Instructors' and Students' Perception on the Use and Effectiveness of the Suggested Online Exam System: The Case of University of Sulaimani, School of Humanities

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ABSTRACT

In recent years, Information Communication Technology (ICT) has grown rapidly in each day. Many governments in developed countries are already used these tools in their educational systems. To provide higher quality education in 21st century, countries like Kurdistan newly started to use ICT tools in their higher education institutes. Due to the spread of network applications and central e-learning systems in schools and universities such as University of Sulaimani, instructors' and students' perception on the use and effectiveness of the suggested online exam system at the School of Humanities is a tremendous need in order to improve and fulfill the current system.

In this thesis, the researcher developed an online examination system which can completely replace the traditional method and would be a beneficial for the university, academic staff and students.

Keywords: ICT, E-learning, Online Examination System, Higher education.

ÖZ

Son yıllarda Bilgi İletişim Teknolojileri (BİT) her gün hızla büyüdü. Birçok gelişmiş ülkeler Gelişmiş ülkeler eğitim sistemlerin de bu Bilgi İletişim Teknolojilerini kullanıyor. 21. Yüzyılda daha kaliteli bir eğitim sağlayabilmek için, Kurdistan gibi ülkeler Bilgi İletişim Teknolojilerinini yüksek öğretimde Süleymani Universitesi gibi daha yeni kullanmaya başladı. Okullarda ve üniversiteler de örneğin Süleymaniye üniversitesinde ağ uygulamalarının ve merkezi E-öğrenme sistemlerinin yayılmasından dolayı İnsan ve Toplum Bilimleri Bölümün de önerilen online sınav sistemi üzerinde öğretmen ve öğrenci görüşleri mevcut sistemi geliştirmek ve eğitim sisteminde var olan boşlukları doldurmak için büyük bir önem arz etmektedir.

Bu araştırmada, araştırmacı online bir sınav sistemi geliştirmiştir ve bu sistem geleneksel sınav sistemiyle tamamen yer değiştirilebilir. Bunun yanında, bu önerilen online sınav sistemi hem üniversiteler için hem de öğrenci ve öğretmenler için faydalı bir sistemdir.

Anahtar Kelimeler: BİT, e-öğrenme, Online Sınav Sistemi, Yükseköğretim.

DEDICATION

All praise to Allah for lighting up my path to reach where I'm standing now, for gifting me a wonderful parents who I'll forever be thankful for, leading my way to success and gave most of their time helping and advising me. Because of all these, I am proudly dedicated to this achievement and others with the support of my parents, lovely teachers, friends, and every person who helped, or shared my way. Thank you all, God bless you!

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ABBREVIATIONS

E-learning	Electronic Learning
ICT	Information Communication Technology
OES	Online Examination System
LMS	Learning Management System

Chapter 1

INTRODUCTION

1.1 Background

In recent years, Information Communication Technology (ICT) has grown rapidly for every day. Many governments in developed countries have already used these tools in their educational systems. As it was mentioned by Moore & Kearsley (2011), ICT can increase the flexibility and ease in accessing the education for the learners. In fact, by using ICT learners can access their educational material and online resources anywhere at any time (Noor-Ul-Amin, 2013). The ICT technology can also be a huge benefit to the disabled learners and provide wide variety of teaching materials which suites their condition (Moore & Kearsley, 2011).

Many researchers believe that, the ICT can improve the learning and teaching quality in the classroom. According to Yelland (2001) the traditional education system is not suitable to provide productive learning in 21st century. As Grimus (2000) mentioned, today the students learn the ICT skills and the knowledge in order to face with the future. New technology also could help the instructors to improve their pedagogical skills and also it can help them to motivate students by encouraging them to participate more in the classroom and learning tasks (Grabe & Grabe, 2007). Moreover, ICT pedagogical tools can provide more resources to the instructors and the students. Internet more specifically is an essential tool in searching and finding resources online (Al-Alwani, 2005). Moreover, schools with ICT learning environments are entirely

different from the traditional schools. In fact, the skills which students' need to learn at these schools are different from each other. At schools which are equipped with ICT technology, the skills such as critical thinking, research and evaluation skills are important, whereas in traditional schools the cognitive skills are more emphasized (Noor-Ul-Amin, 2013).

According to Sife, Lwoga, & Sanga (2007), development of ICT has heavily impact in educational system, mostly in universities. ICT tools in universities have already formed an e-learning system. E-learning can include a wide variety of applications and learning strategies. One of the supplementary applications which can significantly improve educational and pedagogical aspect of the universities is the online examination system. Online examination system can eliminate exam impersonation, plagiarism, cheating for the students, and make the question design and grading easier for instructors (Adebayo & Abdulhamid, 2014).

Many governments in developed countries use ICT tools in their educational system due to the rapid growth and significant development of such tools. However, in Asia and more specifically in Middle East, the use of these technologies is new. To provide higher quality in education in 21st century, countries like Kurdistan newly has started to use ICT tools in their higher education institutes. Due to the spread of network applications and central e-learning systems at schools and universities in Kurdistan, there is tremendous need for an effective examination system to improve and fulfil the current system.

In this research, the researcher develops an online examination system which can completely replace the traditional method and will be beneficial for the University of Sulaimani, department of Media including the academic staff and the students.

1.2 Problem Statement

Although some universities in Kurdistan already utilize e-learning system, but none of these systems are correctly functioned and do not have all the features that are essential for such systems. The leakage of modern examination system is distinct in all these systems.

Moreover, most instructors and students at the University of Sulaimani are not even familiar with the idea of online examination system. Therefore, the design and introducing such system to other universities can be huge benefit for the education industry, academic staff and the students.

1.3 Aim of the Study

The main goal of this thesis is to develop a new online exam system in order to enhance online exam features for the 3rd and 4th year students and teachers from the Faculty of Media department. Then, analyzing the perceptions of the teachers and students are proposed in the online examination system.

1.4 Research Questions

The researcher aims to investigate the following questions:

1. What are the instructors' and students' perceptions on the proposed online exam system regarding its use, effectiveness and practicality?
2. To what extend this new online exam system will fulfil teachers' and students' needs compared to the traditional system?

3. What will be the contribution of this new exam system (both negatively and positively) to the University of Sulaimani?

4. Considering the practicality and time management that the teachers will find it useful to use or not?

1.5 Significance of the Study

In this research, the researcher will replace the traditional method exam system with online exam system. The proposed online exam system suggests more practicality, time management and less expense for both instructors and students.

1.6 Methodology of the Study

In this research both quantitative and qualitative research methods has been used to collect data from participants. For collecting qualitative data, in-depth interview has been applied to gather feedback of instructors' and students' perceptions on the proposed online exam system. For quantitative, a questionnaire has been given to the students at the University of Sulaimani in order to gather information about their experience on the proposed new online exam system.

1.7 Participants

The researcher has collected the data from all of the 3rd and 4th year students and instructors from the Faculty of Media Department who study and teach at the University of Sulaimani.

1.8 Limitations

ICT is a new technology in educational system in Kurdistan, therefore finding a corporative university for this research was a challenge for the researcher. Moreover, not all of the instructors and students in Sulaimani University were computer literate therefore finding correct participants' was also a big obstacle.

1.9 Key Definition

ICT: Information and communications technology (ICT) is often used as an extended synonym or as an umbrella term for information technology (IT), but is a more specific term (i.e. more broad in scope) that stresses the role of unified communications and the integration of telecommunications.

E-learning: learning conducted via electronic media, typically on the Internet.

Chapter 2

LITERATURE REVIEW

2.1 Introduction

In recent years and with the blooming of digital age in all over the globe, the cost of computation has decreased significantly. Today, in most part of the world, people have access to the computers and digital technologies of 21st century. Although the equipment's might not be the same in all countries, but the access to the internet made it easy for everyone to be familiar with the digital technologies. Digital technologies have also been found their ways to revolutionize the educational field, but technology was not successful to change the entire landscape of education, compared to other industries such as teacher training, initial teacher training programs or in-service training.

Over the past fifty years, many teachers have realized that teaching and learning process is not just cognitive and pouring information in the head of the learners, but it is an active process of understanding, discussion and experiment. Computers are now new medium to create, express and discuss information. However, with all the benefits of computers aside, still many instructors are not computer literate enough to use computer in their teaching process. It is worth to mention that, the lack of equipment can also be a reason for instructors to avoid utilizing computers in their classrooms (Kirkman et al., 2002).

The important issue in this century is that; the education relevance to the technology is the most important demand for classroom. Students have to understand how to work and live with technology to be able to keep up with world workforce requirements (Kirkman et al., 2002). The diverse set of technological tools and resources used for communicating, creating, storing and managing information is called ICT, Wajcman (2015). Computers and more specifically, internet have improved the effectivity and efficiency of education significantly in past few years (Tinio, 2016). Despite all the benefits of ICT in education, many recent researches show that various numbers of institutions are failed to integrate technology to their classrooms. According to Gülbahar (2008), the reason of this failing is the instructor's avoidance from these technologies.

The lack of computer skills, hard schedule and difficult user interface of LMS (Learning Management System) programs of universities are some of the reasons that prevents instructors from using ICT tools in their teaching and learning process (Gülbahar, 2008). Modern training needs to be easy and accessible. A learning management system (LMS) allows you to create, distribute and track training anywhere, on any device. The LMS has become a powerful tool for consulting companies that specialize in staffing and training, extension schools, and any corporation looking to get a better grasp on the continuing education of its workforce. Its impact has been felt mostly outside of traditional education institutions, though the same technological and market forces are dramatically changing today's classroom as well.

The proposed system in this research has been designed for Kurdistan Region which is located in North of Iraq. Due to very poor ICT infrastructure, until 1991 the usage

of these tools was almost zero in this area, but after the spring uprising of 1991, Kurdistan regional authorities built an administrative government and implement the ICT strategies in the region (Mahmood, 2013).

Moreover, implementing ICT tools and infrastructure take time and heavy cost. But, it can be said that University of Sulaimani is at the right track in doing that. Today, most universities and schools in Kurdistan are equipped with ICT tools and the demand for efficient administrative and educational application is higher than ever. Regarded to that, the researcher of this thesis has proposed an online examination system which can be used as both administrative and educational tool in Sulaimani University.

In this chapter, the researcher first will indicate some basic concepts and benefits of ICT and e-learning in higher education institutions. Then, the researcher will investigate the utilization of exam management system and the advantages that such system could bring for instructors and students. Finally, the similar projects will be reviewed and discussed.

2.2 Definitions

2.2.1 Concept of ICT

ICT has made impressive changes in many industries, but the greatest expectation of ICT is often centralize in teaching and learning area (Bates 2000). Knowledge about ICT skills are the new literacy in 21st century. Students who are now familiar with ICT technologies have more chances in mastering their course contents faster and deeper (Katz & Macklin, 2007).

The development of ICT, more specifically, the web 2.0 tools are what signifies this century. ICT tools enable the people to access wide web of information and

communicate in many new forms. In fact, ICT in 21st century forces us to change our traditional ways of our lives and computerize many of these processes (Katz & Macklin, 2007).

In past, there were several reasons that limited educational institutions to use ICT tools in their classrooms; lack of enough funding to support this kind of technology, lack of training in their instructors and students and lack of motivation among the teachers to adopt ICT teaching tools, (Oliver, 2002). However, in recent years the education industry has realized that the great potential effects of these tools are on the learning and teaching process. Therefore, many higher education institutes have reformed their agendas and integrated these ICT tools in their classrooms (Katz & Macklin, 2007). ICT improves the quality of teaching and learning by trend introduced as e-learning or online learning which can be used both inside and outside of the universities' campus. Many countries and governments nowadays are using ICT tools as a bridge to access high quality in the 21st century learning methods in their educational systems (Katz & Macklin, 2007); (Stensaker et al., 2007). Moreover, developing countries are not advanced in using such technologies in their industries like developed counties, but the growth of ICT utilization is significantly high in these countries.

In Kurdistan, telecom department has found a comparative advantage in fast internet connection and mobile services, compared to rest of federal Iraq (Maloy, 2013). According to IIG (Invest in Group) (2014), "Kurdistan's ICT sector started from almost nothing in 2005, and has since become one of the Kurdistan Region's most well developed and strategically important sectors"**.** Therefore, the popularity of internet usage in this region has been increased significantly in past few years. Recently higher education institutes in Kurdistan have started to use ICT tools in their classrooms and

administrator part of the universities. This has made an opportunity for both students and teachers to improve their ICT skills and discover new ways of learning and teaching by integrating these technologies in their studies.

2.2.2 E-Learning

With development of technology and usage of ICT in the higher education, the virtual education like: distance education methods became popular in many developed countries. This made universities whom look for wider market, able to seek for new students from worldwide basis (O'Neill & O'Donoghue, 2004). However, having more students is not the only reason that universities use e-learning in their institutes. According to Stockley (2003) e-Learning is "the delivery of learning, training or education program by electronic means. E-learning includes the use of a computer or electronics means in some ways to provide training, educational or learning materials." Clark and Mayer (2016) stated that, in fact e-learning helps the instructors and students to enhance classroom environment, communications, transfers, motivations and equal opportunity for all students with different learning styles (Fuller, 2001); (Bencheva, 2010).

Today, e-learning is mostly used for online courses in universities and colleges. As a result of that, the dominant learning technology of today is the type of the system that organizes and delivers online courses (Downes, 2005). This system is in fact software/application which is called learning management system (LMS). Many companies such as WebCT, Blackboard and Desire2Learn have produced an LMS for higher education institutes (Downes, 2005). Universities use e-learning in their institutes for many reasons such as ; providing consistence and global training, reducing the transferring and delivery time, increasing the satisfactory level of the learning, reducing the information overload and lowering the overall expenses of

education for both learners and universities (Welsh et al., 2003). Moreover, by using e-learning systems, it is easier for the instructors to keep track on learner's activities and history.

Although the education system of Iraq has faced many serious problems and shortcomings in past two decades, but recently the Kurdistan government has heavily invested in IT infrastructure and integrating ICT tools in education system (Tar & Lawrence, 2011). Unfortunately, despite all these investments and efforts still the universities in Kurdistan have lack in the e-learning and learning management systems (LMS). Although few universities are using free LMS platforms such as Moodle, but only limited number of students and instructors use this system efficiently. That is why for now it is essential need for Kurdistan to start integrate and educate its educational sectors with e-learning system and LMS.

2.2.3 Online Exam System

With the rapid growing of LMS usage in higher education institutes, the number of students who take their examination online is also amplifying. Online examination is representing of the exam questions through internet. The universities that use such system are able to announce the status or results in short time periods and more importantly, instructors are able to manage their time more effectively regarding posting and announcing their exam or any other relevant information concerning their courses (Alexander et al., 2001). In fact online testing are suitable for scheduling purposes, automatic grading, easy question banks system and costless since there is no need for paper and pencil and exam halls anymore.

However, there are a lot of discussion about the performance and the effectiveness of online examination systems. Alexander et al. (2001) believed that there is no difference

in the scoring between online exam scores and traditional ones. However in his research, he just compared the result of the scores and not the process that instructors go through for grading the papers. Schult and McIntosh (2004) argued that, using online examination system can add to the student's anxiety in their exam time. However, Russell, Goldberg, and O'Connor (2003) in their research suggested that the students who are comfortable with using computer and are computer literate enough are actually do better in the computerized exams. Many researchers believe that, the anxiety in the computerized exam is because of the use of wrong algorithm and coding while designing such systems (Marszalek et al., 2006).

2.2.4 Traditional Exam Way vs. Online Examination

In traditional course exams, always a heavy load was on the instructors and students. Students had to challenge with many types of questions and different ways to answer them and instructors had to deal with huge number of papers which they had to correct and grade one by one. The traditional way was inefficient and time consuming way, however the online examination system can provide automatic, effective and easy assessments. In addition to that, the monitoring students and the identity checking in traditional exams was always problematic for invigilators. However, the online examination can solve all of these problems by using new identity checking technologies (Sarrayrih & Ilyas, 2013).

According to Jung, the online examination has direct effect on the efficiency, accuracy and also has enhanced the exam security in the universities that adopted this technology in their courses (Jung & Yeom, 2009). Alexander et al (2001) explained that, although the students grade result of traditional exam and online exams are not different with each other, but the time that students spent for completing their exam in traditional was considerable higher than the time that they spent in the online exam. In

addition to all above arguments, Russell et al. (2003) believed that computer based exams can help the students with special needs and physical disabilities. Karim and Shukur (2016) stressed the fact that, computer based systems can make it really easy for such students by managing the exam situation according to their needs and provide more fair situation for such students, comparing to this important thing the universities and overall ministry of education in Kurdistan has already sense the benefits and need of changing the system from traditional to modern computerized way and that's a good start for developing countries with low experience in ICT field. Although many instructors and students were not cooperated before in using such technologies in the classrooms, but the new regulation of Kurdistan will be computerized. Staff and students have to adopt themselves with the situation sooner or later everything in all universities. Most of the new generated students are already familiar with the concept of daily use of computer in their lives, and it is duty of the instructors to learn and adopt the integrated technology in their classrooms.

2.2.5 Potential Challenges of Using E-learning in the University of Sulaimani

Despite all the advantages of e-learning systems, in many developing countries using such systems can be challenge for both instructors and students. These challenges can be in a wide range such as inefficient and faulty LMS, lack of virtual e-learning components (computers, internet, and electricity), active, willing and skilled participants (Andersson, & Grönlund, 2009). The argue here is that, e-learning objective supposed to provide effective and economic knowledge for students and enhance their education life, but in developing countries this objective is decreased in a way for providing education to a large number of poor students in less technological and less equipped environment (Bhuasiri et al., 2012). Nevertheless, the ICT challenges that University of Sulaimani faces up are not less than any other developing

countries. Lack of systematic approach to ICT implementation, lack of people with ICT skills, infrastructural and budget shortage are the most important reasons in developing countries which holds developing counties from changing their ways from traditional paper based to modern computerized procedure's (Sife, Lwoga & Sanga, 2007).

ICT in University of Sulaimani is in the primary steps and although most people are familiar with the concept of computerizing systems but the infrastructures to integrating these technologies in different fields are still under construction. In the educational field, most teaching and learning procedures and administrative applications are still paper based due to absence of any functional and efficient software or advanced system. That is why the writer of this thesis tried to design and implement a system to help computerizing part of teaching and learning process for Sulaimani University.

2.3 Similar Research

Ballantyne (2003) in her article had done a research on evaluation of online teaching in Murdoch University located in Perth, Australia. For this research, Ballantyne evaluated the online teaching and examination results and the feedback that was received from students and the instructors. The researcher at the end of her research identified many benefits from online examination and grading system such as: lowering the costs, having more time for teaching (instead of grading the papers), easy process of administration, more user friendly design options, grater accessibility for the students, better and more accurate data collection technique and reducing the staff time for processing and feed backing (Ballantyne, 2003).

Another research in Tasmania university in Australia showed that electronic examination system does not have too much impact on the performance of the students in that university, yet (Fluck, Pullen & Harper, 2009). In their study, the researchers created a new system based on an open source live CD on Ubuntu on three groups of pre-service teachers and checked the instructors and students opinion on using computers or paper for their examination. Despite the fact that some students find the sound of the keyboard annoying and distracting but it seems that the rest are comfortable with this way of examination. According to many instructors, also this way of exam allowed them to supervise the exam with un-specialist invigilators and also make the process of grading much faster than before (Fluck, Pullen & Harper, 2009).

Furthermore, Ricketts & Wilks (2002) also conducted a research about computer-based examination. In their research, they replaced the traditional paper and pen multiple questions with the same question formats but computer based one, and analysis of their research after one year showed that students who use the online testing do not perform as well as the ones who use the traditional tests. However, in the second year of this research the performance of the students were significantly increased in online exam system, therefore as a result of this research the researcher concluded that the introduction of students with the online testing system is very important**.** Moreover, the interface of the program also played an important part in the success rate of the students. The computer based exam applications are more user friendly and has easy interface in order to improve the adoptability of the students to the new system. In addition to that, the writer suggested that using orientation session to the computer based testing system can have significant effects on improving the performance of the students (Ricketts & Wilks, 2002).

As it was mentioned before, e-learning and ICT are still in their primary levels in Kurdistan and therefore there are no similar projects to compare and discuss it with researcher's proposed application. However, some universities in Erbil, like Salahaddin University and Avicenna center for e-learning, designed a basic learning management system (Thabit & Harjan, 2015). Although both of these systems are not completely functional, efficient or even user-friendly, but it is a good start for a developing country with no experience in this field before. The researcher of this thesis designed a web based application, which can be used as a one of the features of LMS for Sulaimani University. This application will be developed to manage and control the examination, grading and question bank for the university through computer based and online.

As it was mentioned before, in the University of Sulaimani there is no structural usage of e-learning or LMS in the educational sectors, therefore the online examination system, which is a part of teaching and learning management, hasn't been functioned or even implemented for universities yet. That is why the researcher of this thesis decided to design such system for Sulaimani University and test the attitude of instructors and students toward this system. Most researchers like Hu and Shi (2017) in this field have been believed that the most important factor in successful online examination system is its user-friendliness and ease to work; the researchers also have tried to use the most accurate and simple algorithm and user-friendly interface to create the online examination system to solve these problems.

Chapter 3

METHODOLOGY

3.1 Research Design

In this chapter, the researcher discusses the strategy and methods of this research. Moreover, the participants and the data analysis process are also presented.

In any research, the researcher has to consider various methods that might be appropriate for answering the research questions. Then, the chosen method will be implemented theoretically and practically. However, the complex nature of the project sometimes makes it difficult to answer the research questions only from one aspect and single method. “Mix methods” shows a way to investigators in order to collect data, integrate findings and draw influence by using more than one method (Morse, 2003). According to Johnson et al. (2007), “Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches for the broad purposes of breadth and depth of understanding and collaboration.”

In this research, the main question was “what is the perception of the students and instructors about the proposed online examination system?” In order to carry out this research, the researcher used “mix method approach” (qualitative and quantitative) as stated above to collect data.

3.2 Participants

In this research, the population consisted of randomly selected students and instructors from the University of Sulaimani, Faculty of Media. The research has been carried out at the Faculty of Media because for the researcher at the time of data collection Faculty of Media was more convenient comparing to others. The survey was given to 380 Media students who hold bachelor degree in Sulaimani University, but only 165 students were interested to participate in the research. Moreover, for the interviews from 31 instructors, just 10 of them were volunteered to test the proposed system and answer the interview questions. Regarding the students 16 of them volunteered to participate to the semi-structured interviews.

Table 1, shows the participants' age range which is only 0.6 percent of people were between 50-59 years old. 2.4 percent of people were between 37-49 years old; and 3.6 percent of students were between 30-37 years old. Moreover 42.4 percent of students were 18-22 years old and finally, around 50.9 percent of people were between 23-29 years old. Students' demographic information is shown in table below:

Table 1. Students' Age Demographic

Age		F	%
	18-22	70	42.4
	23-29	84	50.9
	30-37	6	3.6
	37-49	4	2.4
	50-59	1	.6
	Total	165	100.0

According to Table 2, 50.9 percent of the participants were male and 49.1 percent of the population was female.

Table 2. Students' Gender Demographic

Gender		F	%
	Male	84	50.9
	Female	81	49.1
	Total	165	100.0

Table 4, shows the students' major of studies in Sulaimani University. These majors include all the departments in Faculty of Media. As it is shown, only 33.3% of the students are studying in Public Relations, around 33.3% of the students are in Television, and 33.3% of the students are studying in Journalism.

Table 3. Students' Major of Study

Major of study		F	%
	Public Relations	55	33.3
	Television	55	33.3
	Journalism	55	33.3
	Total	165	100.0

Table 4, shows the number of years that students are studying in their major in Sulaimani University. The researcher chose students randomly from each department. However, as matter of courses the distributions of total number of these students who study in these departments are equal.

Table 4. Year of Study

Year of study		F	%
	Third Year	70	42.4
	Fourth Year	95	57.6
	Total	165	100.0

Comparing to the third year students', the fourth years' perceptions are more dominant on the use of online exam system because they are more aware of the use and application of the new technology. According to Table 5, only 60.6 percent of the students in Sulaimani University consider themselves as a computer literate and 39.4 percent of the students are completely unfamiliar with the basic concept of computers.

Table 5. Students' Computer Literacy

Computer literacy		F	%
	Yes	100	60.6
	No	65	39.4
	Total	165	100.0

3.3 Data Collection Instrument

In this research, qualitative and quantitative methods have been chosen to gather primary data. This data was collected by using 24 questions adapted from the article of Ogunlade, O. O., & Oladimeji, O. F. (2014) for quantitative approach and 8 open ended questions in semi-structured interviews for qualitative approach. The adapted questionnaire was given to three expertise in Computer Science Department and after receiving their feedback, it was applied to the students. For the semi-structured interviews, after piloting the questions the rest of the interviews were applied.

3.4 Data Collection Procedure

The researcher has chosen the case study approach for this research. Case study allows the exploration and understanding of complex issues. It can be considered a robust research method particularly when a holistic, in-depth investigation is required. A case

study method selects a small geographical area or a very limited number of individuals as the subjects of study (Zainal, 2007). According to Yin (1994) the case design must have five components; the research question(s), its propositions, its unit(s) of analysis, a determination of how the data are linked to the propositions and criteria to interpret the findings.

Considering the types of case study Guba and Lincoln (1981) stated that there are three types; factual, interpretative and evaluative. Likewise in this research due its purpose, the researcher chose the interpretative type of case study because it includes recording, constructing and presenting and deducting facts upon the perceptions of students and teachers. In short, case study approach encourages educators to consider additional steps in a caring educational curriculum that emphasizes the relationships between human beings (Scott, 2005).

3.4.1 Qualitative Data Collection: Semi-Structured Interview

Interview is the most popular way of collecting data. Different interview strategies are used for different research prospective. In this research, the researcher has chosen semi-structures interview which is often sole data source for many qualitative research projects (DiCicco-Bloom & Crabtree, 2006).

Interview is a common way of collecting data directly; hence this approach will allow the researcher to collect the data from the students and instructors who have experience from old traditional system and the new one, then both of them answer the questions about their experience with proposed system and advantages or/and disadvantages that they found in online examination system.

3.4.2 Quantitative Data Collection: Questionnaire

Quantitative research is a strategy of solving problem by generating numerical data that can be transformed into statistics. Quantitative data collection method includes many forms. Questionnaires are one of the most common tools for collecting and recording information in the quantitative research (Miles & Huberman, 1984).

In this research, the researcher intended to perceive the students' perceptions on the proposed online exam system through questionnaire. The purpose of using the questionnaire is to determine the level of satisfaction or dissatisfaction of students from the proposed system and its relevance to the student's computer literacy.

3.5 Data Analysis

Data is one of the main components for any research and to answer the research questions. From the questionnaire the quantitative data and from the semi-structured interviews the qualitative data gathered with the perceptions of students and instructors. The collected data is analyzed by using statistical pack-age for the Social Sciences (SPSS) software. For the interpretation of the analysis, the researcher with the help of an expertise has used descriptive and frequency statistics.

3.6 Validity and Reliability

To ensure the accuracy and the reliability of this research, the questionnaire was adapted from Ogunlade, O. O., & Oladimeji, O. F. (2014) article. The questionnaire was given to three expertise from the department of Computer Science and after receiving their feedback, the researcher applied the questionnaire to all of the 3rd and 4th year students at the University of Sulaimani. Regarding the semi-structured interviews, they were piloted before given to the students and instructors. After piloting, the final draft of the semi-structured interviews was given to the rest of both

students and instructors. Moreover, it is important to underline the fact that this research was designed to the University of Sulaimani for the first time while e-learning application even is not familiar for many academic staff there.

Chapter 4

SYSTEM DESIGN

4.1 Functional Requirements Diagram

The implemented system has much functionality that has been assigned to users according to their rules. In this subchapter, functionality diagram for each actor is explained.

4.1.1 Admin

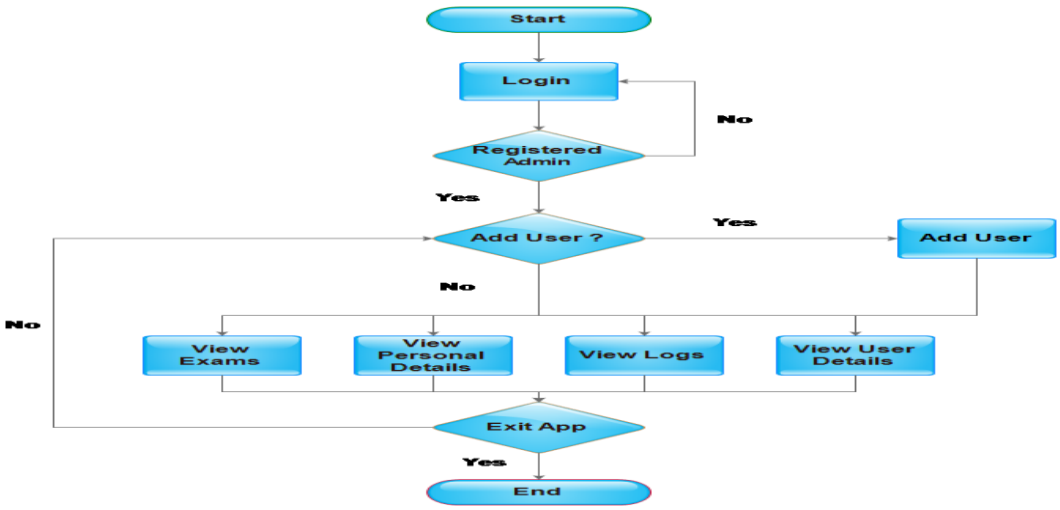

Figure 1. Admin Process

Figure 1, shows the cycle of the Admin and the logical process that admin should proceed to fulfill the functionalities. The diagram starts with login process that allows admin to insert their credentials. If admin is registered in the database, the process will direct admin to the functionality processes. Otherwise, it returns to the login page. The admin of the system has decision process which is adding user to the system (user can

be teacher, reviewer or student). If add user is chosen the process, “Add User” will take place. The admin can run many other processes like: “View Exam”, “View Personal Details”, “View Logs” and “View User Details”. In any time admin can click to exit the app and be redirected again to login page.

4.1.2 Teacher

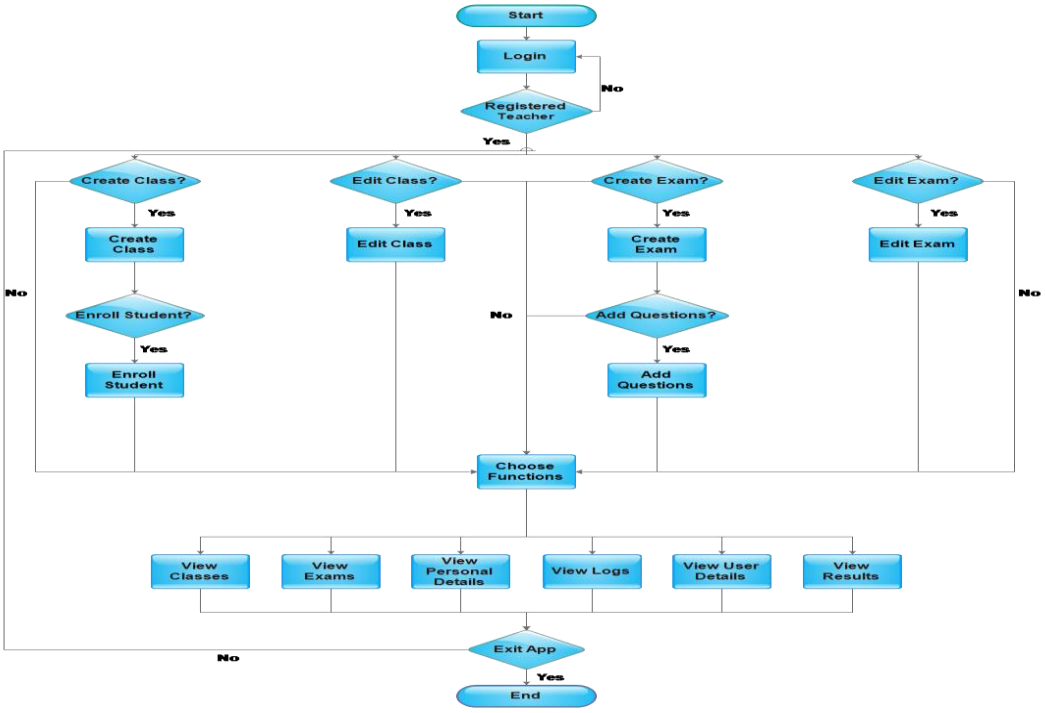

Figure 2. Teacher Process

Figure 2 above shows the life cycle of the teacher which is the most complex diagram inside the system because it has the most Functionality and process. The teacher will be prompt to insert user name and password in the login page, while the credentials are false in the running process of login. If the credentials are correct, the teacher will direct it to its dashboard and will be able to perform the functionality assigned to her/him.

The teacher has many decision processes, starting from “Create Class” process that allows the teacher to add new class which leads to another decision process called “Enroll Student” which allows the teacher to enroll students to create a class. “Edit Class” decision process allows the teacher to edit created class details. The most important decision process is “Create Exam” process which allows the teacher to add exam, this process leads to another decision process which is “Add Question” which allows the teacher to add questions to a specific exam. Last decision process is “Edit Exam” process which allows the teacher to edit exam details and questions. Teacher has also many view processes like: “View Classes”, ”View Exams”, “View Personal Details”, “View Logs”, “View Results” and “View User Details”.

4.1.3 Reviewer

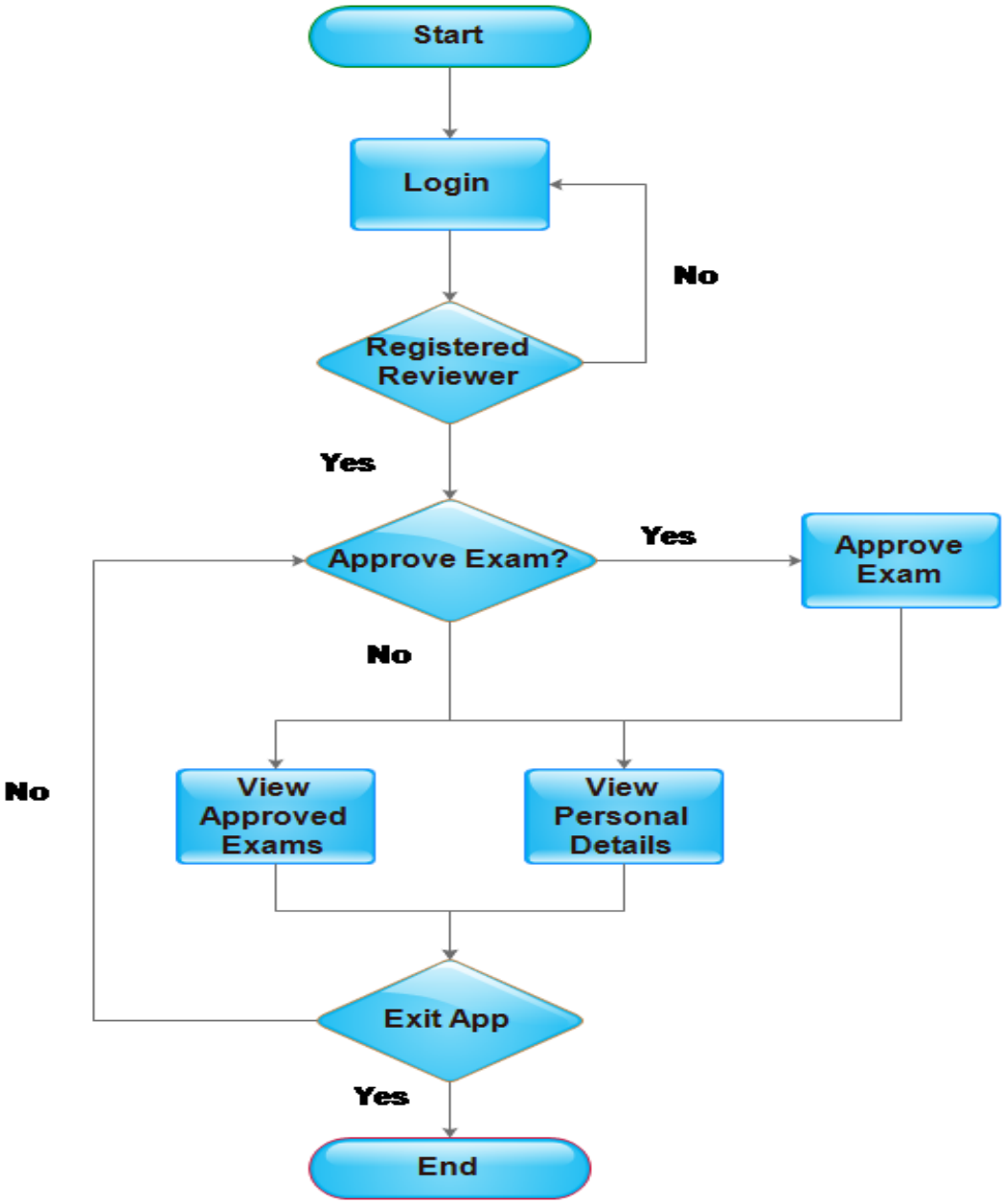

Figure 3. Reviewer Process

The figure above shows the functionality diagram of reviewer. Login page prompts reviewer for his/her credentials and keeps prompting while credentials are false. If credentials are correct, the reviewer will be directed to use functionality assign for him/her. The reviewer has one decision process which is “Approve Exam” to approve

exams created by teachers. The reviewer has two view processes which are: “View Personal Details” and “View Approved Exam”.

4.1.4 Student

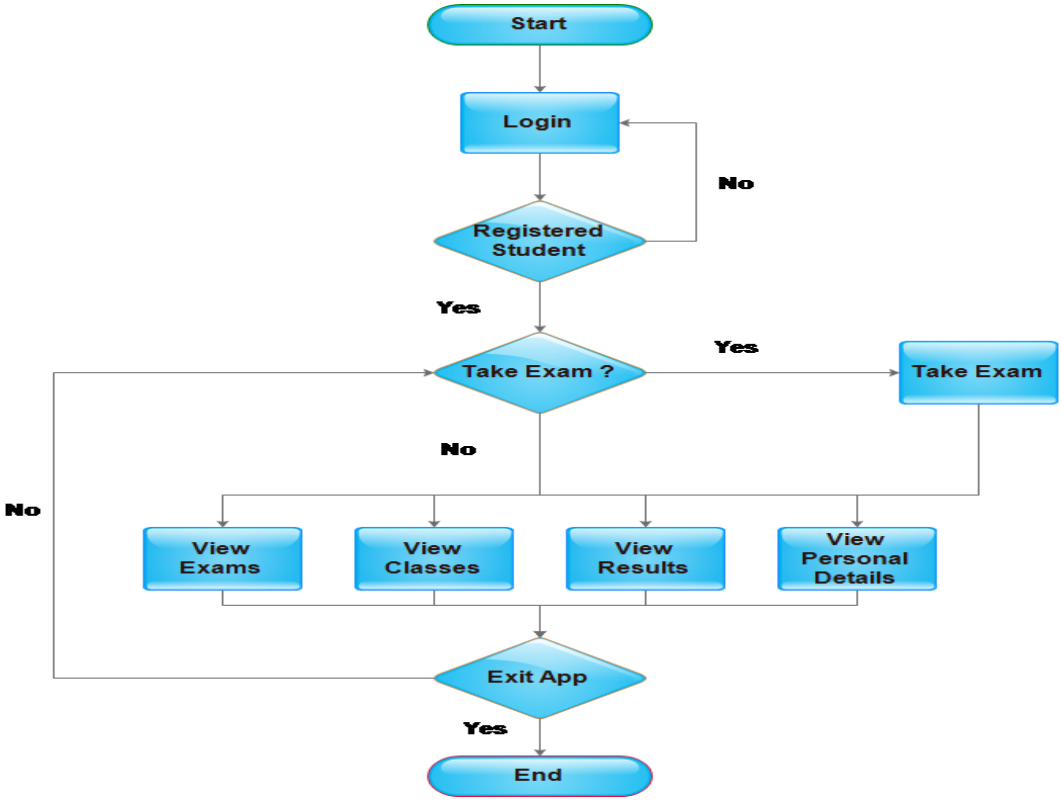

Figure 4. Student Process

The figure above shows the student’s process life cycle. As any other user, while credentials are false the student keeps prompt for correct credentials in login page. When the student insert correct credentials, the student will be directed to its dashboard and will be able to use the functionalities assigned for him/her. The student diagram has an important decision process called “Take Exam” which allows the user to attend exam that created by teacher and approved by reviewer. Student has many view processes like: “View Exams”, “View Classes”, “View Results” and “View Personal Details”.

4.2 Use Case Diagram

There are many figures below that show the main processes in implementing the system and the main actors dealing with those processes.

4.2.1 The Role of the Admin

In the figure below the various roles of the admin can be seen. The person who is in charge of being as an admin can; view classes, exams, user details, personal details, add user and change password.

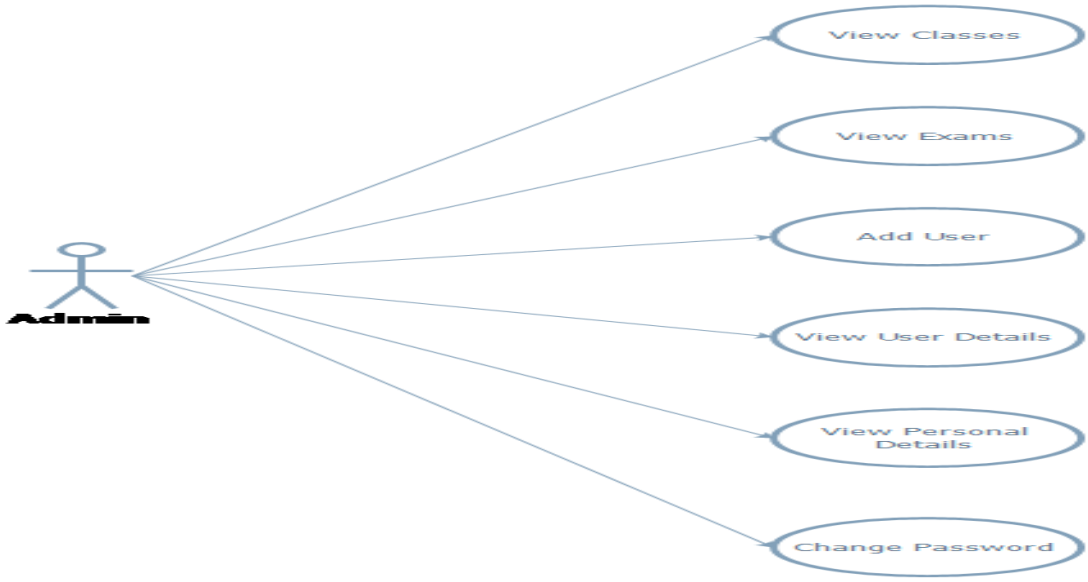

Figure 4. Admin Functionality

Table 6. Admin Dashboard

View Classes	
Brief Description	View classes created by teachers
Actor(s)	Admin
Preconditions	Created Classes
Main Flow	Click “Dashboard”

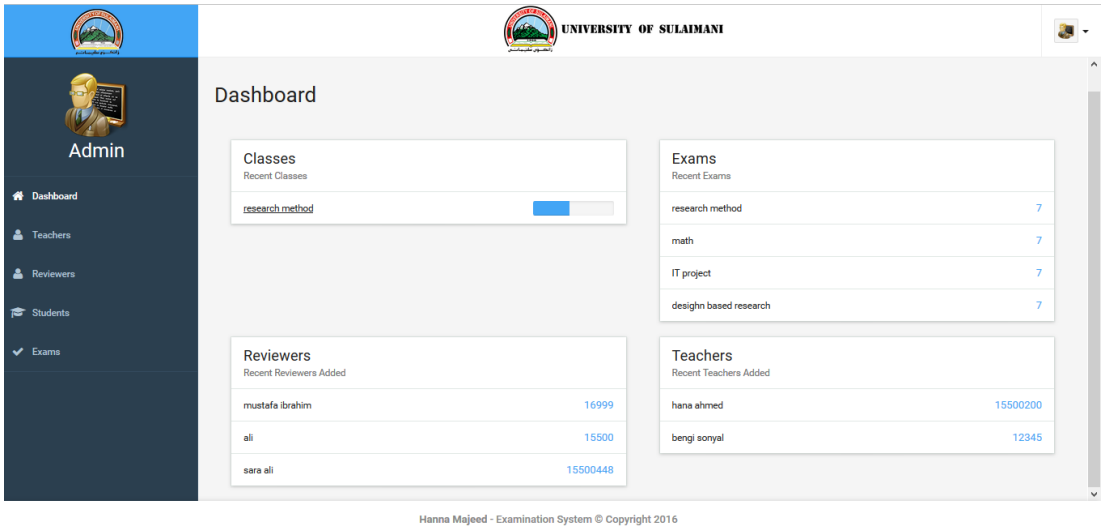

Figure 5. Admin Dashboard

Table 7. Admin Dashboard to view Exams

View Exams	
Brief Description	View exams created by teachers
Actor(s)	Admin
Preconditions	Created Exams

Main Flow	Click “Dashboard”

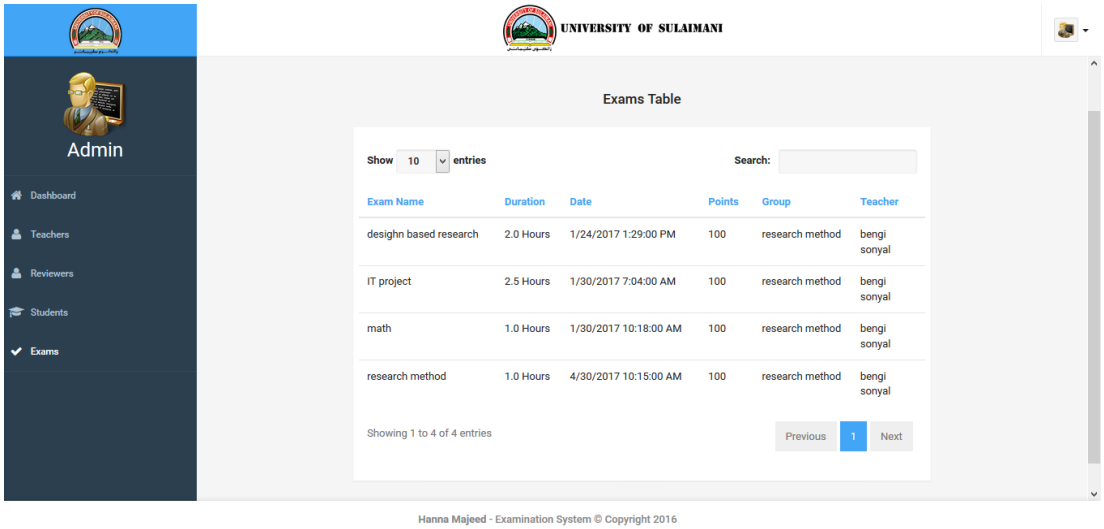

Figure 6. Admin Dashboard to view Exam

Table 8.Admin Dashboard to add Users to the System

Add Users	
Brief Description	Add Users to the system (Teacher, Reviewer and Student)
Actor(s)	Admin
Preconditions	-

Main Flow	Click “Users” Click User Type “Teacher”, “Reviewer” or “Student” Click “Add User” Fill the form Click “Add User”

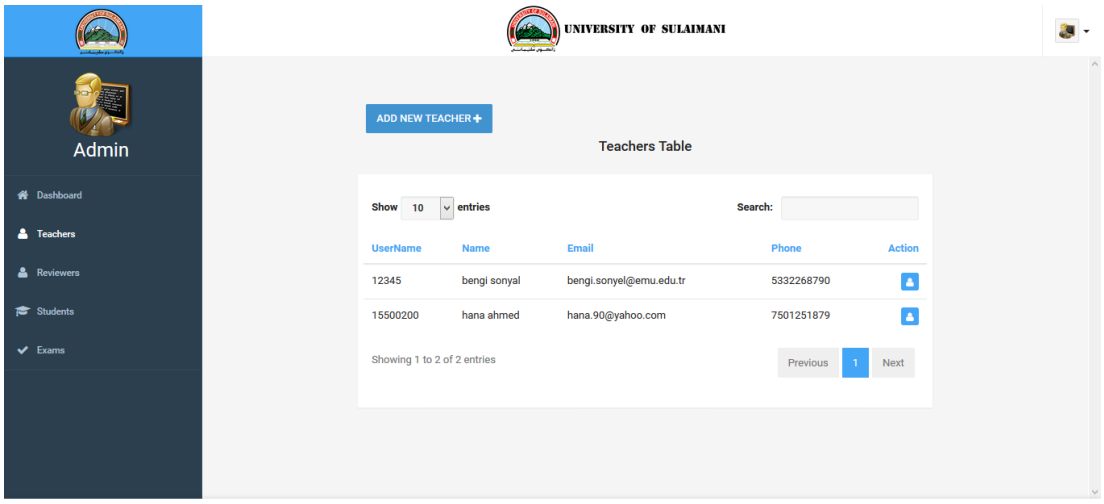

Figure 7. Admin Dashboard to add Teachers

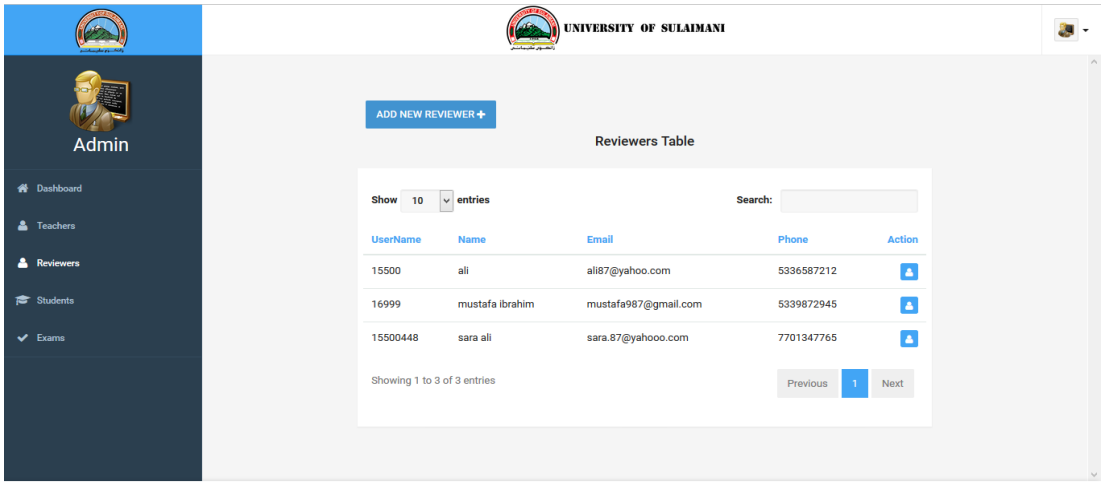

Figure 8. Admin Dashboard to add Reviewers

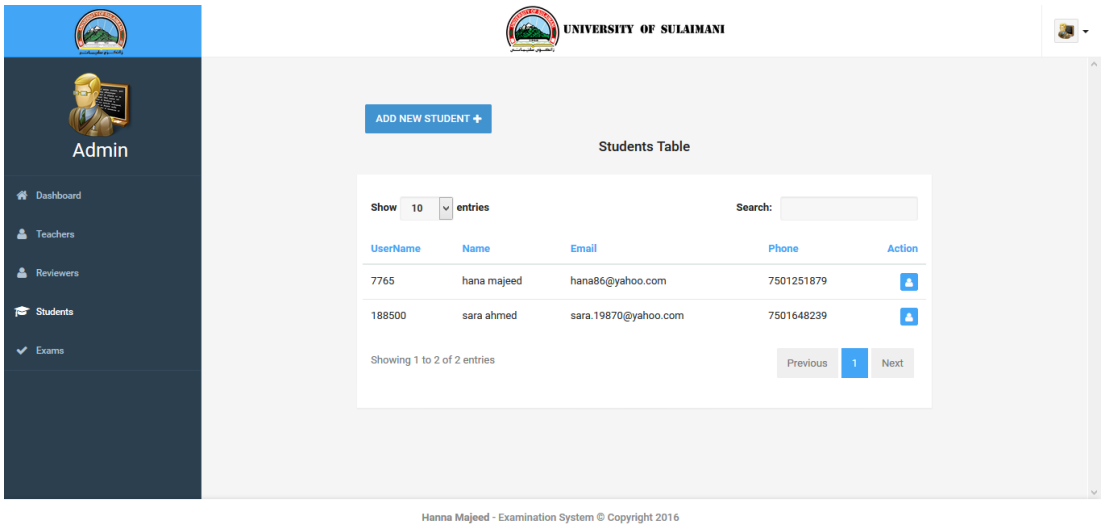

Figure 9. Admin Dashboard to add Students

Table 9. Admin to view User Details

View User Details	
Brief Description	View specific user details
Actor(s)	Admin
Preconditions	Created User
Main Flow	Click “Users” Click User Type “Teacher”, “Reviewer” or “Student” Search User using “Search” Click “Details Button”

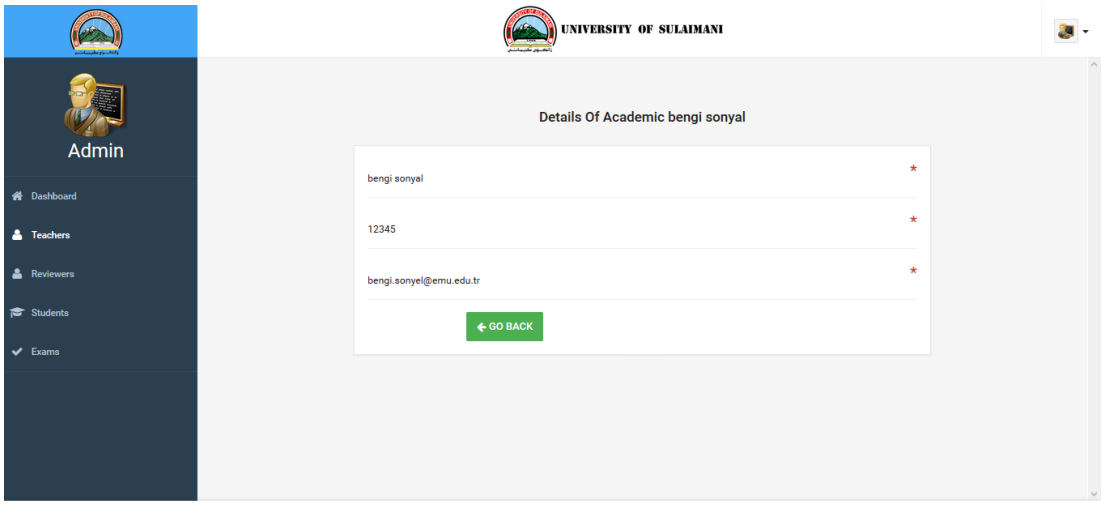

Figure 10. Personal Details about Teacher

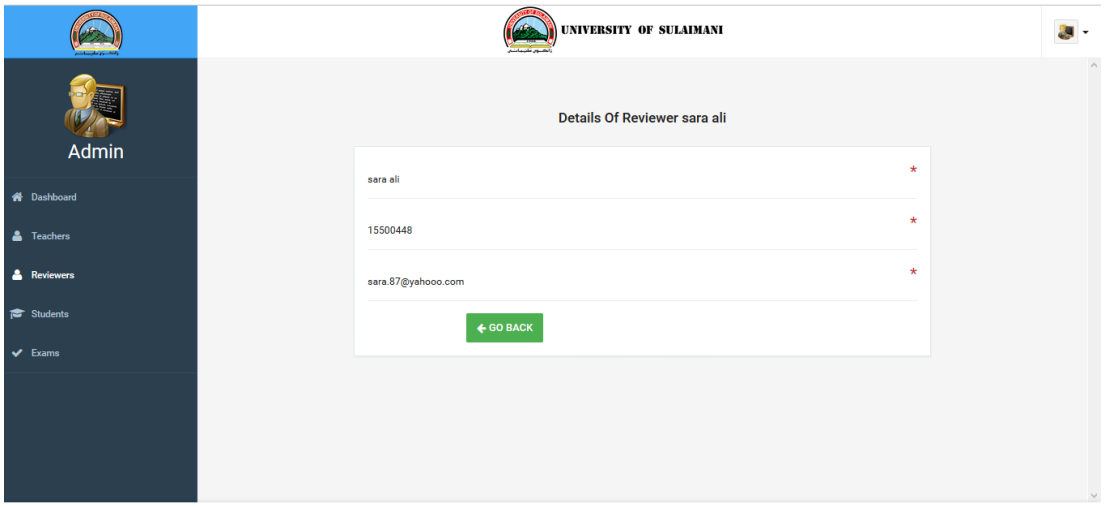

Figure 11. Personal Details about Reviewer

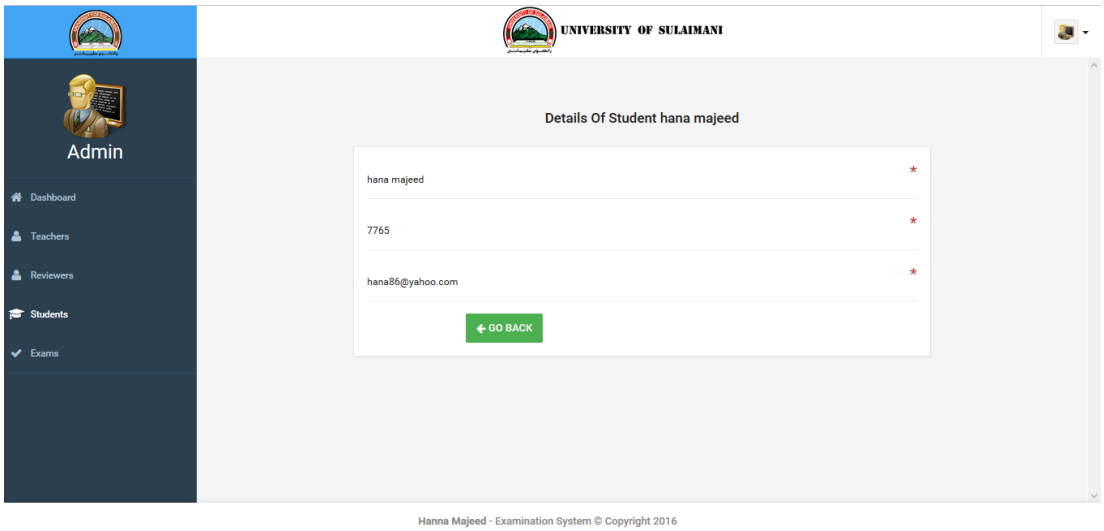

Figure 12. Personal Details about Students

Table 10. Personal Details for Admin

View Personal Details	
Brief Description	View personal details of current login user
Actor(s)	Admin
Preconditions	Logged in User
Main Flow	Click “Setting Button” (right corner) Click “Personal Details”

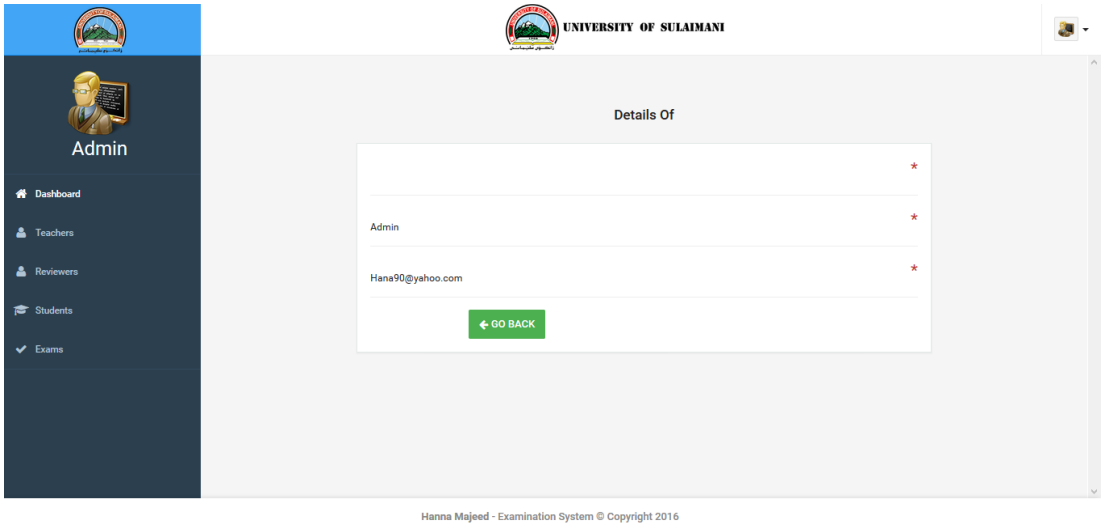

Figure 14. Personal Details for Admin

Table 11. Admin changes Password

Change Password	
Brief Description	View personal details of current login user
Actor(s)	Admin
Preconditions	Logged in User
Main Flow	Click “Setting Button” (right corner) Click “Change Password” Insert Old Password Insert New Password Insert Confirm New Password Click “Change Password” Button

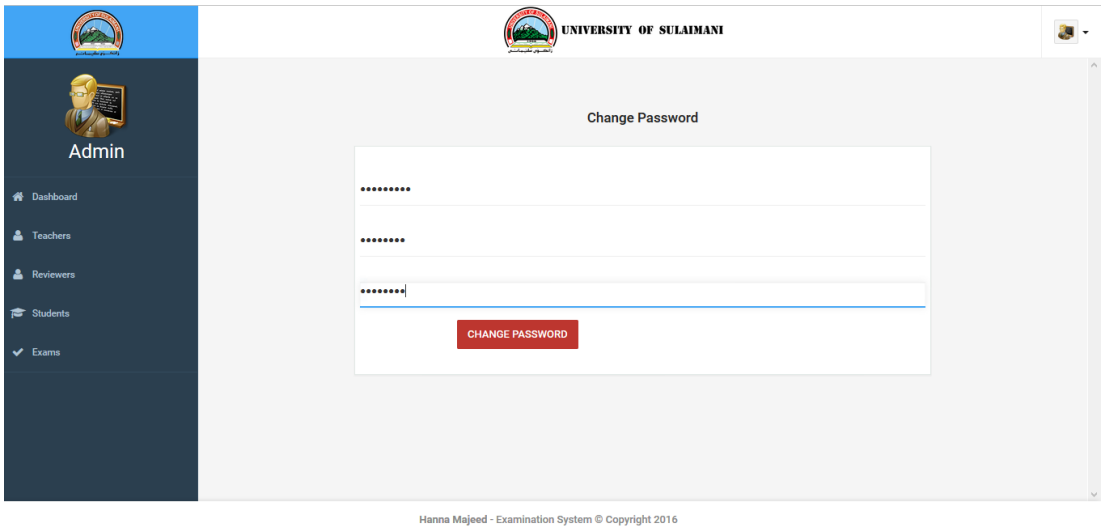

Figure 13. Admin changes Password

4.2.2 The Role of the Teacher

Teacher has many roles in the online examination system such as; create, edit, view classes, add and edit students, create, edit and add exam questions. Finally, they can view results, personal details and change password.

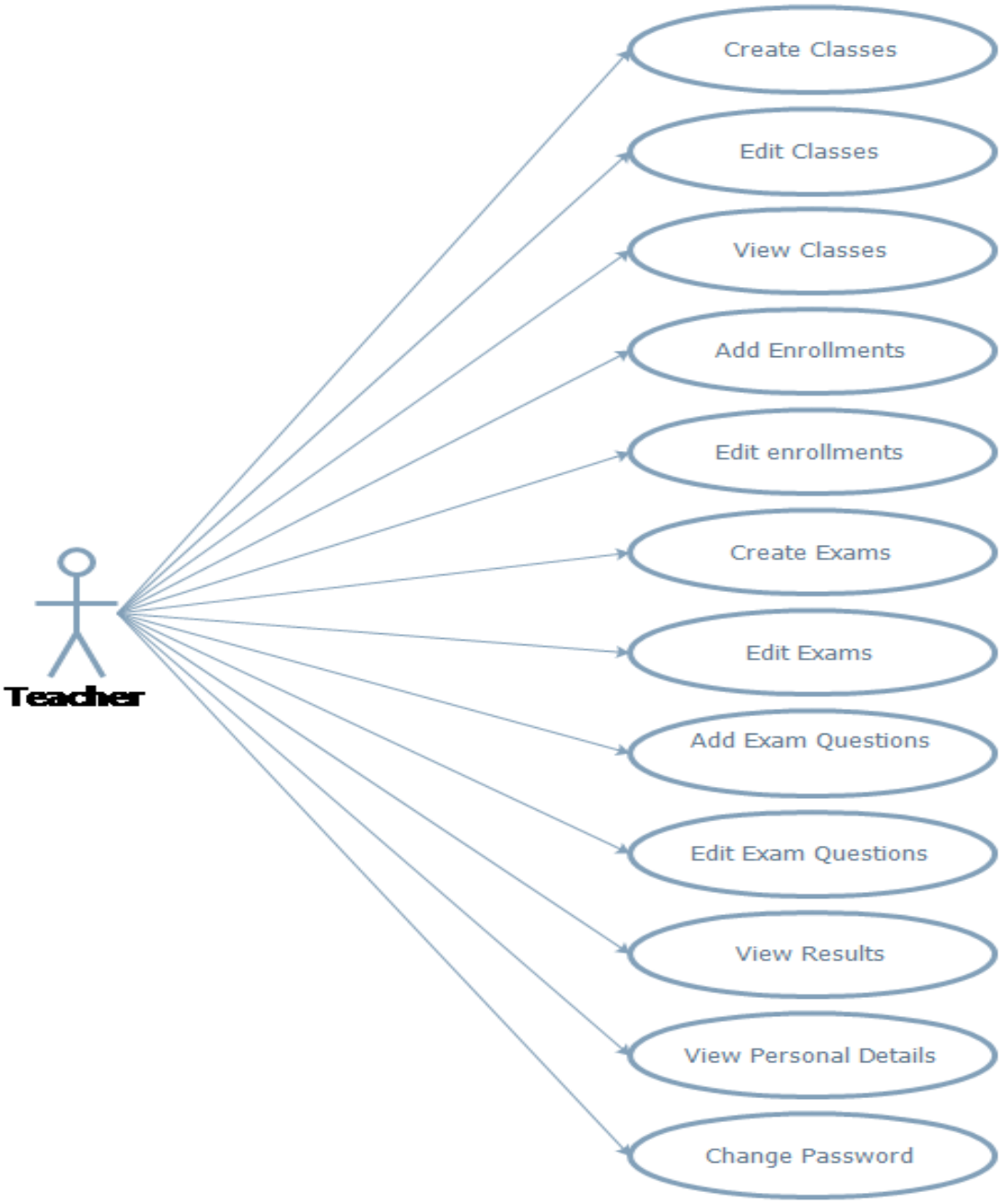

Figure 14. Roles of the Teacher

Table 12. Teacher forming New Classes

Create Classes	
Brief Description	Create new class (group to take exam)
Actor(s)	Teacher

Preconditions	Logged in Teacher
Main Flow	Click “Groups” Click “Add New Group” Button Fill The Form Click “Add Group”

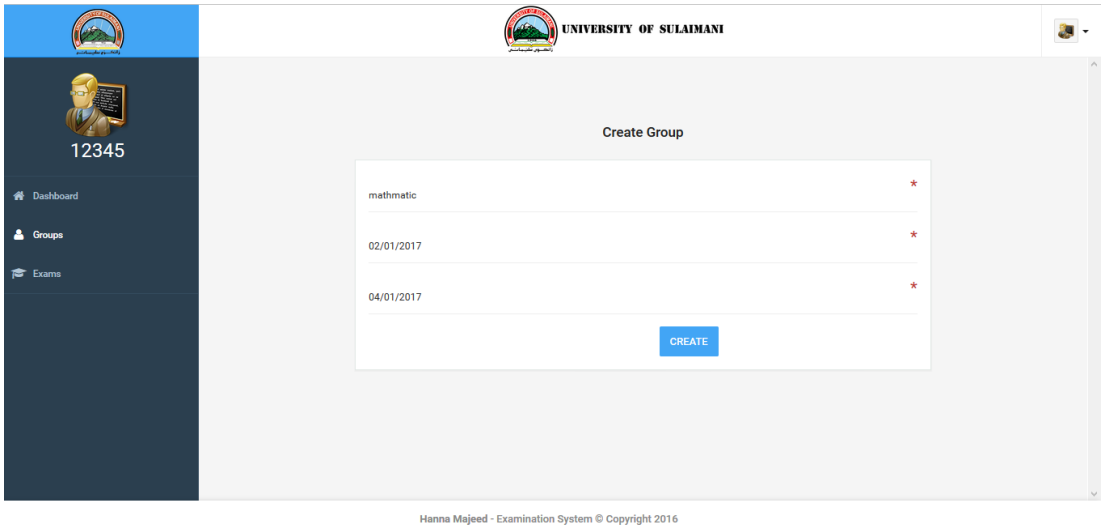

Figure 15. Teacher forming New Group

Table 13. Teacher edits Group Details

Edit Group	
Brief Description	Edit entity details of created group
Actor(s)	Teacher
Preconditions	Created Group

Main Flow	Click “Group” Filter Group using “Search” Choose Group Click “Edit” button Edit Group Details Click “Edit” Button

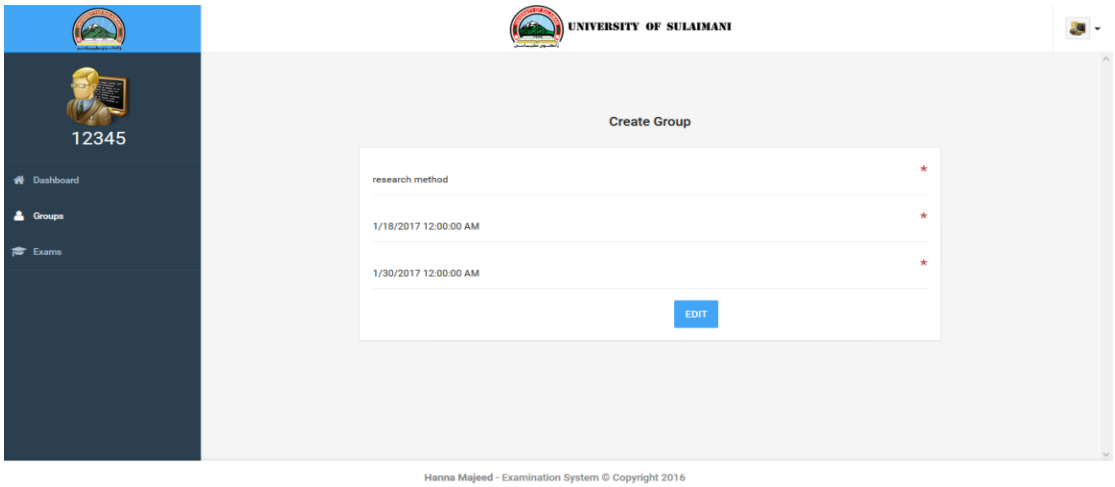

Figure 16. Teacher edits Group Details

Table 14. Teacher views Classes

View Classes	
Brief Description	View specific group details
Actor(s)	Teacher
Preconditions	Created Group

Main Flow	Click “Group” Filter Group using “Search” Choose Group Click “Details” button

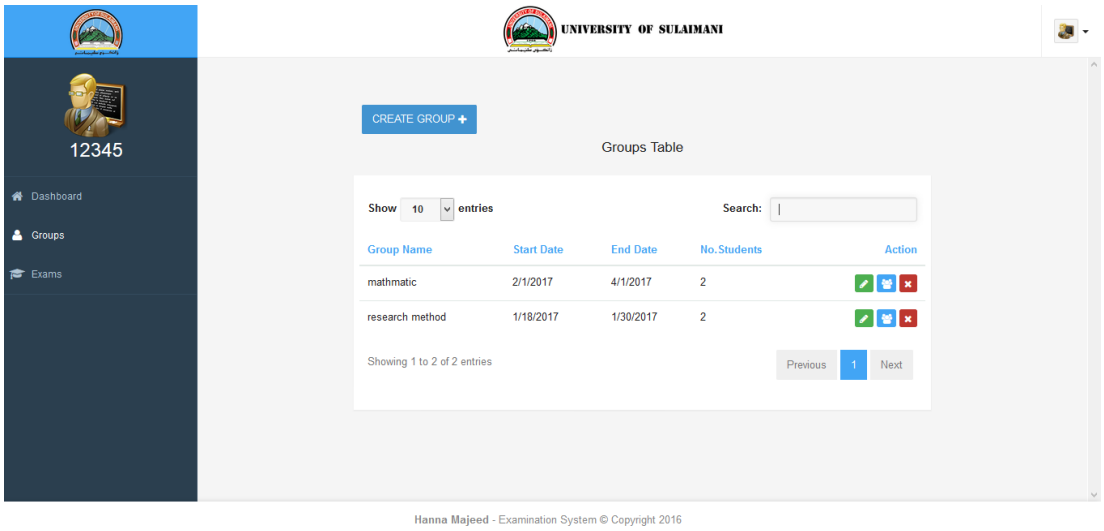

Figure 17. Teacher view Classes

Table 15. Teacher adds Students to create Group

Add Enrollment	
Brief Description	Enroll Students to specific created group
Actor(s)	Teacher
Preconditions	Created Group Registered Students

Main Flow	Click “Group” Filter Group using “Search” Choose Group Click “Enrollment” button Check Student Enrolled Click “Enroll Students” Button

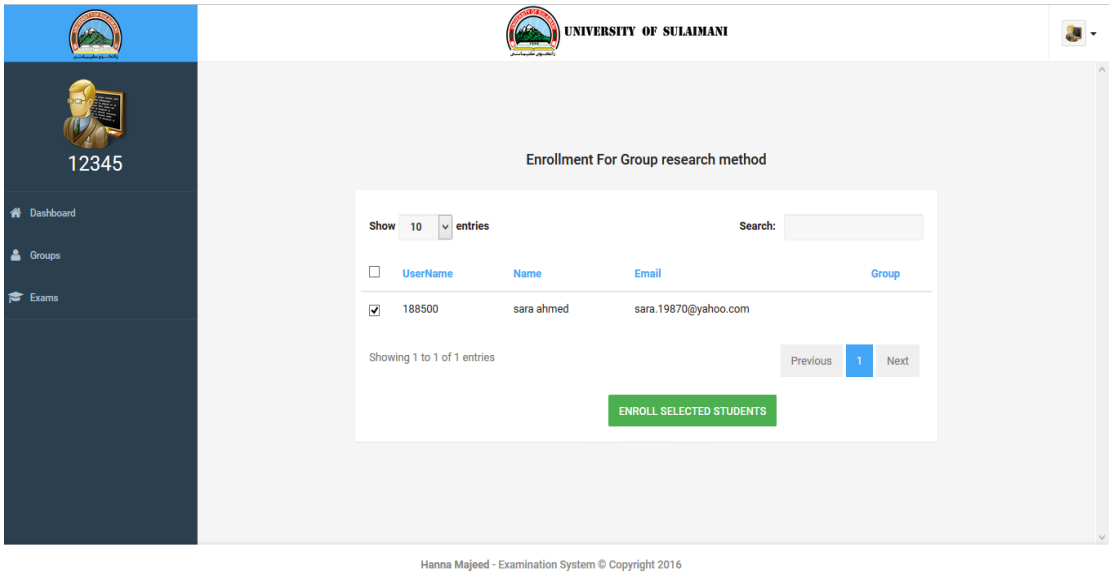

Figure 18. Teacher adds Students to create Group

Table 16. Teacher edits Students’ Enrollment

Edit Enrollment	
Brief Description	Add or remove enrollment to specific group
Actor(s)	Teacher

Preconditions	Created Group Enrolled Students
Main Flow	Click “Group” Filter Group using “Search” Choose Group Click “Manage Enrollment” button Use Checkbox to Manage Enrollments Click “Manage Enrollment” Button

Table 17. Teacher creates Exams

Create Exams	
Brief Description	Create exam to specific group
Actor(s)	Teacher
Preconditions	Created Group
Main Flow	Click “Exams” Click “Add New Exam” Fill The Form Click “Add Exam”

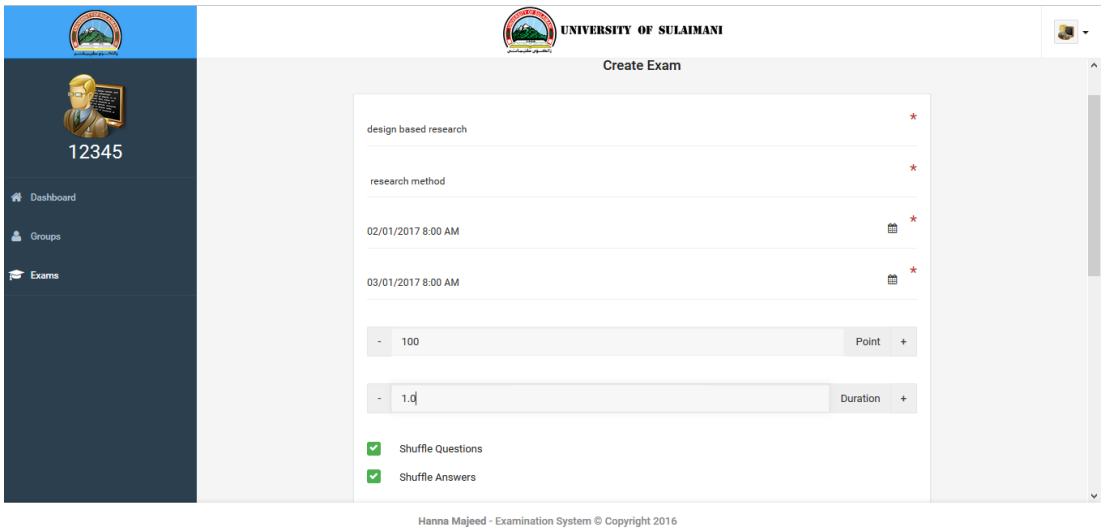

Figure 19. Teacher creates Exam

Table 18. Teacher edits Exam

Edit Exam	
Brief Description	Edit details of created Exam
Actor(s)	Teacher
Preconditions	Created Exam
Main Flow	Click “Exams” Filter Exam using “Search” Choose Exam Click “Edit” button Edit Details Click “Edit”

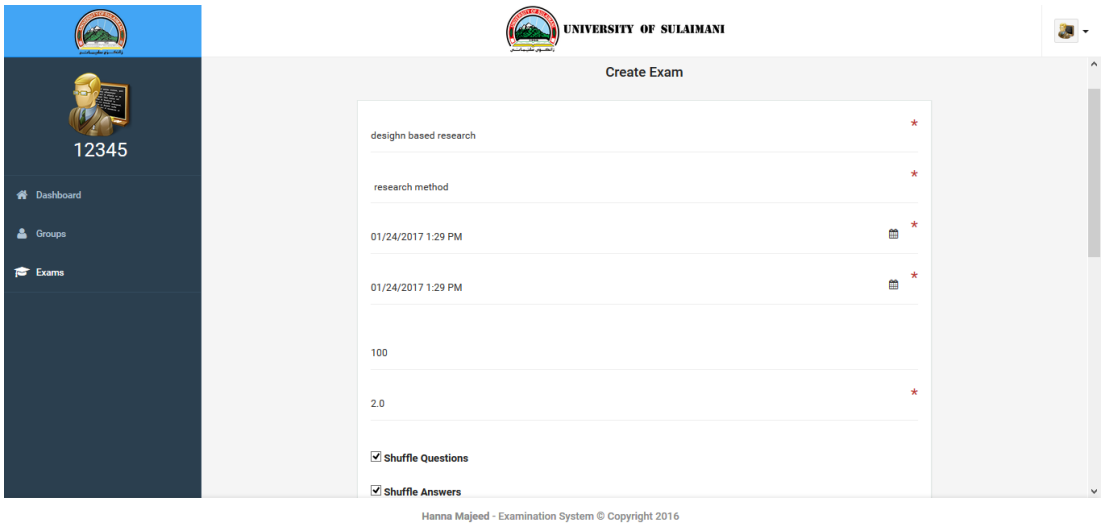

Figure 20. Teacher edits details of created Exam

Table 19. Teacher adds Exam Questions

Add Exam Questions	
Brief Description	Add questions to specific exam
Actor(s)	Teacher
Preconditions	Created Exam
Main Flow	Click “Exams” Filter Exam using “Search” Choose Exam Click “Questions Button” Fill Question Form Click “Save/Add New” Button

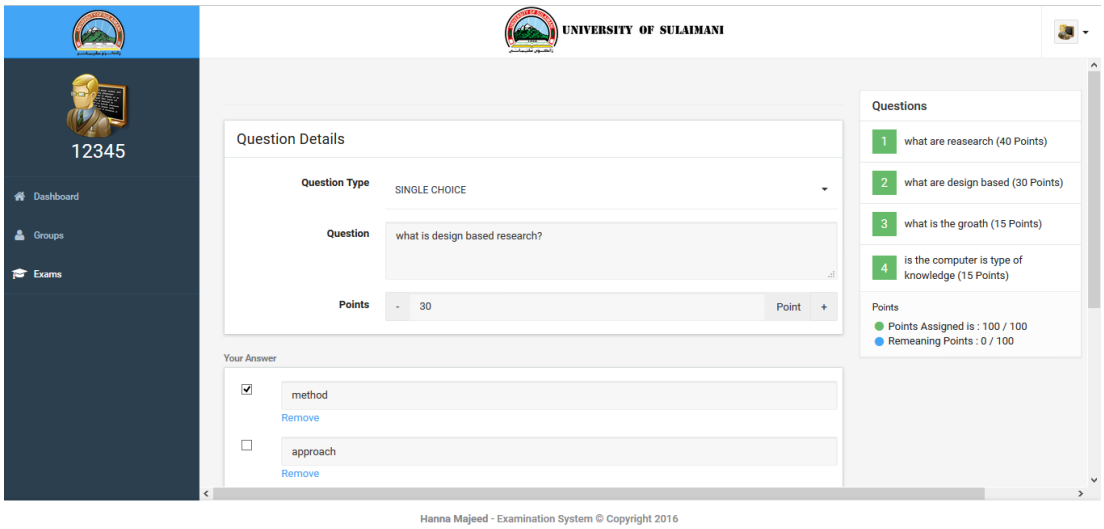

Figure 21. Add Questions to Specific Exam

Table 20. Teacher edits Exam Questions

Edit Exam Questions	
Brief Description	Edit questions for specific exam
Actor(s)	Teacher
Preconditions	Added Questions
Main Flow	Click “Exams” Filter Exam using “Search” Choose Exam Click “Questions Button” Choose Question To Edit Edit Question Click “Save” Button

Table 21. Teacher views the Results

View Results	
Brief Description	View student results for specific exam
Actor(s)	Teacher
Preconditions	Approved Exam Taken Exam By Students
Main Flow	Click “Exams” Filter Exam using “Search” Choose Exam Click “Result” Button

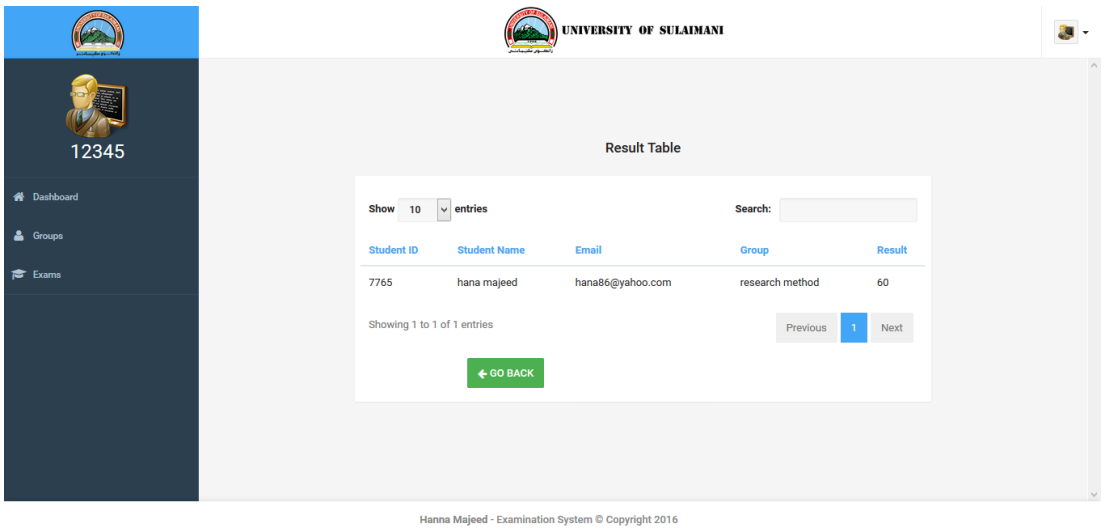

Figure 22. View results for Specific Exam

Table 22. Teacher Personal Details

View Personal Details	
Brief Description	View personal details of current login user
Actor(s)	Teacher
Preconditions	Logged in User
Main Flow	Click “Setting Button” (right corner) Click “Personal Details”

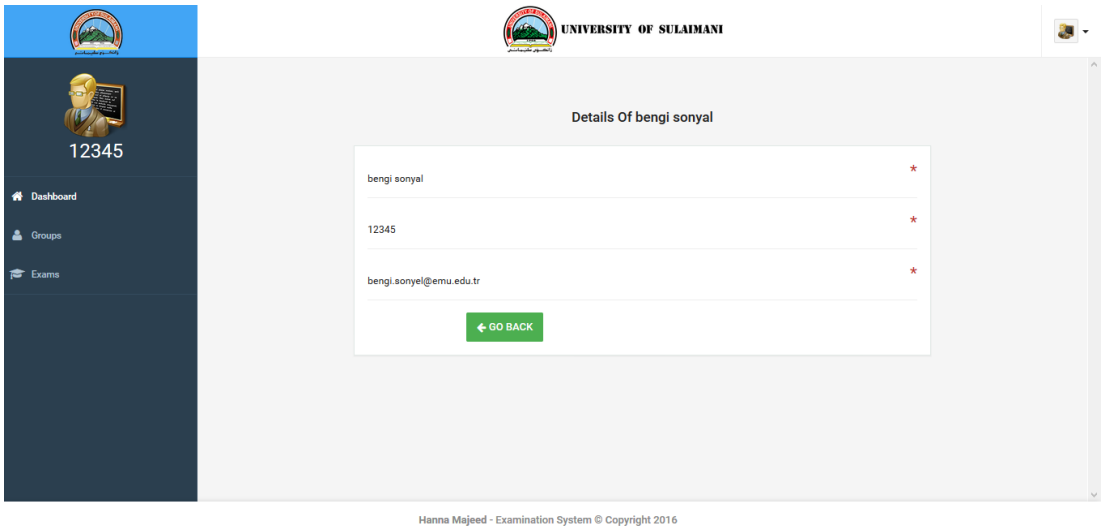

Figure 23. Teacher Personal Details

Table 23. Teacher changes Password

Change Password	
Brief Description	View personal details of current login user
Actor(s)	Teacher

Preconditions	Logged in User
Main Flow	Click “Setting Button” (right corner) Click “Change Password” Insert Old Password Insert New Password Insert Confirm New Password Click “Change Password” Button

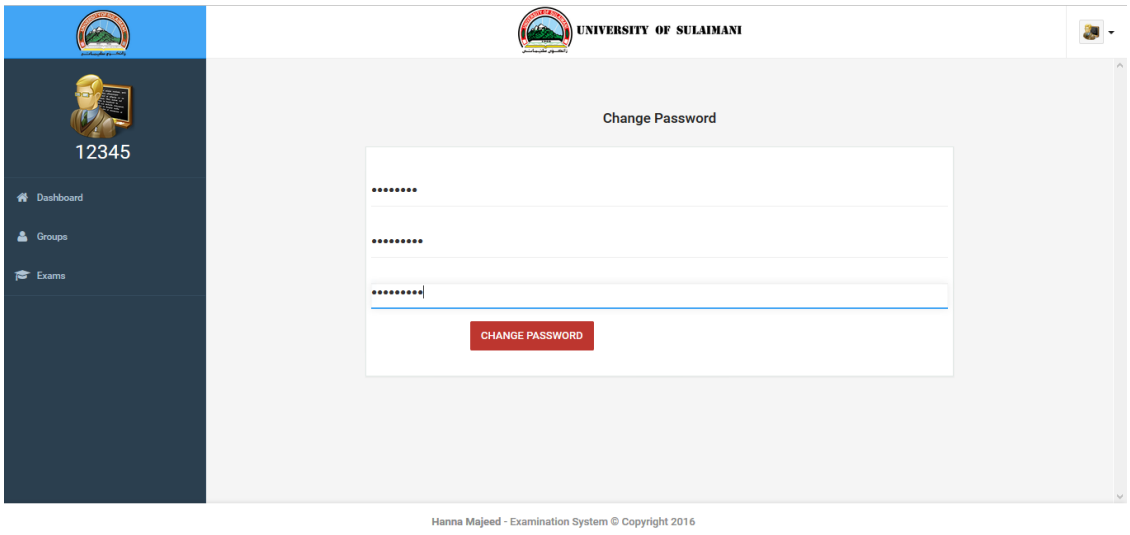

Figure 24. Teacher changes Password

4.2.3 The Role of the Reviewer

The significant role of the reviewer is to approve exams, view approved exams, personal details and change password on the online exam system.

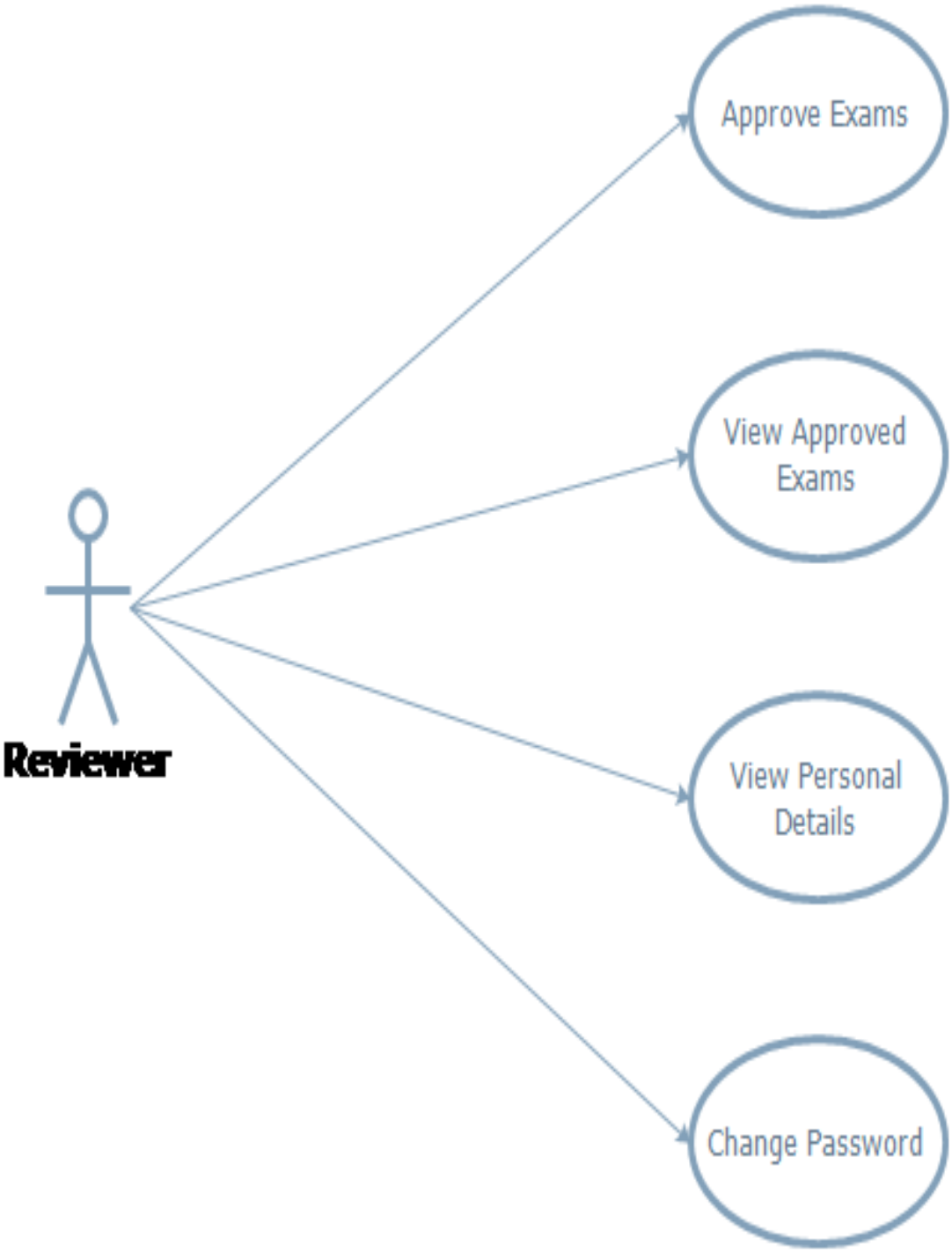

Figure 25. Reviewer

Table 24. Reviewer approves Exams

Approve Exams	
Brief Description	Approve created exam to be taken by students
Actor(s)	Reviewer
Preconditions	Created Exam Added Questions
Main Flow	Click “Dashboard” Filter Exam using “Search” Choose Exam Click “View” Button View Exam Click “Approve”

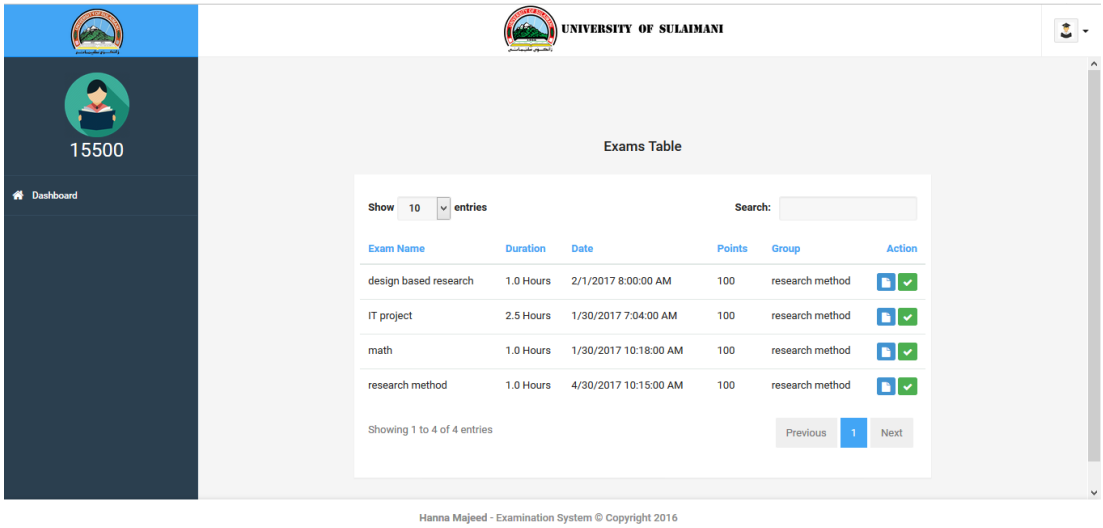

Figure 26. Reviewer approves created Exam

Table 25. Reviewer views Approved Details

View Approved Details	
Brief Description	View personal details of current login user
Actor(s)	Reviewer
Preconditions	Created Exam Added Questions
Main Flow	Click “Dashboard” Filter Exam using “Search” Choose Exam Click “View” Button View Exam

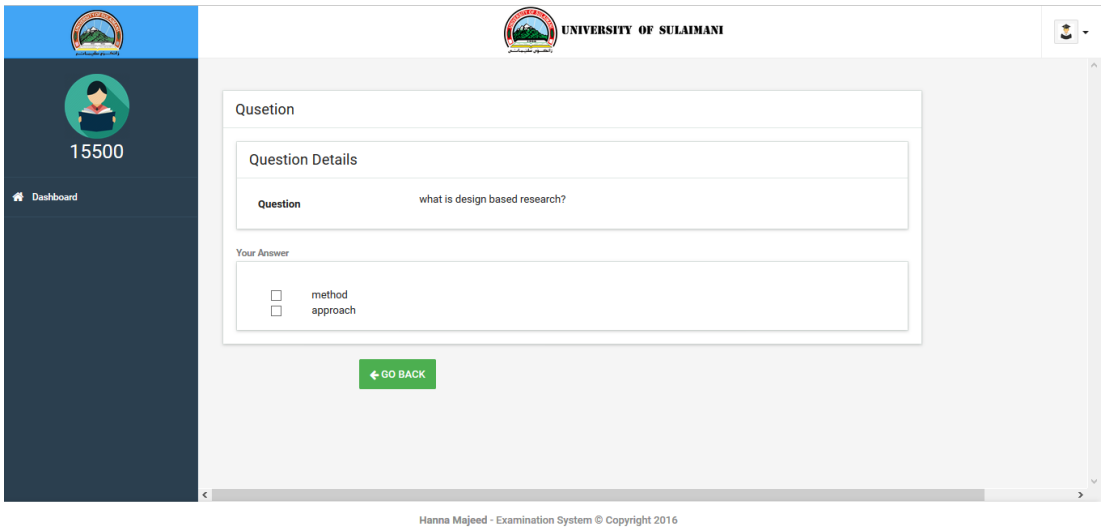

Figure 27. Reviewer views Exam Details

Table 26. Reviewer Personal Details

View Personal Details	
Brief Description	View personal details of current login user
Actor(s)	Reviewer
Preconditions	Logged in User
Main Flow	Click “Setting Button” (right corner) Click “Personal Details”

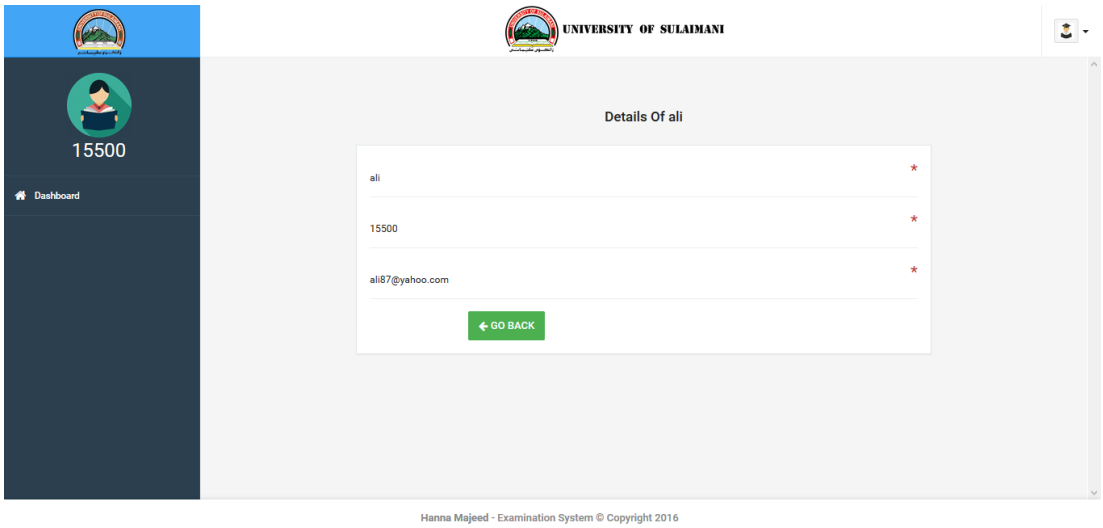

Figure 28. Reviewer Personal Details

Table 27. Reviewer changes Password

Change Password	
Brief Description	View personal details of current login user
Actor(s)	Reviewer
Preconditions	Logged in User
Main Flow	Click “Setting Button” (right corner) Click “Change Password” Insert Old Password Insert New Password Insert Confirm New Password Click “Change Password” Button

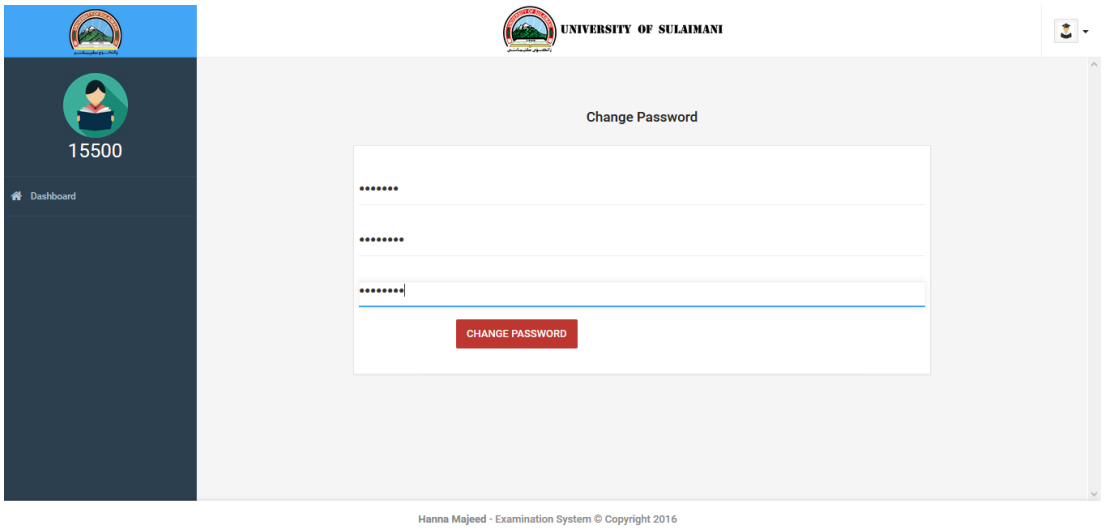

Figure 29. Reviewer changes Password Details

4.2.4 The Role of the Student

In the online exam system, students have the right to view classes, exams, attend exams. After they complete their exams, students have the right automatically to view the results. They can also view their personal details and change their password anytime they want to.

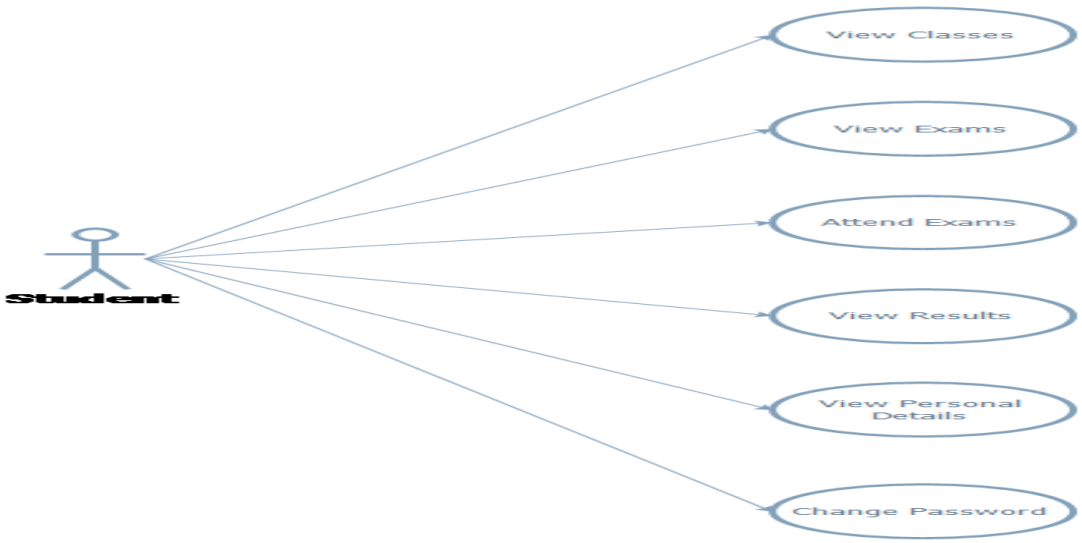

Figure 30. Student

Table 28. Student views Classes

View Classes	
Brief Description	View groups that students enrolled in
Actor(s)	Student
Preconditions	Created Group Added Student (Logged in Student)
Main Flow	Click “Dashboard” View Classes

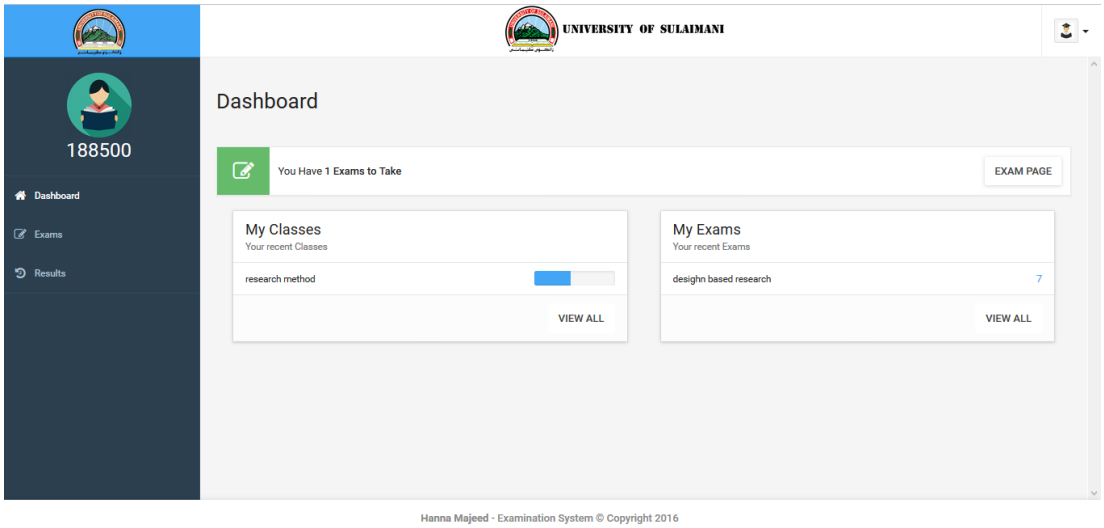

Figure 31. Dashboard of Student

Table 29. Student views Exams

View Exams	
Brief Description	View Current Exams that need to be taken by logged in student

Actor(s)	Student
Preconditions	Created Exam Approved Exam
Main Flow	Click “Exams” View Exams

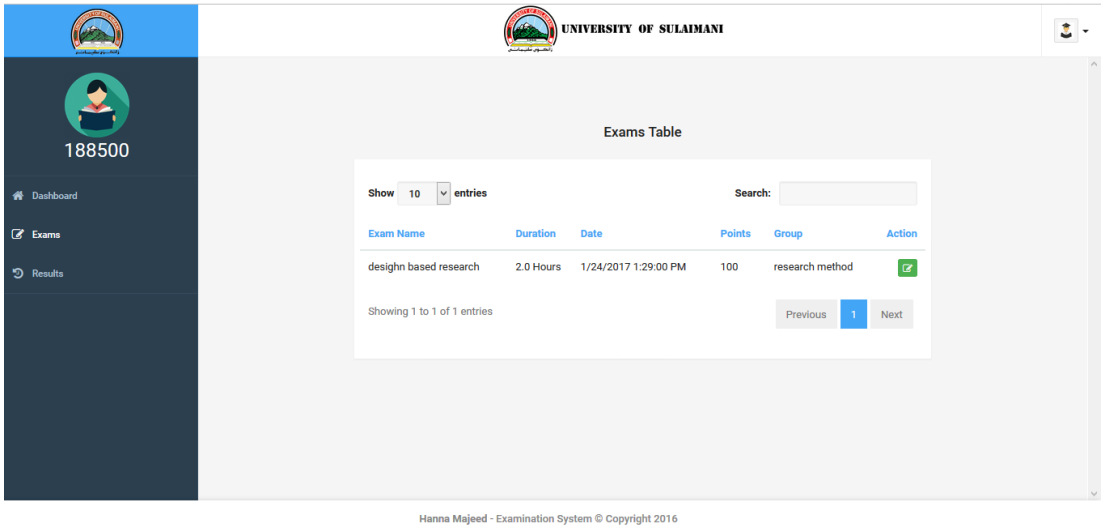

Figure 32. Student Table of Exam

Table 30. Student participation to the Exam

Attend Exam	
Brief Description	Take Exam by logged in student
Actor(s)	Student
Preconditions	Created Exam Approved Exam

Main Flow	Click “Exams” Filter Exam using “Search” Choose Exam Click “Take Exam” Button Answer Questions Click “Submit”

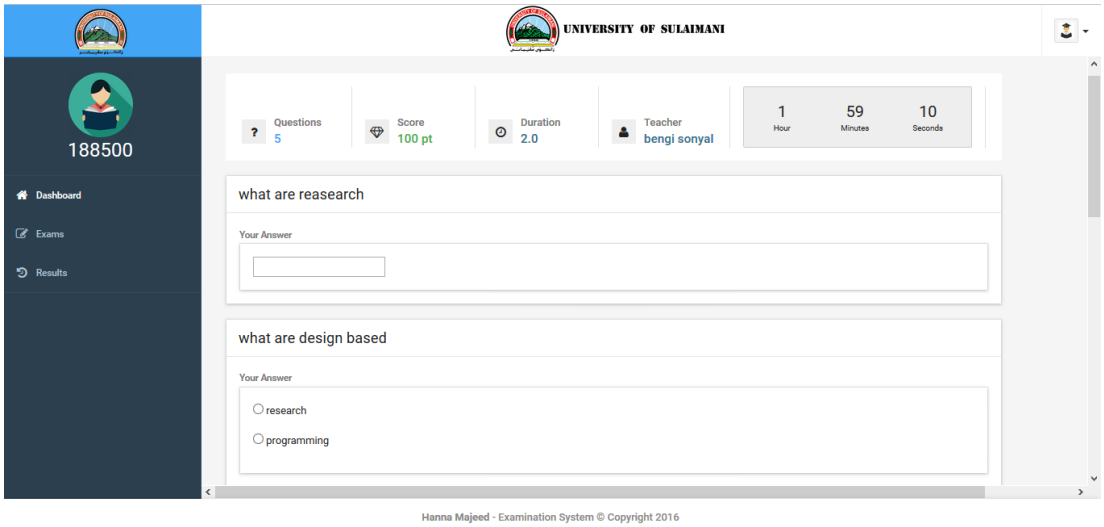

Figure 33. Student active participation to the Exam

Table 31. Student views the Results

View Results	
Brief Description	View Logged in Student’s Results
Actor(s)	Student
Preconditions	Taken Exams

Main Flow	Click “Results” View Results

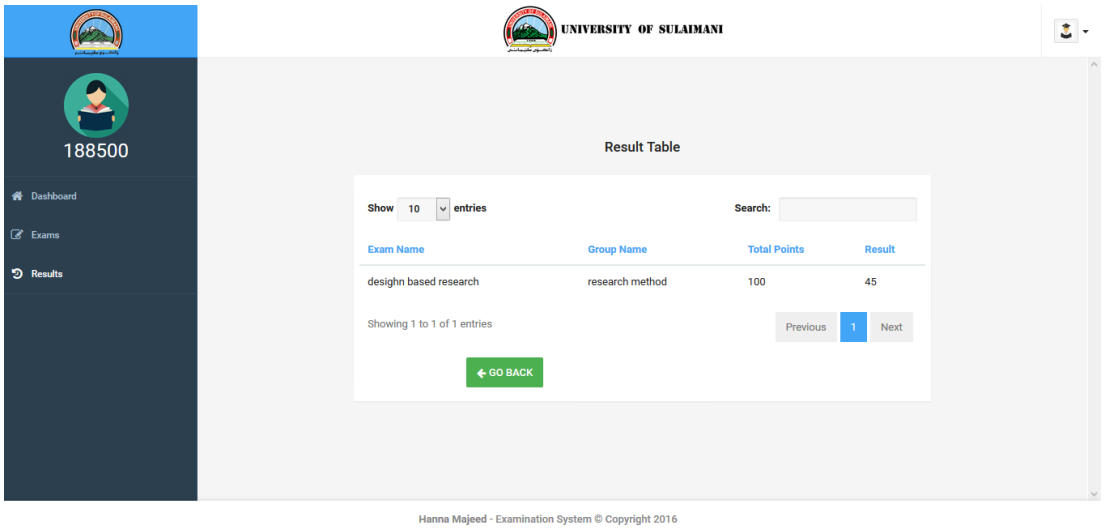

Figure 34. Student Table of Results

Table 32. Student Personal Details

View Personal Details	
Brief Description	View personal details of current login user
Actor(s)	Student
Preconditions	Logged in User
Main Flow	Click “Setting Button” (right corner) Click “Personal Details”

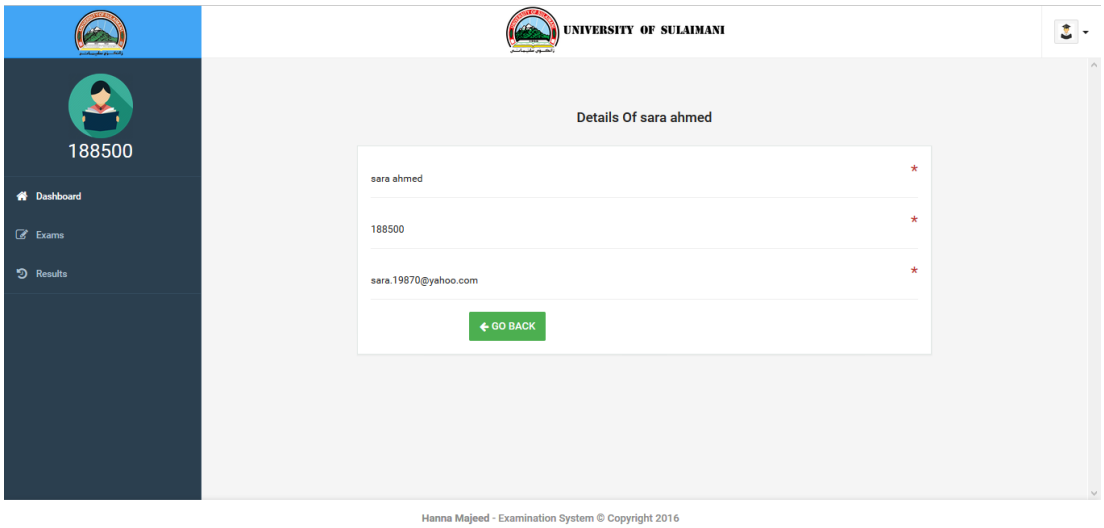

Figure 35. Student Personal Details

Table 33. Student changes Password

Change Password	
Brief Description	View personal details of current login user
Actor(s)	Student
Preconditions	Logged in User
Main Flow	Click “Setting Button” (right corner) Click “Change Password” Insert Old Password Insert New Password Insert Confirm New Password Click “Change Password” Button

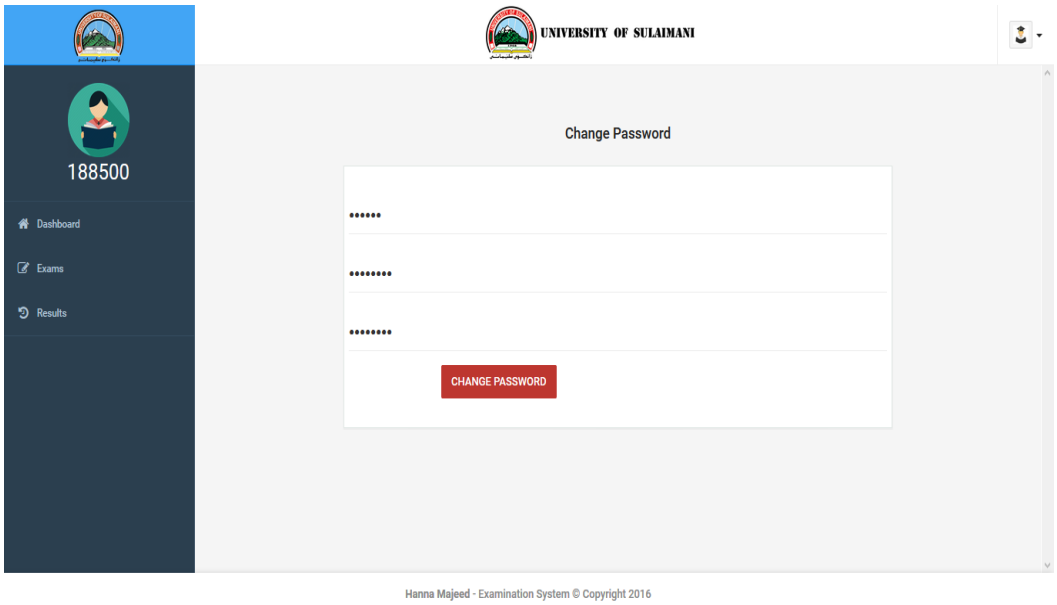

Figure 36. Student changes Password

4.3 Database Diagram

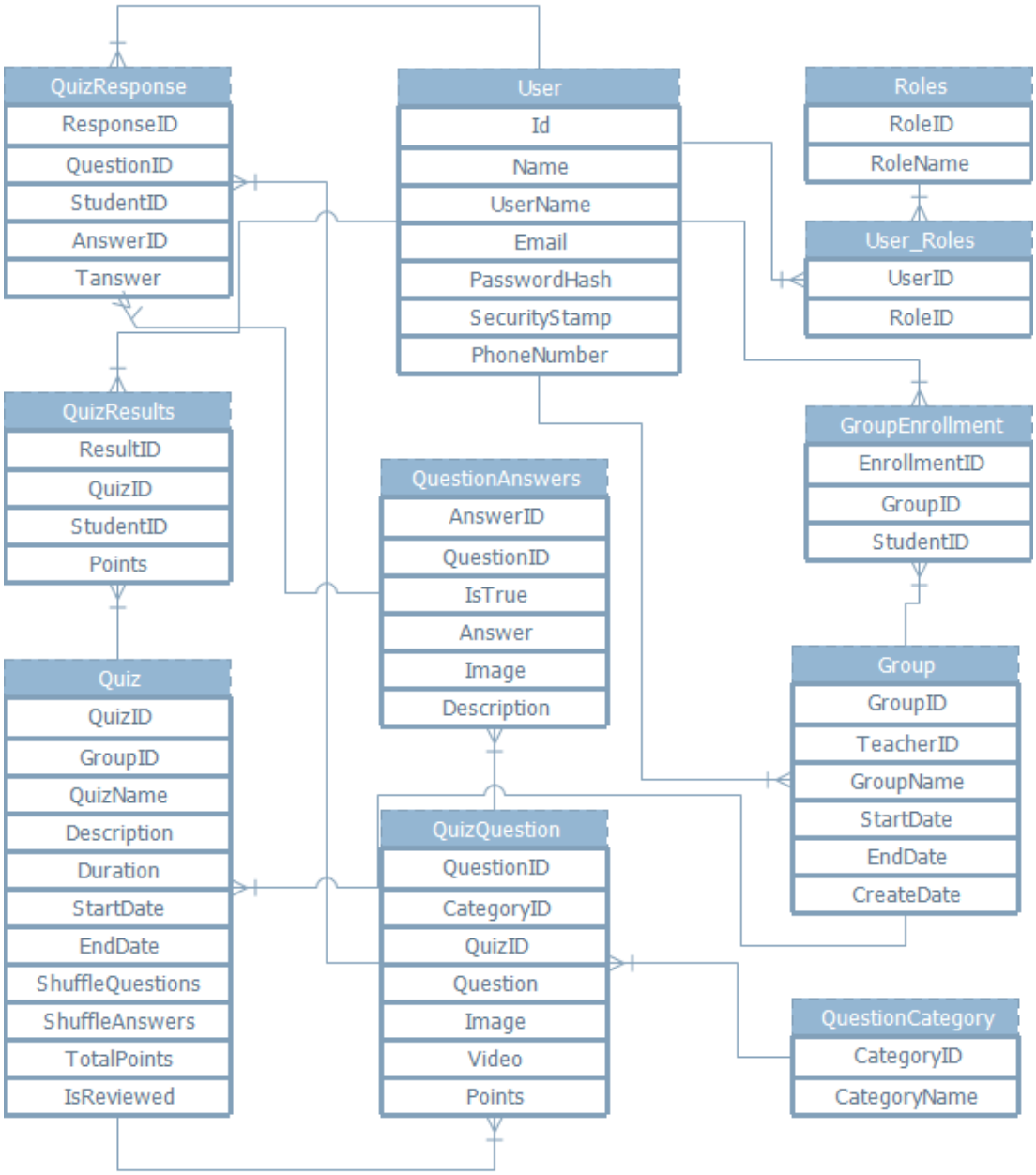

Figure 37. Database diagram

The figure above shows the design of the database. This database for implemented application has 11 entities as shown above. The entities are “Roles”, “User”, “User-Roles”, “Group”, “GroupEnrollment”, “Quiz”, “QuestionCategory”,

“QuizQuestions”, “QuizAnswers”, “QuizResults” and “QuestionResponse”. Each of these entities has its own attributes.

User definitions and roles managed by three different entities. The first entity is “Roles” which contains the “Role_ID” and “Role_Name”. When the program started, it seeds four different roles automatically which are “Admin”, “Teacher”, “Reviewer” and “Student”. The second identity entity is “User” which holds user personal information and the application will seed “Admin” account upon starting the application for very first time. The last identity entity is “User_Roles” which holds the role of each user in the system.

As shown in the figure above, there are two entities to handle groups in the system which are “Group” and “GroupEnrollment”. Group entity holds the class start date and end date, as well as the owner of the group (Teacher). Group Enrollment Entity stores the enrollment of each group of the system by using “GroupID” and “StudentID” as foreign keys.

For quiz, there are four entities to store quiz information which are “Quiz”, “QuestionCategory”, “QuizQuestion”, “QuestionAnswers”. Quiz entity stores the important attributes for each quiz like “GroupID”, “StartDate”, “EndDate”, “TotalPoints” and “Duration”. The categories of questions that used by the system are stored inside “QuestionCategory” entity. This version of the system uses 5 different types of questions which are multiple choice questions, single choice question, and True/False questions; yes/no questions and fill blank questions and all of them will be seeded into the database when the application runs for the very first time.

The “QuizQuestion” entity stores the question for each quiz by using “QuizID” as a foreign key. “QuestionAnswers” entity stores the possible answers for each question linking with “QuizQuestion” entity by “QuestionID” attribute.

The last two entities are “QuizResponse” and “QuizResults”. “QuizResponse” entity stores the response received from student for each quiz, then the application will grade the questions and stores the students’ results inside “QuizResults” entity.

Chapter 5

RESULTS AND DISCUSSIONS

5.1. Quantitative Findings

The aim of this research was to investigate with accord to the perceptions of students and teachers of the University of Sulaimani toward the developed online examination system. This research was conducted through a mix method approach (qualitative and quantitative). For Qualitative approach 6 teachers and 6 students in Sulaimani University were interviewed on the proposed online examination system. This interview aimed to build a better understanding on the relationship between computer literacy level of teachers and students and their understanding on the proposed system, its advantages and disadvantages. In the quantitative approach, the researcher collected 165 surveys from the students on the proposed system. This questionnaire was designed to analyze the students' perceptions toward online examination system.

In this chapter the result of the questionnaire will be analyzed and discussed step by step according to the order of the questions in the questionnaire.

The result of this questionnaire comprised in two sections: students' perceptions about usefulness of online examination system, students' perception about the use of computer-based tests.

5.1.1 Students' Perceptions on the usefulness of Online Examination System

The first part of the questionnaire includes the demographical data for the participants and the second part includes Likert response type questions. These questions should be rated according to the level of respondents' favorability. Usually scales of 1-to-5 are used where: (1= strongly unfavorable to the concept … 5= strongly favorable to the concept). Rest of the scales between this two will be scaled accordingly (Trochim, 2015).

Table 34 below, shows the mean and standard deviation on student's perception on usefulness of the developed online examination system. As it is shown, "OES (Online Examination System) provided an attractive test examination for students" with the highest mean (M=3.6) which shows the interest of students toward the use of the proposed system. On the other hand "OES is easier than traditional exams" with the lowest mean (M=3.21). It's worth to mention that, almost all the entire mean in Table 34 is higher than average mean (M=3.3851) which shows the interest of the participants about proposed system.

Table 34. Students' Perceptions on the usefulness of Online Examination System

	N	Sum	Mean	Std. Deviation
Q1.Using OES gave me greater control over my exam.	165	582.00	3.5273	1.17683
Q2.OES improved my academic Performance.	165	582.00	3.5273	1.17683
Q3.OES is easier than traditional exams	165	530.00	3.3091	1.32420
Q4.OES enhances the effectiveness of my teacher's activities.	165	546.00	3.3091	1.35078

Q5.OES improved the quality of the examination for students	165	546.00	3.3091	1.35078
Q6.OES provides an attractive test examination for students	165	606.00	3.6727	1.09413
Q7.I like using OES because I am computer Literate	165	522.00	3.1636	1.50726
Q8.If OES were not mandatory, I would still like to use it	165	530.00	3.2121	1.36502
Q9.OES is easier to do my course	165	567.00	3.4364	1.30333
Valid N (listwise)	165	Average Mean 3.3851		Average SD 1.2943

5.1.1.1 Students' Perceptions on the usefulness of Online Examination System according their Age Difference

Table 35 below, shows the students' perceptions on the usefulness of online examination system according to the students' age range. Although the researcher has considered population with the age range from 18 to 60+, but the result from the sample of this research showed that all students between 18 to 37 are interested in OES application and to the technology. As it is shown in Table 35, the age range of (18-22) is considered to have the highest mean which signifies the fact that they are the ones who are mostly interested in the OES and technology. Likewise, students who are in the age range between (18-22) and (23-29) are also interested in OES and integrating technology to their class curriculum. On the contrary, respondents' age range between

(37-49) and (50-59) have the least interest in OES application because they are not willing to change their old ways and integrate technology to their examination system.

Table 35. Students' Perceptions on the usefulness of Online Examination System according their Age

		N	Mean	Std. Deviation	P value
Q1.Using OES gave me greater control over my exam.	18-22	70	3.6857	1.19834	.001
	23-29	84	3.5357	1.08046	
	30-37	6	3.1667	1.16905	
	37-49	4	1.2500	.50000	
	50-59	1	3.0000	.	
	Total	165	3.5273	1.17683	
Q2.OES improved my academic Performance.	18-22	70	3.6857	1.19834	.001
	23-29	84	3.5357	1.08046	
	30-37	6	3.1667	1.16905	
	37-49	4	1.2500	.50000	
	50-59	1	3.0000	.	
	Total	165	3.5273	1.17683	
Q3.OES is easier than traditional exams	18-22	70	3.4286	1.23443	.017
	23-29	84	3.1667	1.35178	
	30-37	6	2.6667	1.36626	
	37-49	4	1.2500	.50000	
	50-59	1	3.0000	.	
	Total	165	3.2121	1.32420	
Q4.OES enhances the effectiveness of my teacher's activities.	18-22	70	3.5714	1.33592	.002
	23-29	84	3.2500	1.28827	
	30-37	6	2.8333	1.32916	
	37-49	4	1.0000	.00000	
	50-59	1	2.0000	.	
	Total	165	3.3091	1.35078	
Q5.OES improved the quality of the	18-22	70	3.5714	1.33592	.002
	23-29	84	3.2500	1.28827	

examination for students	30-37	6	2.8333	1.32916	
	37-49	4	1.0000	.00000	
	50-59	1	2.0000	.	
	Total	165	3.3091	1.35078	
Q6.OES provides an attractive test examination for students	18-22	70	3.9000	1.03770	.000
	23-29	84	3.6548	.98781	
	30-37	6	3.3333	1.03280	
	37-49	4	1.0000	.00000	
	50-59	1	2.0000	.	
	Total	165	3.6727	1.09413	
Q7.I like using OES because I am computer Literate	18-22	70	3.3571	1.51357	.034
	23-29	84	3.1429	1.48196	
	30-37	6	2.8333	1.32916	
	37-49	4	1.0000	.00000	
	50-59	1	2.0000	.	
	Total	165	3.1636	1.50726	
Q8.If OES were not mandatory, I would still like to use it	18-22	70	3.4143	1.43953	.010
	23-29	84	3.1786	1.26263	
	30-37	6	3.0000	1.09545	
	37-49	4	1.0000	.00000	
	50-59	1	2.0000	.	
	Total	165	3.2121	1.36502	
Q9.OES is easier to do my course	18-22	70	3.7286	1.23853	.003
	23-29	84	3.3452	1.28470	
	30-37	6	2.8333	1.32916	
	37-49	4	1.5000	.57735	
	50-59	1	2.0000	.	
	Total	165	3.4364	1.30333	
	Average Mean 2.7905			Average SD 1.075	

5.1.1.2 Students' Perceptions on the usefulness of Online Examination System according to their Gender

As it is shown in Table 36, although the number of female (N=81) and male (N=84) in the sample is almost equal, but there is a significant difference between their perceptions on OES. The females in almost all parts have the lowest interest to the OES application and overall to the e-learning technology itself whereas males are interested in OES application and e-learning.

Table 36. Students' Perceptions on the usefulness of Online Examination System according to their Gender

		N	Mean	Std. Deviation	P value
Q1.Using OES gave me greater control over my exam.	Male	84	3.8810	1.17612	.000
	Female	81	3.1605	1.06603	
	Total	165	3.5273	1.17683	
Q2.OES improved my academic Performance.	Male	84	3.8810	1.17612	.000
	Female	81	3.1605	1.06603	
	Total	165	3.5273	1.17683	
Q3.OES is easier than traditional exams	Male	84	3.3810	1.40485	.095
	Female	81	3.0370	1.21906	
	Total	165	3.2121	1.32420	
Q4.OES enhances the effectiveness of my teacher's activities.	Male	84	3.6905	1.36193	.000
	Female	81	2.9136	1.22676	
	Total	165	3.3091	1.35078	
Q5.OES improved the quality of the examination for students	Male	84	3.6905	1.36193	.000
	Female	81	2.9136	1.22676	
	Total	165	3.3091	1.35078	
Q6.OES provides an	Male	84	3.8810	1.20646	.012
	Female	81	3.4568	.92262	

attractive test examination for students	Total	165	3.6727	1.09413	
Q7.I like using OES because I am computer Literate	Male	84	3.5238	1.54823	.002
	Female	81	2.7901	1.37583	
	Total	165	3.1636	1.50726	
Q8.If OES were not mandatory, I would still like to use it	Male	84	3.4762	1.45185	.011
	Female	81	2.9383	1.21805	
	Total	165	3.2121	1.36502	
Q9.OES is easier to do my course	Male	84	3.6786	1.44089	.015
	Female	81	3.1852	1.09671	
	Total	165	3.4364	1.30333	
	Average Mean 3.3707			Average SD 1.266	

5.1.1.3 Students' Perceptions on the usefulness of Online Examination System according to their Year of Education

The population is chosen from bachelor degree students from the Faculty of Media at Sulaimani University. However, the educational years of students are different from each other. According to the results the number of forth year students (N=95) are more than third year students (N=70). Moreover, the results showed that forth year students are more aware of advantages and usefulness of proposed system comparing to the third year students.

Table 37. Students' Perceptions on the usefulness of Online Examination System according to their Year of Education

		N	Mean	Std. Deviation	P value
Q1.Using OES gave me greater control over my exam.	Third Year	70	3.6714	1.22441	.178
	Fourth Year	95	3.4211	1.13530	
	Total	165	3.5273	1.17683	

Q2.OES improved my academic Performance.	Third Year	70	3.6714	1.22441	.178
	Fourth Year	95	3.4211	1.13530	
	Total	165	3.5273	1.17683	
Q3.OES is easier than traditional exams	Third Year	70	3.3857	1.34372	.149
	Fourth Year	95	3.0842	1.30191	
	Total	165	3.2121	1.32420	
Q4.OES enhances the effectiveness of my teacher's activities.	Third Year	70	3.4000	1.42849	.460
	Fourth Year	95	3.2421	1.29414	
	Total	165	3.3091	1.35078	
Q5.OES improved the quality of the examination for students	Third Year	70	3.4000	1.42849	.460
	Fourth Year	95	3.2421	1.29414	
	Total	165	3.3091	1.35078	
Q6.OES provides an attractive test examination for students	Third Year	70	3.8286	1.08976	.117
	Fourth Year	95	3.5579	1.08878	
	Total	165	3.6727	1.09413	
Q7.I like using OES because I am computer Literate	Third Year	70	3.4143	1.48902	.067
	Fourth Year	95	2.9789	1.50162	
	Total	165	3.1636	1.50726	
Q8.If OES were not mandatory, I would still like to use it	Third Year	70	3.4143	1.38828	.103
	Fourth Year	95	3.0632	1.33537	
	Total	165	3.2121	1.36502	
Q9.OES is easier to do my course	Third Year	70	3.5714	1.38910	.254
	Fourth Year	95	3.3368	1.23435	
	Total	165	3.4364	1.30333	
	Average Mean 3.3879			Average SD 1.2953	

5.1.1.4 Students' Perceptions on the usefulness of Online Examination System according to their Major

As it is shown in the table 38 below, the number of participants from each faculty is equal (N=55). Students whose major is Public Relations have lower mean than the other two majors. For Journalism and Television students the "OES provides an attractive type of test examination for students" have the highest mean as shown in the table average mean (M=3.4364) which shows the satisfaction of the students.

Table 38. Students' Perceptions on the usefulness of Online Examination System according to their Major

		N	Mean	Std. Deviation	P value
Q1.Using OES gave me greater control over my exam.	Public Relation	55	3.5273	1.11976	.000
	Television	55	3.5273	1.23009	
	Journalism	55	3.5273	1.19961	
	Total	165	3.5273	1.17683	
Q2.OES improved my academic Performance.	Public Relation	55	3.5273	1.11976	.000
	Television	55	3.5273	1.23009	
	Journalism	55	3.5273	1.19961	
	Total	165	3.5273	1.17683	
Q3.OES is easier than tarditional exams	Public Relation	55	3.4909	1.21522	.159
	Television	55	3.0909	1.36453	
	Journalism	55	3.0545	1.36651	
	Total	165	3.2121	1.32420	
Q4.OES enhances the effectiveness of my teacher's activities.	Public Relation	55	3.0364	1.36033	.186
	Television	55	3.4545	1.34465	
	Journalism	55	3.4364	1.33005	
	Total	165	3.3091	1.35078	
Q5.OES improved the quality of the	Public Relation	55	3.0364	1.36033	.186
	Television	55	3.4545	1.34465	
	Journalism	55	3.4364	1.33005	

examination for students	Total	165	3.3091	1.35078	
Q6.OES provides an attractive test examination for students	Public Relation	55	3.5455	1.08556	.573
	Television	55	3.7455	1.10919	
	Journalism	55	3.7273	1.09637	
	Total	165	3.6727	1.09413	
Q7.I like using OES because I am computer Literate	Public Relation	55	2.8909	1.38340	.260
	Television	55	3.2909	1.58316	
	Journalism	55	3.3091	1.53807	
	Total	165	3.1636	1.50726	
Q8.If OES were not mandatory, I would still like to use it	Public Relation	55	3.0727	1.16832	.652
	Television	55	3.2727	1.48392	
	Journalism	55	3.2909	1.43595	
	Total	165	3.2121	1.36502	
Q9.OES is easier to do my course	Public Relation	55	3.2000	1.20800	.258
	Television	55	3.5455	1.35835	
	Journalism	55	3.5636	1.33005	
	Total	165	3.4364	1.30333	
	Average Mean 3.3744			Average SD 1.2929	

5.1.1.5 Students Perceptions on the usefulness of Online Examination System according to their Computer Literacy Skills

Table 39, shows the number of students whose computer literacy skills are significantly higher than the ones who consider themselves are not familiar with computer skills.

Table 39. Students' Perceptions on the usefulness of Online Examination System according to their Computer Literacy Skills

		N	Mean	Std. Deviation
Q1.Using OES gave me greater control over my exam.	Yes	100	4.1700	.68246
	No	65	2.5385	1.09083
	Total	165	3.5273	1.17683
Q2.OES improved my academic Performance.	Yes	100	4.1700	.68246
	No	65	2.5385	1.09083
	Total	165	3.5273	1.17683
Q3.OES is easier than traditional exams	Yes	100	3.9100	1.01598
	No	65	2.1385	.98230
	Total	165	3.2121	1.32420
Q4.OES enhances the effectiveness of my teacher's activities.	Yes	100	3.8500	1.09521
	No	65	2.4769	1.28826
	Total	165	3.3091	1.35078
Q5.OES improved the quality of the examination for students	Yes	100	3.8500	1.09521
	No	65	2.4769	1.28826
	Total	165	3.3091	1.35078
Q6.OES provides an attractive test examination for students	Yes	100	4.0900	.69769
	No	65	3.0308	1.27438
	Total	165	3.6727	1.09413
Q7.I like using OES because I am computer Literate	Yes	100	4.2300	.70861
	No	65	1.5231	.73117
	Total	165	3.1636	1.50726
Q8.If OES were not mandatory, I would still like to use it	Yes	100	4.1500	.72995
	No	65	1.7692	.67937
	Total	165	3.2121	1.36502
Q9.OES is easier to do my course	Yes	100	4.2300	.70861
	No	65	2.2154	1.03821
	Total	165	3.4364	1.30333
	Average Mean 3.2491			Average SD 1.056

5.1.2 Students' Perceptions on the use of Simplicity of Computer-Based Tests

The third part of the questionnaire is also based on Likert response scale. These group items are rated according to the level of their favorability. Usually scales of 1-to-5 are

used where: (1= strongly unfavorable to the concept … 5= strongly favorable to the concept).

Table 40, shows the mean and standard deviation on the perceptions of students' on the use of simplicity of computer-based tests. As it shown in table 40, "Due to the use of simplicity of computer based tests; I prefer using OES for my exams in the future." (M=3.36, SD=1.34) and "I believe that it is easy to use the OES for my course" (M=3.54, SD=1.31) has the mean more than others. Meanwhile "There is not enough time to use OES for Test." (M=2.84, S=1.34) has the lowest mean. The low mean showed that students are not interested about integrating technology in their exam system and believe that there is not enough time for making current system more technological.

Table 40. Perceptions of Students on the use of Simplicity of Computer-Based Tests

	N	Mean	Std. Deviation
Q1.I believe that it is easy to use the OES for my course	165	3.5455	1.31341
Q2.Interaction with the computer is clear and understandable during OES.	165	3.5455	1.31341
Q3.Testing with OES does not require a lot of mental effort	165	3.3273	1.50675
Q4.I need an experienced person nearby when I use OES for my test	165	2.8303	1.14564
Q5.Due to ease of use I prefer using OES for my exams in future.	165	3.3697	1.34447
Q6.OES needs more technical skills of computer that I don't have.	165	2.8303	1.14564
Q7.There is not enough time to use OES for Test.	165	2.8424	1.31572
Q8.I do not have sufficient skills to use OES	165	2.9030	1.18540
Q9.I prefer OES over traditional exams	165	3.3697	1.34447

Valid N (list wise)	165	Average Mean 3.1737	Average SD 1.2905

5.1.2.1 Students' Perceptions on the use of simplicity of Computer-Based Tests according to their Age

According to the Table 41, the age range between (18-22) has a higher mean comparing to other age range. However, in Q8, Q7, Q6 and Q4 there is a significant change. That is because older students with age range more than 37 have more negative view about using the suggested system than younger students with age range of (18-36).

Table 41. Students' Perceptions on the use of simplicity of Computer-Based Tests according to their Age

		N	Mean	Std. Deviation	P value
Q1.I believe that it is easy to use the OES for my course	18-22	70	3.8143	1.25447	.001
	23-29	84	3.5000	1.25631	
	30-37	6	2.8333	1.47196	
	37-49	4	1.5000	.57735	
	50-59	1	1.0000	.	
	Total	165	3.5455	1.31341	
Q2.Interaction with the computer is clear and understandable during OES.	18-22	70	3.8143	1.25447	.001
	23-29	84	3.5000	1.25631	
	30-37	6	2.8333	1.47196	
	37-49	4	1.5000	.57735	
	50-59	1	1.0000	.	
	Total	165	3.5455	1.31341	
Q3.Testing with OES does not require a lot of mental effort	18-22	70	3.3857	1.65322	.027
	23-29	84	3.4524	1.32087	
	30-37	6	2.5000	1.64317	
	37-49	4	1.5000	.57735	
	50-59	1	1.0000	.	
	Total	165	3.3273	1.50675	
Q4.I need an experienced	18-22	70	2.8857	1.05697	.001
	23-29	84	2.6190	1.13970	

person nearby when I use OES for my test	30-37	6	3.6667	1.03280	
	37-49	4	4.7500	.50000	
	50-59	1	4.0000	.	
	Total	165	2.8303	1.14564	
Q5.Due to ease of use I prefer using OES for my exams in future.	18-22	70	3.5857	1.33507	.005
	23-29	84	3.3571	1.27669	
	30-37	6	2.6667	1.50555	
	37-49	4	1.5000	.57735	
	50-59	1	1.0000	.	
	Total	165	3.3697	1.34447	
Q6.OES needs more technical skills of computer that I don't have.	18-22	70	2.8857	1.05697	.001
	23-29	84	2.6190	1.13970	
	30-37	6	3.6667	1.03280	
	37-49	4	4.7500	.50000	
	50-59	1	4.0000	.	
	Total	165	2.8303	1.14564	
Q7.There is not enough time to use OES for Test.	18-22	70	2.7714	1.30962	.004
	23-29	84	2.7143	1.26654	
	30-37	6	4.0000	1.09545	
	37-49	4	4.7500	.50000	
	50-59	1	4.0000	.	
	Total	165	2.8424	1.31572	
Q8.I do not have sufficient skills to use OES	18-22	70	3.0571	1.14063	.001
	23-29	84	2.6190	1.13970	
	30-37	6	3.6667	1.03280	
	37-49	4	4.7500	.50000	
	50-59	1	4.0000	.	
	Total	165	2.9030	1.18540	
Q9.I prefer OES over traditional exams	18-22	70	3.5857	1.33507	.005
	23-29	84	3.3571	1.27669	
	30-37	6	2.6667	1.50555	
	37-49	4	1.5000	.57735	
	50-59	1	1.0000	.	
	Total	165	3.3697	1.34447	
	Average Mean 3.0016			Average SD 1.1280	

5.1.2.2 Students' Perceptions on the ease of using Computer-Based Tests according to their Gender

As it is shown in Table 42, although the number of female and male in the sample is almost the same, but there is a significant difference between their results. The female students in almost all parts have the lowest interest to the OES application. However, in Q8, Q7, Q6 and Q4 there is a significant difference which meant higher for female students and has a result of negative meaning of these questions.

Table 42. Students' Perceptions on the ease of using Computer-Based Test according to their Gender

		N	Mean	Std. Deviation	P value
Q1.I believe that it is easy to use the OES for my course	Male	84	3.7024	1.42084	.118
	Female	81	3.3827	1.17864	
	Total	165	3.5455	1.31341	
Q2.Interaction with the computer is clear and understandable during OES.	Male	84	3.7024	1.42084	.118
	Female	81	3.3827	1.17864	
	Total	165	3.5455	1.31341	
Q3.Testing with OES does not require a lot of mental effort	Male	84	3.7500	1.40460	.000
	Female	81	2.8889	1.49164	
	Total	165	3.3273	1.50675	
Q4.I need an experienced person nearby when I use OES for my test	Male	84	2.6429	1.06015	.032
	Female	81	3.0247	1.20390	
	Total	165	2.8303	1.14564	
Q5.Due to ease of use I prefer using OES for my exams in future.	Male	84	3.6429	1.42814	.007
	Female	81	3.0864	1.19580	
	Total	165	3.3697	1.34447	
Q6.OES needs more technical skills of computer that I don't have.	Male	84	2.6429	1.06015	.032
	Female	81	3.0247	1.20390	
	Total	165	2.8303	1.14564	

Q7.There is not enough time to use OES for Test.	Male	84	2.4762	1.14572	.000
	Female	81	3.2222	1.37840	
	Total	165	2.8424	1.31572	
Q8.I do not have sufficient skills to use OES	Male	84	2.6905	1.09738	.019
	Female	81	3.1235	1.23878	
	Total	165	2.9030	1.18540	
Q9.I prefer OES over traditional exams	Male	84	3.6429	1.42814	.007
	Female	81	3.0864	1.19580	
	Total	165	3.3697	1.34447	
	Average Mean 3.1732			Average SD 1.2720	

5.1.2.3 Students' Perceptions on the use of Simplicity of Computer-Based Tests according to their Year of Education

The sample of the population is chosen from bachelor degree students' third and fourth year of their study in Sulaimani University. As it is shown in table 43 below, the fourth year students have higher mean on understanding and the use of the proposed system than the third year students. This is because the fourth year students are more aware of the benefits of improving computer literacy skills and the online exam system compared to the traditional one.

Table 43. Students' Perceptions on the use of Simplicity of Computer-Based Tests considering their education

		N	Mean	Std. Deviation	P value
Q1.I believe that it is easy to use the OES for my course	Third Year	70	3.6429	1.41458	.415
	Fourth Year	95	3.4737	1.23635	
	Total	165	3.5455	1.31341	
Q2.Interaction with the computer is clear and understandable during OES.	Third Year	70	3.6429	1.41458	.415
	Fourth Year	95	3.4737	1.23635	
	Total	165	3.5455	1.31341	

Q3.Testing with OES does not require a lot of mental effort	Third Year	70	3.5143	1.53927	.172
	Fourth Year	95	3.1895	1.47529	
	Total	165	3.3273	1.50675	
Q4.I need an experienced person nearby when I use OES for my test	Third Year	70	2.6857	1.12344	.165
	Fourth Year	95	2.9368	1.15603	
	Total	165	2.8303	1.14564	
Q5.Due to ease of use I prefer using OES for my exams in future.	Third Year	70	3.4714	1.44183	.406
	Fourth Year	95	3.2947	1.27056	
	Total	165	3.3697	1.34447	
Q6.OES needs more technical skills of computer that I don't have.	Third Year	70	2.6857	1.12344	.165
	Fourth Year	95	2.9368	1.15603	
	Total	165	2.8303	1.14564	
Q7.There is not enough time to use OES for Test.	Third Year	70	2.6857	1.35714	.190
	Fourth Year	95	2.9579	1.27926	
	Total	165	2.8424	1.31572	
Q8.I do not have sufficient skills to use OES	Third Year	70	2.7714	1.18164	.222
	Fourth Year	95	3.0000	1.18501	
	Total	165	2.9030	1.18540	
Q9.I prefer OES over traditional exams	Third Year	70	3.4714	1.44183	.406
	Fourth Year	95	3.2947	1.27056	
	Total	165	3.3697	1.34447	
	Average Mean 3.1718			Average SD 1.2932	

5.1.2.4 Students' Perceptions on the use of Simplicity of Computer-Based Tests according to their Major

As it is shown in the table 44, the mean in all majors of Public Relations, Television and Journalism is almost the same. However, the students' mean in Public Relations is slightly higher than others majors.

Table 44. Students' Perceptions on the use of Simplicity of Computer-Based Tests considering their Major

		N	Mean	Std. Deviation	P value
Q1.I believe that it is easy to use the OES for my course	Public Relation	55	3.3273	1.15557	.322
	Television	55	3.6545	1.39069	
	Journalism	55	3.6545	1.37731	
	Total	165	3.5455	1.31341	
Q2.Interaction with the computer is clear and understandable during OES.	Public Relation	55	3.3273	1.15557	.322
	Television	55	3.6545	1.39069	
	journalism	55	3.6545	1.37731	
	Total	165	3.5455	1.31341	
Q3.Testing with OES does not require a lot of mental effort	Public Relation	55	2.9818	1.39431	.114
	Television	55	3.5091	1.55006	
	journalism	55	3.4909	1.53807	
	Total	165	3.3273	1.50675	
Q4.I need an experienced person nearby when I use OES for my test	Public Relation	55	2.8000	1.00738	.942
	Television	55	2.8182	1.20325	
	journalism	55	2.8727	1.23310	
	Total	165	2.8303	1.14564	
Q5.Due to ease of use I prefer using OES for my exams in future.	Public Relation	55	3.1818	1.18776	.448
	Television	55	3.4727	1.42536	
	journalism	55	3.4545	1.41183	
	Total	165	3.3697	1.34447	
Q6.OES needs more technical skills of	Public Relation	55	2.8000	1.00738	.942
	Television	55	2.8182	1.20325	

computer that I don't have.	journalism	55	2.8727	1.23310	
	Total	165	2.8303	1.14564	
Q7.There is not enough time to use OES for Test.	Public Relation	55	2.8000	1.00738	.956
	Television	55	2.8545	1.44553	
	journalism	55	2.8727	1.46635	
	Total	165	2.8424	1.31572	
Q8.I do not have sufficient skills to use OES	Public Relation	55	2.8727	1.05505	.946
	Television	55	2.8909	1.24235	
	journalism	55	2.9455	1.26810	
	Total	165	2.9030	1.18540	
Q9.I prefer OES over traditional exams	Public Relation	55	3.1818	1.18776	.448
	Television	55	3.4727	1.42536	
	journalism	55	3.4545	1.41183	
	Total	165	3.3697	1.34447	
	Average Mean 3.1737			Average SD 1.2879	

5.1.2.5 Students' Perceptions on the use of Simplicity of Computer-Based Tests according to their Computer Literacy Skills

According to Table 45, the number of the students whose computer literacy are significantly higher have better understanding about the online exam system and can easily work with . Moreover in the Q8, Q7, Q6 and Q4 is shown that computer literate students find the system more user-friendly and choose to work with it without any difficulty or supervision.

Table 45. Students' perceptions on the use of Simplicity of Computer-Based Tests regarding their computer literacy

		N	Mean	Std. Deviation
Q1.I believe that it is easy to use the OES for my course	Yes	100	4.2700	.72272
	No	65	2.4308	1.23705
	Total	165	3.5455	1.31341
Q2.Interaction with the computer is clear and understandable during OES.	Yes	100	4.2700	.72272
	No	65	2.4308	1.23705
	Total	165	3.5455	1.31341
Q3.Testing with OES does not require a lot of mental effort	Yes	100	4.2700	.72272
	No	65	1.8769	1.21845
	Total	165	3.3273	1.50675
Q4.I need an experienced person nearby when I use OES for my test	Yes	100	2.1700	.82945
	No	65	3.8462	.75479
	Total	165	2.8303	1.14564
Q5.Due to ease of use I prefer using OES for my exams in future.	Yes	100	4.1500	.83333
	No	65	2.1692	1.06901
	Total	165	3.3697	1.34447
Q6.OES needs more technical skills of computer that I don't have.	Yes	100	2.1700	.82945
	No	65	3.8462	.75479
	Total	165	2.8303	1.14564
Q7.There is not enough time to use OES for Test.	Yes	100	2.1800	1.11355
	No	65	3.8615	.88171
	Total	165	2.8424	1.31572
Q8.I do not have sufficient skills to use OES	Yes	100	2.1700	.82945
	No	65	4.0308	.63662
	Total	165	2.9030	1.18540
Q9.I prefer OES over traditional exams	Yes	100	4.1500	.83333
	No	65	2.1692	1.06901
	Total	165	3.3697	1.34447
	Average Mean 3.32964			Average SD 1.033

5.2 Qualitative Findings

For qualitative research, 12 teachers and students from Sulaimani University were invited to test the proposed system and then interviewed. Before the semi-structured interviews were applied by the researcher, the interview questions were piloted with 3 teachers and students. Then the rest of the questions were given to the rest. The questions in the interview were designed to answer four main questions; first teachers had to give their personal information and background, second their computer literacy level, third their experience and evaluation on working with proposed system, finally their perceptions about limitation or benefits of using the proposed system in the classrooms. The analysis of these answers is discussed in the following sections. Table 46 shows the codes which are derived from the research questions in order to analyze the qualitative data.

Table 46. Codes which derived from the Research Questions in order to interpret the Qualitative Research Results

Research Questions	**Codes derived from Research Questions**
1. What are the instructors and students perceptions about the proposed online exam system?	T'S and S'S percepts.
2. What will be the contribution of this new exam system (both negatively and positively) to the University of Sulaimani?	Contrib. of new syst.
3. Considering the practicality and time management will the teachers find it useful to use or not?	Adv. or Dis. of new syst.

To be able to analyze the findings of the interviews, first of all the researcher coded the research questions into the four main categories. The first question "What are the instructors and students perceptions about the proposed online exam system?" is coded as "T'S and S'S percepts" , the second research question "To what extend this new online exam system will fulfill teachers' and students' need compared to the traditional system?" is coded as "T'S and S'S need.", moreover the third research question "What will be the contribution of this new exam system (both negatively and positively) to the University of Sulaimani?" is coded as "Contrib. of new syst." And finally the last question "Considering the practicality and time management will the teachers find it useful to use or not?" is coded as "Adv. or Dis. of new system".

Table 47. Definition of the derived Codes from the Research Questions

Codes	**Definitions**
T'S and S'S precepts.	Teachers' and Students' Perceptions
T'S and S'S need.	Teachers' and Students' Need
Contrib. of new syst.	Contribution of the new System
Adv. or Dis. of new syst.	Advantages or Disadvantages of the new System

5.2.1 Analysis of the Semi-Structured Interviews with the Teachers

According to the semi-structured interview answers most of the teachers were male, between 30 to 55 years old and taught for more than five years in Sulaimani University. The major of all teachers differ from each other in the Faculty of Media.

5.2.2.1 Transcriptions of the Instructors' Perceptions from Semi-Structured Interviews on Computer Literacy

Almost all of the instructors considered themselves computer literate enough to do their daily educational chores. However, the level of computer knowledge of some teachers was not at an international level in order to be considered as a real computer literate.

For instance, T1 said that:

> *I don't have so much experience in using computer programs, but I know enough to facilitate those tasks related to my skills, and often following to learn more about programs.*

T2 and T3 said:

> *I know enough to teach my students as a lecturer by using presentation programs such as Microsoft office programs.*
> *I have a limited skill on using computer. I am not a perfect enough to know how to use all programs.*

However, some teachers like T4, T5 and T6 believed that they were experienced enough on computer literacy:

T4 said:

> *I see the new system as a good improvement and easy to use but still requires training people from the beginning.*

T5 expressed that:

> *I have a very good computer skill, because I finished master and after that PhD. As a teacher I need a computer to enter the data and for my lectures, as well.*

Additionally T6 said:

> *I have good computer skill as I was lecturing computer for three years to the students.*

5.2.2.2 Instructors Perceptions of the New Online Examination System according to the Semi-Structured Interviews

Most teachers found the proposed system very useful since it reliefs them from writing up questions and correcting the answers. For example T3 stated that this way can be beneficial for the university too since it reduces the cost for university such as exam hall, papers, and invigilators. T3:

> *The new system is very useful and everywhere and it is very cost effective. For example in Kurdistan the university pays a lot of money to those people who are monitoring the exam halls yearly. But if the university spends that amount of money in improving computer labs, it will return some money to the university…*

Likewise, according to T4:

> *I agree with the new system of online exam as it facilitates for lecturers comparing to paper works, I think it is better as it avoids cheating during exams, also easier to check the answers.*

Moreover, T6 added that:

> *I used both of them in teaching. I am using new technologies in our lecturing programs, and we have to use online systems to support students in learning and motivate them to follow media s science.*

However, some teachers like teacher T1 and T2 believed that using such system with current technological infrastructure of Sulaimani University is not a good idea and students and teachers cannot perform fast and efficient enough.

T1:

> *I don't see the new system could be followed at this moment, we don't have enough computer labs and knowledge on computer literacy for both students*

and instructors. I don't agree on using it too, it is just not easy and comfortable like the traditional exam system.

According to T2:

Using new technologies has its own positives and negatives too, For example: computers might have problems caused by viruses, or hacked, or the program might be complicated for some users, or might take more time to understand it.

5.2.2.3 Instructors Limitation and Benefits of Using Online Examination System deducted from the Semi-Structured Interviews

Although it seemed that most teachers were aware of the advantages of the new examination system with technology integrated in it, but most of them were concerned about the infrastructure needed for security and using such system as a main examination system of the university. Many of them believed that the traditional way of writing answers for the exam is easier for the students but they prefer the automatic correcting feature of the online exam system.

According to T6:

The new system is not that difficult especially for those users who are using new technologies such as smart phones and tablets, those were not easy at the beginnings, too.

T3 also said that:

The system is easy for the students and new lectures, but it might be difficult for the lecturers who got a long with the traditional system, but it can be easier if the university provides them with quick trainings before usage.

T2 underlined the same issue that:

The new online exam website requires experience, which I don't find it easy to start using it for university students.

On the contrary, some teachers refused to endorse the proposed system since they find it difficult to follow. According to T5:

> *The new technologies are hard to be followed by older people, for example, we have people that are still don't have smart phones, they don't like using new technologies. And also either students or lecturers have to know computer and English or Arabic language before using it.*

T3 said:

> *I am sure that the new exam system won't be easy at the beginning, but might be easier if there will be short training on using it before we start using it…*

Furthermore, T1 and T2 said:

> *Using new technologies has its own positives and negatives too. For example, computers might have problems caused by viruses or hacked or the program might be complicated for some users or might take more tıme to understand it…*

T2:

> *I don't see the new system could be followed at this moment and I don't agree on using it.*

To sum up, using online exam system at the University of Sulaimani from the perception of teachers had advantages and disadvantages. As emphasized above, although most of the teachers were volunteered to use this system, but still due to certain constraints such as the training of the teachers, infrastructure of the University's computer labs and practicality to apply the proposed online exam system in all departments was debatable.

5.2.2.4 Transcriptions of the Students' Perceptions from Semi-Structured Interviews on ICT

For the effective use of ICT and also the application of the proposed online exam S1, S2 and S3 supported the view that:

S1 said:

> *In my opinion yes, it can have a great impact on education level for students.*

S2:

> *It is an affective system and it is a very good way in finding resource of information and in facilitates.*

And S3 said:

> *Of course technologies are very affective on studies especially to facilitate in studying. For example: using E-Books easier to read the required information from difficult sources.*

On the contrary to these, S4, S5 and S6 had got hesitations according the new online proposed exam system;

> *Everything has its own advantages and disadvantages. ICT is a specific program and should be reviewed and checked between a group of people to decide on negativities and positives before we start using it.*

> *Yes, in my opinion it has an important role on education system, but if we are talking about making exam system online, I don't think it is a good idea because for some reasons that cannot describe in one point.*

> *Actually it has two sides. Still it has not because a system to be followed in the ministry of higher education. Yes, it has benefit for people a lot because of giving a lot of information and saving people time. But, it hasn't got a system so seems kind of slow so that neither the teachers can convey information in a good way nor the students can receive well, so that it cannot be succeed here.*

5.2.2.5 Students' Perceptions on the Advantages of ICT and the use of Proposed Online Exam System deducted from Semi-Structured Interviews

All of the students agreed on the fact that ICT was beneficial for students and teachers. It was more suggested that the online exam system was actually very useful, but due to the lack of infrastructural factors plus educational background of students and

teachers to put it into process right now can be a negative handicap for the University of Sulaimani.

S1, S2, S3, S4, S5 and S6 said:

S1:

> *ICT has a lot of benefits for students and also for the teachers. For example, the teachers won't have to collect big number of paper to correct them in the tradition way. And for the students they can get their results back as soon as they finish the exam, also they don't have to wait a certain amount of time.*

S2:

> *Saves time, students can get information from internet much quicker than any other resources like the public libraries.*

S3:

> *Advantages are getting information easier but depends on the way of using it, For example: there are people who are not using computer safety.*

S4:

> *It saves time on checking questions, replacing questions, and it is accurate as you might not lose any marks. Also, facilitates on answering the questions very quickly.*

S5:

> *Yes, it has many benefits, if we don't have that system, student will follow the previous students, but ICT is a helping system because whenever the student needs support, they can reach people in their major field of study to ask for help, and also they can write articles and documents easier.*

S6:

> *As I said in the beginning in terms of time, it saves the student time and the students learn a lot in a limited time, also they can contact the teachers directly whenever they want. The teachers can send their questions and get the answers back from the students or group very soon.*

5.2.2.6 Students' Perceptions on the Disadvantages of ICT and the use of Proposed Online Exam System deducted from Semi-Structured Interviews

Like the discussion of the advantages again all agreed on the fact that, ICT and online exam system have disadvantages on students and teachers in the University of Sulaimani.

S1, S2, S3, S4, S5 and S6 said that:

S1:

> *The negative effects of ICT might be in leaving to read books and newspapers.*

S2:

> *Disadvantages are health issues, as well as being addicted on technologies. We cannot change the system straight away as many universities are not capable of using it at this moment. As they are only capable of using traditional way because they don't have much experience on computer.*

S3:

> *Disadvantages are in wasting time if you are not using it in a good way , is better to use the same time on reading different books rather than wasting time. Because of the advantages and disadvantages mentioned above, it takes time to get along with it to change from traditional way to online exams maybe students aren't ready at this moment because of the electricity or another reasons.*

S4:

The weak points of ICT , first is the slow internet connection or any issue in internet might cause losing the questions , then losing the marks or the students might need explanation on the questions which the lecturer might not be available at this moment.

S5:

Yes, ICT takes a lot of time from students that they cannot control their own major. In my opinion it is a difficult progress, we didn't reach that point to change our traditional system exam for online system, we have more necessary things to change like administration.

S6:

If it is overused, may it cause some physical problems in the body, like backache or sight problems. Yes, for sure. We can change it like all the developed countries and improve it to better but, the problem is we have to reset the system from the beginning and train the teachers to learn how to teach in the new system and then training the students. The problem is that all the teachers are used to the classical and the old way of teaching. If we bring a new system into the ministry of education and higher education, we have to give the teachers so many presentations and seminars because maybe there are some teachers in the position of professor but they don't have much knowledge about technology.

Owing to students' perceptions on the effectiveness of using ICT and the proposed online exam system, it can be said that students were neither negative nor positive. Students view the use of ICT as necessary and effective for many areas in education. Therefore, this showed that at University of Sulaimani from the students' perceptions in order to apply and use the online exam system still needs time to be digested by students and teachers and put into application with a strong infrastructure and training.

Chapter 6

CONCLUSION

In this research, the researcher proposed a new online examination system (OES) and examines the perceptions of teachers and students in the University of Sulaimani for the first time and can be concluded as:

- The proposed system when it is implemented correctly can reduce many problems such as time wasting for repeatedly question design, paper correction, invigilation, and supervision cost and administration paperwork.

- Moreover, although the proposed system has many advantages and user-friendly for many students and teachers, but the lack of computer literacy in Kurdistan has made it difficult to adapt this new online exam system. Therefore, it is suggested that certain computer training sessions can be designed for both teachers and students in this university.

- It is important to note that all teachers and students need to be aware of the fact that using computer skills in 21st century is unavoidable. Whether it is wanted or not all of the systems are being computerized. Although the speed of this process in developing countries is slower than developed ones, but there is no escape from a worldwide and lifelong education for all of us.

After reviewing the result of questionnaire and semi-structured interview analysis, can be concluded as; many teachers in their semi-structured interviews mentioned that, although they like the proposed system but they were not sure if Sulaimani University is ready for such kind of integration of technology in their curriculum. "the media born of the communications revolution which can be used for instructional purposes alongside the teacher, textbook, and blackboard as well as a systematic way of designing, carrying out, and evaluating the total process of learning and teaching in terms of specific objectives, based on research in human learning and communications, and employing a combination of human and nonhuman resources to bring about more effective instructions" (Seattler, 2004). Unlike this, teachers at University of Sulaimani were worried about the access of the students to the technological equipment's of the computer labs, tablet or even smart phones. Some teachers were even concerned about the speed and the stability of the internet in Kurdistan and its effect on the examination process.

On other hand, the percentage of computer literacy although was higher than 50% in both students and teachers but still it cannot be a comparable percentage with developed countries. Integrating technology and computer to the classroom requires some basic skills and equipment. However, high motivation and interest degree of students and teachers can be a good sign for the future of Sulaimani University but it is necessary for Universities in Kurdistan and schools to include computer literacy courses as their primary courses. In line with this view, "instructional technology is concerned with improving the effectiveness and efficiency of learning in educational contexts, regardless of the nature or substance of that learning. …Solutions to instructional problems might entail social as well as machine technologies." (Cassidy,

1982). Furthermore, considering the three research questions, the researcher came up with the following findings:

According to the first research question:

“What are the instructors and students perceptions about the proposed online exam system?”

According to the result of this research majority of the students and instructors (T1, T2, T3, T4, T5, T6 and S1, S2, S3, S4, S5, S6) preferred the proposed system to the traditional exam system. However, the students and instructors who were older in age wise seemed to be resisting change due to their limited computer literacy skills and habit of bound to be to the use of traditional system.

Considering the second research question:

“To what extend this new online exam system will fulfill teachers’ and students’ need compared to the traditional system?”

Most students and teachers (T1, T2, T4 and S2, S3, S4, S5) were worried about the way that they can express their knowledge by using computer as they were not computer literate enough. On the other hand, some students and instructors were satisfied with the functionality and the features of the use of computer and proposed system because, they had enough knowledge in computer.

For the third research question:

“What will be the contribution of this new exam system (both negatively and positively) to the University of Sulaimani?”

According to (T1,T2,T3,T4,T5,T6 and S1,S2,S3,S4,S5,S6), proposed system can contribute to the instructors by spending less time for designing exam questions, invigilation’s and paper correction. This could also reduce the expenses of the university. Students also find the new way of examination more interesting, user-friendly and motivating.

Finally, for the fourth research question:

“Considering the practicality and time management will the teachers find it useful to use or not?”

Almost all of the instructors (T1, T3, T4, T5, T6) with computer literacy skills and younger in age find the system interesting, useful, user-friendly and functional. However, older instructors’ age wise with limited computer skills were not interested to change their traditional ways to technologically integrated ways.

6.1 Future Work

- Due to time constraint in this research, the researcher was only able to apply in one department of the proposed online exam system. In order to generalize further and have more solid data according this issue, definitely it needs to be applied in the other departments of University of Sulaimani.

- Both students and instructors should go training according computer literacy.

- Both students and instructors should be open to lifelong learning and its approaches such as online exam system.

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APPENDICES

Appendix A:

Students' Perceptions on the usefulness of Online Examination System according to their Age

		Sum of Squares	df	Mean Square	F	Sig.
Using OES gave me greater control over my exam.	Between Groups	21.404	1	21.404	16.959	.000
	Within Groups	205.723	163	1.262		
	Total	227.127	164			
OES improved my academic Performance.	Between Groups	21.404	1	21.404	16.959	.000
	Within Groups	205.723	163	1.262		
	Total	227.127	164			
OES is easier than traditional exams	Between Groups	4.877	1	4.877	2.812	.095
	Within Groups	282.698	163	1.734		
	Total	287.576	164			
OES enhances the effectiveness of my teacher's activities.	Between Groups	24.889	1	24.889	14.787	.000
	Within Groups	274.347	163	1.683		
	Total	299.236	164			
OES improved the quality of the examination for students	Between Groups	24.889	1	24.889	14.787	.000
	Within Groups	274.347	163	1.683		
	Total	299.236	164			
OES provides an attractive test examination for students	Between Groups	7.419	1	7.419	6.401	.012
	Within Groups	188.908	163	1.159		
	Total	196.327	164			
I like using OES because I am computer Literate	Between Groups	22.197	1	22.197	10.326	.002
	Within Groups	350.384	163	2.150		
	Total	372.582	164			
If OES were not mandatory, I would still like to use it	Between Groups	11.932	1	11.932	6.623	.011
	Within Groups	293.644	163	1.801		
	Total	305.576	164			

OES is easier to do my course	Between Groups	10.038	1	10.038	6.093	.015
	Within Groups	268.544	163	1.648		
	Total	278.582	164			

Students' Perceptions on the usefulness of Online Examination System according to their Year of Education

		Sum of Squares	df	Mean Square	F	Sig.
Using OES gave me greater control over my exam.	Between Groups	2.527	1	2.527	1.834	.178
	Within Groups	224.601	163	1.378		
	Total	227.127	164			
OES improved my academic Performance.	Between Groups	2.527	1	2.527	1.834	.178
	Within Groups	224.601	163	1.378		
	Total	227.127	164			
OES is easier than traditional exams	Between Groups	3.664	1	3.664	2.103	.149
	Within Groups	283.912	163	1.742		
	Total	287.576	164			
OES enhances the effectiveness of my teacher's activities.	Between Groups	1.005	1	1.005	.549	.460
	Within Groups	298.232	163	1.830		
	Total	299.236	164			
OES improved the quality of the examination for students	Between Groups	1.005	1	1.005	.549	.460
	Within Groups	298.232	163	1.830		
	Total	299.236	164			
OES provides an attractive test examination for students	Between Groups	2.953	1	2.953	2.489	.117
	Within Groups	193.374	163	1.186		
	Total	196.327	164			
I like using OES because I am computer Literate	Between Groups	7.638	1	7.638	3.412	.067
	Within Groups	364.944	163	2.239		
	Total	372.582	164			
If OES were not mandatory, I would still like to use it	Between Groups	4.969	1	4.969	2.694	.103
	Within Groups	300.607	163	1.844		
	Total	305.576	164			

OES is easier to do my course	Between Groups	2.218	1	2.218	1.308	.254
	Within Groups	276.364	163	1.695		
	Total	278.582	164			

Students' Perceptions on the usefulness of Online Examination System according to their Major

		Sum of Squares	df	Mean Square	F	Sig.
Using OES gave me greater control over my exam.	Between Groups	.000	2	.000	.000	1.000
	Within Groups	227.127	162	1.402		
	Total	227.127	164			
OES improved my academic Performance.	Between Groups	.000	2	.000	.000	1.000
	Within Groups	227.127	162	1.402		
	Total	227.127	164			
OES is easier than traditional exams	Between Groups	6.448	2	3.224	1.858	.159
	Within Groups	281.127	162	1.735		
	Total	287.576	164			
OES enhances the effectiveness of my teacher's activities.	Between Groups	6.145	2	3.073	1.698	.186
	Within Groups	293.091	162	1.809		
	Total	299.236	164			
OES improved the quality of the examination for students	Between Groups	6.145	2	3.073	1.698	.186
	Within Groups	293.091	162	1.809		
	Total	299.236	164			
OES provides an attractive test examination for students	Between Groups	1.345	2	.673	.559	.573
	Within Groups	194.982	162	1.204		
	Total	196.327	164			
I like using OES because I am computer Literate	Between Groups	6.145	2	3.073	1.358	.260
	Within Groups	366.436	162	2.262		
	Total	372.582	164			
If OES were not mandatory, I would still like to use it	Between Groups	1.612	2	.806	.430	.652
	Within Groups	303.964	162	1.876		
	Total	305.576	164			

OES is easier to do my course	Between Groups	4.618	2	2.309	1.365	.258
	Within Groups	273.964	162	1.691		
	Total	278.582	164			

Students' Perceptions on the usefulness of Online Examination System according to their Computer Literacy

		Sum of Squares	Df	Mean Square	F	Sig.
Using OES gave me greater control over my exam.	Between Groups	104.863	1	104.863	139.802	.000
	Within Groups	122.264	163	.750		
	Total	227.127	164			
OES improved my academic Performance.	Between Groups	104.863	1	104.863	139.802	.000
	Within Groups	122.264	163	.750		
	Total	227.127	164			
OES is easier than traditional exams	Between Groups	123.632	1	123.632	122.920	.000
	Within Groups	163.944	163	1.006		
	Total	287.576	164			
OES enhances the effectiveness of my teacher's activities.	Between Groups	74.271	1	74.271	53.813	.000
	Within Groups	224.965	163	1.380		
	Total	299.236	164			
OES improved the quality of the examination for students	Between Groups	74.271	1	74.271	53.813	.000
	Within Groups	224.965	163	1.380		
	Total	299.236	164			
OES provides an attractive test examination for students	Between Groups	44.199	1	44.199	47.357	.000
	Within Groups	152.128	163	.933		
	Total	196.327	164			
I like using OES because I am computer Literate	Between Groups	288.656	1	288.656	560.629	.000
	Within Groups	83.925	163	.515		
	Total	372.582	164			
If OES were not mandatory, I would still like to use it	Between Groups	223.287	1	223.287	442.296	.000
	Within Groups	82.288	163	.505		
	Total	305.576	164			

OES is easier to do my course	Between Groups	159.887	1	159.887	219.569	.000
	Within Groups	118.695	163	.728		
	Total	278.582	164			

Students' Perceptions on the ease of use of Computer-Based Test according to their Age

		Sum of Squares	Df	Mean Square	F	Sig.
Q1.I believe that it is easy to use the OES for my course	Between Groups	31.490	4	7.873	5.010	.001
	Within Groups	251.419	160	1.571		
	Total	282.909	164			
Q2.Interaction with the computer is clear and understandable during OES.	Between Groups	31.490	4	7.873	5.010	.001
	Within Groups	251.419	160	1.571		
	Total	282.909	164			
Q3.Testing with OES does not require a lot of mental effort	Between Groups	24.432	4	6.108	2.809	.027
	Within Groups	347.895	160	2.174		
	Total	372.327	164			
Q4.I need an experienced person nearby when I use OES for my test	Between Groups	24.270	4	6.067	5.083	.001
	Within Groups	190.979	160	1.194		
	Total	215.248	164			
Q5.Due to ease of use I prefer using OES for my exams in future.	Between Groups	25.844	4	6.461	3.820	.005
	Within Groups	270.605	160	1.691		
	Total	296.448	164			
Q6.OES needs more technical skills of computer that I don't have.	Between Groups	24.270	4	6.067	5.083	.001
	Within Groups	190.979	160	1.194		
	Total	215.248	164			
Q7.There is not enough time to use OES for Test.	Between Groups	25.667	4	6.417	3.976	.004
	Within Groups	258.236	160	1.614		
	Total	283.903	164			
Q8.I do not have sufficient skills to use OES	Between Groups	26.784	4	6.696	5.260	.001
	Within Groups	203.664	160	1.273		
	Total	230.448	164			

Q9.I prefer OES over traditional exams	Between Groups	25.844	4	6.461	3.820	.005
	Within Groups	270.605	160	1.691		
	Total	296.448	164			

Students' Perceptions on the ease of use of Computer-Based Test according to their Gender

		Sum of Squares	Df	Mean Square	F	Sig.
Q1.I believe that it is easy to use the OES for my course	Between Groups	4.214	1	4.214	2.464	.118
	Within Groups	278.695	163	1.710		
	Total	282.909	164			
Q2.Interaction with the computer is clear and understandable during OES.	Between Groups	4.214	1	4.214	2.464	.118
	Within Groups	278.695	163	1.710		
	Total	282.909	164			
Q3.Testing with OES does not require a lot of mental effort	Between Groups	30.577	1	30.577	14.584	.000
	Within Groups	341.750	163	2.097		
	Total	372.327	164			
Q4.I need an experienced person nearby when I use OES for my test	Between Groups	6.012	1	6.012	4.684	.032
	Within Groups	209.236	163	1.284		
	Total	215.248	164			
Q5.Due to ease of use I prefer using OES for my exams in future.	Between Groups	12.768	1	12.768	7.336	.007
	Within Groups	283.681	163	1.740		
	Total	296.448	164			
Q6.OES needs more technical skills of computer that I don't have.	Between Groups	6.012	1	6.012	4.684	.032
	Within Groups	209.236	163	1.284		
	Total	215.248	164			
Q7.There is not enough time to use OES for Test.	Between Groups	22.951	1	22.951	14.336	.000
	Within Groups	260.952	163	1.601		
	Total	283.903	164			
Q8.I do not have sufficient skills to use OES	Between Groups	7.731	1	7.731	5.658	.019
	Within Groups	222.718	163	1.366		
	Total	230.448	164			

Q9.I prefer OES over traditional exams	Between Groups	12.768	1	12.768	7.336	.007
	Within Groups	283.681	163	1.740		
	Total	296.448	164			

Students' Perceptions on Ease of Use of Computer-Based Test according to the Year of Study

ANOVA

		Sum of Squares	Df	Mean Square	F	Sig.
Q1.I believe that it is easy to use the OES for my course	Between Groups	1.153	1	1.153	.667	.415
	Within Groups	281.756	163	1.729		
	Total	282.909	164			
Q2.Interaction with the computer is clear and understandable during OES.	Between Groups	1.153	1	1.153	.667	.415
	Within Groups	281.756	163	1.729		
	Total	282.909	164			
Q3.Testing with OES does not require a lot of mental effort	Between Groups	4.252	1	4.252	1.883	.172
	Within Groups	368.075	163	2.258		
	Total	372.327	164			
Q4.I need an experienced person nearby when I use OES for my test	Between Groups	2.542	1	2.542	1.948	.165
	Within Groups	212.707	163	1.305		
	Total	215.248	164			
Q5.Due to ease of use I prefer using OES for my exams in future.	Between Groups	1.258	1	1.258	.695	.406
	Within Groups	295.190	163	1.811		
	Total	296.448	164			
Q6.OES needs more technical skills of computer that I don't have.	Between Groups	2.542	1	2.542	1.948	.165
	Within Groups	212.707	163	1.305		
	Total	215.248	164			
Q7.There is not enough time to use OES for Test.	Between Groups	2.986	1	2.986	1.732	.190
	Within Groups	280.917	163	1.723		
	Total	283.903	164			
Q8.I do not have sufficient skills to use OES	Between Groups	2.106	1	2.106	1.503	.222
	Within Groups	228.343	163	1.401		
	Total	230.448	164			

Q9.I prefer OES over traditional exams	Between Groups	1.258	1	1.258	.695	.406
	Within Groups	295.190	163	1.811		
	Total	296.448	164			

Students' Perceptions on the ease of use of Computer-Based Test according to their Major

		Sum of Squares	Df	Mean Square	F	Sig.
Q1.I believe that it is easy to use the OES for my course	Between Groups	3.927	2	1.964	1.140	.322
	Within Groups	278.982	162	1.722		
	Total	282.909	164			
Q2.Interaction with the computer is clear and understandable during OES.	Between Groups	3.927	2	1.964	1.140	.322
	Within Groups	278.982	162	1.722		
	Total	282.909	164			
Q3.Testing with OES does not require a lot of mental effort	Between Groups	9.855	2	4.927	2.202	.114
	Within Groups	362.473	162	2.237		
	Total	372.327	164			
Q4.I need an experienced person nearby when I use OES for my test	Between Groups	.158	2	.079	.059	.942
	Within Groups	215.091	162	1.328		
	Total	215.248	164			
Q5.Due to ease of use I prefer using OES for my exams in future.	Between Groups	2.921	2	1.461	.806	.448
	Within Groups	293.527	162	1.812		
	Total	296.448	164			
Q6.OES needs more technical skills of computer that I don't have.	Between Groups	.158	2	.079	.059	.942
	Within Groups	215.091	162	1.328		
	Total	215.248	164			
Q7.There is not enough time to use OES for Test.	Between Groups	.158	2	.079	.045	.956
	Within Groups	283.745	162	1.752		
	Total	283.903	164			
Q8.I do not have sufficient skills to use OES	Between Groups	.158	2	.079	.055	.946
	Within Groups	230.291	162	1.422		
	Total	230.448	164			

Q9.I prefer OES over traditional exams	Between Groups	2.921	2	1.461	.806	.448
	Within Groups	293.527	162	1.812		
	Total	296.448	164			

Students' Perceptions on the ease of the use of Computer-Based Test according to their Computer Literacy

		Sum of Squares	Df	Mean Square	F	Sig.
Q1.I believe that it is easy to use the OES for my course	Between Groups	133.261	1	133.261	145.150	.000
	Within Groups	149.648	163	.918		
	Total	282.909	164			
Q2.Interaction with the computer is clear and understandable during OES.	Between Groups	133.261	1	133.261	145.150	.000
	Within Groups	149.648	163	.918		
	Total	282.909	164			
Q3.Testing with OES does not require a lot of mental effort	Between Groups	225.602	1	225.602	250.625	.000
	Within Groups	146.725	163	.900		
	Total	372.327	164			
Q4.I need an experienced person nearby when I use OES for my test	Between Groups	110.677	1	110.677	172.517	.000
	Within Groups	104.572	163	.642		
	Total	215.248	164			
Q5.Due to ease of use I prefer using OES for my exams in future.	Between Groups	154.560	1	154.560	177.557	.000
	Within Groups	141.888	163	.870		
	Total	296.448	164			
Q6.OES needs more technical skills of computer that I don't have.	Between Groups	110.677	1	110.677	172.517	.000
	Within Groups	104.572	163	.642		
	Total	215.248	164			
Q7.There is not enough time to use OES for Test.	Between Groups	111.389	1	111.389	105.246	.000
	Within Groups	172.514	163	1.058		
	Total	283.903	164			
Q8.I do not have sufficient skills to use OES	Between Groups	136.400	1	136.400	236.402	.000
	Within Groups	94.048	163	.577		
	Total	230.448	164			

Q9.I prefer OES over traditional exams	Between Groups	154.560	1	154.560	177.557	.000
	Within Groups	141.888	163	.870		
	Total	296.448	164			

Appendix B: Qualitative Data Analysis

Analysis of the Semi-Structured Interviews with the Teacher 1

T1	Codes derived from research Q'S
1. I don't have so much experience in using computer programs, but I know enough to facilitate those tasks related to my skills, and often following to learn more about programs.	T'S and S'S percepts.
2. Of course. I am following the new technologies in my skill because my lecture (media electronic) is new subject, I have grouping using google drive during the internet to sent lectures to my students.	T'S and S'S need.
3. According to my thinking yes, it is a very good job to use that new online exam website because it saves time, very cost effective, facilitates in checking the answers and comparing to the paper works which might lose sometimes. Using new technologies has its own positives and negatives too. For example, computers might have problems caused by viruses or hacked or the program might be complicated for some users or might take more time to understand it. However I don't see the new system could be followed at this moment, we don't have enough computer labs and knowledge on computer literacy for both students and instructors. I don't agree on using it too, it is just	Adv. or Dis. of new syst.

not easy and comfortable like the traditional exam system.	
4. Yes. Usefulness because I agree with using new online exam but it depends how we can make online popular, benefit and how we can connect with each other. It should be change from using paper works to online exams.	Contrib. of new syst.

Analysis of the Semi-Structured Interviews with the Teacher 2

T2	Codes derived from research Q'S
1. I know enough to teach my students as a lecturer by using presentation programs such as: Microsoft office programs.	T'S and S'S percepts.
2. I have no doubts in using both old and new technologies, because I believe that old system is exist for a purpose and has its own features too.	T'S and S'S need.
3. There is one issue in using new technologies, which has to be examined on students from basic education, so the students get along with it before they join university.	Adv. of new syst.
4. Yes, usefulness system that work in everywhere in the world. Also, I believe we can get benefit from it	Contrib. of new syst.

and they must be go with it from basic education.	
5. The new online exam website requires experience, which I don't find it easy to start using it for university students. I don' see the new system could be followed at this moment and I don't agree on using it.	Dis. of new syst.

Analysis of the Semi-Structured Interviews with the Teacher 3

T3	Codes derived from research Q'S
1. I have a limited skill on using computer. I am not a perfect enough to know how to use all programs.	T'S and S'S percepts.
2. I agree with the new system of online exam as it facilitates for lecturers comparing to paper works, I think it is better as it a voids cheating during exams, also easier to check the answers.	T'S and S'S percepts. / T'S and S'S need.
3. The new system can be trusted, as it is only between the students and the computer. Also, it doesn't require a third parts to support.	Adv. of new syst.
4. The new system is very useful everywhere, and it is very cost effective. For example in Kurdistan, the university pays a lot of money to those people who are monitoring the exam halls yearly, but if the university spends that amount of money in improving computer labs it will return some money to the university, but it must be very well planned.	Contrib. of new syst.
5. I am sure that the new exam system won't be easy at the beginning, but might be easier if there will be short training on using it before we start using it. The system is easy for the students	Dis. of new syst.

and new lectures, but it might be difficult for the lecturers who got a long with the traditional system, but it can be easier if the university provides them with quick trainings before usage.	

Analysis of the Semi-Structured Interviews with the Teacher 4

T4	Codes derived from research Q'S
1. I have a very good computer skill, as I used a lot during my studies for master degree in UK, I had a software training on using computer.	T'S and S'S percepts.
2. I agree on using new system, as the old system has become a routine and might be boring for students.	T'S and S'S percepts. / T'S and S'S need.
3. As I see it, the new system is a very good step of improvement, It has been used in other countries in E-learning environment websites and also I see it as a very successful system	Contrib. of new syst.
4. Yes, the online system is one of modern system during the university and technologies. I agree with the new system of online exam as it facilitates for lecturers comparing to paper works, I think it is better as it avoids cheating during exams, also easier to check the answers.	Adv. of new syst.
5. I see the new system as a good improvement and easy to use, but still requires to train people in the beginning.	Adv. and Dis. of new syst. / T'S and S'S percepts.

Analysis of the Semi-Structured Interviews with the Teacher 5

T5	Codes derived from research Q'S
1. I have a good computer skill because I finished master and after that PHD. As a teacher I need a computer to enter the data and for lecture.	T'S and S'S percepts.
2. I used both of them in teaching. I am using new technologies in our lecturing programs, and we have to use online systems to support students in learning and motivates them to follow media s science.	Adv. of new syst. / T'S and S'S need.
3. I agree on using new technologies in teaching or learning programs, but to use it for exams in our community, online exams does not trust it, we are not able to use it for all the exams, as how can we make sure if the person who answered for the exam, Was the real student or was someone else as a replacement who answered an the questions? We cannot manage to trust that there won't be a third party support in online exams.	Dis. of new syst.
4. I can say that the online exams are useful in Kurdistan, but should happen step by step there should be enough trust between the lecturers and students before we start using it, and we have to make sure that the students have a good internet skill so as to be able to use it. Also, we have to make sure that students in Kurdistan using online websites for exams properly, because the most students focus are on social media usage. How now a days, we have to make sure that students are professional enough ever use new technologies.	Contrib. of new syst.
7. The new technologies are hard to be followed by older people, for example, we have people that are still doesn't have smart phones, they don't like using new technologies. And also either students or lecturers have to know computer and	Dis. of new syst.

English or Arabic language before using it.	

Analysis of the Semi-Structured Interviews with the Teacher 6

T6	Codes derived from research Q'S
1. I have good computer skill as I was lecturing computer for three years to the students.	T'S and S'S percepts.
2. We have to use new system as we have to update ourselves with technologies improvements and we have to get along with it.	T'S and S'S need.
3. I think that it is time to get along with new systems, but we still have some lecturers that will use hand writing even as they don't like to type on computers.	Adv. and Dis. of new syst.
4. The system is very useful to use it in Kurdistan, as it has less cheating opportunities and student could get their results once when they finished answering.	Contrib. of new syst.
5. The new system is not that difficult especially for those users who are using new technologies such as smart phones and tablets however it is not easy at the beginnings to use.	Adv. and Dis. of new syst.

Appendix C: Analysis of the Semi-Structured Interviews with the Students

Analysis of the Semi-Structured Interviews with the Student 1

S1	Codes derived from research Q'S

1. In my opinion yes, it can have a great impact on education level for students.	T'S and S'S percepts.
2. ICT has a lot of benefits for students and also for the teachers. For example, the teachers won't have to collect big number of paper to correct them in the tradition way. And for the students they can Get their results back as soon as they finish the exam, also they don't have to wait a certain amount of time.	Adv. of new syst.
3. The negative effects of ICT might be in leaving to read books and newspapers.	Dis. of new syst.
4. Yes, if this process is supported and worked for it. I will support to change from tradition type to online type.	T'S and S'S need.

Analysis of the Semi-Structured Interviews with the Student 2

S2	Codes derived from research Q'S
1. It is an affective system and it is a very good way in finding resource of information and in facilitates.	T'S and S'S percepts.
2. Saves time, students can get information from internet much quicker than any other resources like the public libraries.	Adv. of new syst.
3. Disadvantages are health issues, as well as being addicted on technologies.	Dis of new syst.
4. We cannot change the system straight away as many universities are not capable of using it at this moment. As they are only capable of using traditional way because they don't have much experience on computer.	Dis of new syst.

Analysis of the Semi-Structured Interviews with the Student 3

S3	Codes derived from research Q'S
1. Of course technologies are very affective on studies especially to facilitate in studying. For example: using E-Books easier to	T'S and S'S percepts.

read the required information from difficult sources.	
2. Advantages are getting information easier but depends on the way of using it, For example: there are people who are not using computer safety.	Adv. of new syst.
3. Disadvantage are it is wasting time if you are not using it in a good way , is better to use the same time on reading different books rather than wasting time.	Dis of new syst.
4. Because of the advantages and disadvantages mentioned above, it takes time to get along with it to change from traditional way to online exams maybe students aren't ready at this moment because of the electricity or another reasons.	Dis of new syst.

Analysis of the Semi-Structured Interviews with the Student 4

S4	Codes derived from research Q'S
1. Everything has its own advantages and disadvantages. ICT is a specific program and should be reviewed and checked between a group of people to decide on negativities and positives before we start using it.	Adv. and Dis. of new syst.
2. It saves time on checking questions, replacing questions, and it is accurate as you might not lose any marks. Also, facilitates on answering the questions very quickly.	Adv. of new syst.
3. The weak points of ICT , first is the slow internet connection or any issue in internet might cause losing the questions , then losing the marks or the students might need explanation on the questions which the lecturer might not be available at this moment.	Dis of new syst.
4. Yes, it is easy to use it through specific program.	Contrib. of new syst.

Analysis of the Semi-Structured Interviews with the Student 5

S5	Codes derived from research Q'S

1. Yes, in my opinion it has an important role on education system, but if we are talking about making exam system online, I don't think it is a good idea because for some reasons that cannot describe in one point.	T'S and S'S percepts.
2. Yes, it has many benefits, if we don't have that system, student will follow the previous students, but ICT is a helping system because whenever the student need support, they can reach people in their major field of study to ask for help, and also they can write articles and documents easier.	Adv. of new syst.
3. Yes, ICT takes a lot time from students that they cannot control their own major.	Dis of new syst.
4. In my opinion it is a difficult progress we didn't reach that point to change our traditional system exam for online system we have more necessary things to change like administration.	Dis of new syst.

Analysis of the Semi-Structured Interviews with the Student 6

S6	Codes derived from research Q'S
1. Actually it has two sides. Still it has not because a system to be followed in the ministry of higher education Yes, it has benefit for people a lot because of giving a lot of information and saving people time. But, it hasn't got a system so seems kind of slow so that neither the teachers can convey information in a good way nor the students can receive well. So that it cannot succeed here.	T'S and S'S percepts. / Dis of new syst.
2. As I said in the beginning in terms of time, it saves the student time and the students learn a lot in a limited time, also they can contact the teachers directly whenever they want. The teachers can send their questions and get the answers back	Adv. of new syst.

from the Students or group very soon.	
3. If it is overused, may it cause some physical problems in the body, like backache or sight problems.	Dis of new syst.
4. Yes, for sure. We can change it like all the developed countries and improve it to better. But, the problem is we have to reset the system from the beginning and train the teachers to learn how to teach in the new system and then training the students. The problem is all the teachers are used to the classical and the old way of teaching. If we bring a new system into the ministry of education and higher education, we have to give the teachers so many presentations and seminars because maybe there are some teachers in the position of professor but they don't have much knowledge about technology.	Dis of new syst.

Appendix D: Questionnaire

Hana Dler Ahmed
M.Sc in Computer and Instructional Technology in Teacher Education
07701251879
Hana.majeed90@yahoo.com

Dear Students,

The purpose of this questionnaire is to collect data about "Instructors and Students Perception on the use and effectiveness of the suggested Online Exam System: The Case of University of Sulaimani, School of Humanities".The purpose of research can be listed as follows:

- To reveal students 'perception regarding the teaching methods which are being used by instructors in online courses.

- To assess students' needs and their preferences regarding to teaching methods such as collaborative work, problem solving and discussion in online courses.

- To reveal students' perception on educational technology tools which are used in online courses.

- To suggest a new online model of teaching method/s to instructors in order to support them to plan, deliver and make necessary changes when needed in their courses.

- To determine the pros and cons of online learning from students' perception.

As a researcher, I would appreciate if you could fill in the questionnaire, which will only take 15 minutes. This is completely confidential and will not be used for any other purpose except this research.
I would kindly appreciate your invaluable contributions to my research.

Part A.
1.Institution: ……
2.Age: 18-22 ( ) 23-29 ( ) 30-37 ( ) 37-49 ( ) 50-59 ( ) 60+ ( )
3.Sex: Female ( ) Male ( )
5.Education Level :
1st Year ( ) 2nd Year ( ) 3rd Year ( ) 4th Year ( )
6.Department :
Public Relation( ) Television ( ) Journalism ( )
7. Do you consider yourself computer literate?
Yes ( ) No ( )

Part B.

Please answer the following question by selecting the appropriate level of agreement on the following statements. Strongly Agree = 5, Agree = 4, Neutral = 3, Disagree = 2, Strongly Disagree = 1,

Q.8	Students Perceived Usefulness of online examination system	Strongly agree	Agree	Neutral	Strongly Disagree	Disagree
1	Using OES gave me greater control over my exam.					
2	OES improved my academic Performance.					
3	OES is easier than traditional exams					
4	OES enhances the effectiveness of my teacher's activities.					
5	OES improved the quality of the examination for students.					
6	OES provides an attractive test examination for students					

7	I like using OES because I am computer Literate					
8	If OES were not mandatory, I would still like to use it					
9	OES is easier to do my course					

Part C.

Please answer the following question by selecting the appropriate level of agreement on the following statements. Strongly Agree = 5, Agree = 4, Neutral = 3, Disagree = 2, Strongly Disagree = 1

Q.9	**Perceived Ease of Use of Computer-Based Test**	**Strongly agree**	**Agree**	**Neutral**	**Strongly Disagree**	**Disagree**
1	I believe that it is easy to use the OES for my course					
2	Interaction with the computer is clear and understandable during OES.					
3	Testing with OES does not require a lot of mental effort					
4	I need an experienced person nearby when I use OES for my test					
5	Due to ease of use I prefer using OES for my exams in future.					
6	OES needs more technical skills of computer that I don't have.					
7	There is not enough time to use OES for Test.					
8	I do not have sufficient skills to use OES					
9	I prefer OES over traditional exams					

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Educational Sciences
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bengi.sonyel@emu.edu.tr

Consent form for Students

If you have any inquiries about any aspect of the questionnaire please don't hesitate to contact with me or my supervisor. If you are willing to participate into this research please fill in your name and surname in the given blank space and sign.

Name and Surname.....

Sign.....

Date.....

Appendix E: Semi-Structured Interview Questions for Teachers

Hana Dler Ahmed
M.Sc in Computer and Instructional
Technology in Teacher Education
07701251879
Hana.majeed90@yahoo.com

Semi-Structured Interviews with Teachers

Dear Teachers,

The purpose of this Semi-Structured Interviews is to collect data about "Instructors and Students Perception on the use and effectiveness of the suggested Online Exam System: The Case of University of Sulaimani, School of Humanities". This research aims to answer the following as listed:

- To reveal students 'perception regarding the teaching methods which are being used by instructors in online courses.
- To assess students' needs and their preferences regarding to teaching methods such as collaborative work, problem solving and discussion in online courses.
- To reveal students' perception on educational technology tools which are used in online courses.

- To suggest a new online model of teaching method/s to instructors in order to support them to plan, deliver and make necessary changes when needed in their courses.

- To determine the pros and cons of online learning from students' perception.

As a researcher, I would appreciate if you participate into this research. This is completely confidential and will not be used for any other purposes.
Thank you very much for your contributions.

❖ **Demographic features:**

1) Could you please introduce yourself?

❖ **Computer and Online skills:**

2) Do you consider yourself a computer literate?

3) Are you open to new technologies and applications or prefer traditional ways in teaching?

❖ **Evaluation of new online examination system:**

4) Do you find the program creditable and reliable for replacing traditional exam system?

5) What are some advantages of designed examination system?

6) Do you believe in the usefulness of online examination system for Kurdistan universities?

❖ **Limitation to use online examination system: the reasons you find the current system hard to use.**

7) Do you think using OES needs too much technical skills and therefore it is hard to keep up? Or you find the system simple enough?

8) What are the obstacles to the implementation and usage of OES application in Kurdistan?

Hana Dler Ahmed
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Educational Sciences
03926302390
bengi.sonyel@emu.edu.tr

Consent form Teachers

If you have any inquiries about any aspect of the interview please don't hesitate to contact with me or my supervisor. If you are willing to participate into this research please fill in your name and surname in the given blank space and sign.

Name and Surname.....

Sign.....

Date.....

Appendix F: Semi-Structured Interview Questions for Students

Hana Dler Ahmed
M.Sc in Computer and Instructional Technology in Teacher Education
07701251879
Hana.majeed90@yahoo.com

Semi-Structured Interviews with Students

Dear Students,

The purpose of this semi-structured Interview is to collect data about "Instructors and Students Perception on the use and effectiveness of the suggested Online Exam System: The Case of University of Sulaimani, School of Humanities".The research area can be listed as follows:

- To reveal students 'perception regarding the teaching methods which are being used by instructors in online courses.
- To assess students' needs and their preferences regarding to teaching methods such as collaborative work, problem solving and discussion in online courses.
- To reveal students' perception on educational technology tools which are used in online courses.
- To suggest a new online model of teaching method/s to instructors in order to support them to plan, deliver and make necessary changes when needed in their courses.
- To determine the pros and cons of online learning from students' perception.

As a researcher, I would appreciate if you participate into this research.This is completely confidential and will not be used for any other purposes.
Thank you very much for your contributions.

1) Do you think ICT is an effective tool in learning and teaching? Why/Why not?
2) What are the benefits of ICT for students?
3) What are the disadvantages of ICT for students?
4) Do you think through ICT traditional type of exams can be replaced with online exams? Why/Why not?

Hana Dler Ahmed
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Consent form for Students

If you have any inquiries about any aspect of the interview please don't hesitate to contact with me or my supervisor. If you are willing to participate into this research please fill in your name and surname in the given blank space and sign.

Name and Surname.....

Sign.....

Date.....

Appendix G: Permission Letter

KURDISTAN REGIONAL GOVERNMENT-IRAQ
Council Of Ministers
Ministry of Higher Education & Scientific Research
University of Sulaimani Presidency
Directorate of International Academic Relations

No: 1717
Date: 25/09/2016

زانکۆی سلێمانی
سەرۆکایەتی زانکۆی سلێمانی
بەڕێوەبەرایەتی پەیوەندییە ئەکادیمیە نێودەوڵەتییەکان

حکومەتی هەرێمی کوردستان – عیراق
سەرۆکایەتی ئەنجوومەنی وەزیران
وەزارەتی خوێندنی باڵا و توێژینەوەی زانستی

ژمارە:
بەرواری: / / زایینی
/ / کوردی

To: Eastern Mediterranean University

Subject: Confirmation Letter

This is to confirm that **Mrs. Hana Dler Ahmed** is a Master student at Eastern Mediterranean University in Turkey. We would like to inform you that she has fulfilled a questionnaire and interview entitled "Online Exam System in University of Sulaimani" that were distributed to the Lectures and students of Third and Fourth Grades of Media Department at University of Sulaimani.

Facilitating her request is highly appreciated.

Best regards,

Dr. Karzan Ghafur Khidhir
Director of International Academic Relations
University of Sulaimani

University of Sulaimani
Office
Directorate of Foreign Relations

Copy to:
- Record of outbound letters.