

**Comparison of Employer Perceptions of the Efficacy of Traditional Classroom versus Online Learning Modes of Graduate Program Delivery Related to Employee Productivity in Jordan**

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## **DEDICATION**

To

My parents whose encouragement, guided me and give me support throughout this  
doctoral study

My wife, without her support I would not have been able to complete this study.

My sons and daughters Ala, Mohammed, Ahmad, Sarah and Yara

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## **ABSTRACT**

The purpose of this quantitative study was to investigate the perception by employers of the performance level of employees as a function of the type of degree they hold. The study successfully compared the performance level of employees who earned their degrees from accredited online institutions with those employees who earned their degrees from conventional classroom institutions. The focus of the study was only on employees who hold a masters degree or a Ph.D. The population for the study was selected from three different organizations in Jordan, and the researcher used the simple random approach in selecting the population sample. The collected data came from a survey sent to the managers and another survey sent to the employees.

The collected data were analyzed by applying the analysis of variance (ANOVA) and the t-test to compare the performance levels of the online-educated participants with the performance levels of the traditionally educated participants.

The conclusion was that there is no statistically significant difference in the performance level between those who earned their degree from online institutions and those who earned their degrees from conventional classroom institutions. Specific recommendations related to the findings are discussed. The findings may be useful to organizational recruiters and to the employees themselves. This is an important finding because it helps to debunk the popularly held view among employers in Jordan that online programs are inferior to traditional classroom programs

## TABLE OF CONTENTS

<b>Dedication</b> .....	vi
<b>Acknowledgments</b> .....	vi
<b>Abstract</b> .....	vi
<b>Table of Contents</b> ....	vi
<b>List of Figures</b> .....	ix
<b>List of Tables</b> .....	x
<b>Chapter 1 – Introduction</b> .....	1
1.1.Problem Overview.....	1
1.2.Statement of the Problem .....	2
1.3.Purpose of the Study .....	3
1.4.Rationale.....	3
1.5.Significance of the Study .....	4
1.6.Hypothesis of the Study .....	4
1.7.Limitations of the Research.....	5
1.8.Research Questions .....	6
1.9.Definitions of Terms .....	6
1.10 Research Outline.....	7
<b>Chapter 2 – Literature Review</b> .....	8
2.1. Introduction.....	8

2.2. The Online environment.....	8
2.3. Growth of Online Education.....	10
2.4. Online Education.....	11
2.5. Online Education versus Classroom Education.....	13
2.6. Why Move to Online Education?.....	17
2.7. Characteristics of Online Education.....	18
2.8. Employee Effectiveness Measure.....	19
<b>Chapter 3 – Research Methodology .....</b>	<b>24</b>
3.1. Methodology.....	24
3.2. Research Design.....	25
3.3. Quantitative Method.....	25
3.4. Sample.....	26
3.5. Sample Population Contact.....	27
3.6. Data Collection.....	27
3.7. Instrument Test.....	28
3.8. Tools for Data Analysis.....	32
3.8.1. Analysis of Variance (ANOVA).....	32
3.8.2. F-Test.....	33
3.9. Summary.....	33
<b>Chapter 4 – Data Analysis.....</b>	<b>35</b>
4.1. Demographics.....	36
4.1.1. Employees’ Data.....	36
4.1.2. Managers’ Data.....	40

4.2. Data Descriptive Statistics.....	44
4.2.1. Descriptive Statistics for Employees’ Data.....	44
4.2.2. Descriptive Statistics for Managers’ Data.....	55
4.3. Data Statistical Analysis.....	66
4.3.1. Statistical Analysis of Employees’ Data.....	66
4.3.2. Instrument Reliability Analysis for Employees’ Data.....	77
4.3.3. Statistical Analysis of Managers’ Data.....	81
4.3.5. Managers’ Instrument Reliability Analysis.....	89
4.4. Summary.....	93
<b>Chapter 5 – Discussion and Recommendations.....</b>	<b>94</b>
5.1. Discussion.....	94
5.2. Recommendations.....	95
5.3. Future Study.....	96
5.4. Summary.....	96
<b>References .....</b>	<b>98</b>
<b>Appendix A – Survey Instrument.....</b>	<b>106</b>
<b>Appendix B – Survey Instrument.....</b>	<b>112</b>



## LIST OF FIGURES

Figure 4.1: Demographics of the Participants (Employees' Data).....	38
Figure 4.2: Demographics of the Participants (Employees' Data).....	39
Figure 4.3: Demographics of the Participants (Managers' Data).....	42
Figure 4.4: Demographics of the Participants (Managers' Data).....	43
Figure 4.5: The Average Performance Level before Online (Employees' Data) .....	51
Figure 4.6: The Average Performance Level after Online (Employees' Data).....	52
Figure 4.7: The Average Performance Level before Classroom (Employees' Data).....	53
Figure 4.8: The Average Performance Level after Classroom (Employees' Data).....	54
Figure 4.9: The Average Performance Level before Online (Managers' Data) .....	62
Figure 4.10: The Average Performance Level after Online (Managers' Data).....	63
Figure 4.11: The Average Performance Level before Classroom (Managers' Data).....	64
Figure 4.12: The Average Performance Level after Classroom (Managers' Data).....	65

## LIST OF TABLES

Table 2.1:	Employee Effectiveness (Source SBA 2005).....	22
Table 3.1:	ANOVA Single Factor before the Degree .....	29
Table 3.2:	SPSS Using ALPHA Analysis .....	30
Table 3.3:	ANOVA Single Factor after the Degree .....	31
Table 3.4:	SPSS Using ALPHA Analysis .....	32
Table 4.1:	Demographics of the Participants (Employees' Data) .....	36
Table 4.2:	Demographics of the Participants (Employees' Data) .....	36
Table 4.3:	Demographics of the Participants (Employees' Data) .....	37
Table 4.4:	Demographics of the Participants (Employees' Data) .....	37
Table 4.5:	Demographics of the Participants (Employees' Data) .....	37
Table 4.6:	Demographics of the Participants (Employees' Data) .....	38
Table 4.7:	Demographics of the Participants (Managers' Data) .....	40
Table 4.8:	Demographics of the Participants (Managers' Data) .....	41
Table 4.9:	Demographics of the Participants (Managers' Data) .....	41
Table 4.10:	Demographics of the Participants (Managers' Data) .....	41
Table 4.11:	Demographics of the Participants (Managers' Data) .....	42
Table 4.12:	Demographics of the Participants (Managers' Data) .....	42
Table 4.13:	Descriptive Statistics of Online Participants (Employees' Data) .....	45

Table 4.14: Descriptive Statistics of Classroom Participants (Employees' Data) .....	46
Table 4.15: Descriptive Statistics of Online Participants (Employees' Data).....	47
Table 4.16: Descriptive Statistics of Classroom Participants (Employees' Data) .....	48
Table 4.17: Descriptive Statistics of Online Participants (Employees' Data).....	49
Table 4.18: Descriptive Statistics of Classroom Participants (Employees' Data) .....	50
Table 4.19: Descriptive Statistics of Online Participants (Managers' Data) .....	56
Table 4.20: Descriptive Statistics of Classroom Participants (Managers' Data) .....	57
Table 4.21: Descriptive Statistics of Online Participants (Managers' Data).....	58
Table 4.22: Descriptive Statistics of Classroom Participants (Managers' Data) .....	59
Table 4.23: Descriptive Statistics of Online Participants (Managers' Data).....	60
Table 4.24: Descriptive Statistics of Classroom Participants (Managers' Data) .....	61
Table 4.25: ANOVA Single Factor for all Participants (Employees' Data).....	67
Table 4.26: ANOVA Single Factor before Online and Classroom (Employees' Data)..	69
Table 4.27: ANOVA Single Factor after Online and Classroom (Employees' Data)....	70
Table 4.28: ANOVA Single Factor before and after Online (Employees' Data) .....	72
Table 4.29: ANOVA Single Factor before and after Classroom (Employees' Data) .....	73
Table 4.30: T-test Analysis Comparing the Participants before Education (Employees' Data).....	75
Table 4.31: T-test Analysis Comparing the Participants after Education (Employees' Data).....	77

Table 4.32: Reliability Analysis for Online Participants (Employees' Data) .....	78
Table 4.33: Reliability Analysis for Classroom Participants (Employees' Data) .....	79
Table 4.34: Reliability Analysis for Online and Classroom Participants (Employees' Data).....	80
Table 4.35: ANOVA Single Factor for all Participants (Managers' Data) .....	82
Table 4.36: ANOVA Single Factor before Online and Classroom (Managers' Data)....	83
Table 4.37: ANOVA Single Factor after Online and Classroom (Managers' Data).....	84
Table 4.38: ANOVA Single Factor before and after Online (Managers' Data) .....	85
Table 4.39: ANOVA Single Factor before and after Classroom (Managers' Data) .....	86
Table 4.40: T-test Analysis Comparing the Participants before Education (Managers' Data).....	87
Table 4.41: T-test Analysis Comparing the Participants after Education (Managers' Data).....	89
Table 4.42: Reliability Analysis for Online Participants (Managers' Data) .....	90
Table 4.43: Reliability Analysis for Classroom Participants (Managers' Data) .....	91
Table 4.44: Reliability Analysis for Online and Classroom Participants (Managers' Data).....	92

## CHAPTER 1 – INTRODUCTION

### 1.1 Problem Overview

Because of the tremendous growth of the World Wide Web and the high speed of the Internet, the demand for computers and communications networks is also increasing. According to (<http://www.isc.org/index.pl>) the number of Internet domains increased from 2.2 million in 1994 to 600 million in July 2007. At the same time the demand and the opportunities for online education have increased greatly. A study carried out by the National Center for Education Statistics (NCES) found that 72% of the classroom education institutions are increased from 1994-1998, and the same study found that 20% of these institutions were planning to start online education. Other studies done on online education have found no difference in employee effectiveness between employees who got their degrees online and those who attended a traditional university (Steve Rouses, 2006; Neuhasar, 2002). Other studies, however, did not find that online education is at the same level as traditional education (Vogt, 2006 ). One study found that students who attend online institutions will have higher grades than those who attend traditional classroom institutions (Palanisamy, 2007).

There are many factors that may affect people in Jordan in pursuing their education online. One of them is that the Internet is now available anywhere in Jordan. Furthermore, a student can choose an institution from a large number of accredited institutions, especially those in the United States. One reason that makes online education preferable is that employees may not want to leave their job but at the same time they want a degree. With online education they can do the two things in parallel. A further factor affecting the shift to online education is that there is little difference in quality

between traditional education and online education (Noble, 1998)., Another factor that affected the shift from traditional online is that online education allows the student to maintain up-to-date skills (Vogt, 2001).

The rationale for participating in an online education program can vary from learner to learner. For some students, the appeal of online education may be the ability to accomplish an individual educational goal or challenge. For others, a chance to discover classes and course material that may not be available in a particular geographical area can make an online education an attractive opportunity. For example, a student might desire to undertake course material at specific important institutions, such as Harvard, Penn State, or Cornell (Shea, 2001). The question arises, however, of whether a student, after finishing his study, will have the chance to get as good a job as those who earned their degrees in a traditional way. A survey done by (Adams & Lefeur, 2006) found that 72% of hiring professionals would prefer to hire a candidate with a traditional degree versus a candidate with online degree

## **1.2 Statement of the Problem**

The problem is that, globally, organizations prefer to hire employees who received their degrees from traditional classroom institutions, and that greatly affects organizations in Jordan. Several hiring authorities in the industry area believe strongly that there are differences between online and conventional degrees (VOGT, 2001)

The perception in Jordan is that employees who received their degrees through conventional classroom education are more effective than the employees who received their degrees through online education, so when choosing employees, recruiters in most

organizations in Jordan will preferentially hire those who earned their degrees in the traditional classroom setting. This is very normal in Jordan because online degree holders are very new in the country and the recruiters have very limited knowledge about online education, even though, as the research discussed in the literature review found, the online-educated participants in some studies actually perform better than those educated in the traditional classroom setting.

To some hiring professionals the term “online education” conjures up images of spam e-mail messages offering Ph.D.’s for little more than a flat fee and the applicant’s life experience (Carnevale, 2007). Thus there is a huge gap in understanding the effectiveness of online education versus that of conventional education.

### **1.3 Purpose of the Study**

The purpose of this study is to explore and assess the performance level of employees in Jordan universities and organizations who earned their degrees from accredited online colleges compared to those who earned their degrees from traditional classroom colleges. This quantitative study will examine only those employees who finished advanced degrees, either a master’s degree or a Ph.D., in online and traditional settings, because Jordanian universities and organizations are increasingly hiring employees at different levels who have earned advanced degrees. The organizations in Jordan need to be aware of distance education and its effectiveness, and so this study is intended to determine the difference—if there is a difference—between the two types of education .

#### **1.4 Rationale**

The most commonly cited reason for individuals pursuing online education is for the development and improvement of their professional skill (Saba, 2001), since most organizations in Jordan ask for the types of degree that applicants have. However, a study done by Gray (2001) on the perception of online education discovered that the majority of employers never considered hiring employees with online education.

#### **1.5 Significance of the Study**

If no significant difference is found in performance between holders of the two types of degrees, the study will help organizations in Jordan recognize the effectiveness of online education as compared to the traditional classroom education. By measuring and analyzing the performance levels of employees within Jordanian organizations, this study will help recruiters and also help employees focus their efforts when choosing and pursuing their education. The findings of this research will help recruiters make better decision when hiring and will also help students better choose the institutions where they want to pursue their education and better choose the way they want to do it.

#### **1.6 Hypothesis of the Study**

In this research we have a null hypothesis ( $H_0$ ) and an alternative hypothesis ( $H_a$ ), both of which were designed to discover the difference between the performance levels of the employees who earned their master's degrees or Ph.D.'s from online institutions or from traditional classrooms institutions.



Ho: There is no difference between the performance level of the Jordan Organizations' Employees who have earned their master's degrees or Ph.D.'s from online institutions and those who have earned their master's degrees or Ph.D.'s from traditional classroom institutions.

Ha: There is a difference between the performance level of the Jordan Organizations' Employees who have earned their master's degrees or Ph.D.'s from online institutions and those who have earned their master's degrees or Ph.D.'s from traditional classroom institutions.

### **1.7 Limitations of the Research**

Since the researcher measures the participant's perception of the employee's performance level, he assumed a very high degree of honesty and objectivity when collecting the data. The data are coming from managers from three different organizations in Jordan who have experience with both employees educated in both settings, online and classroom; therefore this study will be limited to these three organizations and will not be generalized to other organizations in Jordan or worldwide. There was one study found dealing with the productivity of the participants within a high-tech organization, and the researchers who performed that study limited their findings to the organization that the study was performed in .

The findings of this research may not reflect the attitudes of the larger group of employees in Jordan organizations, as the study sampled only those employees who received master's or doctorate degrees.

## **1.8 Research Questions**

The research is intended to explore the performance levels that employees have in relation to the type of education they obtained, so the basic research question is as follows:

Does the performance level of an employee rely on the type of education he earned?

## **1.9 Definitions of Terms**

- Performance level: It is the measure of output of any production practice, or it is the accomplishment of an individual over a limited time of work.
- Online Education: It is a course where most or all of the content is delivered through the Internet. Typically these courses have no face-to-face meeting (Allen and Seman, 2005).
- Assessment: It is the measurement of progress toward a learning goal (Simonson et al., 2003).
- Classroom education: It is the learning where the teacher lectures and the student listens and writes observations; communication between the lecturer and the student has been viewed as an vital factor within this arrangement (O'Mally & McCraw, 1999).
- Online learner: A person who took more than 75% of his education by online environment.
- Classroom learner: A learner who attends a physical classroom environment, and may take less than 25% of his whole process of education.

- Technology: It is the method of using tools and equipment to do jobs professionally.

### **1.10 Research Outline**

The following is a brief description of remainder of this dissertation: Chapter 2 will offer a review of the literature pertaining to online education and traditional classroom education as well as to the evaluation of the performance level of an employee. Chapter 3 describes the methodology that the survey employed to collect and analyze the data. Chapter 4 presents the survey and data analysis. Chapter 5 offers the conclusion and recommendations for future study.

## **CHAPTER 2 – LITERATURE REVIEW**

### **2.1 Introduction**

It is essential to review sources that discuss online education in their studies. The goal of this literature review is to compare the present and the historical studies that measured employee performance levels as a function of the type of education received. By searching the literature, the researcher found that there are very few studies dealing with the performance level of employees versus the type of education received. On the other hand, the researcher found many studies that compared the two types of education, online and traditional classroom, and that considered the skills obtained from an online education, the growth of online education, and, in some cases, the general perception of online education compared with conventional classroom education. The literature review also includes studies concerning the measurement of employee performance levels. The findings of the literature review were used in the design and development of the instrument that the researcher used to gather the information from the employees and the managers in Jordan.

### **2.2 The Online environment**

Husmann and Miller (2001) said that there are a lot of discussions about the quality of online education. These researchers added that many people are distrustful of online education, because the courses are mainly taught by add-on instructors and are offered by not accredited institutions. Therefore, it is often found that online learning and online programs are outside of official faculty formation and review for instructional quality (Gaud, 1999). Different opponents of online education have even suggested that

online courses should be highly criticized because they lower the importance of academic values (Buck, 2001). Brown and Green (2003) have recommended that online education provides a “cash cow” to some universities. These organizations see online learning as a means to distribute lessons to a large number of paying customers without the overhead expenses of providing the physical space for the classes. Although, proponents of online education state that offering online programs and courses may help schools increase their curricula offerings and expand graduates’ technology skills and marketability, the online educations may also develop the students’ problem solving skills (Donlevy, 2003). Rosie (2000) stated that online education can encourage students’ significant thinking skills, deep learning and mutual learning.

Sunal et al. (2003) suggested that only a handful of research studies on best practices in asynchronous or synchronous online teaching exist, and many research based best practice studies had flaws in their research design. For example, Muirhead (2000) examined some of the online courses offered in his academic organization of employment. From this he inferred there are several areas that must be revised when a course is committed to an online environment in higher education. Primarily, Muirhead supported a prerequisite of emotional support and instructional support for the student. Muirhead also suggested that faculty should not only author their own online courses, but they should maintain a full course load when teaching online classes. Finally, he stated that ongoing technological support must be available to students in order to support best practices in online teaching.

Collaboration is one important factor that affects the online environment.

The Western Interstate Commission for Higher Education (WICHE, 2001) suggested that one of the greatest practices an organization must provide to its staff is suitable support and training required to instruct in an online environment. If faculty can agree that online course development requires training, and if they are ready to confess that the development process can be a compound effort, then it may be reasonable to judge that a high quality online course can be produced throughout a mutual effort (Caplan, 2004).

### **2.3 Growth of Online Education**

Recently online education, together with virtual schools and universities, has experienced a huge growth in higher education and has become the 21<sup>st</sup> century version of mail-based correspondence courses (Paige, 2004). The history of distance education can be tracked back to 1700s in the form of correspondence courses, but technology-based education can be linked to the introduction of film-based devices in the early 1900s. The first catalog of instruction films appeared in 1910 (Reiser, 1987), and in 1913 Thomas Edison proclaimed that, due to the invention of film, "Our school system will be completely changed in the next ten years" (Saettler, 1968, p. 68). Online education proceeded to improve, and now it offers a different kind of communication between the instructor and the student, via e-mails, chat rooms, and video conferences, and it can provide video courses together with the text. The development of a reliable and more affordable long-distance telephone system allowed for the use of audio and videoconferencing, making it possible for the student and the teacher to interact in real

time. Videoconferencing is a synchronous technology which is moderately expensive. It can consist of a single teacher delivering a lecture to one or more students on different sites (Thournton, 2005).

## **2.4 Online Education**

Online education is well known as an educational effort where the instructor and the student can be separated by large geographical area (Long & Javidi, 2001). When online learning takes place, the student and the teacher are physically separated from each other (Sach & Stair, 2004). Online education is in growing demand from people who want to continue their education without leaving their jobs. Online learners are likely to be older than 23 years old and not entering college immediately after high school (Bull, 2005). Online education has grown quickly over the last decade, with over 500,000 U.S. students earning their degrees online (Symonds, 2003), and online education is growing at a rate of more than 30% per year. Internet technology and communications plays an important role in attracting student to pursue their online education. For example, the University of Phoenix has approximately 150,000 enrolled in accredited courses online (Rudestam & Schoenholz, 2002). There are several online education tools that make studying more feasible, for instance, the blackboard, which is a virtual learning environment that supports online learning and teaching and can be accessed by registered users from anywhere in the world using the Internet. Another software that helps in online education is the Elluminate, which provides live online learning. This software can be used to conduct online courses, meeting, and seminars, and the learner can use Elluminate for virtual office hours using a whiteboard chat and voice. The learner has

many tools to communicate with the instructor and with fellow learners, including e-mails, chat rooms, and message boards. Institutions may also employ audio or video multimedia or any dedicated software programs to improve learning and interactivity (St. Pierre, 2005). Online education can be conducted in two ways. Synchronous online means that the students and the instructor will communicate live during class, or the communication between the instructor and the user can be done on their free time. Most online classes are asynchronous, which allows students time for reflection and research and to compose their messages with more thought (SWOL, 2005). It is not like traditional classes where a problem is discussed for a limited time. The online learner can send messages through blogs in which thousands of students and instructors can interact and take the questions and discuss them in details. Therefore the online interaction of the participants produces a high-quality dialogue in which every student can benefit. As the number of online schools has continued to grow, traditional schools have also use some online educations. The traditional school in Jordan, for example, uses online exams, and approximately 65% of Jordan universities use online education in different disciplines, for example, medicine, English, and computer science.

Companies and professional organizations have recognized the benefit of online education for their employees and members, and many organizations have made online education eligible for reimbursement programs and, in some cases, have partnered with specific online schools to offer course work at a discount rate (Carnevale, 2007). The acceptance of online education by the business community is a product of a continuous development of the online education atmosphere as well as the added expediency and flexibility that it offers to employees looking to improve their skills and knowledge



(Carnevale, 2007). Thus this process of online learning has multiple benefits for the organization and the employees. The organization will benefit from the expertise that the employee will get from his new education without interrupting his work, and the employee will also benefit in improving his career and getting a new degree.

A set of frequent themes gained from a review of the literature of online education are specific online teaching practices which are as follows: (a) flexibility: the ability of a faculty member to accept change and allow students to play a more significant role in their own learning and use the technology to teach in an online environment and deal with unexpected changes that regularly occur in an online environment; (b) feedback: clearly defined answer time parameters set by faculty members and informational and acknowledgement responses that are positive, flexible, reflective and supportive; and (c) assessment: the types of tools, rubrics, formative and collective guides that faculty utilize to grade or assess student learning in an online environment.

## **2.5 Online Education versus Classroom Education**

As we discussed in the previous section, online education plays a very important role in the education process, and some schools are using a mixed approach combining online and traditional classroom education. For instance, the University of Phoenix lets the students meet at the beginning of a class to discuss their educational process, and they will be given access to the library. Some universities have joined their libraries together in such a way that their students can search and explore all the consortium libraries. There has been a rapid development in network communications and the software tools—for example, there are now more than 200 companies producing and selling online tools

for online education—and these products are making it easier to access online sites and, in the end, helping with online education as a whole. In using these online tools, the role of the students changed from just listening to sharing their ideas, making the student a more active participant. Some studies found that students educated online can be at the same level as those educated in the traditional classroom (Dodd, 2001; Tucker 2001), and other found no significant difference between an employee with a degree from an online institution and an employee with a degree from a traditional classroom institution (Rousses, 2006). A study done in different areas, including North America, the Middle East, Latin America, Europe, and Africa, compared the two types of education and found that classroom education is still seen by the participants to be the better education (Jones, 2004). Dr. Thomas Russell from the University of North Carolina studied more than 355 reports on online education and traditional education, and, after studying these reports and studies, Dr. Thomas discovered that there is no significant different between online and the traditional education. One important study done by Tucker (2001) explored the difference between the two types of education, the online and the traditional education, Tucker employed for his study two classes on business communication at the University of North Carolina. Both classes had the same environment, shared the same material, did the same tests, and shared the same teacher. The only difference was that one of the classes was taught online, and the other one was taught the traditional way. The students in the classes were chosen in a way that both of the classes had the same level of students. The result was that the T- test failed to find any significant difference between the class that was taught online and the class that been taught the traditional way except that the online students graded higher in the exam than the traditional students. Another

study was done by (Palanisamy, 2007 ) in two Malaysians smart schools. The smart schools are a division of the Malaysian information technology plan that exposes the students and teacher to IT in every aspect of the education, with the goal of changing the educational process from conventional classroom education to electronic education. A comparative study had been done on two Malaysian smart schools. The study looked at the learning of mathematics through online learning and the traditional classroom learning. The study took into account form 1 and form 2, where form1 students were dealing with area and perimeter, and form 2 students were dealing with ratios of two quantities, ratios of three quantitative properties, and linear equations. The main purpose was to find the mean accomplishment of the two types of form students, those who were expose to online education and those who exposed to the traditional classroom education; they chose the students to be of similar background, in which they took into account the parents' education level and the facilities provided in the houses for the children. Then they divided the students into two groups, with the first group being the online students and the second group the classroom students. The students were exposed to pre- and post-testing, with the purpose of the pre-test being to identify the previous knowledge of the students in the two forms of education, and the result was that the means of the two form students was almost the same. The second part of the study was to check the mean of the students in the online and the conventional classrooms for the post-test, and the result was that there was a significant difference between the online students and the conventional students, where the achievement of the online students was somewhat better than the conventional classroom students.

The success of online education depends on the institutions and the faculty members that perform the education. The faculty members together with the staff must have experience in the technology and the method of online education (Allen, 2003). A study found that the traditional instructors were not able to embrace online education because they wanted to use their traditional skills to teach online students (NDAHI, 1999). Online programs can offer more subjects than do the local university, as the online learner can enter programs in another state or another country, and he can choose his preferred subjects from a wide range of different subject offered by online education. He can choose from nursing, business, web design, and a lot more, and he can pursue his education as far as the level of Ph.D. (SWOL, 2005). Furthermore, online education is much better for those who feel shy in a classroom and cannot make comments or ask questions (SWOL, 2005). Communicating with the instructor is very simple if the student uses e-mail for this purpose, and because of classroom limitations both students and instructors found it is suitable to communicate through e-mail. Since sometime some of the students do not have a chance to talk to the instructor during class time, online education can actually make it easier to communicate (SWOL, 2005). There are other benefits of online education as well. If, for instance, a person has a job and takes care of a home, it may not be easy to find time to go to class as well, but with online education the student can use the website instead of attending the classes. A second benefit is the flexibility of online education in the sense that the working student can do his work during his free time, which allows much more flexibility than the classroom where the student must attend the classes (Jhosta, 2006). Many experts in the field of education said that the online education can be compared to the traditional classroom education, and

online students feel that, not only does online education have a similar environment for the education, but every student has to say something during the discussion and also every student can choose the suitable online tool for him (Jhosta, 2006). Online education does not require physical attendance, the students are far away from each other, and the instructor is not visible, so therefore the full responsibility to complete a successful program is on the individual student (Mirkin, 2006). The convenience of the online education should not be taken advantage of; it should have the same concentration as the traditional classroom programs (Mirkin, 2006). But some online learners misinterpret the facilities and online flexibility as implying that the online course demands less academic rigor than the traditional education (Mikies & Sneil, 1999). However, when a student enrolls in online education, he finds out very quickly that online education need the same effort or even more than the traditional education (Carnvale, 2007).

## **2.6 Why Move to Online Education?**

In the past, teaching and learning were restricted to the classroom, with classroom strategies like lectures, discussions, and field trips composing the education process (DEAL III, 2002). The increasing demand for education and the restricted funding to build more physical classrooms made the decision makers in many universities look for an alternative way of teaching (Karber, 2003). Communication and the development of technology also helped in shifting from traditional education to online education (DEAL III, 2002). The discovery of the World Wide Web “opened doors to the class-room to the world around us” (DEAL III, 2002, p.21). The online programs becomes a smart solution, in part because they allow people to earn their degrees while working full time (Karber,

2003). There are four reasons for the movement from traditional education to online education (Karber, 2003). First the students who have a job can pursue their studies without leaving their jobs. Second, online education is comfortable for those who live in busy cities and find it very difficult to attend the classes. Third, because the geographical area is not a problem in online education, students can choose their programs from different universities all over the world. Fourth, students can communicate with many different students through the Web and can get their ideas about various topics (Sing, 2008).

## **2.7 Characteristics of Online Education**

One of the important characteristics of online education is the communication between the students and the instructor, which is done through e-mail, or blackboards, or any other electronic tools, such as posting student work on the Web or audio- or video-conferencing .There is no face-to-face communication between students and instructor (Karber, 2003). Online courses can be taken from home, work, or any other place in the world; all that is needed is a computer and an Internet provider (Roussas, 2006). Online software tools allow students to read a lesson again and again until it is understood, and a student can also share the questions and answers with fellow students and the instructor (Sing, 2008).

## 2.8 Employee Effectiveness Measure

In measuring the effectiveness of employees, Hank (2005) defined four measurements:

- Job Knowledge: for example, the level of capability and the level of management
- Productivity: for example, how long it takes the employee to finish his job
- Quality: for example, the number of defects
- Customer service: for example, customer satisfaction.

These measurements will be taken into account in the research survey. Another study found that measuring the productivity of the employee can be done by, for example, computing the number of reports the employee filed or how many lines of functioning code he wrote. Another way to measure employee productivity is to compute it as a team work (Datta, 2006). An additional method to compute the employee productivity is to measuring how many units a worker has made or the number of worker hours necessary to produce a unit of the output (Handelsman, 2005). A survey done by Cux (1999) they found that 42% think that online education improves employee performance and productivity. Thomas and Baraon (1994) evaluated the performance level of employees based on economic productivity, such as input versus output. Another method for evaluating the performance level of employees is measuring the time that the employee needs to produce a known level of production (Handelsman, 2005).

Table 2.1 shows an instrument developed by the Small Business Administration (2005) to measure the performance level of the employees. This Small Business Administration instrument was used as the basis of the instrument designed and developed by the researcher for this study.



1. Usually is resourceful in finding ways to overcome obstacles in doing his or her job	0	1	2	3	4	5
2. will probably received at least one promotion at this organization	0	1	2	3	4	5
3. Usually produces excellent results	0	1	2	3	4	5
4. Tries harder more than other employees	0	1	2	3	4	5
5. did his or her job in at least an above average manner	0	1	2	3	4	5
6. is probably capable of developing innovative, services and or products	0	1	2	3	4	5
7. often discovered ways to the existing task effectively than they were being done before	0	1	2	3	4	5
8. is willing to take an extra job	0	1	2	3	4	5
9. takes less than the average amount of time /effort to the do the job/task	0	1	2	3	4	5
10. will probably stay in the organization for two or more years	0	1	2	3	4	5
11. Usually contributes well in tasks requiring teamwork	0	1	2	3	4	5

12. has and uses good interpersonal skills	0	1	2	3	4	5
13. usually does things right from the first time	0	1	2	3	4	5
14. Has the capability to grow and keep up with added responsibilities.	0	1	2	3	4	5
15. Would be difficult to replace with someone else who could do his or her job equally well.	0	1	2	3	4	5
16. Has a high level of commitment to the organization.	0	1	2	3	4	5
17. Is so efficient that his or her absence would result in significantly lower the productivity in the organization	0	1	2	3	4	5
18. Could probably find a higher –level job in another organization.	0	1	2	3	4	5
19. Usually do things in time.	0	1	2	3	4	5
20. Fits in well with the culture of the organization.	0	1	2	3	4	5

Table 2.1 Employee effectiveness (Source, Small Business Administration 2005)

Where 0 indicates Strongly Disagree 1 indicates Disagree, 2 indicates Disagree somewhat, 3 Indicates Agree somewhat, 4 indicates Agree, 5 indicates Strongly Agree .

Addressing the e-learning and the productivity (CUX, 1999) Corporate University Exchange, did a survey of 120 executives at companies with mutual universities, and they found out that 42% think that e-learning encourage the performance and the productivity. (FPM 1999) the foundation for performance measurements develop a guide to performance measurements as follows

- Competitiveness: relative market share and position, sales growth
- Financial Performance : profitability, liquidity , market relations , etc
- Quality of service : Reliability , Responsiveness , Appearance , Cleanliness , etc
- Flexibility :Volume flexibility , Specification and speed of delivery flexibility
- Resource Utilization: productivity, efficiency, etc.
- Innovation: Performance of innovation process and the performance of individual performance.

## **CHAPTER 3 –RESEARCH METHODOLOGY**

The intention of this study is to evaluate the performance level of employees who earned a master's or a Ph.D. degree from an accredited online institution and compare it with employees who earned their degrees from accredited traditional classroom institutions. The view in Jordan is that employees who earned their degrees from accredited traditional institutions are more productive than those who earned their degrees from online institutions. The research is intended to explore and test this perception by surveying a number of master's and Ph.D. degree holders in Jordan's organizations and also surveying managers about their employees. Working from instruments developed by Roussas (2006), the Small Business Administration (2005), and by Hank (2005), the researcher developed a new survey instrument specifically for this project.

### **3.1 Methodology**

There is a limited amount of research exploring the relationship between the performance levels of employees who earned their degree from online institutions and employees who earned their degree from traditional classroom institutions. Research survey questions were used to discover employee performance levels in three Jordanian organizations, the Jordan Universities, the Jordanian army, and the greater Amman municipality.

### **3.2 Research Design**

This is quantitative research used to explore and determine the performance level of employees who have a master's degree or a Ph.D. degree earned from accredited online institutions or traditional classroom institutions and who are working on different Jordan organizations. According to Fierro (1997), the reason for using the quantitative method is that the conclusions resulting from such research are considered to be more consistent and applicable. Objectivity will be the main design of the research, so the research finding can be useful to other institutions (Fierro, 1997). Since the survey is designed to measure the performance level of employees, it was imperative that the participants be able to answer the questions with the highest level of honesty. A survey was developed with answers on a scale from 1 to 10 where 1 is the worst and 10 is the best; questions were asked about employee performance both before the degree was earned and after the degree was earned. A comment column was provided to allow the participants to make comments if they wished. Certain demographic information, including age, sex, type of education, and years of experience, was also gathered.

### **3.3 Quantitative Method**

Any research can be done in three ways: quantitative, qualitative, or a combination of both ways. In this research the researcher used the quantitative method to determine the statistical significance of the performance of online-educated employees in comparison to those educated in the classroom. The quantitative method is an iterative way in which hypotheses are refined; evidence is evaluated using statistical ways. Quantitative research usually consists of the following (Williams, 2001):

- Generating hypotheses
- Developing the instruments, in this case, the survey questions
- Collection of data
- Modeling and analysis of data
- Evaluation the result

### **3.4 Sample**

The population for the research study came from three different organizations in Jordan. The first group was from the Jordan Universities. The second group came from the Jordanian armed forces, and the third group was from the greater Amman municipality. These three groups were chosen because they provided a sample of employees who earned master's and Ph.D. degrees in both ways, online and in the classroom. The initial way to contact these groups was by e-mail. A simple random sample was used, so that each employee in the three groups had the same opportunity of being selected for the sample. One hundred fifty individuals were chosen from those who had earned their degree from online institutions, and another hundred fifty were chosen who had earned their degree from a classroom institution. The researcher limited the selection of those employees who were part of the study population to those employees who had finished their degrees and been at the job for at least six months. One hundred managers were also selected to be part of the survey to give their attitudes about their employees who finished their master's and Ph.D. degrees in both ways. The researcher also limited the participants to those who were on the job for at least six months after finishing the degree.

### **3.5 Sample Population Contact**

After the researcher had the IRB (Institutional Review Board) form approved by the Office of Human Research, on May 23, 2008, an e-mail was sent to all the participants asking them for their participation through answering the survey questions and sending the survey it back to the researcher via e-mail.

Participants were informed that the study would be used in the dissertation study of a student, and an Arabic version of the survey questions was provided to all participants. Participants were also informed that the data from this study might be shared or published but that there would be no names provided on the forms.

### **3.6 Data Collection**

An e-mail message was sent to three hundred of the survey population briefly explaining the research and asking for their participation in a short survey. The e-mail emphasized that their participation was completely voluntary and that their responses would remain unidentified. The e-mail thanked the participants for their help. The collection period for collecting the information was three weeks for the employees and another three weeks for the managers. This survey was possible due to the help the researcher had from six friends in Jordan who put a lot of effort into assisting him. Excel was used to administer the findings as well as SPSS software, which is a general statistical package for data management and analysis.

### 3.7 Instrument Test

A copy of the survey questions were sent to five participants who hold a Ph.D. degree, and another copy was sent to five participants who hold a master's degree. The researcher deleted the introduction and the demographic part, and all the ten participants were asked to write in the comment part what they thought was the reason of the study and were asked to delete any questions that they thought were inappropriate. The researcher received e-mails back from the ten participants, and the result was that they all thought that the reason for the study was to explore and evaluate employee performance levels before and after a degree was obtained. None of the ten participants found a question to be inappropriate. All of the ten participants found that their performance level was improved after they obtained their degrees.

Analysis of variance (ANOVA), which is used to test hypotheses and check the differences of the hypotheses by using two or more means, was used to check the differences between the following hypotheses related to the question of doing things with responsibility.

$H_0: \mu_1 = \mu_2$ , the null hypothesis, where

$\mu_1$  is the average productivity of the five participants in relationship to the question of doing things with responsibility before they obtained their Ph.D. degree.

$\mu_2$  is the average productivity of the five participants in relationship to the question of doing things with responsibility before they obtained their master's degree.

$H_a: \mu_1 \neq \mu_2$ , the alternative hypothesis.



The result is illustrated in the following table, which was done in Excel using ANOVA one.

ANOVA: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
group1	5	36	7.2	1.7
group2	5	29	5.8	0.7

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	4.9	1	4.9	4.083333	0.077971	5.317655
Within Groups	9.6	8	1.2			
Total	14.5	9				

*Table 3.1 ANOVA single factor before they earned the degree*

In the above table, the calculated  $F = 4.083333$  is less than the  $F$  critical = 5.317655, and that leads one to infer that the null hypothesis is not rejected, therefore the average productivity of the five participants before they obtained the master's degree has no variance with the average productivity with the five participants before they earned their Ph.D. degree in relating to the question, doing things with responsibility.

SPSS software is used to check the reliability analysis of the instrument; the following table illustrates the result:

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	6.500	5.800	7.200	1.400	1.241	.980	2
Item Variances	1.200	.700	1.700	1.000	2.429	.500	2
Inter-Item Correlations	.733	.733	.733	.000	1.000	.000	2
Alpha = .800	Standardized Items Alpha = .846						
Master's	Master				B.S.		
	1.00				.733		
B.S.	0.733				1.00		

Table 3.2 SPSS using alpha analysis

Alpha in the above table has a very high value = 0.80, and that validates the instrument reliability.

The following hypothesis was also checked using ANOVA

H<sub>0</sub>:  $\mu_3 = \mu_4$ , the Null hypothesis, where

$\mu_3$ : is the average productivity of the five participants in relationship to the question of doing things on time after they obtain their Ph.D. degree.

$\mu_4$ : is the average productivity of the five participants in relationship to the question of doing things on time after they obtain their master's degree.

H<sub>a</sub>:  $\mu_3 \neq \mu_4$ , the alternative hypothesis

The result is illustrated in the following table, which is done in excel using ANOVA one way.

ANOVA: Single Factor


SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Ph.D.	5	44	8.8	0.7
master's	5	37	7.4	1.8

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	4.9	1	4.9	3.92	0.083062	5.317655
Within Groups	10	8	1.25			
Total	14.9	9				

*Table 3.3 ANOVA single factor after they earned the degree*

The null hypothesis is also accepted here, because the calculated  $F = 3.92$  and it is less than the critical  $F$ , which is equal to 5.317655, which indicates no variance between the participants when they obtained their Ph.D. degrees and the participants after they obtained their master's degrees. Therefore the conclusion from the two hypotheses is that, in relation to doing the job with responsibility, education should not take into account for the employees when hired 

SPSS software was also used to check reliability for the two hypotheses; the following tables illustrate the result that the researcher obtained by applying the SPSS to each situation.

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	8.1	7.4	8.8	1.400	1.189	.980	2
Item Variances	1.250	.700	1.800	1.100	2.571	.605	2
Inter-Item Correlations	.757	.757	.757	.000	1.000	.000	2
Alpha = .810	Standardized Items Alpha = .862						
Ph.D.	Ph.D.				Master		
Ph.D.	1.00						.757
Master	0.757				1.00		

Table 3.4 SPSS using alpha analysis

### 3.8 Tools for Data Analysis

#### 3.8.1 Analysis of Variance (ANOVA)

ANOVA is used to compare the sample mean of two or more groups, to check whether they are significantly different from each other. The classical one-way ANOVA analysis generally deals with k outcome groups (Han, 2008); for this study k is equal to 2 because two groups are being compared, the online education group and the traditional classroom education group. ANOVA is used in two applications. The first one is to explore and evaluate observational data, and the other is in the analysis of experimental data in which the variables are checked for variance differences (Han, 2008).

The null hypothesis for ANOVA is that the average value of the dependent variable—in this case, the productivity of the employees—is the same for all the groups, and the alternative hypothesis is that the average value is not the same for the groups. One-way ANOVA tests differences in a single interval dependent variable (employee productivity) of teams or groups formed by two independent variables or more (online

education and classroom traditional education). It is also known as invariant ANOVA, simple ANOVA, single classification ANOVA, or one-factor ANOVA (Garson, 2008).

### **3.8.2 F-Test**

F-test is a statistic used in ANOVA; It is used to estimate whether the independent variable (online or classroom education) has a significant relation to the dependant variable (productivity). The f-test uses the ratio of variance, where the large variance should be the numerator. Accepting the null hypothesis  $H_0$  means that the variance 1 equals to variance 2, and they are from the same population (Ziewers, 1998). Therefore the f-test is checking the mean of the independent variables. If the means of the groups differ significantly, that means the independent variable has an effect on the dependent variables (Roussas, 2006).

### **3.9 Summary**

As mentioned before, the focus of this study is to evaluate the employees' performance levels and compare those who finished their degrees (Ph.D. or master's) online with those who finished their degrees in traditional classroom institutions. The researcher used a quantitative method to collect the data from Jordan. The researcher took only those participants who had a Ph.D. and a master's degree and who were in their positions for at least six months.

A random sample of ten participants was selected to check the validity and reliability of the instruments, and the result was that all of them discovered the purpose of

the study. The researcher used the SPSS software, in particular the Cronbach's alpha, to check the reliability of the instruments, and the large value of alpha led to the conclusion that the instrument was appropriate to be sent to the participants.

## CHAPTER 4 – DATA ANALYSIS

The research is designed to evaluate the performance levels of employees who hold a Ph.D. or a master's degree in Jordan organizations and compare the performance levels of those who finished their degree from online institutions with those who got their degrees from accredited classroom institutions. Most organizations in Jordan prefer to hire people who earned their degrees from traditional classroom institutions. Therefore the research's main focus is to compare the performance level of employees who received their degrees in the two ways, online and via conventional classroom education.

Chapter 3 described how the data were collected and how a sample was taken to check the reliability of the survey instrument. As described, an e-mail was sent to three hundred candidates from three different organizations in Jordan, of which one hundred fifty had graduated from online institutions and the other one hundred fifty had graduated from traditional classroom institutions. Eighty-two of the online degree holders responded, and ninety-three of the classroom-educated responded. Another e-mail was sent to one hundred managers, and sixty nine managers were responded; thirty-seven of them provided information about both kinds of employees, nine provided information about online-educated employees only, and twenty-three provided information about classroom-educated employees only.

Three weeks were allowed for the employee survey to returned, and another three weeks was allowed for the managers' data back to be collected. The participants were not informed about the purpose of the research, and that may have improved the respondents' objectivity and honesty.

## 4.1 Demographics

### 4.1.1 Employee data

The following tables and graphs offer data on the participating employees, including numbers for online- and classroom-educated, master's degrees and Ph.D.'s, males and females, ages, years in the job before getting the degree, and years in job after getting the degree

	Male	Female	Sum
Online	62	20	82
Classroom	58	35	93

*Table 4.1 Demographics of the participating employees*

	Master's	Ph.D.	Sum
Online	70	12	82
Classroom	69	24	93

*Table 4.2 Demographics of the participating employees*



	Master's		Ph.D.		Sum
	Female	Male	Female	Male	
Online	20	50		12	82
Classroom	29	40	6	18	93

Table 4.3 Demographics of the participating employees

	23-30 Years			31-40 Years				41-50 Years			51-60 Years				
	Master's		Ph.D. F	Master's		Ph.D. F		Master's		Ph.D. F		Master's		Ph.D. F	
	F	M	M	F	M	M	M	F	M	M	M	F	M	M	M
Online	7	30		11	15		12	2	5						
Classroom	19	25		10	15	6					18				

Table 4.4 Demographics of the participating employees

Years at job before the degree	<1	1-3 Years	4-6 Years	7-10 Years	>10 Years
Online		3	79		
Classroom		23	47	23	

Table 4.5 Demographics of the participating employees

Years at job after the degree	<1	1-3 Years	4-6 Years	7-10 Years	>10 Years
Online		44	38		
Classroom		59	34		

Table 4.6 Demographics of the participating employees

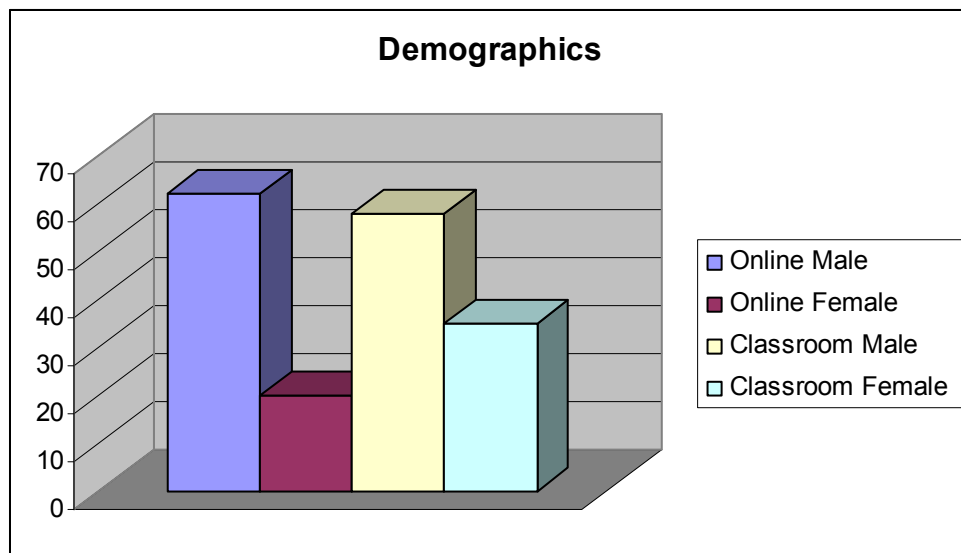
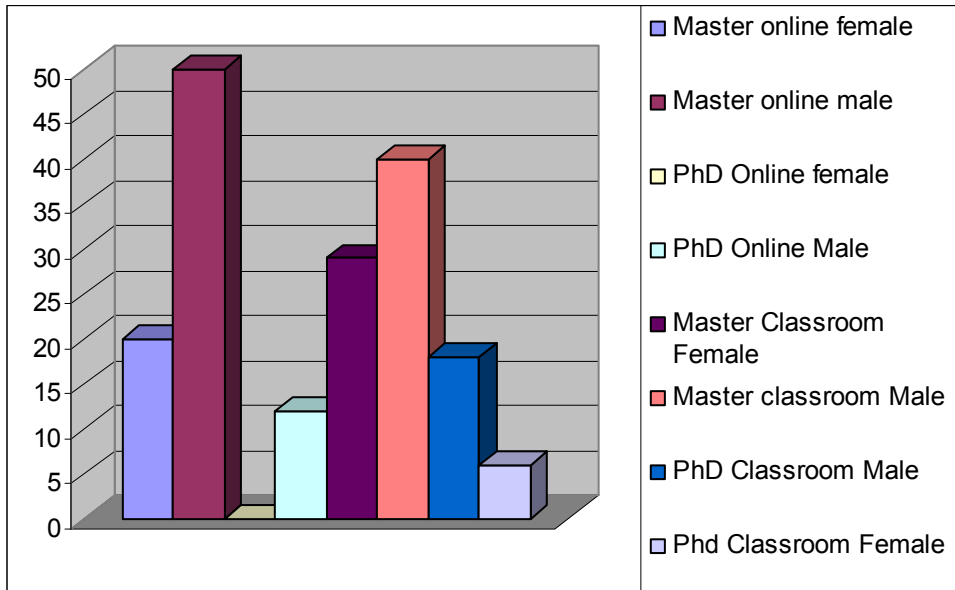


Figure 4.1 Demographics of the participating employees



*Figure 4.2 Demographics of the participating employees*

In summary, eighty-two of the participants finished their degrees online. Sixty-two of them were males and twenty were females. Seventy of the online participants were master's degree holders, while twelve participants were Ph.D. holders. Twenty of the master's degree holders were female, while fifty of them were male. Twelve of the online Ph.D. holders were male. Thirty-seven of the online degree holders were twenty-three to thirty years of age, while thirty-eight were between thirty-one and forty. Only seven people of the online participants were between forty-one and fifty. Three of the online degree holders had been in their job for one year to three years, and seventy-nine were in the job for four to six years before getting a master's degree or a Ph.D. by online education. Forty-four of the online degree holders were in their job for a year to three years after getting the degree, and thirty-eight of them were in the job for four to six years after getting the job.

The total number of participants who earned a degree through classroom institutions was ninety-three; fifty-eight of them were male and thirty-five were female. Sixty-nine of them were master’s degree holders, while a twenty-four were Ph.D.’s. Twenty-nine of master’s degree holders were female, and forty were male; six of the Ph.D. holders were female, while eighteen were male. Forty-four of the classroom participants were twenty-three to thirty years of age, and thirty-one were thirty-one to forty, while eighteen were forty-one to fifty. Twenty-three of the classroom participants were in the job for one to three years, and forty-seven were in the job for four to six years before getting the degree, and another twenty-three were in the job for seven to ten years before getting the degree. Fifty-nine of the classroom participants were in the job for one to three years after getting the degree, while thirty-four were in the job for four to six years after getting the degree.

#### **4.1.2 Managers’ Data**

The following tables and graphs offers the data collected from the managers regarding both kinds of employees, the online- and classroom-educated, master’s degree and Ph.D., male and female, age, years in job before getting the degree, and years in job after getting the degree .

	Male	Female	Sum
Online	23	14	37
Classroom	19	18	37

*Table 4.7 Demographics of the Managers’ data*

	Master's	Ph.D.	Sum
Online	31	6	37
Classroom	26	11	37

Table 4.8 Demographics of the Managers' data

	Master's		Ph.D.		Sum
	Female	Male	Female	Male	
Online	14	17		6	37
Classroom	14	12	4	7	37

Table 4.9 Demographics of the Managers' data

	Younger than 30 Years		30-40 Years		41-50 Years		51-60 Years		sum
	Master	Ph.D.	Master	Ph.D.	Master	Ph.D.	Master	Ph.D.	
	F M	F M	F M	F M	F M	F M	F M	F M	
Online	14	17		6					37
Classroom	14	12			4	7			37

Table 4.10 Demographics of the Managers' data

Years at job before the degree	< 6 months	> 6 months
Online		37
Classroom		37

Table 4.11 Demographics of the Managers' data

Years at job after the degree	< 6 months	> 6 months
Online		37
Classroom		37

Table 4.12 Demographics of the Managers' data

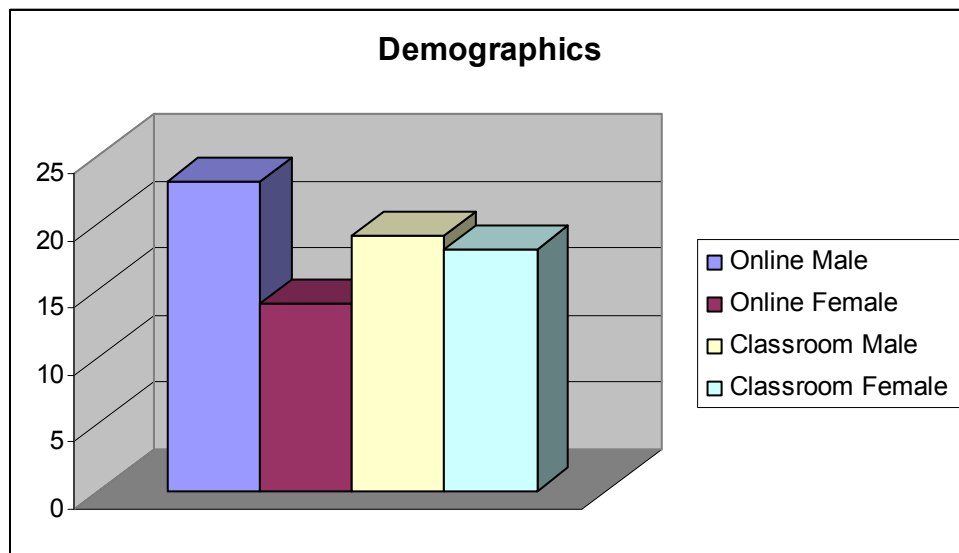
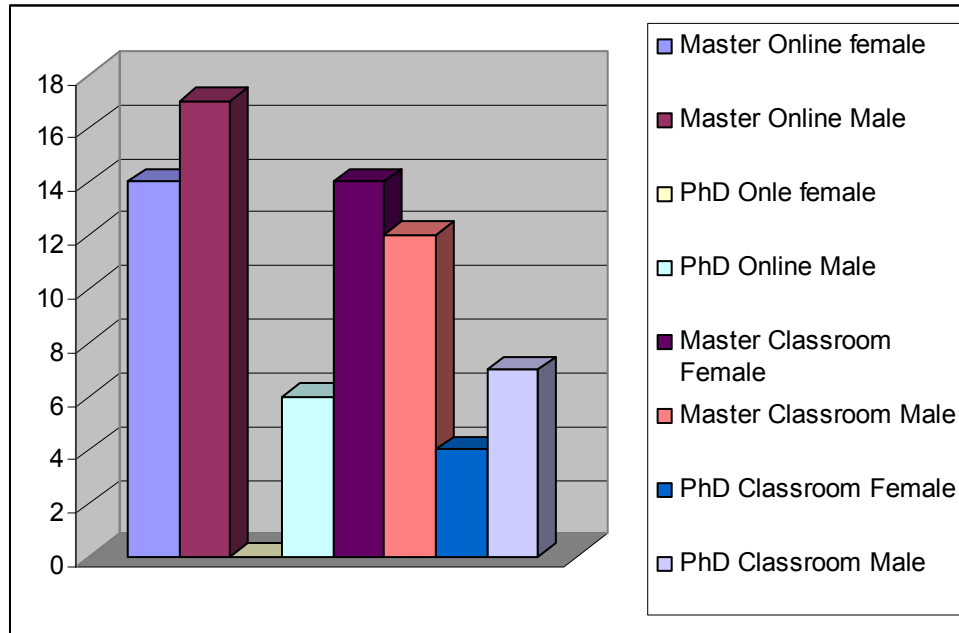


Figure 4.3 Demographics of the managers' data



*Figure 4.4 Demographics of the managers' data*

The total number of the managers was sixty-nine, but thirty-two of them provided information only for only one type of education; the other thirty-seven managers provided information for both classroom- and online-educated employees.

Twenty-three of the online-educated were males, and fourteen were females; thirteen of the online participants held a master's degree, while six of them had a Ph.D. All of the online-educated were younger than thirty years old, and all of them were on the job more than six months before getting the degree and more than six months after getting the degree. Twenty-three of the participants with a master's degree were female, and fourteen were male; there were no females who had earned Ph.D. online, while there were six males who did. Of the classroom-educated participants, eighteen were female

and nineteen male. Twenty-six of them were master's degree holders, and eleven were Ph.D. holders. Fourteen of those with a master's degree were female, and twelve were male; four of classroom-educated Ph.D. holders were female, while seven were male. Thirty-three of the classroom-educated were younger than thirty years old, while four of them were between thirty and forty years old.

## **4.2 Data Descriptive Statistics**

Descriptive statistics are used to illustrate the basic characteristics of the collected data. They are used to present the quantitative data in a convenient form, and they consist of the following:

- Graphics
- Tables
- Summary statistics

The survey questions in the study used ratings from one to ten, in which one was the worst and ten was the best.

### **4.2.1 Descriptive Statistics for Employees' Data**

The following tables illustrated the average performance level of the employees and the variance in the performance level of the employees before they got their online and classroom degrees and after they earned their degrees.



Survey questions	Before online degree	After online degree
1	6.68	8.56
2	7.26	8.68
3	7.14	8.49
4	7.69	8.63
5	7.57	8.65
6	7.48	8.57
8	6.69	8.43
9	7.44	8.65
10	7.21	8.24
11	7.60	8.72
12	7.84	8.52
13	7.28	8.68

*Table 4.13 Descriptive statistics for the average performance level of online participants (employees' data)*

Survey questions	Before Classroom degree	After Classroom degree
1	7.13	8.53
2	7.42	8.15
3	7.43	8.55
4	7.57	8.32
5	7.23	8.40
6	7.52	8.71
7		
8	7.13	8.65
9	7.71	8.61
10	7.49	8.70
11	7.53	8.30
12	7.52	8.55
13	7.30	8.45
14		

*Table 4.14 Descriptive statistics for the average performance level of classroom participants (employees' data)*

Survey questions	Before online degree	After online degree
1	0.25	0.25
2	0.19	0.22
3	0.14	0.25
4	0.24	0.33
5	0.29	0.35
6	0.25	0.25
7		
8	0.22	0.30
9	0.25	0.28
10	0.22	0.19
11	0.22	0.38
12	0.24	0.25
13	0.31	0.22
14		

*Table 4.15 Descriptive statistics for the Variance performance level of online participants (employees' data)*

Survey questions	Before Classroom	After Classroom
1	0.16	0.25
2	0.25	0.13
3	0.25	0.25
4	0.25	0.22
5	0.31	0.24
6	0.25	0.21
7		
8	0.11	0.23
9	0.34	0.24
10	0.25	0.21
11	0.25	0.21
12	0.25	0.25
13	0.21	0.25
14		

*Table 4.16 Descriptive statistics for the Variance performance level of classroom participants (employees' data)*

Table 4.17 and table 4.18 respectively show the descriptive statistics measure for the online-educated and the classroom-educated participants.

Statistic	Before online Education	After Online Education	Note
Median	7.27	8.60	
Mean	7.28	8.57	
Standard Dev.	0.32	0.13	
Sample Variance	0.11	0.02	
Sum	7072	8432	
Skewness	-0.86	-1.37	Skewness characterizes the degree of asymmetry of a distribution around its mean
Range	1.01	0.723	the length of the smallest interval which contains all the data
Max	7.69	8.72	
Min	6.68	8.24	

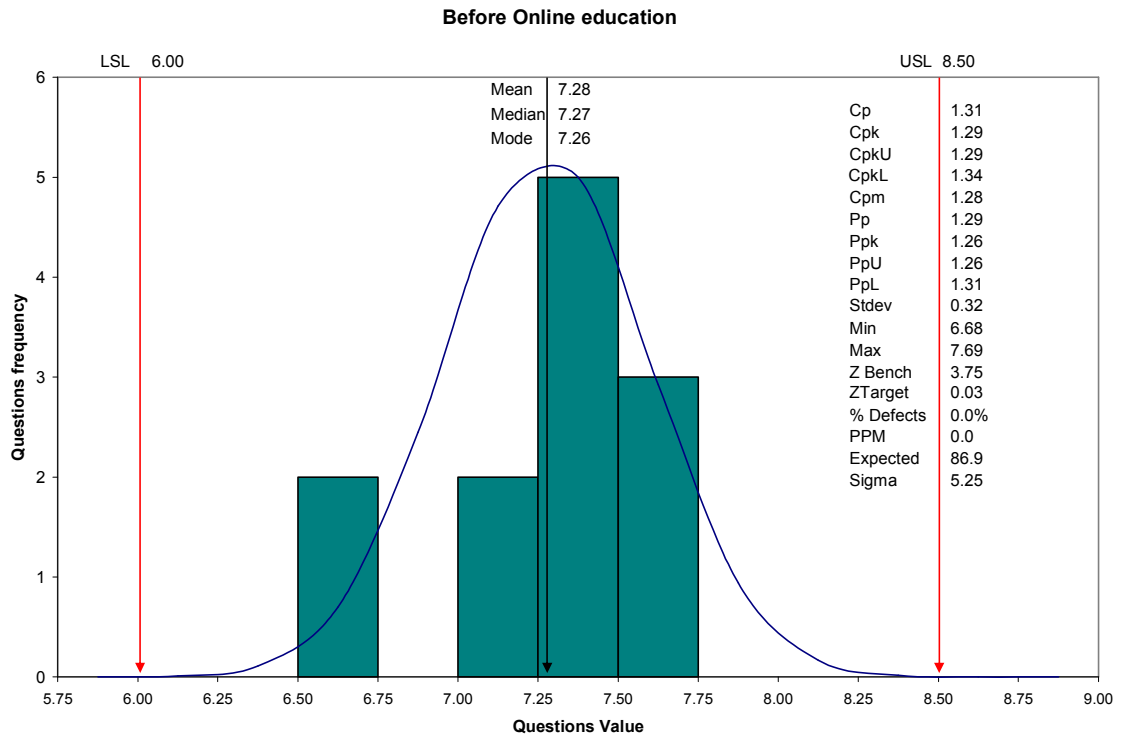
*Table 4.17 Descriptive statistics for online participants  
(employees' data)*

Statistic	Before classroom Education	After classroom Education	Note
Median	7.46	8.54	
Mean	7.41	8.49	
Standard Dev.	0.18	0.17	
Sample Variance	0.03	0.03	
Sum	8266	9478	
Skewness	-0.37	-0.60	Skewness characterizes the degree of asymmetry of a distribution around its mean
Range	0.58	0.56	the length of the smallest interval which contains all the data
Max	7.71	8.71	
Min	7.13	8.15	

*Table 4.18 Descriptive statistics for classroom participants  
(employees' data)*

The figures below show the average performance level of the employees calculated from the data collected. Figure 4.5 shows the average performance level of the employees before they finished their online education, figure 4.6 show the average

performance level of the employees after they finished their online education, while figure 4.7 and figure 4.8, respectively, show the average performance level of the employees before and after they finished their classroom education. All four figures have the properties of a normal distribution.



*Figure 4.5 The average employee performance level before online participant*

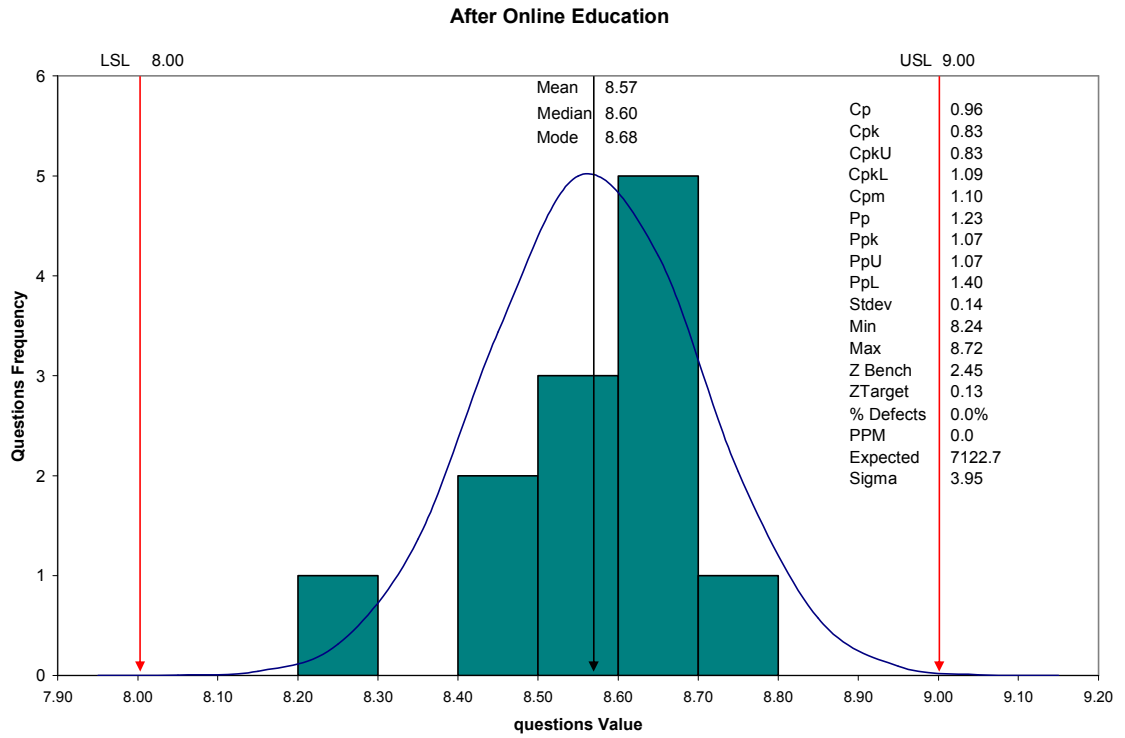


Figure 4.6 The average employee performance level after the online participants



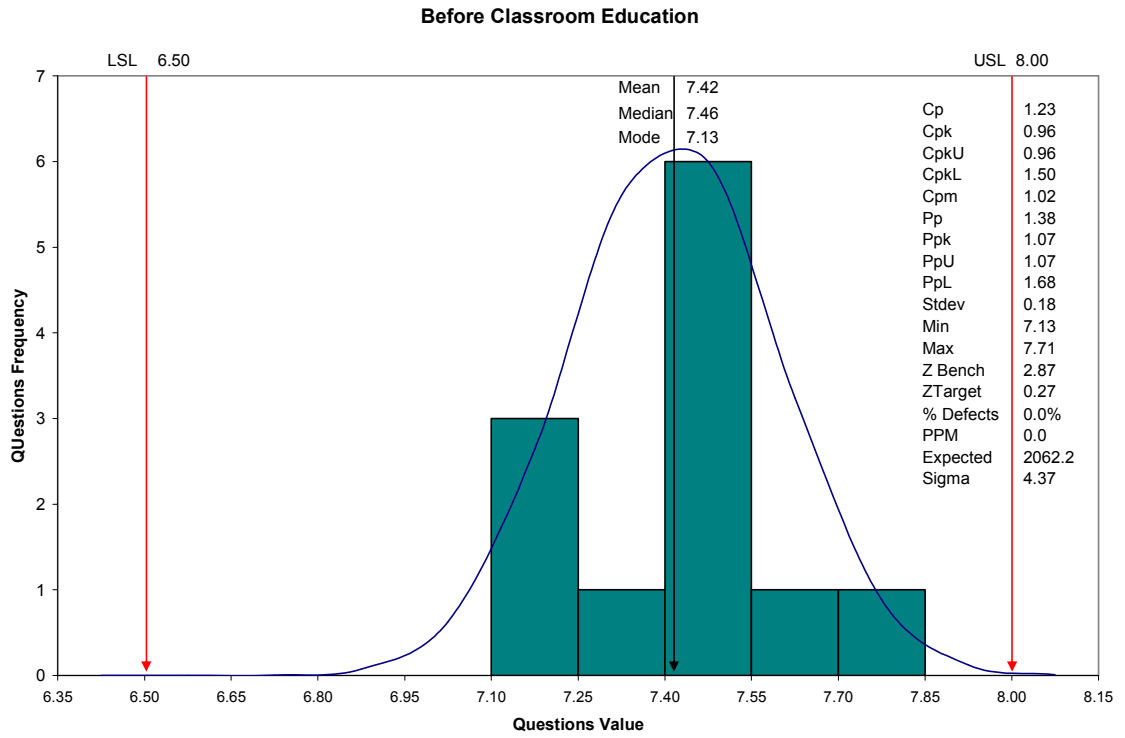


Figure 4.7 The average employee performance level before the class education

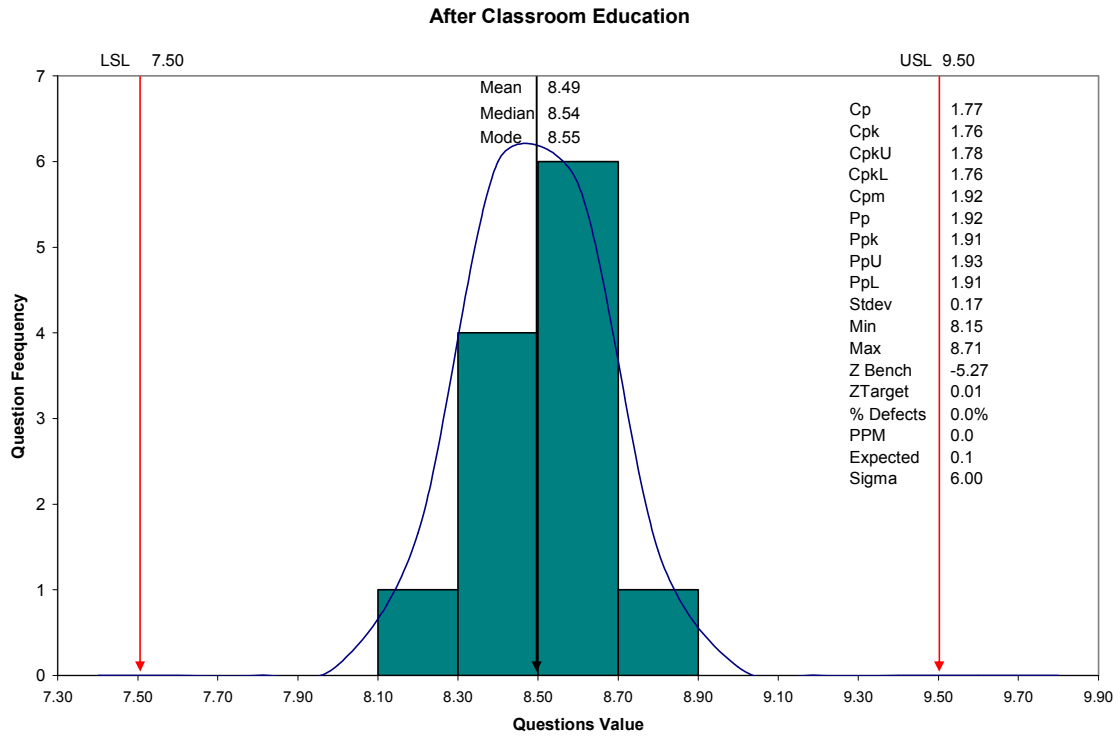


Figure 4.8 The average employee performance level after the classroom education

The over all average performance level of online participants before they earned their degree was (7.28/10) and after they finished their degree was (8.57/10) with standard deviations of 0.32 and 0.13. The overall average performance level for the employees who finished their degree by classroom education was (7.41/10) and after they finished their education was (8.49 /10) with standard deviations of 0.5 and 0.54.

The variance in the average performance level of the employees before getting their traditional classroom degree is  $(7.41 - 7.28) = 0.13$ , which means the performance level of employees before getting their traditional classroom participants is higher than the performance level of employees before getting their online education by (0.13/10). Similarly the variance in the average performance level of the employees after getting

their online education is  $(8.57 - 8.49) = 0.08$ , which means the performance level of online participants is higher than the performance level of traditional classroom participants by  $(0.08/10)$ .

The conclusion of these descriptive statistics is that the average performance level of online-educated participants is a little higher than the average performance level of traditional classroom-educated participants when they received their degree, and the average performance level of online participants is less than the average performance level of classroom participants before receiving their degree.

#### **4.2.1 Descriptive Statistics for Managers' Data**

The following tables illustrate the average performance level and the variance of the performance levels of the employees before they got their online and classroom degrees and after they earned their degrees.

Survey questions	Before online degree	After online degree
1	6.92	8.43
2	7.22	8.32
3	7.14	8.46
4	7.76	8.73
5	7.92	8.73
6	7.35	8.35
7	7.11	8.49
8	7.16	8.57
9	7.81	8.41
10	7.43	8.92
11	7.35	8.41
12	7.16	8.76
13	7.84	8.86
14	7.92	8.92

*Table 4.19 Descriptive statistics for the average performance level of online participants (Managers' data)*

Survey questions	Before Classroom degree	After Classroom degree
1	7.24	8.57
2	7.35	8.24
3	7.38	8.51
4	7.35	8.95
5	7.84	8.60
6	7.11	8.41
7	7.68	8.49
8	7.54	8.59
9	7.43	8.46
10	7.65	8.78
11	7.60	8.35
12	7.76	8.68
13	7.81	8.84
14	7.97	9.11

*Table 4.20 Descriptive statistics for the average performance level of classroom participants (Managers' data)*

Survey questions	Before online degree	After online degree
1	0.19	0.25
2	0.17	0.23
3	0.12	0.23
4	0.19	0.20
5	0.08	0.20
6	0.23	0.23
7	0.15	0.26
8	0.14	0.25
9	0.21	0.25
10	0.25	0.08
11	0.23	0.25
12	0.14	0.20
13	0.14	0.12
14	0.08	0.08

*Table 4.21 Descriptive statistics for the variance performance level of online participants (Managers' data)*

Survey questions	Before classroom	After classroom
1	0.19	0.25
2	0.23	0.19
3	0.24	0.26
4	0.23	0.22
5	0.14	0.25
6	0.10	0.25
7	0.23	0.26
8	0.26	0.25
9	0.31	0.26
10	0.35	0.17
11	0.36	0.23
12	0.30	0.23
13	0.16	0.14
14	0.19	0.21

*Table 4.22 Descriptive statistics for the variance performance level of classroom participants (Managers' data)*

Table 4.23 and table 4.24, respectively, show the descriptive statistics for the online-educated and the classroom-educated participants.

Statistic	Before online Education	After Online Education	Note
Median	7.35	8.53	
Mean	7.44	8.60	
Standard Dev.	0.35	0.22	
Sample Variance	0.12	0.05	
Sum	3851	4453	
Skewness	0.29	0.33	Skewness characterizes the degree of asymmetry of a distribution around its mean
Range	1.00	0.60	the length of the smallest interval which contains all the data
Max	7.92	8.92	
Min	6.92	8.32	

*Table 4.23 Descriptive statistics for online participants  
(Managers' data)*



Statistic	Before classroom Education	After classroom Education	Note
Median	7.57	8.58	
Mean	7.55	8.61	
Standard Dev.	0.25	0.24	
Sample Variance	0.06	0.06	
Sum	3911	4461	
Skewness	-0.06	0.61	Skewness characterizes the degree of asymmetry of a distribution around its mean
Range	0.86	0.87	the length of the smallest interval which contains all the data
Max	7.97	9.11	
Min	7.11	8.24	

*Table 4.24 Descriptive statistics for classroom participants  
(Managers' data)*

The figures below show the average performance level of the employees calculated from the data collected. Figure 4.9 shows the average performance level of the employees before they finished their online education, figure 4.10 show the average performance level of the employees after they finished their online education, while figure 4.11 and figure 4.12, respectively, show the average performance level of the employees before and after they finished their classroom education. All four figures have the properties of a normal distribution.

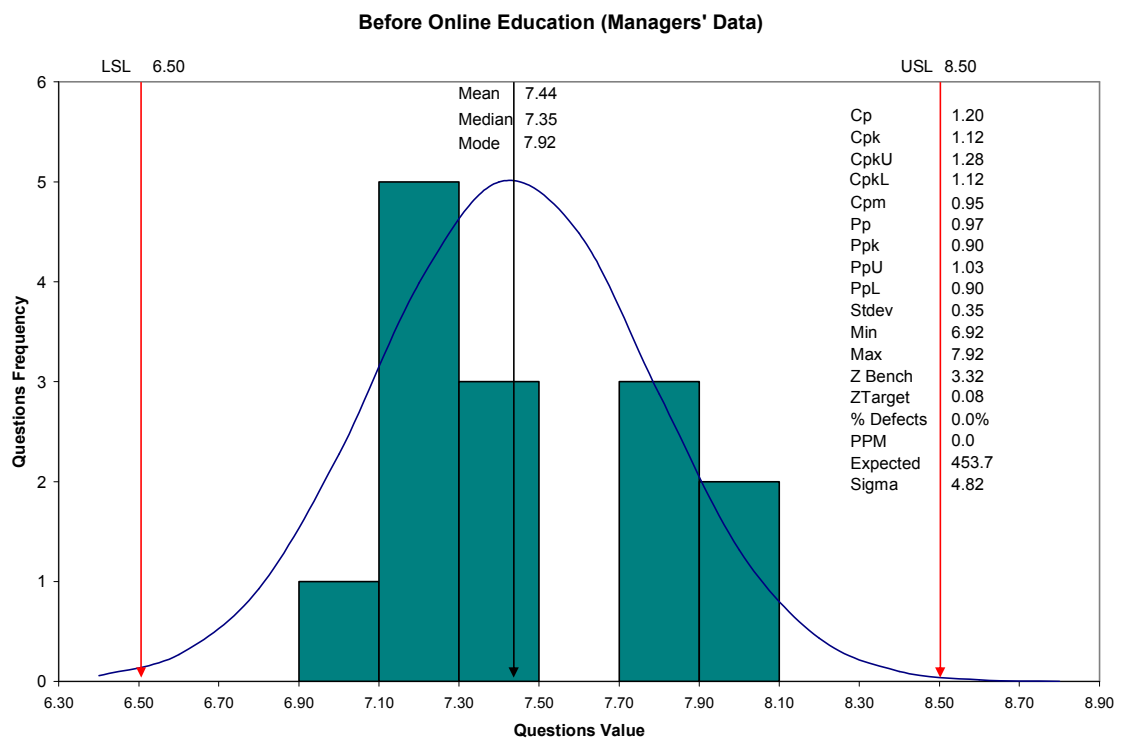


Figure 4.9 The average employee performance level before online participants (Managers' data)

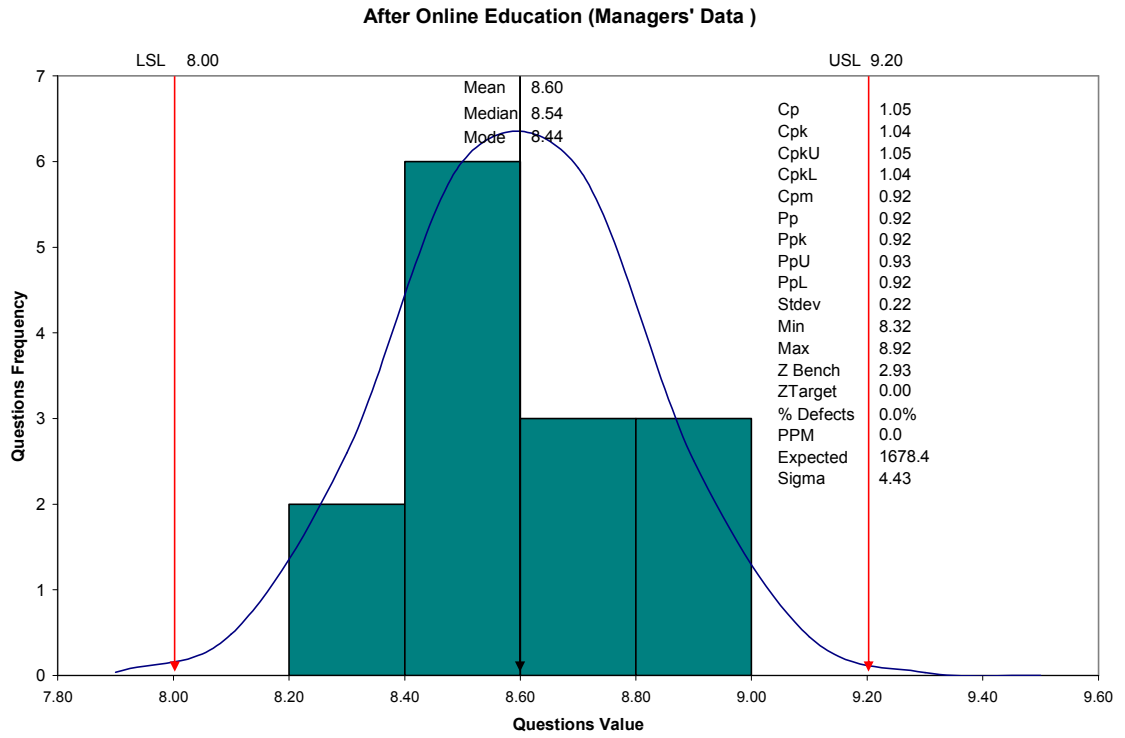
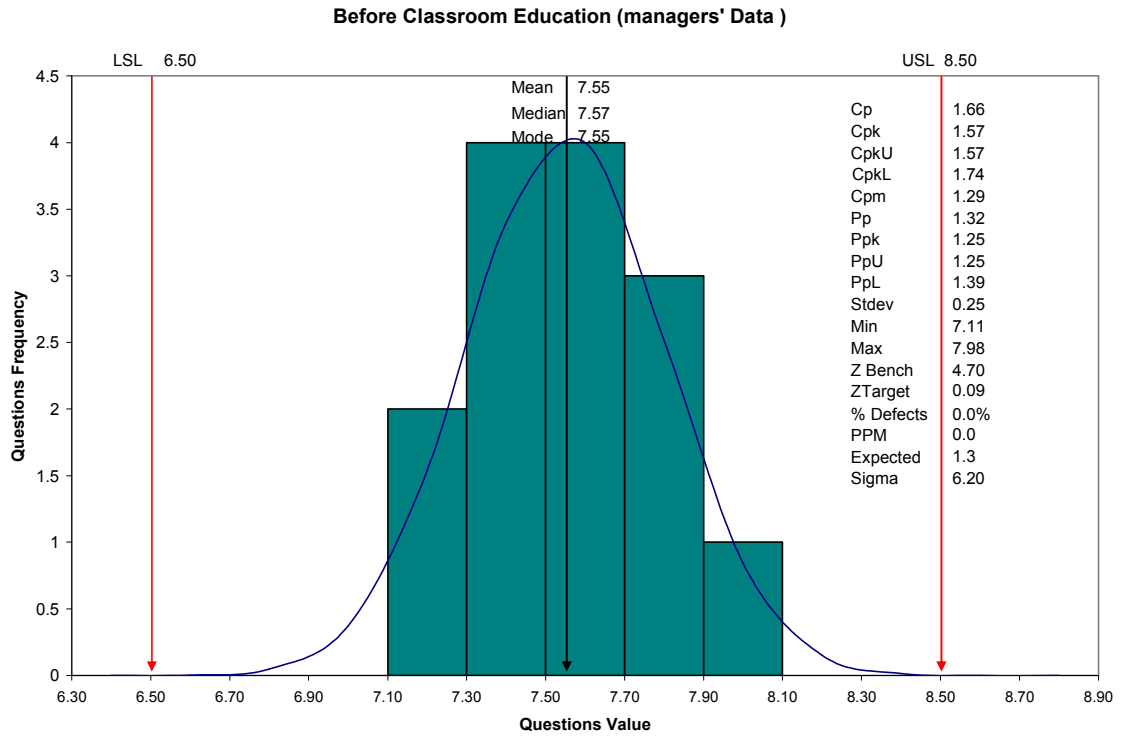


Figure 4.10 The average employee performance level after the online participants (Managers' data)



*Figure 4.11 The average employee performance level before the class education (Managers' data)*

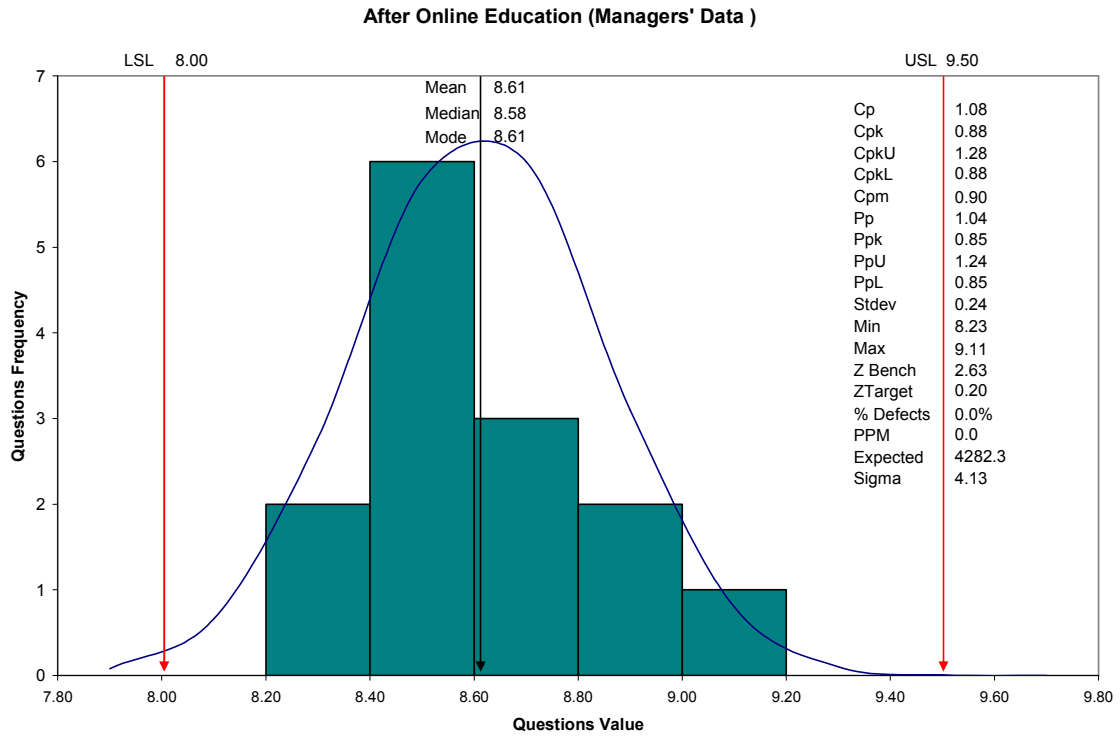


Figure 4.12 The average employee performance level after the classroom education ((Managers' data)

The overall average performance level of online participants before they earned their degrees was (7.44/10) and after they finished their degrees was (8.60/10) with standard deviations of 0.35 and 0.22. The overall average performance level for the employees who finished their degree by classroom education was (7.55/10) and after they finished their education was (8.61/10) with standard deviations of 0.25 and 0.24.

The variance in the average performance level of the employees before getting their traditional classroom degree is  $(7.55 - 7.44) = 0.11$ , which means the performance level of employees before getting their traditional classroom participants is higher than the performance level of employees before getting their online education by  $(0.11/10)$ . Similarly the variance in the average performance level of the employees after getting

their online education is  $(8.61 - 8.60) = 0.01$  which means the performance level of traditional classroom participants is slightly higher than online participants the performance level of by  $(0.01/10)$ .

Therefore the conclusion of these descriptive statistics is that the average performance level of traditional classroom participants is a little higher than the average performance level of online-educated participants when they received their degree.

### **4.3 Data Statistical Analysis**

In this part the ANOVA analysis of variance will be used to analyze the data collected from the participants and then to compare the results of those who finished their degrees online with those who finished their degrees in the classroom. Different hypotheses will be checked to compare the mean of the online- and the classroom-educated. A t-test is used to check the mean between the online- and the classroom-educated.

#### **4.3.1 Statistical Analysis of Employees' Data**

The following null hypothesis and the alternative hypothesis were checked:

$H_0: \mu_1 = \mu_2 = \mu_3 = \mu_4$  where

$\mu_1$ : The average performance level of the participants before they earned their online education.

$\mu_2$ : The average performance level of the participants after they earned their online education.

$\mu_3$ : The average performance level of the participants before they earned their classroom education.

$\mu_4$ : The average performance level of the participants after they earned their classroom education.

$H_A: \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4$ , which indicated that one of the means is different from the others

Table 4.25 shows the result after using the ANOVA single factor.

ANOVA: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Before Online	12	87.3	7.28	0.104
After online	12	102.82	8.57	0.0182
Before Class	12	88.98	7.41	0.0329
After Class	12	101.92	8.49	0.030

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	17.02	3	5.67	121.963	2.4E-21	2.816
Within Groups	2.047	44	0.046			
Total	19.07	47				

*Table 4.25 ANOVA single factor for all participants*

The result in table 4.25 shows that when using  $\text{ALPHA} = 0.05$ , the calculated F-value is equal to 121.963, and this value is much bigger than the F-critical value, which is 2.816; furthermore, the P-value is almost zero.

These calculations lead to the rejection of the null hypothesis and the acceptance of the alternative hypothesis. Therefore the conclusion is that there is at least one of the tested performance levels that differs from the others, but that does not tell us which one is different. Therefore ANOVA is used to test couples of average performance level to find out which ones are equal and which are different.

The following hypothesis was tested by ANOVA:

$H_0: \mu_1 = \mu_2$  where

$\mu_1$  is the average performance level of employees before they earned their online degree

$\mu_2$  is the average performance level of employees before they earned their classroom degree

$H_a: \mu_1 \neq \mu_2$ ; the performance level is not equal for both of them



ANOVA: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Before Online	12	87.3	7.28	0.104
Before Classroom	12	88.98	7.41	0.0329

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	0.1176	1	0.1176	1.707	0.204	4.3009
Within Groups	1.515	22	0.06888			
Total	1.63	23				

*Table 4.26 ANOVA single factor for participants before online and before classroom*

As shown in table 4.26, when using ALPHA = 0.05 the calculated F-value is equal to 1.707, and it is smaller than the calculated F-critical, which is equal to 4.3009. This leads to the acceptance of the null hypothesis, and therefore the conclusion of the ANOVA result is that there is no significant statistical variance between the performance level of the participants before they earned their degrees online and before they earned their degrees by classroom education.

The following null and alternative hypothesis is checked using ANOVA:

H0:  $\mu_1 = \mu_2$  where

$\mu_1$  is the average performance level of employees after they earned their online degree

$\mu_2$  is the average performance level of employees after they earned their classroom degree

Ha:  $\mu_1 \neq \mu_2$ ; the performance level is not equal for both of them

ANOVA: Single Factor

SUMMARY				
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
After online	12	102.82	8.57	0.018
After classroom	12	101.91	8.49	0.030

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	0.0337	1	0.0337	1.395	0.250	4.3009
Within Groups	0.532	22	0.0241			
Total	0.565	23				

*Table 4.27 ANOVA single factor for participants after online and after classroom*

Table 4.27 clearly shows that, using ALPHA = 0.05, the calculated F-value (1.395) is less than the F-critical value (4.3009), and that leads to accepting the null hypothesis. Therefore the ANOVA result clarifies that there exists no significant statistical variance between the performance levels of the participant who earned their

degrees by online education and those who earned their degrees by traditional classroom education.

The following hypothesis is also tested using ANOVA:

H<sub>0</sub>:  $\mu_1 = \mu_2$  where

$\mu_1$  is the average performance level of the participants before they earned their online education

$\mu_2$  is the average performance level of the participants after they earned their online education

H<sub>a</sub>:  $\mu_1 \neq \mu_2$ ; the performance level is not equal for both of them

As shown in table 4.28 below, when using ALPHA =0.05, the calculated F-value is 163.08, which is much larger the F-critical value, which is 4.330, and this leads to rejecting the null hypothesis, and the conclusion of the ANOVA result is that there exists a statistical variance in the performance levels of the participants before they earned the online degrees and after they earned the online degrees.

ANOVA: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Before On	12	87.3	7.28	0.104
After On	12	102.82	8.57	0.018

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	10.03	1	10.03	163.08	1.19E-11	4.30091
Within Groups	1.35	22	0.061			
Total	11.39	23				

*Table 4.28 ANOVA single factor for participants before and after online*

The following hypothesis was also tested using ANOVA:

H<sub>0</sub>:  $\mu_1 = \mu_2$  where

$\mu_1$  is the average performance level of the participants before earned their classroom education

$\mu_2$  is the average performance level of the participants after earned their classroom education

H<sub>a</sub>:  $\mu_1 \neq \mu_2$ ; the performance level is not equal for both of them

Anova: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Before Classroom	12	88.98	7.41	0.032
After Classroom	12	101.92	8.49	0.030

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups						
	6.9676	1	6.976	221.30	5.8E-13	4.3009
Within Groups						
	0.693	22	0.0315			
Total						
	7.670	23				

*Table 4.29 ANOVA single factor for participants before and after classroom.*

Table 4.29 illustrates that ANOVA result. It is clear that when using ALPHA=0.05 the calculated F-value is much larger than the calculated F-critical value, and that forced the rejection of the null hypothesis, F-value = 221.30 and the critical F-value = 4.3009. Therefore the conclusion is that there exists a significant statistical variance in the performance levels of the participants before they earned their traditional classroom education and after they earned their classroom degrees.

Another conclusion could be found from the last two tables, table 4.28 and table 54.29, which is that the variance of the participants' performance levels after they finished their online education or classroom education is significantly higher than the performance level of the participants before they earned their online or classroom education.

A t-test is also used to check the following hypothesis:

$H_0: \mu_1 = \mu_2$  where

$\mu_1$  is the average performance level of the participants before earning their online education

$\mu_2$  is the average performance level of the participants before earning their classroom education

$H_a: \mu_1 \neq \mu_2$ ; the performance level is not equal for both of them

t-Test: Two-Sample Assuming Unequal Variances

	<i>Before Online</i>	<i>Before Classroom</i>
Mean	7.28	7.41
Variance	0.1048	0.0329
Observations	12	12
Hypothesized Mean Difference	0	
Df	17	
t Stat	-1.306	
P(T<=t) one-tail	0.104	
t Critical one-tail	1.739	
P(T<=t) two-tail	0.208	
t Critical two-tail	2.10	

*Table 4.30 T-test analyses comparing before education*

As shown in table 4.30, when using ALPHA =0.05, the t-test critical value is 2.10, and the t-test calculated value for the average performance level of the participants is - 1.306, and this leads to accept the null hypothesis and the conclusion of the t-test is that there exists no statistical significant difference between the participants before they finished their education in either the online or the classroom education case.

Another hypothesis was also checked using the t-test:

$H_0: \mu_1 = \mu_2$  where

$\mu_1$  is the average performance level of the participants after finishing their online education

$\mu_2$  is the average performance level of the participants after finishing their classroom education

$H_a: \mu_1 \neq \mu_2$ ; the performance level is not equal for both of them

Similar to the before-education case, table 4.30 shows that when using  $\text{ALPHA} = 0.05$ , the t-test critical value is 2.078 and the t-test calculated value is 1.18 with P-value equals to 0.279, and this also leads to accepting the null hypothesis, and the conclusion is that there is no significant statistical difference between the participants after they finished their degree in either the online or the traditional-classroom case.



t-Test: Two-Sample Assuming Unequal Variances

	<i>After online</i>	<i>After classroom</i>
Mean	8.57	8.49
Variance	0.018	0.030
Observations	12	12
Hypothesized Mean Difference	0	
Df	21	
t Stat	1.181	
P(T<=t) one-tail	0.125	
t Critical one-tail	1.720	
P(T<=t) two-tail	0.250	
t Critical two-tail	2.079	

*Table 4.31 T-test analyses comparing after education*

### **4.3.2 Instrument Reliability Analysis for Employees' Data**

As was done with the pilot sample, the reliability of the instruments will be checked to make sure that the researcher is using the right instrument for the survey. Cronbach's alpha was used to check the reliability. Cronbach's alpha ranges from -1 to +1, where -1 indicates inconsistency and instability of the instrument, and +1 indicates steadiness and stability of the instrument.

Tables 4.32, 4.33, and 4.34 show the result of Cronbach's alpha:

Reliability Analysis scale alpha				
1. Before Online				
2. After Online				
Correlation Matrix				
	Before Online	After Online		
Before Online	1.00	0.520		
After Online	0.520	1.00		
Alpha	0.586			
Standardized Item Alpha	0.684			
Reliability Coefficient	2			

*Table 4.32 Reliability Analysis for online participants*

As shown in table 4.32, the ALPHA value of 0.586 shows a good level of stability and consistency for the online participants.

Reliability Analysis scale alpha				
1. Before Classroom				
2. After Classroom				
Correlation Matrix				
	Before Classroom	After Classroom		
Before Classroom	1.00	0.520		
After Classroom	0.520	1.00		
Alpha	0.586			
Standardized Item Alpha	0.684			
Reliability Coefficient	2			

*Table 4.33 Reliability Analysis for classroom education*

An ALPHA value of 0.586 also shows good consistency for classroom participants.

Reliability Analysis scale alpha				
1. Before Online 2. After Online 3. Before Classroom 4. After Classroom				
Correlation Matrix				
	Before Online	After Online	Before Class	After Class
Before Online	1.00	0.520	0.697	0.073
After Online	0.520	1.00	0.505	-0.020
Before Class	0.697	0.505	1.00	0.342
After Class	0.073	-0.020	0.342	1.00
Alpha	0.69			
Standardized Item Alpha	0.689			
Reliability Coefficient	4			

*Table 4.34 Reliability Analysis for online and classroom education*

Table 4.34 shows that the ALPHA value for the overall participants, both online and classroom, is 0.69, which is a sign of a high level of consistency. Therefore the conclusion is that the instrument used to collect the data was reliable and stable.

### 4.3.3 Statistical Analysis of Managers' Data

The following null hypothesis and the alternative hypothesis were checked:

H<sub>0</sub>:  $\mu_1 = \mu_2 = \mu_3 = \mu_4$  where

$\mu_1$ : The average performance level of the participants before they earned their online education.

$\mu_2$ : The average performance level of the participants after they earned their online education.

$\mu_3$ : The average performance level of the participants before they earned their classroom education.

$\mu_4$ : The average performance level of the participants after they earned their classroom education.

H<sub>A</sub>:  $\mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4$ , which indicated to that one of the means is different from the others

Table 4.35 shows the result after using the ANOVA single factor.

Anova: Single Factor

SUMMARY				
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
bef. On	14	104.09	7.435	0.119273
Afr On	14	120.36	8.597143	0.046637
Bfr Class	14	105.71	7.550714	0.062669
Afr Class	14	120.58	8.612857	0.05736

ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	17.41152	3	5.80384	81.18975	1.27E-19	2.7826
Within Groups	3.717214	52	0.071485			
Total	21.12874	55				

Table 4.35 ANOVA single factor for all participants

The result in table 4.35 shows that when using ALPHA = 0.05, the calculated F-value is equal to 81.18, and this value is much bigger than the F-critical value, which is 2.78. Also, the P-value is almost zero.

These calculations lead to rejecting the null hypothesis and accepting the alternative hypothesis. Therefore, the conclusion is that there is at least one of the tested average performance levels that differs from the others, but that does not give us which one is different. Therefore ANOVA is used to test pairs of average performance levels in order to find out which ones are equal and which are different.

The following hypothesis was tested by ANOVA:

$$H_0: \mu_1 = \mu_2 \text{ where}$$

$\mu_1$  is the average performance level of employees before they earned their online degree

$\mu_2$  is the average performance level of employees before they earned their classroom degree

$H_a: \mu_1 \neq \mu_2$ ; the performance level is not equal for both of them

Anova: Single Factor

SUMMARY				
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
bef. On	14	104.09	7.435	0.119273
Bfr Class	14	105.71	7.550714	0.062669

ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	0.093729	1	0.093729	1.030314	0.319438	4.225201
Within Groups	2.365243	26	0.090971			
Total	2.458971	27				

*Table 4.36 ANOVA single factor for participants before online and before classroom*

As shown in table 4.36, when using ALPHA = 0.05 the calculated F-value is equal to 1.03, and it is smaller than the calculated F-critical, which is equal to 4.225, and this leads to accept the null hypothesis. Therefore the conclusion of the ANOVA result is that there is no significant statistical variance between the performance levels of the participants before they earned their degrees online and before they earned their degrees by classroom education.

The following null and alternative hypothesis is checked using ANOVA:

$H_0: \mu_1 = \mu_2$  where

$\mu_1$  is the average performance level of employees after they earned their online degree

$\mu_2$  is the average performance level of employees after they earned their classroom degree

$H_a: \mu_1 \neq \mu_2$ ; the performance level is not equal for both of them

Anova: Single Factor

SUMMARY						
Groups	Count	Sum	Average	Variance		
Afr On	14	120.36	8.597143	0.046637		
Afr Class	14	120.58	8.612857	0.05736		

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0.001729	1	0.001729	0.033242	0.856742	4.225201
Within Groups	1.351971	26	0.051999			
Total	1.3537	27				

Table 4.37 ANOVA single factor for participants after online and after classroom

Table 4.37 clearly shows that using ALPHA = 0.05, the calculated F-value (0.033) is less than the F-critical value (4.225), and that leads to accepting the null hypothesis. Therefore the ANOVA result shows that there exists no significant statistical variance between the performance levels of the participants who earned their degrees by online education and those who earned their degrees by traditional classroom education.

The following hypothesis is also tested using ANOVA:

$H_0: \mu_1 = \mu_2$  where



$\mu_1$  is the average performance level of the participants before earned their online education

$\mu_2$  is the average performance level of the participants after earned their online education

$H_a: \mu_1 \neq \mu_2$ ; the performance level is not equal for both of them

Anova: Single Factor

SUMMARY						
Groups	Count	Sum	Average	Variance		
before Online	14	104.09	7.435	0.119273		
Afr On	14	120.36	8.597143	0.046637		

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	9.454032	1	9.454032	113.9655	5.34E-11	4.225201
Within Groups	2.156836	26	0.082955			
Total	11.61087	27				

Table 4.38 ANOVA single factor for participants before and after online

As shown in table 4.38, when using ALPHA =0.05 the calculated F-value is 113.96, which is much larger than the F-critical value, which is 4.225, and this leads to rejecting the null hypothesis, and the conclusion of the ANOVA result is that there exists a statistical variance in the performance levels of the participants before they earned the online degrees and after they earned the online degrees.

The following Hypothesis is also tested using ANOVA

$H_0: \mu_1 = \mu_2$  where

$\mu_1$  is the average performance level of the participants before earned their classroom education

$\mu_2$  is the average performance level of the participants after earned their classroom education

Ha:  $\mu_1 \neq \mu_2$ ; the performance level is not equal for both of them

Anova: Single Factor

SUMMARY						
Groups	Count	Sum	Average	Variance		
Bfr Class	14	105.71	7.550714	0.062669		
Afr Class	14	120.58	8.612857	0.05736		

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	7.897032	1	7.897032	131.5853	1.13E-11	4.225201
Within Groups	1.560379	26	0.060015			
Total	9.457411	27				

Table 4.39 ANOVA single factor for participants before and after classroom.

Table 4.39 illustrates that ANOVA result. It is clear that when using ALPHA=0.05 the calculated F-value is much larger than the calculated F-critical value, and that forces one to reject the null hypothesis, F-value = 131.5 and the critical F-value = 4.225. Therefore, the conclusion is that there exists a significant statistical variance in the performance levels of the participants before they earned their traditional classroom education and after they earned their classroom degrees.

Another conclusion could be found from the last two tables, table 4.38 and table 4.39, which is that the variance of the participants' performance levels after they finished their online education or classroom education is significantly higher than the performance levels of the participants before they earned their online or classroom education.

A t-test was also used to check the following hypothesis:

H0:  $\mu_1 = \mu_2$  where

$\mu_1$  is the average performance level of the participants before earning their online education

$\mu_2$  is the average performance level of the participants before earning their classroom education

Ha:  $\mu_1 \neq \mu_2$ ; the performance level is not equal for both of them

t-Test: Two-Sample Assuming Unequal Variances

	<i>Before online</i>	<i>Before classroom</i>
Mean	7.435	7.550714286
Variance	0.119273	0.062668681
Observations	14	14
Hypothesized Mean Difference	0	
df	24	
t Stat	-1.01504	
P(T<=t) one-tail	0.160105	
t Critical one-tail	1.710882	
P(T<=t) two-tail	0.320209	
t Critical two-tail	2.063899	

Table 4.40 T-test analyses comparing before education

As shown in table 4.40, when using ALPHA =0.05 the t-test critical value is 2.06, and the t-test calculated value for the average performance level of the participants is -1.02, and this leads to accepting the null hypothesis, and the conclusion of the t-test is that there exist no statistically significant difference between the participants before they finished their education, in either the online or the classroom cases.

Another hypothesis was also checked using the t-test:

H<sub>0</sub>:  $\mu_1 = \mu_2$  where

$\mu_1$  is the average performance level of the participants after finishing their online education

$\mu_2$  is the average performance level of the participants after finishing their classroom education

H<sub>a</sub>:  $\mu_1 \neq \mu_2$ ; the performance level is not equal for both of them

Similar to the before–education case, table 4.41 shows that when using ALPHA = 0.05, the t-test critical value is 2.055 and the t-test calculated value is -0.182 with P-value equals to 0.43, and this also leads to accepting the null hypothesis, and the conclusion is that there is no significant statistical difference between the participants after they finished their degrees in either the online or the traditional classroom case.

t-Test: Two-Sample Assuming Unequal Variances

	<i>After online</i>	<i>After Classroom</i>
Mean	8.597143	8.612857143
Variance	0.046637	0.05736044
Observations	14	14
Hypothesized Mean Difference	0	
df	26	
t Stat	-0.18233	
P(T<=t) one-tail	0.428371	
t Critical one-tail	1.705618	
P(T<=t) two-tail	0.856742	
t Critical two-tail	2.055529	

*Table 4.41 T-test analyses comparing after education*

### **4.3.5 Managers' Instrument Reliability Analysis**

Just as was done with the employees' data, Cronbach's alpha was also used to check the reliability of the instrument.

Tables 4.42, 4.43 and 4.43 show the result of Cronbach's alpha.

Reliability Analysis scale alpha				
3. Before Online				
4. After Online				
Correlation Matrix				
	Before Online	After Online		
Before Online	1.00	0.536		
After Online	0.536	1.00		
Alpha	0.650			
Standardized Item Alpha	0.698			
Reliability Coefficient	2			

*Table 4.42 Reliability Analysis for online participants*

As shown in table 4.42, the ALPHA value of 0.648 shows a good level of stability and consistency for the online participants.

Reliability Analysis scale alpha				
3. Before Classroom				
4. After Classroom				
Correlation Matrix				
	Before Classroom	After Classroom		
Before Classroom	1.00	0.528		
After Classroom	0.528	1.00		
Alpha	0.691			
Standardized Item Alpha	0.691			
Reliability Coefficient	2			

*Table 4.43 Reliability Analysis for classroom education*

An ALPHA value of 0.688 also shows good consistency for classroom participants.

Reliability Analysis scale alpha				
5. Before Online 6. After Online 7. Before Classroom 8. After Classroom				
Correlation Matrix				
	Before Online	After Online	Before Class	After Class
Before Online	1.00	0.530	0.470	0.538
After Online	0.536	1.00	0.741	0.884
Before Class	0.470	0.741	1.00	0.528
After Class	0.538	0.884	0.528	1.00
Alpha	0.839			
Standardized Item Alpha	0.865			
Reliability Coefficient	4			

*Table 4.44 Reliability Analysis for online and classroom education*

Table 4.44 shows that the ALPHA value for the overall participants, online and classroom, is 0.839, which is a sign of high level of consistency. Therefore the conclusion is that the instrument used to collect the data was reliable and stable.



#### **4.4 Summary**

The data collected from three different organizations in Jordan were analyzed, beginning with the demographic data, which were analyzed and illustrated in a graphical way. Then ANOVA and t-test were used to compare the performance levels of the participants who finished their degree online versus those who finished their degrees by conventional classroom education. The finding was that there is no significant statistical difference between those who finished their degrees in the two ways.

The reliability of the finding and the instrument was also checked using the SPSS software, in particular, using the Cronbach's alpha, and the result showed that the instrument and the findings had a high level of consistency.

## CHAPTER 5 – DISCUSSION AND RECOMMENDATIONS

### 5.1 Discussion

The growth of online education has become very important in the educational process for both the students and the universities that provide this service. By using the Web, universities and students can reach geographical areas that were impossible to reach before. Employees all over the world can pursue their online education without leaving their jobs. Different studies about the effectiveness of online education compared to conventional classroom education have found that there is no gap existing between the two types of educations (Phillips, 2007). Online participants have proved that they can achieve at the same level and have the same grades as the classroom participants when they have the similar coursework (Neuhauser, 2002). However, other studies have found that online education does not have the same effectiveness of traditional classroom education and that the value of online degrees is less than those received with traditional education (Bullock, 2003). The major concerns are about the lack of instructors' experience and the capability of that educational environment to prepare students for jobs (Bullock, 2003). Other concerns about the effectiveness of the online education stem from the newness of this educational environment and the need for established institutions for online education (Scheeres, 2002).

Jordanian organizations have traditionally preferred to hire employees who earned their degrees in the traditional classroom settings, but this study found that the performance levels of employees in Jordanian organizations do not differ between

employees who earned their degree through online education and employees who earned their degrees via traditional classroom education.

There has been no previous study comparing employee effectiveness in Jordan. This study was done in three large Jordanian organizations with the hope that the findings of the study will affect the perceptions and the way that these organizations look at online degree holders.

## **5.2 Recommendations**

Based on the findings of this study, the researcher found that there is no significant statistical difference between perception of the employers of the performance levels of employees who earned their degrees through online education and those employees who earned their degrees via conventional classroom education. The findings were validated by using the ANOVA test and the t-test, and they all give the same result.

The conclusion of this study should increase the employment of online degree holders by different organizations in Jordan. These organizations should improve their hiring practices by giving online degree holders the same chance that they give the traditional classroom degree holder.

The conclusion of this study should also influence the administrations in these organizations by encouraging their employees to take online courses, especially with the increase of accredited online institutions, and that should affect the performance level of the organizations as a whole.

The conclusion of this study should also influence the institutions that provide online education to better train the instructors and keep up with the latest techniques that

can keep online education on a par with conventional classroom education. The findings of the study should also encourage schools that only focus on traditional classroom education to begin planning to provide online education, in particular those school with a good reputations. That will make it easy for those who would like to attend the school but who are far away from it.

This study may also be helpful for the ministry of education in Jordan. The results may encourage the ministry to take into account the effectiveness of online education in graduate study, or even in the schools. The ministry might, for instance, apply online education to create smart schools in which the students take all the courses by online education. This way is effective, as the case mentioned in the literature review shows.

### **5.3 Future Study**

This study was prepared in Jordan, focusing on the participants who hold a master's and a Ph.D. degree; this study may affect the way organizations in Jordan hire new employees. Further study could focus on those employees who hold a bachelors degree from either online or traditional schools. Another future study could be done comparing the productivity of females versus males.

### **5.4 Summary**

This quantitative study was conducted in different organizations in Jordan in order to find out the difference in the performance levels of employees who earned their degrees through conventional classroom education versus those who earned their degrees online. The study focused only on master's degrees holders and Ph.D. holders. The

finding was that online degree holders perform as well as those who earned their degrees in the traditional classroom setting, and these findings show the need to do more research in Jordan to confirm this result.

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## APPENDIX A

### Survey Instrument for Employees

I am conducting a survey to explore if there is a difference on your performance level before you obtained your master's or Ph.D. degree, and after you obtained the degree. The survey is consisting of 14 questions, in addition to the demographic part. Please note that your response is important .Responses will remain confidential. Your participation in the study is completely voluntary and you are not required to provide any personal information. A level from 1 to 10 is provided to choose your answer where 1 indicates the worst and 10 indicates the best. If you want to add any additional information, please do that on the comment part, when you had done with your answers please send it to [ibr\\_moh@yahoo.com](mailto:ibr_moh@yahoo.com). Your effort is appreciated.

## Demographics

1. Gender

Male

Female

2. Your level of education

Classroom  Master's  Ph.D..

Online  Master's  . Ph.D..

3. Years at the current job before the degree

Less than 6 months

1 – 3.

4 – 6.

7 – 10.

More than 10 years.

4. Years at the current job after the degree

Less than 6 months

1 – 3.

4 – 6.

7 – 10.

More than 10 years.

5. Age:

Younger than 30

30-40

41-50

- 51-60
- Older than 60



Please answer the following questions where 1 indicates the worst and 10 indicate the best.

Note: Before: indicates before you got your degree

After: indicates after you got your degree

1. Job knowledge: such as the level of supervision required and the level of expertise.

Before: 1 2 3 4 5 6 7 8 9 10

After: 1 2 3 4 5 6 7 8 9 10

2. Productivity: such as how long it takes you to complete the assignment.

Before: 1 2 3 4 5 6 7 8 9 10

After: 1 2 3 4 5 6 7 8 9 10

3. Quality: such as the number of defects and warranty claims

Before: 1 2 3 4 5 6 7 8 9 10

After: 1 2 3 4 5 6 7 8 9 10

4. Customer service: such as customer satisfaction and customer retention.

Before: 1 2 3 4 5 6 7 8 9 10

After: 1 2 3 4 5 6 7 8 9 10

5. You are doing you job with excellent skills

Before: 1 2 3 4 5 6 7 8 9 10

After: 1 2 3 4 5 6 7 8 9 10

6. You usually doing things on time

Before: 1 2 3 4 5 6 7 8 9 10

After: 1 2 3 4 5 6 7 8 9 10

7. You are doing things with responsibility

Before: 1 2 3 4 5 6 7 8 9 10

After: 1 2 3 4 5 6 7 8 9 10

8. You are willing to do extra work

Before: 1 2 3 4 5 6 7 8 9 10

After: 1 2 3 4 5 6 7 8 9 10

9. You usually do the things right from the first time

Before: 1 2 3 4 5 6 7 8 9 10

After: 1 2 3 4 5 6 7 8 9 10

10. You discover ways to do the work than they were being done before

Before: 1 2 3 4 5 6 7 8 9 10

After: 1 2 3 4 5 6 7 8 9 10

11. You fit in well with the culture of the organization

Before: 1 2 3 4 5 6 7 8 9 10

After: 1 2 3 4 5 6 7 8 9 10

12. What is the level of doing the job correctly?

Before: 1 2 3 4 5 6 7 8 9 10

After: 1 2 3 4 5 6 7 8 9 10

13. You are so efficient that your absence result in significantly lower productivity.

Before: 1 2 3 4 5 6 7 8 9 10

After: 1 2 3 4 5 6 7 8 9 10

14. Your overall productivity.

Before:      1      2      3      4      5      6      7      8      9      10

After: 1      2      3      4      5      6      7      8      9      10

Comments:

## **APPENDIX B**

### **Survey Instrument for Managers**

I am conducting a survey to explore if there is a difference on the employee performance level before he/she obtained his Master's or Ph.D. degree, and after he/she obtained the degree. The survey is consisting of 14 questions, in addition to the demographic part. Please note that your response is important .Responses will remain confidential. Your participation in the study is completely voluntary and you are not required to provide any personal information. A level from 1 to 10 is provided to choose your answer where 1 indicates the worst and 10 indicates the best .If you want to add any additional information, please do that on the comment part, when you had done with your answers please send it to [ibr\\_moh@yahoo.com](mailto:ibr_moh@yahoo.com). Your effort is appreciated.

## Demographics

Please answer the following questions if you have an employee earned his master's degree or Ph.D. degree by online education and an employee earned his master's degree or Ph.D. by classroom education and he/she is in his job for at least six months after he /she earned his/her degree.

1. The employee level of education

Classroom  Master's  Ph.D..

Online  Master's  Ph.D..

2. The employee gender

Male

Female.

3. The employee Age:

Younger than 30

30-40

41-50

51-60

Older than 60

4. Years for the employee at the job before earned the degree

less than 6 months

more than 6 months

5. Years for the employee at the job after earned the degree

- ( ) less than 6 months
- ( ) more than 6 months

Please answer the following questions where 1 indicates the worst and 10 indicate the best.

Note: Before: indicates before you got your degree  
 After: indicates after you got your degree

1. The employee job knowledge: such as the level of supervision required and the level of expertise .

Before: 1 2 3 4 5 6 7 8 9 10  
 After: 1 2 3 4 5 6 7 8 9 10

2. The employee productivity: such as how long it takes him/her to complete the assignment.

Before: 1 2 3 4 5 6 7 8 9 10  
 After: 1 2 3 4 5 6 7 8 9 10

3. The employee quality: such as the number of defects and warranty claims .

Before: 1 2 3 4 5 6 7 8 9 10  
 After: 1 2 3 4 5 6 7 8 9 10

4. The employee is providing a very good customer service: such as customer satisfaction and customer retention.

Before: 1 2 3 4 5 6 7 8 9 10  
 After: 1 2 3 4 5 6 7 8 9 10

5. The employee is doing his job with excellent skills

Before: 1 2 3 4 5 6 7 8 9 10  
After: 1 2 3 4 5 6 7 8 9 10

6. The employee usually doing things on time

Before: 1 2 3 4 5 6 7 8 9 10  
After: 1 2 3 4 5 6 7 8 9 10

7. The employee is willing to do extra work

Before: 1 2 3 4 5 6 7 8 9 10  
After: 1 2 3 4 5 6 7 8 9 10

8. The employee usually does the things right from the first time

Before: 1 2 3 4 5 6 7 8 9 10  
After: 1 2 3 4 5 6 7 8 9 10

9. The employee discovers ways to do the work than they were being done before

Before: 1 2 3 4 5 6 7 8 9 10  
After: 1 2 3 4 5 6 7 8 9 10

10. The employee fits in well with the culture of the organization

Before: 1 2 3 4 5 6 7 8 9 10  
After: 1 2 3 4 5 6 7 8 9 10

11. The employee is doing his job correctly.

Before: 1 2 3 4 5 6 7 8 9 10  
After: 1 2 3 4 5 6 7 8 9 10

12. The employee is so efficient that his absence result in significantly lower productivity.

Before:	1	2	3	4	5	6	7	8	9	10
After:	1	2	3	4	5	6	7	8	9	10

13. The employee produces excellent results

Before:	1	2	3	4	5	6	7	8	9	10
After:	1	2	3	4	5	6	7	8	9	10

14. The employee overall productivity .

Before:	1	2	3	4	5	6	7	8	9	10
After:	1	2	3	4	5	6	7	8	9	10

Comments: