53: I can convert tables to text
1. Confident 2. Somewhat confident 3. Need Help
Q54: I can use table data in formulas
1. Confident 2. Somewhat confident 3. Need Help
Q55: I can create bookmarks
1. Confident 2. Somewhat confident 3. Need Help
Q56: I can insert hyperlinks
1. Confident 2. Somewhat confident 3. Need Help
Q57: I can change document themes
1. Confident 2. Somewhat confident 3. Need Help
Q58: I can change document style sets
1. Confident 2. Somewhat confident 3. Need Help
Q59: I can insert simple headers and footers
1. Confident 2. Somewhat confident 3. Need Help

Q60: I can insert page numbers 1. Confident 2. Somewhat confident 3. Need Help
Q61: I can insert watermarks 1. Confident 2. Somewhat confident 3. Need Help
Q62: I can configure page backgrounds 1. Confident 2. Somewhat confident 3. Need Help
Q63: I can modify page setup 1. Confident 2. Somewhat confident 3. Need Help
Q64: I can manage page breaks 1. Confident 2. Somewhat confident 3. Need Help
Q65: I can create document sections 1. Confident 2. Somewhat confident 3. Need Help
Q66: I can save documents in non-standard file formats 1. Confident 2. Somewhat confident 3. Need Help
Q67: I can maintain backward compatibility 1. Confident 2. Somewhat confident 3. Need Help
Q68: I can save files to remote locations 1. Confident 2. Somewhat confident 3. Need Help
Q69: I can modify document properties 1. Confident 2. Somewhat confident 3. Need Help
Q70: I can protect documents by using passwords 1. Confident 2. Somewhat confident 3. Need Help
Q71: I can configure documents to print 1. Confident 2. Somewhat confident 3. Need Help
Q72: I can insert document properties

1. Confident	2. Somewhat confident	3. Need Help
Q73: I can insert built-in fields		
1. Confident	2. Somewhat confident	3. Need Help
Q74: I can insert text boxes		
1. Confident	2. Somewhat confident	3. Need Help
Q75: I can insert Quick Parts		
1. Confident	2. Somewhat confident	3. Need Help
Q76: I can organize Building Blocks		
1. Confident	2. Somewhat confident	3. Need Help
Q77: I can customize Building Blocks		
1. Confident	2. Somewhat confident	3. Need Help
Q78: I can insert footnotes and endnotes		
1. Confident	2. Somewhat confident	3. Need Help
Q79: I can manage footnote locations		
1. Confident	2. Somewhat confident	3. Need Help
Q80: I can configure endnote formats		
1. Confident	2. Somewhat confident	3. Need Help
Q81: I can modify footnote numbering		
1. Confident	2. Somewhat confident	3. Need Help
Q82: I can insert citations and placeholders		
1. Confident	2. Somewhat confident	3. Need Help
Q83: I can change citation styles		
1. Confident	2. Somewhat confident	3. Need Help
Q84: I can insert bibliographies		
1. Confident	2. Somewhat confident	3. Need Help

Q85: I can add captions 1. Confident 2. Somewhat confident 3. Need Help
Q86: I can set caption positions 1. Confident 2. Somewhat confident 3. Need Help
Q87: I can change caption formats and labels 1. Confident 2. Somewhat confident 3. Need Help
Q88: I can exclude labels from captions 1. Confident 2. Somewhat confident 3. Need Help
Q89: I can customize the Quick Access Toolbar 1. Confident 2. Somewhat confident 3. Need Help
Q90: I can customize the ribbon 1. Confident 2. Somewhat confident 3. Need Help
Q91: I can record simple macros 1. Confident 2. Somewhat confident 3. Need Help
Q92: I can manage macro security 1. Confident 2. Somewhat confident 3. Need Help
Q93: I can assign keyboard shortcuts 1. Confident 2. Somewhat confident 3. Need Help
Q94: I can record simple macros 1. Confident 2. Somewhat confident 3. Need Help
Q95: I can customize the Quick Access Toolbar 1. Confident 2. Somewhat confident 3. Need Help
Q96: I can Customize the ribbon 1. Confident 2. Somewhat confident 3. Need Help

