

PILOT EXPERIMENTAL FOR PRE-SERVIES TEACHER TO DELIVER THE OBJECTIVES OF ISLAMIC EDUCATION VIA MULTIMEDIA

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Abstract

This study investigates the influence of delivering Islamic education objectives via multimedia, The main question of this Research is: whether Multimedia can deliver the objectives of Islamic Education better than the traditional methods. The multimedia background and its contributions in the field of education are also examined. Instruments have been used in this study: Pilot Experiments instruction. The study use quantitative data was generated from the sample. The ultimate aim of this research is to determine the positive and negatives effects of using multimedia inIslamicEducation. Data were gathered by Pilot experiments. The results of Pilot experiment findings show that there are wide acceptances among Pre-Service Teachers, that the Islamic education via multimedia rather than the traditional methods Finally the study concludes with several suggestions and recommendations for using multimedia in this regard.

Problem Of Research

There is now sufficient evidence provided by the researchers within the field of Islamic education in Kuwait (Al-FailakawÊ, 2003; Al-Ghannam, 2002) indicating that one of the central issues facing the subject is that : inactive teaching methods severely limit achievement of the main educational objectives in Islamic Education. Experts and researchers in the field further criticise the teaching of Islamic subjects in Kuwaiti Educational system due to its lack of multimedia use in the achievement of

its objectives. The ministry of education in Kuwait, represented by the department of Islamic Education subjects, has not shown extensive interest in using multimedia nor has it encouraged teachers to implement the use of multimedia in their classroom teaching. Other subjects such as English Language, Maths, Arabic Language, etc. are currently adopting the use of multimedia to facilitate learning, to correct any learning difficulties and to meet other needs that Kuwaiti pupils may have.

Educators are currently experiencing an explosion of multimedia instructional systems. Multimedia has suddenly become fact in global technology for instruction and learning. Although multimedia instruction is the fastest growing area of educational technology research, little is actually known about how to design effectively and implement these systems for their educational applications (Romiszowski, 1997). The use of multimedia in industry has been extensive, as it has been effective in increasing productivity and improving memory retention rates, where research has shown that people remember 20% of what they see, 40% of what they see and hear, but about 75% of what they see, hear and do simultaneously (Lindstrom, 1994).

It appears that within the Kuwaiti national curriculum Islamic education is the main area where multimedia technology is least used to improve teaching and learning. Moreover, teachers of the Islamic education subject do not have enough opportunity during their initial teacher training to develop their skills and understanding of multimedia technology and its potential benefits in creating an effective educational environment. It should be noted that there is now enough research-based evidence to suggest that Islamic education in all levels of the educational system has become relatively ineffective in communicating its main objectives to students. As a result the students increasingly find the subject boring as the main instruction medium is either

lecturing or centered on teaching selected texts. This static learning and teaching environment is failing to facilitate active participation of students in the topics covered.

The core educational values of Islam contained within its central sources, the Qur'an and Hadiths, explicitly stress the importance of education and encourage teachers to provide clear and effective instruction while teaching an aspect of Islam. Most importantly the educational teachings of Islam suggest adopting best methods and instruments while teaching as well as taking seriously the needs and reality of the learners. The Qur'an, for example was revealed originally as short passages mostly as a response to a particular problem or an issue experienced by its first audience in 7th century Arabia. Thus, it is clear that the Qur'an took the needs and conditions of its first addressees very seriously while communicating its main values to them. Similarly several authentic narrations attributed to the prophet Muhammad explicitly suggest that Muslims should teach and explain religious issues according to learner's level of understanding.

As such it is clear that at least in principle any new technology that facilitates better learning and teaching should be welcomed by Muslim educators. However, it appears that due to the influence of traditional cultural attitudes this fundamental educational openness in Islam is not always observable in today's diverse Muslim societies. Despite its highly modernized infrastructure, the Kuwaiti educational system, like most of the Gulf states, reflects features of a traditional educational system in which rote learning, and dominance of the teacher's authority are clearly observable. Particularly the Islamic education curriculum reflects most of these rather negative trends of educational conservatism and, in some cases, even authoritarianism.

The current research strongly suggests that the State of Kuwait needs to resist the temptation of conservatism in this area of education and at the same time the government should be encouraged to insert multimedia as a primary element in the field of Islamic education, and to make the effort to develop an educational system required for the continued progress of any society in the world.

The main focus of the present study can be summarised (see Figure 1) as an exploration of issues informing the use of multimedia in delivering Islamic education objectives.

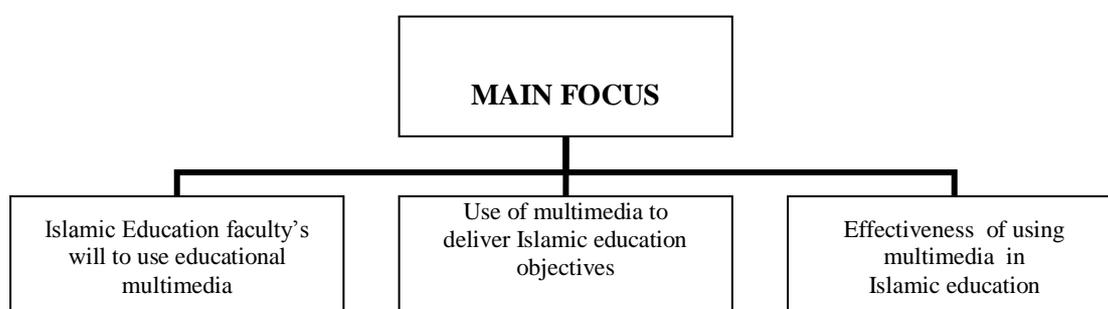


Figure 1: Main Focus of the Study

Research Questions

Based on the above described wider research context and problems the study will attempt to answer the following specific questions:

1. Can multimedia be used to deliver Islamic education objectives?
2. Can the delivery of Islamic education objectives by multimedia be successful?
3. Are Islamic education teachers willing to accept the use of multimedia?
4. Do the Pre-Services teachers in Islamic education find it difficult to deal with multimedia?

The study aims to contribute to a wider understanding of the use of multimedia in Islamic education in the state of Kuwait. In the light of these specific research questions the broad study aims are to :

1. Investigate relevance and practicality of multimedia use in delivering Islamic education objectives.
2. Explore attitudes/views of Pre-Services teachers of Islamic education towards the use of multimedia in Islamic education classroom.
3. Consider the overall pedagogic contribution of multimedia use for the planning and delivery of Islamic education objectives.

Significance of the Study

The research strategies in Islamic education generally are limited to historical or theological approaches. The significance of the present study lies in its attempt to investigate challenges facing Islamic education through adopting a rigorous empirical research strategy, involving general social sciences and educational research methodologies in particular. In addition, the study is intended to be a contribution to the ongoing efforts, both at the levels of practitioners and policy makers, to improve the teaching and learning strategies in Islamic education.

Limits of the Study

The limitations of the study are as follows:

1. The study is limited to pre-service teachers/teacher trainees who are majoring in Islamic education at the College of Basic Education and who are enrolled on “Computer in Education” courses for the academic year 2009/2010.
2. The study is also limited to the use of presentation multimedia in the delivery of Islamic education objectives in a sample study.

Literature Reviews

Abdul-hafiz Mohammed writes in his book (*Introduction to technology education*) that all sides of involving technology in education should be discussed to show how it would positively help the teaching and learning process. He mentions that this help will take account of individual differences and provide feedback to the learner, increase the abilities of the sender and the receiver and add to skills in general. In particular, IT skills can be used in teaching and will help in the acquisition of orientation and positive developments, etc. He emphasizes that they will help to reduce the time needed to learn things and develop the teachers' and students' problem-solving skills, to implement many difficult tests and install rounded concepts, together with conversational and other social skills.

The interest in using multimedia as a method of teaching is obvious. Many countries have known about the benefits of technological tools in teaching students and been discussing it for years. Moreover, many international conferences have discussed the value of improving the curriculum by using multimedia and other technological devices to aid teaching in schools. This is what UNESCO has emphasized in many conferences, such as the First International Conference of Technical and Vocational Education in 1987 in Berlin. Other conferences were held in 1998 in Australia, Greece, the United Arab Emirates, Ecuador, Kenya, similar to the International Project of Technical Vocational Education in 1992. The second conference of Technical and Vocational Education held in Seoul, Korea in April 1999 should also be mentioned. Some countries have described their search for the desired results as a successful mission and have described the process step by step. Below are listed some of the experiences contributed by different countries which have already taken this path, from which Kuwait may usefully learn.

Salem Al-Kindi

Many Arab researchers have lately written about involving technology as a method of modern teaching which impacts on students and teachers simultaneously. Salem Al-Kindi is an Omani researcher on modern educational techniques. He aims in his study to assess the expertise reached by Oman in using educational technology in general education and mentions some difficulties faced during his survey of the situation. In fact, there is often no research consensus about the best ways of combining technology with teaching, but in general the same problems remain.

Salem Al-Kindi's study is based on current assumptions, which are:

- Recruiting new techniques to assist in the educational process is an important part of the development of general education.
- Recruiting modern techniques in education has the purpose of improving the efficiency of the various elements of teaching.

He has certain goals in mind, which would be attained by writing this study. Briefly, his aims in the research are the following:

- To encourage the use of modern techniques as a method of teaching in the schools of Oman. He is sure that when readers (teachers in particular) see the advantages of using multimedia in teaching students, they will at once be interested in trying them out.
- To identify the difficulties for himself (and later for the government) in implementing in education in Oman.
- To provide some suggestions to the Ministry of Education which may help to increase the effectiveness of technological devices in Omani education.

The findings in this study discuss a few issues and problems which Salem Al-Kindi faced throughout. One was that many teachers in his society are unfamiliar with the importance of using multimedia as a new method in teaching and with the huge impact they might have on the students, both their excitement in learning in class and how easily they would memorise the information conveyed by these means. Unfortunately, however, the responses to some points about the use of this modern technology were discouraging and less enthusiastic than expected. This implies that the teachers and the supervisors, although they are keen to improve their ways of teaching, prefer to go on using the same methods, even though they already know about the value of combining it with multimedia technologies. He emphasises that the principals in the Ministry of Education in Oman should consider establishing a training programme for teachers to offer professional experience in IT in order to improve their ways of teaching.

Another issue which Al-Kindi highlights is the lack of training courses for teachers. Without these professional courses, the teachers cannot always use the equipment correctly and they might lead their students into further difficulties in understanding the subject matter. Therefore, the researcher has identified a lack of training courses for teachers, especially courses that teach them how to produce and develop their teaching materials. This has led to a greater difficulty for teachers who tried to utilise educational technology. That was the most formidable problem for them because lack of training leads to all sorts of difficulties that were observed in the present study. It can be the source of more difficulties if it is not countered and dealt with properly (Alkindi,2005).

He considers this problem the main difficulty faced by teachers in teaching their students. It will lead to even more problems for both teachers and students because the former will fail to deliver the information to their students adequately and the latter will find difficulty in understanding their subjects and earn lower grades.

In conclusion, the researcher notes that the students included in his study are more aware of ways to convey their subjects using the technological tools; they think they are important and valuable. The benefits of this method are great to both them and their teachers. Hence, he wants schools to be provided with educational technology and teaching aids. If this happened, the students would doubtless overcome all the possible barriers they might face in learning their school subjects.

I. Abdulaziz AlSultan (1999)

Another study, from Saudi Arabia, is by Abdulaziz Al-Sultan (1999), who writes about using the Internet in education. His research surveys different schools in Saudi Arabia. Abdulaziz Al-Sultan finds that the use of the Internet in education is very important for improving the delivery of education; he sheds light on the positive and negative impacts of using this technological method and the reactions of teachers and students in their acceptance and rejection of it as a method of teaching.

Abdulaziz claims that in general people all over the world naturally do not like to change what they have become used to. Some people will try to resist anything new but others encourage any change in their everyday life. One of the factors which the researcher found in his study is the resistance of teachers, who refused to change their ways of teaching inside classrooms. This resistance was in no way obvious, but they simply refused to attend courses or lectures which discussed new and modern methods of teaching, or ignored these ways of teaching and continued to teach in the same familiar ways. With this behaviour, teachers resist change and view it negatively.

Dr. Mustafa Fallata (2006) claims that resistance towards change results mainly from the following factors:

- Some teachers prefer to persist in their old ways of teaching, without giving any clear reasons.
- Some teachers are unwilling to adapt any modern method and techniques. They may feel insecure because they have no experience or skills in using these techniques and they are afraid of failure if they use them, which will lead to further problems, such as weakening the connection between them and their students and teaching which does not result in understanding.
- The feeling of indifference toward the new things and change. Some of the teachers prefer routine and are reluctant to change.

Abdulaziz-Al-Sultan added some other factors, noted during his research. Among the main ones after his presentation to a number of teachers were:

- The language barrier. English is not the first language for Saudis and there are many teachers who are not fluent in it; they may lack the self-confidence even to speak one or two words. Some teachers dislike admitting their fear of using English in class, however little. But some agree with the researcher that they should learn more English.
- Another factor is IT ignorance. Many teachers know nothing about using and dealing with computers. They feel that learning skills is difficult. Some teachers are not interested in practicing with computers even during their spare time. The first two factors are the main barriers to the use of multimedia, IT, or other modern techniques.

- Unfortunately, some of the teachers in the researcher's survey were lazy; they were not happy about possible changes in their careers because they believe that these changes will increase their workload and require more hours of work in learning these methods and then preparing lessons adapted to them. Their present method of teaching requires them only to talk to their students about what they have put on the board, which takes only a few minutes to write.
- The last factor is the need to teaching these teachers the most up-to-date methods and how to use technology as a method of delivering their classes to students. To prepare these teachers will take a good deal of time, in particular if they have no experience of using such technologies.

After completing his survey of teachers and students, the researcher found the results better than he had expected. The resistance which he found in the first place was less than he thought and some teachers were willing and happy with such changes, while many students were happy and interested in seeing the difference between the two ways of teaching and preferred the modern way, because it would help them to understand better and memorise more easily. In general the survey result encouraged all sides to believe in the benefits of using multimedia.

His survey is based on data from 210 educators, teachers and supervisors in different regions of Saudi Arabia. He asked some questions about the use of computers in teaching and found that 70% of his respondents encouraged the use of computers in the classroom. 91% indeed were in favour of supporting the use of computers not only inside but also outside classrooms, because it would help students to increase their skills in using computers in learning subjects and would also help them to educate themselves independently with such equipment. The researcher asked also for

their views on the use of computers as a method of teaching and only 8% thought it was difficult. Through the survey, he found many advantages that encouraged him to recommend the use of IT:

- It will encourage people to learn more and practice using technology such as computers, since the percentage who liked the idea of using technology in education was 70%, some of whom had no computer at home. But using computers in education will help to increase the cultural awareness of learning and practicing the new technology.
- Purchasing power in Saudi Arabia is considered one of the highest in the area. Using IT in education will increase the number of computers bought for personal use and thus diminish IT ignorance and increase the awareness of its importance. In particular, the percentage of people who wanted to encourage multimedia teaching was extremely high, 91%.
- 18 teachers only believed that dealing with IT is difficult. Compared with the teachers who do not own a computer, this is considered a small number and indicates that the psychological barrier factor is weak even among those who have not dealt with computers so far.

Among the students, the results show that many students have their own computers at home. 70% of them believed that the use of computers in education would help them by facilitating their learning and understanding, although 17% thought that it was difficult to use such technology inside the classroom.

Elsewhere in this study, the writer shows the negative side of using IT in education. The first negative factor is widespread in all societies such impact of unsustainable use of as ours and concerns the immoral websites and programs held on websites. Some educators offer solutions to this problem to prevent their bad influence upon

students, such as programs which prevent users from accessing selected sites on the network when they use the computers after their lessons. Other solutions are lectures to spread cultural awareness and have open discussions to talk about the negative impact on students of accessing such sites.

After mentioning the factors of resistance felt by some teachers in Saudi Arabia and the students' views, with his generally encouraging results, A-Al-Sultan (1999) says that there are many factors which the Ministry of Education should consider in order to ensure the successful use of technological tools in education.

- Government support is vitally important in phasing the budgets for implementing the tools and whatever the schools need to prevent undue pressure on the Ministry of Education's own budget.
- It should also encourage also private institutions, companies and centres to participate in supporting teachers, students and schools.
- It should arrange programmes and professional courses for teachers in order to prepare them to deal with multimedia and use it properly. Otherwise, there will be adverse consequences for the Ministry and the students would be the victims because they will not understand their lessons and will earn lower grades.
- It should provide the technical support and maintenance in every school, to ensure that if a device needs repair, it can be seen to at once, without interrupting the class.
- It should help future teachers in universities and colleges by introducing a basic element in their course which discusses and teaches them how to use the technology properly in their teaching and to give them practice in the use of technological devices, with lectures to gain the knowledge that they need.

- It should integrate the information about technological devices into the curricula to help teachers use them without effort the first time in front of the students.
- It should plan symposiums, lectures and courses to encourage educators, teachers and supervisors to understand the technology and understand the benefits for teaching.

Abdulaziz Al-Sultan believes that if the Ministry of Education were to follow the steps suggested in his study, the effort would succeed. His beliefs are shared with many educators, teachers, supervisors and principals in the Ministry of Education; his survey makes this clear. Saudi Arabia has to do some hard work to gain the outstanding results they should have, given that it is considered one of the richest countries in the world.

This is why the government should encourage this study to prepare a sophisticated generation for the job of improving their country.

To prevent a biased view of the use of multimedia in Kuwaiti schools, religious men were asked to come up with four views from different levels of education and social position which could together form a larger view.

Nayef Al-Hajaj is a Kuwaiti teacher in the University of Kuwait, who teaches Islamic education. He supports the idea of using multimedia in Islamic education. When asked why he thought of doing so as a basic educational method, he replied that these days the world was different and many things were changing within years or even days; for example, the Ministry of Education changes the curriculum every few years. In line with this, teachers too should change their methods of teaching for many reasons, one of them being the level of understanding in young students, which is not as it used to be. Nowadays children can learn a good deal of complicated information

which older generations could not easily grasp. Therefore, he supports the use of multimedia because it makes learning easier and is associated with modern things all over the world. Its use would show that Islamic education is not wholly abstract in its content, but is a subject and body of knowledge which can be developed in different times and places.

But the use of multimedia should not be an open field. Teachers should accept some limitations and be strict in what they choose. This is because some devices are not suitable for use in this context. He was afraid that that some teachers might perhaps impair the value of Islamic learning by choosing some unsuitable devices.

(Al-Hajaj 2008).

A contrasting view was expressed by Mohammed Al-Rashidey, another teacher in the University of Kuwait. He disapproved of the whole idea. He refused to involve technology in the teaching of Islamic education and he preferred to retain the old traditional method of teaching, because, according to him, it was a safer way of preserving the value of Islamic education; technology is “not necessary” he said. He believed that Islamic education needs no improvements in the teachers’ methods because it is an easy subject to learn, which does not call for many explanations, and is very simple understand. His rejection of multimedia techniques can be attributed to his fear for the future. He thought that, over time, teachers would perhaps choose devices for harmful reasons. For example, he says that some teachers might introduce music (which is not allowed in Islamic education) into classrooms which would reduce the value of Islamic education. (Al-Rashidey,2008)

Rashed AlOmiry is a doctor in the College of Legislation in Kuwait. He said that the general idea of multimedia devices for the younger generation is associated with having fun and playing games and that, if teachers use multimedia in teaching Islamic

education the students will become confused and, without noticing the Islamic education, will lose some of the value and respect which they should feel towards it. Young people think differently from adults and the results of using multimedia would not appear as positive ones. Immediately students thought that Islamic education Islamic was some kind of fun class, they would cease to show due concentration and attention and the classes would cease to have the proper influence, because of the general idea of multimedia already in their minds. (AlOmiry,2008).

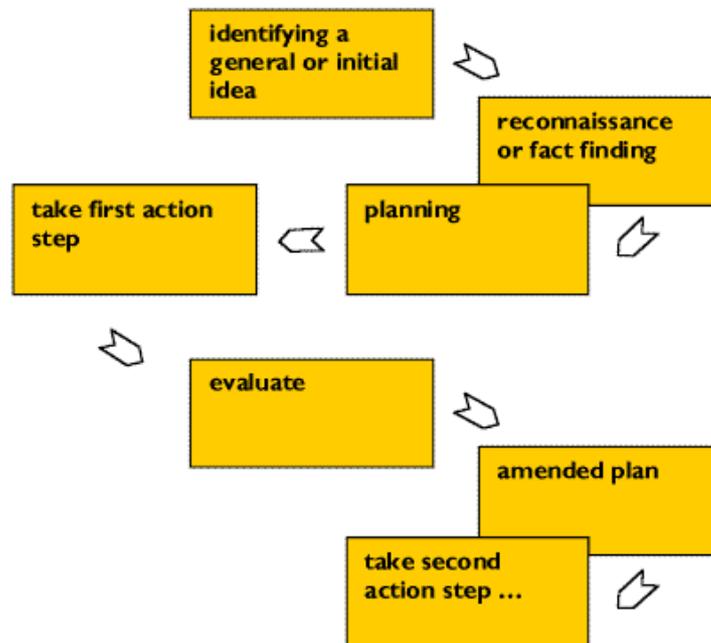
The last view was contributed by Mohammed Faris. He is an active researcher in Islamic affairs and an Imam in Kuwait City. His opinion was that teachers can use multimedia properly and positively if they choose suitable devices. Not all technological devices are properly used in Islamic education, with some exceptions, for example, CD recordings are perfect for helping students to repeat and memorize the Qur'anic verses. (Faris,2008)

Research Methodology

Much of this research is now more commonly described as action research, whose original roots in the scientific paradigm is evident according to Kurt Lewin in describing each step deductively leading to another. Lewin (1948) argued that:

“The research needed for social practice can best be characterized as research for social management or social engineering. It is a type of action-research, a comparative research on the conditions and effects of various forms of social action, and research leading to social action. Research that produces nothing but books will not suffice” (Lewin, 1948).

Kurt Lewin is generally credited as the person who coined the term ‘**action research**’.



Recently, the socio-anthropological aspect tends to be much more evident in action research (O’Hanlon, 1996).

Each paradigm has three distinct features of its own: ontology, epistemology and methodology. In more detail, ontology is the study of what exists or the reality being investigated by the researcher. On this basis, the reality which is investigating in this study that the delivery of Islamic education objectives via multimedia. Epistemology is concerned with the way in which we can come to know about this reality or the relationship between the reality and the researcher. I want in this research to discover how my investigation of the specific teaching of Islamic education with multimedia on behalf state of Kuwait is going to contribute to the wider understanding of the value of multimedia in this field. Methodology looks at the means of acquiring this knowledge or the design and

techniques used by the researcher to investigate the reality under scrutiny (Healy and Perry, 2000; Coll and Taylor, 2001). My study will deploy a survey methodology using a mixed approach (quantitative and qualitative) to investigate the delivery of Islamic education objectives via multimedia.

Each researcher is influenced by these epistemological paradigms and forms his/her own theoretical framework in order to carry out his or her research. As a novice researcher, I intend in this chapter to evaluate the implications of positivism quantitative and constructivism qualitative for my research in order to justify the approach taken in the present study.

I am compelled to find my data by directly interacting with the educational field of Ministry of Education students and teachers. This kind of interaction must reflect their social and cultural context, which will enrich the account of the phenomena being investigated. Pragmatically, providing the type of evidence that the decision-makers find useful is most likely to cause change.

Positivist Paradigms in Research (Quantitative)

Positivism is founded on an ontological belief that reality and the knowledge we obtain from it, are of things which exist. Critics like Healy and Perry (2000) argue that, positivists hold that there is knowledge or reality 'out there' in a world, which exists independently of people. Positivism also argues that when something exists it can be measured accurately and defined clearly so that the knowledge of it can be expressed in measurements. The world from the positivists' point of view is only rational in this sense. This being the case, positivism makes use of quantitative data which derive from strict rules and procedures (Robson, 2002). Some of the methods adopted by positivists are structured experiments and interviews, which all aim to collect quantifiable data.

From this perspective, part of the aim of this project was to measure the delivery of Islamic Education Objectives through Multimedia, so the research uses an experimental approach designed to arrive at some of the quantifiable aspects of students' attitudes. This should produce data which can be statistically analyzed and generalizable.

According to Healy and Perry (2000), positivists separate themselves from the world which they study, mainly because in their research they view the world as spectators, as it were, through a "one-way mirror" as if they have no relation to it or impact on it. Its weakness, according to constructivists is that it is fundamentally inappropriate for studying a social science phenomenon, because it treats respondents as if they were independent, non-reflective objects and ignores their ability to reflect on problem situations in an interdependent way (Robson, 2002). Consequently, to use only positivist methods to measure Pre-Service teachers' attitudes would be to leave out an important dimension of the data.

Positivists argue that individuals learn behavior and act sufficiently logically that it is possible to predict what someone will usually do in a particular set of circumstances.

This, combined with using large samples, means that the uniqueness of individual reactions may be ignored. To create policies, all decision-makers need to know is what factors are likely to be most effective in the learning process (Tall, 2007). The positivist paradigm, therefore, defends its argument in a very strict and structured way.

Although the positivist paradigm provides us with an ideal for scientific research, it was found to be unhelpful in areas of research, which study what happens in society by observing it in detail. Whilst I agree with many of the positivism's assumptions about knowledge and how to measure it, I think that it will not be able to answer all the questions raised by my subject.

Pilot Experiment

Although, the intention is to investigate the use of multimedia for pre-service Teachers, it was considered essential to first check the potential value of the material by using it with trainee teachers. If they did not find it helpful, teachers would be unlikely to use it with their pupils in schools. The population of this study consists of the pre-service

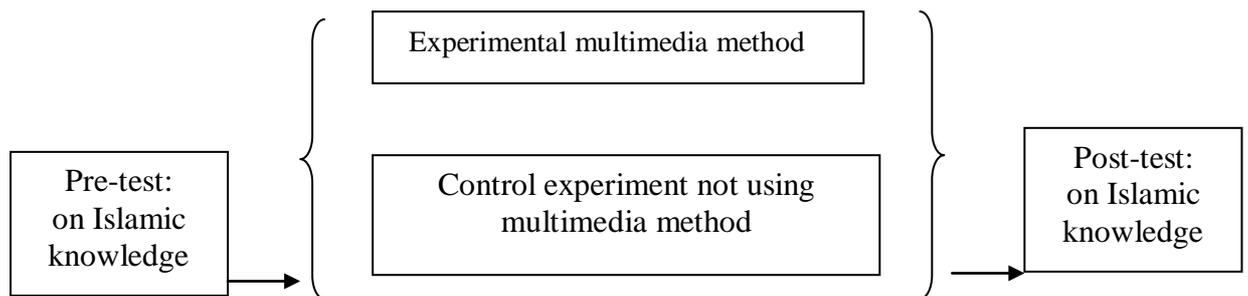
teachers enrolled as current students at the College of Basic Education in Kuwait during the academic year of 2009/2010. According to the office of the assistant dean of students' affairs, the number of pre-service teachers majoring in the field of Islamic education is 233. These students are divided into two sub-majors: Islamic education for primary level and Islamic education for intermediate and secondary level. The number of Islamic education primary major is 189, which became the target population of the current study.

To ensure a representative sample of the 189 pre-service teachers, a stratified sampling procedure consisting of 28 participants will be applied, and they will be separated into male and female. The reason for selecting them on the basis of gender is that females outnumber males by 10:4. The two subgroups (18 male and 38 female) will be randomly assigned to each of the two treatments of the study, an experimental group and a control group. Subjects were selected from the defined population by using a cluster sampling method. It was easier and

more convenient to select groups of individuals than to select individuals from a defined population (Borg *et al.*, 1996). Classrooms were selected based on the instructor's co-operation. Approximately 56 students were enrolled, and these students constituted the population of the study. Thus, the appropriate sample size for this study was 56 students

Pilot research design

The basic research design fits the positivist paradigm using an experimental, or as it is sometimes described, a quasi-experimental design. It therefore, utilised an experimental design with a pre- and post-test to help control group design. According to Borg *et al.* (1996), this design controls for history, maturation, testing, instrumentation, statistical regression, differential selection, experimental mortality, and interaction of selection and maturation in striving for internal validity. In addition, the design controls for interaction of testing and X (experimental treatment) as a source of external validity. The following diagram illustrates the type of experimental design used in this study:



Different teachers taught the two classes of pre-service teachers. I used school judgment to select a good multimedia teacher and a good traditional teacher to undertake the teaching needed in the experiment.

The experimental group in this study participated in a multimedia instructional session, and the control group participated in a traditional classroom instructional session. Both groups were given a post-test to measure achievement and performance of knowledge and skills, respectively (Sullivan et al., 1990). The experimental group received instruction delivered via multimedia. The control group received traditional classroom instruction. Experimental design usually requires random sampling procedures which ensures that study sample is representative and not biased. However application of random sampling in studies exploring social and educational issues is quite difficult in that it is not always possible have a truly representative sample (Borg et al., 1996). This study aimed to ensure that the design met its requirements.

However, it be must be noted that in this study it was not always possible to follow all the experimental design procedures. For example because some of the instructors could not volunteer their class time for this study it was not possible to include them in the experiments. Where practicable, random assignment was used in this study by putting the name and number of all courses in a hat. Then, these courses were selected and assigned randomly to one of the groups, either the control group or the experimental group. A factorial design with two independent variables was used for the analysis. The two independent variables were methods of instruction and gender. The study utilised a fixed-effects model because the researcher selected specific levels of interest for both factors (Hinkle *et al.*, 1998). Two levels of instruction, traditional classroom instruction and multimedia classroom instruction, were crossed with the levels of gender (male and female). With these two factors, two dependent variables were measured -

achievement and performance on mainly cognitive tasks and skills provided by the clear instructions.

Statistical testing

Since the researcher uses a pre-score for each individual, more efficient tests than the t test and one way analysis of variance can be used. The researcher, therefore, used regression analysis - the graphic version of Analysis of Covariance (ANCOVA). The positive aspect of using regression analysis/ANCOVA over analysis of variance is that the former uses a PRE-TEST SCORE to allow the researcher to take into account pre-knowledge/ability.

Regression analysis and analysis of covariance do exactly the same task; they use the pre- test scores to predict those of the post-test. Analysis of Covariance is more commonly used, in my view, because it was easier for early computer programmes to present the outcome - literally printing out an F score and the number of degrees of freedom, all that was then required was the use of a table of F to discover the level of probability/significance of rejecting the null hypothesis. Its advantage over Regression Analysis is that it is easier to state the level of probability. Regression Analysis has the advantage for a non-statistician that the result is presented as a picture. With Analysis of Covariance, even though one 'knows' that a result is significant, one has to search the basic statistical information of mean to know whether that is because the experimental group has done better or worse. With Regression Analysis, the picture shows that: if the regression line (the correlation line when the pre-test is used to predict the post-test) for the experiment is higher than the regression line for the control then the experimental group has done better. The further apart the regression lines the better/worse continuum reflecting the performance of the experimental group. As a statistical application, regression

analysis is essentially about computing the amount of change in one variable for a unit change in another in a given experimental design. The level of significance in such an experimental design is indicated by the confidence interval drawn on either side of the control group's regression line. Commonly, as here, the confidence interval is drawn for the 5% level of significance. The results of regression analysis applied in this study will be discussed while presenting the quantitative data analysis.

Pilot Experiment

The pilot study provided preliminary information about the quality of the materials designed for use by teachers with children. It allowed the researcher to test the validity and reliability of the cognitive test used in this study. Because this study used new instruments that measure students' performance on the given subject, fifty-six pre-service Islamic education teachers were selected for the pilot study. The pilot study revealed environmental factors that might interfere with the administration of the study. Classroom selection, lighting, peripheral devices were the main obstacles facing the application of the study. One of the problems encountered was the shortage in the number of headphones compared with the number of the students participating in the study.

The limitation of the pilot element of the research was that the results obtained, to discussed in the Finding, proved that trainee teachers considered the materials relevant and that they could use them in action. The initial experiments were not designed to illustrate definitively whether:

- a) Children could use the materials.
- b) Whether recently trained teachers would be prepared to use them initially
- c) Whether such teachers would use the materials effectively in the

schools.

Or, d) Whether the religious authorities would think that the multimedia approach was relevant to the teaching of Islam.

Hence, further research was planned to broaden the findings and to provide greater impact.

Pilot Experiment Findings

The experimental and control groups were both provided with identical information. In the case of the control group Islamic education was presented by a college teacher using his normal teaching approach. The teacher and the researcher had discussed and agreed the aims of the teaching and the teacher was encouraged to provide as meaningful an experience as he could for his students. The experimental group was taught by an expert in IT in the college. The materials had all been prepared by the researcher and the expert IT teacher had become familiar with them before he began teaching it. The maximum score on the identical pre- and post-tests is 30.

Experimental Results – All Students

Table 6: Statistical Results of Experimental and Control Groups

	Control Group		Experimental Group	
	Pre-test	Post-test	Pre-test	Post-test
Correl=	0.380		-0.021	
Number	28	28	28	28
Mean =	21.9	21.5	24.9	27.0
St.Dev.	3.52	3.52	2.93	2.40
Pop.Est.St.Dev	3.59	3.58	2.99	2.44

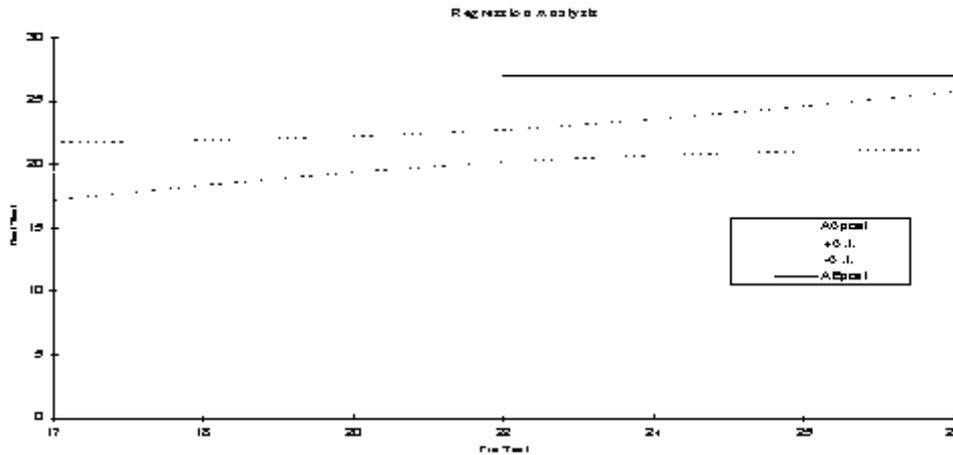
Table 6 demonstrates that the two groups were not ideal. On the pre-test, the control group only scored 21.9 on average, compared to the experimental group average score of 24.9. However, it is evident that whilst the control group apparently learned

very little during the teaching process (final score = 21.5), that of the experimental group increased to an average of 27.0. Interestingly, whilst the pre- and post-scores of the control group correlate at 0.38, there is a zero correlation for the experimental group indicating that the multimedia approach has affected individuals in different ways.

Table : Comparison of Experimental and Control Groups using Analysis of Covariance

Analysis of Covariance			
		Sums of Squares	
	df	X	Y
Between	1	123.02	423.50
Within	54	588.54	507.93
Total	55	711.55	931.43
	Adj df	VarEst	F ratio
Between	1	273.078	30.142
Within	53	9.060	
Total	54		

The score of $F=30.142$ with 1 and 53 degrees of Freedom is Highly Significant (F of 7.12 is significant at 1% level). The statistical result is illustrated effectively using the regression analysis graph.



The regression line for the experimental group is only drawn at the right of the graph, because the pre-scores of the students were higher than those of some members of the control group. The regression line can be seen to be considerably above the 95% confidence interval and hence to be statistically significant.

Experimental Results – Male and Female Students

Table 8: Comparative Statistics of Male and Female Students

Female Students	Control Group		Experimental Group	
	Pre-test	Post-test	Pre-test	Post-test
Correl=	0.445		0.198	
Number	19	19	19	19
Mean =	21.84	22.00	25.21	27.00
St.Dev.	3.33	3.66	2.55	2.62
Pop.Est.St.Dev	3.42	3.76	2.62	2.69
Male Students	Pre-test	Post-test	Pre-test	Post-test
Correl=	0.310		-0.507	
Number	9	9	9	9
Mean =	22.11	20.33	24.22	26.89
St.Dev.	3.90	2.91	3.52	1.85
Pop.Est.St.Dev	4.14	3.08	3.73	1.96

The Mean scores displayed in the above table indicate clearly differences in the degree of learning by the male and female students in the control group; with the male students showing a considerably lower average score, whilst the female students scored about the same.

When the students results were compared using analysis of covariance and regression analysis (Tables 9 and 10 below), both results are statistically significant.

Table: Comparison of Female Scores in Control and Experimental Groups

Analysis of Covariance					Adjusted
		Sums of Squares			Sum Squares
	df	X	Y	Sum Prod	X
Between	1	107.79	237.50	160.00	98.720
Within	36	333.68	384.00	128.00	334.90
Total	37	441.47	621.50	288.00	433.62
	Adj df	VarEst	F ratio		
Between	1	98.720	10.317		
Within	35	9.569			
Total	36				

F of 7.39 required for significance at 1% level.

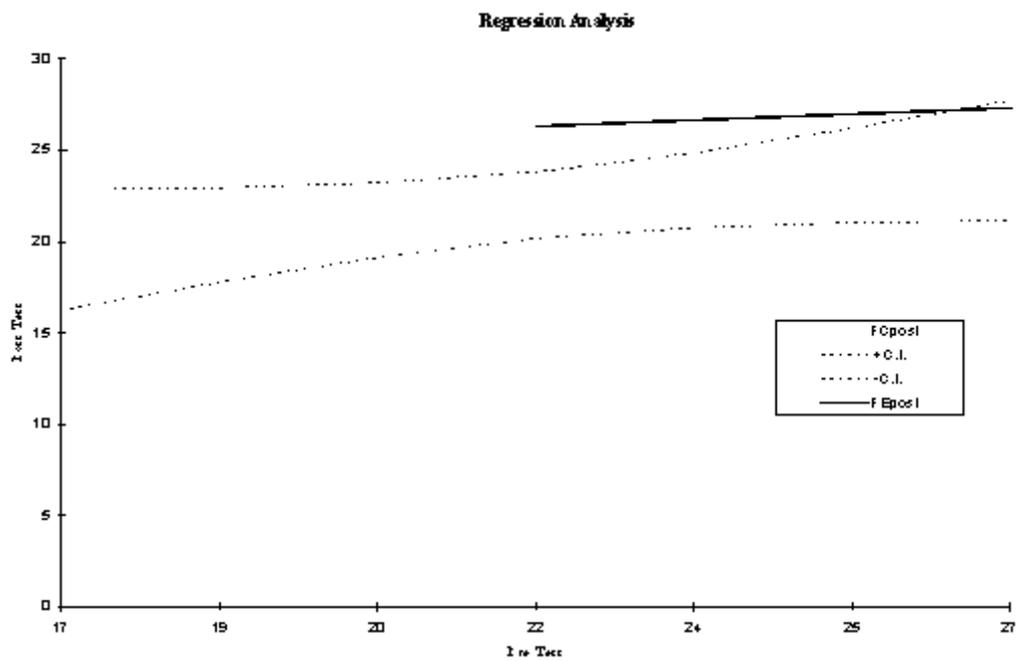
Table: Comparison of Male Scores in Control and Experimental Groups

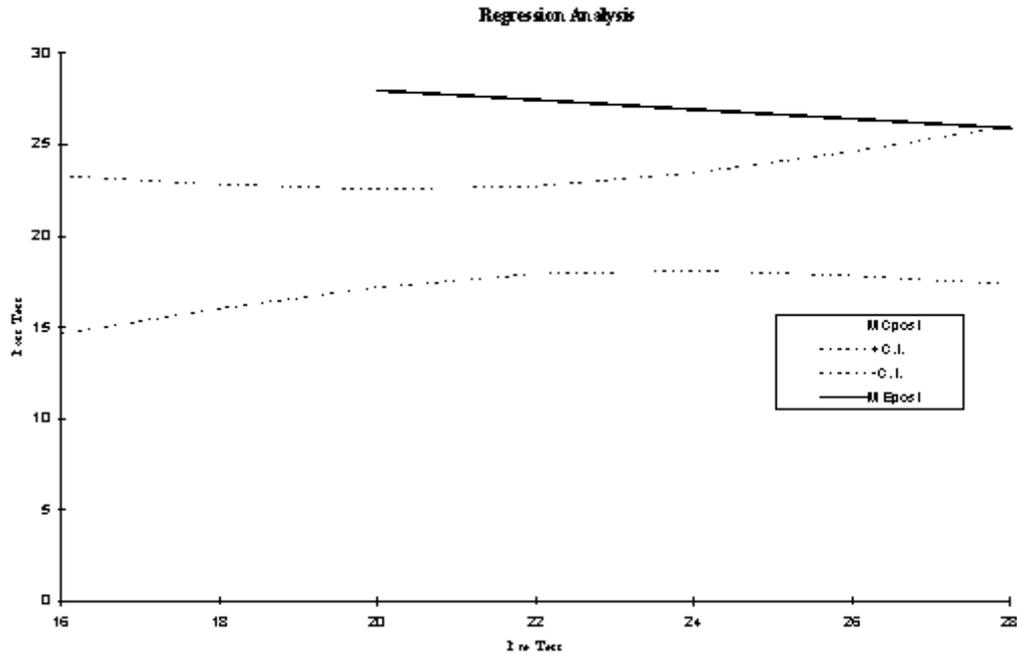
Analysis of Covariance					Adjusted
		Sums of Squares			Sum Squares
	Df	X	Y	Sum Prod	X
Between	1	20.06	193.39	62.28	178.069
Within	16	248.44	106.89	1.89	106.87
Total	17	268.50	300.28	64.17	284.94
	Adj df	VarEst	F ratio		
Between	1	178.069	24.992		
Within	15	7.125			
Total	16				

F of 8.68 required for significance at 1% level.

Although the groups are small it is evident that the statistical difference between the achievements of the control and experimental groups remain significant at the 1% level. In both, the mean scores (Table 9) showed that the experimental students did better than the control students and this is confirmed by the regression analysis figures below.

Figure 4: Regression Analysis Results of Female Students





Qualitative Comments on the Teaching Process

The researcher observed both control and experimental groups. It was evident that the students concentrated much more in the experimental group.

Conclusion

The pilot study demonstrated that compared to the traditional teaching style the use of multimedia materials by students at the College created a more effective experience of learning and teaching. Feedback from participants indicated that there was an overwhelming appreciation for and interest in multimedia. In fact most of the students who used multimedia showed natural curiosity towards the topic. Students felt that they were motivated to engage in a personal exploration an interactive learning facilitated by the diverse multimedia pedagogic tools.

However it must be notated that the pilot study also revealed some weakness in the design of the experiment. An observable weakness was in the fact that even before they were taught, the students were clearly familiar with the material and most gained more than two thirds of the possible maximum in the pre-test. This also meant that the test might underestimate any improvement and hence any advantage of the better teaching approach.

The pilot experiment demonstrated convincingly that the multimedia material was effective in the protected environment of the college with adult students. It was therefore decided, with help from the Ministry of Education, to observe the use of the material with small classes of primary pupils. In the three 'experiments' where effectiveness was the issue, the lessons were taught by the researcher, an expert in IT, and by a normal Islamic education teacher. The effectiveness of the multimedia was apparent and, as a result, it was decided to use the materials in a normal classroom, i.e. in primary classes that were single sex, and contained about twenty children each. In all cases the classes taught using multimedia obtained higher final scores, and in all but one case (a class of girls), the outcome was statistically significant. The research therefore demonstrated that multimedia is an effective teaching approach.

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