Appendix B: Pre and Post Test for MS PowerPoint

Full Name:
Class and Section:
Q1: I can Explore the user interface 1. Confident 2. Somewhat confident 3. Need Help
Q2: I can Open and close files in PowerPoint 1. Confident 2. Somewhat confident 3. Need Help
Q3: I can Use views to navigate through presentations 1. Confident 2. Somewhat confident 3. Need Help
Q4: I can change to view in color/grayscale 1. Confident 2. Somewhat confident 3. Need Help
Q5: I can create blank presentations 1. Confident 2. Somewhat confident 3. Need Help
Q6: I can Create presentations by using template 1. Confident 2. Somewhat confident 3. Need Help
Q7: I can Modify presentation properties 1. Confident 2. Somewhat confident 3. Need Help
Q8: I can Import text files into presentations 1. Confident 2. Somewhat confident 3. Need Help
Q9: I can Import online documents into presentations 1. Confident 2. Somewhat confident 3. Need Help
Q10: I can Maintain backward compatibility 1. Confident 2. Somewhat confident 3. Need Help
Q11: I can save presentations as web pages

1. Confident 2. Somewhat confident 3. Need Help

Q12: I can apply styles to slides

1. Confident 2. Somewhat confident 3. Need Help

Q13: I can modify slide backgrounds

1. Confident 2. Somewhat confident 3. Need Help

Q14: I can Change page setup options in PowerPoint

1. Confident 2. Somewhat confident 3. Need Help

Q15: I can Apply formatting and styles to text in PowerPoint

1. Confident 2. Somewhat confident 3. Need Help

Q16: I can Change text to WordArt in PowerPoint

1. Confident 2. Somewhat confident 3. Need Help

Q17: I can Insert hyperlinks in PowerPoint

1. Confident 2. Somewhat confident 3. Need Help

Q18: I can Create bulleted and numbered lists in PowerPoint

1. Confident 2. Somewhat confident 3. Need Help

Q19: I can Create multiple columns in a single shape

1. Confident 2. Somewhat confident 3. Need Help

Q20: Modifying slide order

1. Confident 2. Somewhat confident 3. Need Help

Q21: Inserting section headers

1. Confident 2. Somewhat confident 3. Need Help

Q2: I can Hide slides in PowerPoint

1. Confident 2. Somewhat confident 3. Need Help

Q22: I can delete slides

1. Confident 2. Somewhat confident 3. Need Help

Q23: I can Insert transitions between slides 1. Confident 2. Somewhat confident 3. Need Help
Q24: I can Manage multiple transitions 1. Confident 2. Somewhat confident 3. Need Help
Q25: I can Modify transition effect options in PowerPoint 1. Confident 2. Somewhat confident 3. Need Help
Q26: I can insert pictures on slides 1. Confident 2. Somewhat confident 3. Need Help
Q27: I can Resize images 1. Confident 2. Somewhat confident 3. Need Help
Q28: I can crop images 1. Confident 2. Somewhat confident 3. Need Help
Q29: I can apply effects to slides 1. Confident 2. Somewhat confident 3. Need Help
Q30: I can apply styles to slides 1. Confident 2. Somewhat confident 3. Need Help
Q31: I can insert shapes

1. Confident 2. Somewhat confident 3. Need Help
Q32: I can Create custom shapes
1. Confident 2. Somewhat confident 3. Need Help
Q33: I can apply Apply styles to shapes
1. Confident 2. Somewhat confident 3. Need Help
Q34: I can Resize shapes
1. Confident 2. Somewhat confident 3. Need Help
Q35: I can modify shape backgrounds
1. Confident 2. Somewhat confident 3. Need Help
Q36: I can Apply borders to shapes
1. Confident 2. Somewhat confident 3. Need Help
Q37: I can Align and group shapes
1. Confident 2. Somewhat confident 3. Need Help
Q38: I can display gridlines
1. Confident 2. Somewhat confident 3. Need Help
Q39: I can Convert lists to SmartArt
1. Confident 2. Somewhat confident 3. Need Help
Q40: I can Add shapes to SmartArt

1. Confident 2. Somewhat confident 3. Need Help
Q41: I can Change color of SmartArt
1. Confident 2. Somewhat confident 3. Need Help
Q42: I can Moving text within SmartArt shapes
1. Confident 2. Somewhat confident 3. Need Help
Q43: I can reverse the direction of SmartArt elements
1. Confident 2. Somewhat confident 3. Need Help
Q44: I can create tables in slides
1. Confident 2. Somewhat confident 3. Need Help
Q45 I can import tables from external sources
1. Confident 2. Somewhat confident 3. Need Help
Q46 I can apply table styles
1. Confident 2. Somewhat confident 3. Need Help
Q47 I can Modify number of rows and columns
1. Confident 2. Somewhat confident 3. Need Help
Q48 I can Insert charts on slides
1. Confident 2. Somewhat confident 3. Need Help

<p>Q49: I can Import charts from external sources</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q50: I can Create and modify chart styles</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q51 I can Modify chart type</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q52 I can add legends to charts</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q53 I can Modify chart parameters</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q54 I can Link to external media</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q55 I Can Set start/stop times</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q56 I Can Set media options</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q57 I Can Adjust media window size</p>

1. Confident 2. Somewhat confident 3. Need Help
Q58 I Can Trim timing on media clips
1. Confident 2. Somewhat confident 3. Need Help
Q59 I can Apply animations to shapes
1. Confident 2. Somewhat confident 3. Need Help
Q60 I can apply animations to text strings
1. Confident 2. Somewhat confident 3. Need Help
Q61: I can add paths to animations
1. Confident 2. Somewhat confident 3. Need Help
Q62: I can Modify duration of effects
1. Confident 2. Somewhat confident 3. Need Help
Q63: I can Modify animation options
1. Confident 2. Somewhat confident 3. Need Help
Q64: I can Configure start and finish options
1. Confident 2. Somewhat confident 3. Need Help
Q65: I can Reorder animations
1. Confident 2. Somewhat confident 3. Need Help
Q66: I can Use the Animation Pane

1. Confident 2. Somewhat confident 3. Need Help
Q67: I can modify presentation themes
1. Confident 2. Somewhat confident 3. Need Help
Q68: I can apply slide masters
1. Confident 2. Somewhat confident 3. Need Help
Q69: I can add new layouts
1. Confident 2. Somewhat confident 3. Need Help
Q70: I can modify existing layouts
1. Confident 2. Somewhat confident 3. Need Help
Q71: I can Add background images
1. Confident 2. Somewhat confident 3. Need Help
Q72: I can Control page numbers
1. Confident 2. Somewhat confident 3. Need Help
Q73: I can Insert headers and footers
1. Confident 2. Somewhat confident 3. Need Help
Q74: I can add slide layouts
1. Confident 2. Somewhat confident 3. Need Help

<p>Q75: I can Duplicate existing slides</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q76: I can Merge multiple presentations</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q77: I can reuse slides from other presentations</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q78: I can view multiple presentations</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q79: I can Set track changes</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q80: I can Modify options for track changes</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q81: I can Discard changes from specific users</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q82: I can Manage comments</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q83: I can Create custom slide shows</p>

1. Confident 2. Somewhat confident 3. Need Help
Q84: I can Configure slide show options
1. Confident 2. Somewhat confident 3. Need Help
Q85: I can Rehearse timing
1. Confident 2. Somewhat confident 3. Need Help
Q86: I can Configure slide show resolution
1. Confident 2. Somewhat confident 3. Need Help
Q87: I can Use Presenter View
1. Confident 2. Somewhat confident 3. Need Help
Q88: I can navigate within slide shows
1. Confident 2. Somewhat confident 3. Need Help
Q89: I can Annotate slide shows
1. Confident 2. Somewhat confident 3. Need Help
Q90: I can Proof presentations
1. Confident 2. Somewhat confident 3. Need Help
Q91: I can Check for accessibility issues
1. Confident 2. Somewhat confident 3. Need Help
Q92 I can Check for compatibility issues

1. Confident 2. Somewhat confident 3. Need Help
Q93: I can Set handout print options
1. Confident 2. Somewhat confident 3. Need Help
Q94: I can Print selections from presentations
1. Confident 2. Somewhat confident 3. Need Help
Q95: I can print presentations in gray scale
1. Confident 2. Somewhat confident 3. Need Help
Q96: I can Print speaker notes
1. Confident 2. Somewhat confident 3. Need Help
Q97: I can remove presentation metadata
1. Confident 2. Somewhat confident 3. Need Help
Q98: I can Mark as final
1. Confident 2. Somewhat confident 3. Need Help
Q99: I can Compress media
1. Confident 2. Somewhat confident 3. Need Help
Q100: I can Embedded fonts
1. Confident 2. Somewhat confident 3. Need Help

Q101: I can Restrict permissions

1. Confident 2. Somewhat confident 3. Need Help

Q102: I can encrypt presentations with a password

1. Confident 2. Somewhat confident 3. Need Help

Appendix C: Pre and Post Test Questions for MS Excel

Full Name:
Class and Section:
Q1: I can explore the user interface in MS Excel 1. Confident 2. Somewhat confident 3. Need Help
Q2: I can open and close files in MS Excel 1. Confident 2. Somewhat confident 3. Need Help
Q3: I can set the magnification level 1. Confident 2. Somewhat confident 3. Need Help
Q4: I can change workbook views 1. Confident 2. Somewhat confident 3. Need Help
Q5: I can identify worksheet elements 1. Confident 2. Somewhat confident 3. Need Help
Q6: I can select cells, rows, columns, and text

1. Confident 2. Somewhat confident 3. Need Help

Q7: I can adjust row height and column width

1. Confident 2. Somewhat confident 3. Need Help

Q8: I can create new blank workbooks

1. Confident 2. Somewhat confident 3. Need Help

Q9: I can create new workbooks by using templates

1. Confident 2. Somewhat confident 3. Need Help

Q10: I can add values to workbook properties

1. Confident 2. Somewhat confident 3. Need Help

Q11: I can save workbooks to remote locations

1. Confident 2. Somewhat confident 3. Need Help

Q12: I can save workbooks in alternative file formats

1. Confident 2. Somewhat confident 3. Need Help
Q13: I can maintain backward compatibility 1. Confident 2. Somewhat confident 3. Need Help
Q14: I can open non-native files directly in Excel 1. Confident 2. Somewhat confident 3. Need Help
Q15: I can import files 1. Confident 2. Somewhat confident 3. Need Help
Q16: I can append data to worksheets 1. Confident 2. Somewhat confident 3. Need Help
Q17: I can copy and paste data 1. Confident 2. Somewhat confident 3. Need Help
Q18: I can transpose columns and rows 1. Confident 2. Somewhat confident 3. Need Help

Q19: I can use AutoFill function 1. Confident 2. Somewhat confident 3. Need Help
Q20: I can use Flash Fill function 1. Confident 2. Somewhat confident 3. Need Help
Q21: I can expand data across columns 1. Confident 2. Somewhat confident 3. Need Help
Q21: I can Search for data within a workbook 1. Confident 2. Somewhat confident 3. Need Help
Q22: I can find and replace data 1. Confident 2. Somewhat confident 3. Need Help
Q23: I can use the Name box 1. Confident 2. Somewhat confident 3. Need Help
Q24: I can use Go To command 1. Confident 2. Somewhat confident 3. Need Help

<p>Q25: I can create named ranges in Excel</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q26: I can add worksheets to existing workbooks</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q27: I can copy and can move worksheets</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q28: I can change worksheet order</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q29: I can change worksheet tab color</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q30: I can insert hyperlinks</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q31: I can hide worksheets</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q32: I can insert and delete columns and rows</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q33: I can insert and delete cells</p>

1. Confident 2. Somewhat confident 3. Need Help
Q34: I can hide columns and rows
1. Confident 2. Somewhat confident 3. Need Help
Q35: I can freeze panes
1. Confident 2. Somewhat confident 3. Need Help
Q36: I can split the window
1. Confident 2. Somewhat confident 3. Need Help
Q37: I can open additional windows
1. Confident 2. Somewhat confident 3. Need Help
Q38: I can arrange additional windows
1. Confident 2. Somewhat confident 3. Need Help
Q39: I can change font and font styles
1. Confident 2. Somewhat confident 3. Need Help
Q40: I can apply number formats
1. Confident 2. Somewhat confident 3. Need Help
Q41: I can using the Format Painter
1. Confident 2. Somewhat confident 3. Need Help
Q42: I can Moving text within SmartArt shapes

1. Confident 2. Somewhat confident 3. Need Help
Q43: I can reverse the direction of SmartArt elements
1. Confident 2. Somewhat confident 3. Need Help
Q44: I can modify cell alignment and indentation
1. Confident 2. Somewhat confident 3. Need Help
Q45 I can wrap text within cells
1. Confident 2. Somewhat confident 3. Need Help
Q46 I can merge cells
1. Confident 2. Somewhat confident 3. Need Help
Q47 I can apply cell formatting
1. Confident 2. Somewhat confident 3. Need Help
Q48 I can Insert charts on slides
1. Confident 2. Somewhat confident 3. Need Help
Q49: I can apply cell styles
1. Confident 2. Somewhat confident 3. Need Help
Q50: I can change workbook themes
1. Confident 2. Somewhat confident 3. Need Help

<p>Q51 I can insert headers and footers</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q52 I can insert watermarks</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q53 I can modify page setup</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q54 I can repeat headers and footers</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q55 I can set print scaling</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q56 I can configure workbooks to print</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q57 I can print individual worksheets</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q58 I can set a print area</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q59 I can define an order of operations</p>

1. Confident 2. Somewhat confident 3. Need Help
Q60: I can reference cell ranges in formulas
1. Confident 2. Somewhat confident 3. Need Help
Q61: I can utilize references (relative, mixed, absolute)
1. Confident 2. Somewhat confident 3. Need Help
Q62: I can display formulas
1. Confident 2. Somewhat confident 3. Need Help
Q63: I can set data validation
1. Confident 2. Somewhat confident 3. Need Help
Q64: I can specify input messages
1. Confident 2. Somewhat confident 3. Need Help
Q65: I can configure error alerts
1. Confident 2. Somewhat confident 3. Need Help
Q66: I can pinpoint invalid data
1. Confident 2. Somewhat confident 3. Need Help
Q67: I can utilize the SUM function
1. Confident 2. Somewhat confident 3. Need Help
Q68: I can utilize the AVERAGE function

1. Confident 2. Somewhat confident 3. Need Help
Q69: I can utilize the MIN and MAX functions
1. Confident 2. Somewhat confident 3. Need Help
Q70: I can utilize the COUNT function
1. Confident 2. Somewhat confident 3. Need Help
Q71: I can utilize the SUMIF function
1. Confident 2. Somewhat confident 3. Need Help
Q72: I can utilize the AVERAGEIF function
1. Confident 2. Somewhat confident 3. Need Help
Q73: I can utilize the COUNTIF function
1. Confident 2. Somewhat confident 3. Need Help
Q74: I can utilize the RIGHT, LEFT, and MID functions
1. Confident 2. Somewhat confident 3. Need Help
Q75: I can utilize the TRIM function
1. Confident 2. Somewhat confident 3. Need Help
Q76: I can utilize the UPPER and LOWER functions
1. Confident 2. Somewhat confident 3. Need Help

<p>Q77: I can utilize the CONCATENATE function</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q78: I can convert tables and ranges</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q79: I can apply styles to tables</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q80: I can change sort order</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q81: I can sort data on multiple columns</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q82: I can filter records</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q83: I can define titles</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q84: I can band rows and columns</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q85: I can remove styles from tables</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q86: I can add and removing cells within tables</p>

<p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q87: I can remove duplicates</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q88: I can insert Total rows</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q89 I can create charts</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q90: I can position charts</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q91: I can resize charts</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q92 I can apply chart layouts and styles</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q93: I can add chart legends</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q94: I can modify chart parameters</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>

<p>Q95: I can add data series to charts</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q96: I can switch between rows and columns in chart source data</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q97: I can use Quick Analysis</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q98: I can apply conditional formatting</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q99: I can insert sparklines</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q100: I can insert subtotals</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q101: I can create outlines</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q102: I can collapse groups of data in outlines</p> <p>1. Confident 2. Somewhat confident 3. Need Help</p>
<p>Q103: I can insert images</p>

1. Confident 2. Somewhat confident 3. Need Help
Q104: I can position objects
1. Confident 2. Somewhat confident 3. Need Help
Q105: I can create text boxes
1. Confident 2. Somewhat confident 3. Need Help
Q106: I can create WordArt
1. Confident 2. Somewhat confident 3. Need Help
Q107: I can create SmartArt
1. Confident 2. Somewhat confident 3. Need Help
Q108: I can add borders to objects
1. Confident 2. Somewhat confident 3. Need Help
Q109: I can add styles and effects to objects
1. Confident 2. Somewhat confident 3. Need Help
Q120: I can change object colors
1. Confident 2. Somewhat confident 3. Need Help
Q122: I can modify object properties
1. Confident 2. Somewhat confident 3. Need Help

Q122: I can manage macro security

1. Confident 2. Somewhat confident 3. Need Help

Q124: I can record simple macros

1. Confident 2. Somewhat confident 3. Need Help

Q126: I can assign shortcut keys

1. Confident 2. Somewhat confident 3. Need Help

Q127: I can customize the Quick Access Toolbar

1. Confident 2. Somewhat confident 3. Need Help

Q128: I can customize the ribbon

1. Confident 2. Somewhat confident 3. Need Help

Appendix D: Interview script for Lab Instructors

interviewee:

Standard Criteria

Q1: What are standard guidelines you follow while designing ICT lab manuals for Microsoft office productivity tools.

Q2: How many modules of MS office (MS Word, MS PowerPoint and MS Excel) have been covered in FOICT course?

Q3: How long a module is taught in terms of week(s)/hr. (s).

Assessment Criteria

Q4: What are assessment method(s) opted for each module.

Q5: To what extent have you taught or included the following topics in FoICT curriculum: Fill the following boxes by typing yes.

MS Word

Areas focused	Not Covered	Basic	Medium	Advance
MS word Create and Manage Documents				
MS word format text paragraph and sections				
MS word create table and lists				
MS word apply references				
MS word insert and format				

objects				
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b.MS PowerPoint

Areas Focused	Not Covered	Basic	Medium	Advance
Create and manage presentations				
insert and format shape and slides				
create slide content (text, table, charts, format SmartArt images and media)				
Apply transitions and animations				
Manage multiple presentations (merge content, review changes, protection)				

MOS Excel 2013

Areas Focused	Not Covered	Basic	Medium	Advance
Create and manage worksheets and workbooks				
Create cells and ranges				

Create tables				
Apply formulas and functions				
Create charts and objects				

Perception

Q6: What is your perception on including MOS certification in FoICT course? elaborate by discussing its strengths and weaknesses.

Motivation Level

Q7: What would be the impact of certification on the student's motivation?

Q8: How do you think new manuals are different from old manuals. Please elaborate.

Future Recommendations

Q9: How can we occupied students with better IT Skills specifically with and without MOS Certification Exams.

Appendix E: Script for Focus Group Discussion

Focused Group Questionnaire

NAME:

BATCH:

SECTION:

Introduction: I invited you all to discuss about” Microsoft Office Specialist Trainings Impact “. That was part of your FoICT course. As the purpose of those trainings were to make you guys feel more capable in terms of using MS office while working on your assignments and presentations. The purpose of certification was to give you people a sense of achievement; along with it you can justify your skills in market by showing that certification. In below table there are several open questions. Your personal opinions and view are very important for us. There are no right or wrong answers. Please feel welcome to express yourself freely while answering

Questions/Responses

Q1: How did MOS trainings help you in doing your assignments?

Response:

Q2: How would you grade the difficulty level of MOS trainings was it of basic, medium or expert level?

Response:

Q3: What are the positive and negative aspects of the Microsoft office trainings according to you?

Response:

Q4: What was the pace of training? Was that too fast, medium or slow?

Response:

Q5: What motivated you to take the MOS trainings, integrated in FoICT course?

Response:

Q6: How motivated were you to take these trainings if certification would not be the part of those trainings

Response:

Q7: What was your general impression of the Microsoft Office Specialist Trainings?

Response:

Q8: What kind of skills you feel are developed after taking these MOS trainings?

Response:

Q9: Where will you use these skills you have developed after taking MOS Trainings?

Response:

Q10: In your opinion what would be changed in the training or what should be included in the trainings further

Response: