

## **Investigating online learning environments in a web-based math course in Jordan**

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### **ABSTRACT**

The Ministry of Education of Jordan (Moe) is the first institution introducing an open e-learning platform in the school system of Jordan, and has been deploying the system in 100 experimental (discovery) schools in that region. This study focuses on a web-based learning environment and the integration of uses and gratification approach into the evaluation of the quality of Jordanian tenth grade math students' experiences when interacting with an e-learning platform. This study investigates the learning activities and the relationships created when learners interacting with e-learning platform. This study uses interviews, direct classroom observations and field-notes of classroom practices. The findings suggest that Jordanian students recognized the potential of e-learning platform to support the data gathering for teaching and learning, but they were uncomfortable and unsatisfied with the learning environment provided (e.g., practiced low interactions with the features of the interface created, low student–student relationships, low student–teacher relationships and low student–media interaction). The reflection activities and technology competence for male participants were higher than female participants. The results of this study highlight the importance of integrating uses and gratifications approach into the evaluation of learning process in online learning environments.

**Key words:** *online learning, online environment, web based instruction, e-learning, online education*

### **INTRODUCTION**

Since the reformation of Knowledge Economy, Schools are attempting to move from teacher directed approaches to learning, characterized by subjective passive transmission to ones that are learner centered and knowledge constructed. One innovation school administrators and instructional staff are utilizing to make this transformation is online learning. Engagement in learning is considered to be a fundamental element for quality learning environment (Flottemesch, 2000, Garrison & Anderson, 2003; Kearsley, 1995; Sherry, 1996; Juwah, 2006). It is conceptualized as the mechanism whereby participants in the learning environment communicate with each other and respond to each other needs (Mayes, 2006). The introduction of Information Communication Technology (ICT) into a learning environment can contribute to improved various levels and types of interaction (Brown & Long, 2006), the learning experience is enriched as learners engage in interactions within the learning environment that serve to scaffold of the application of knowledge (Wiley, 2006). Recent research report that when the level of interaction is inadequate or nonexistent, learners often feel isolated and degraded of the learning experience can take place (Bibeau, 2001; Howland & Moore, 2002; Mann, 2005; Wanstreet, 2006).

Implementation of any technical innovation into a school system can be a difficult and arduous task because of the learning environment nature of schools. Clayton (2003) reports the following activities that shape online learning environments: student – interface interaction, student – tutor relationships, student – student relationships, student – media interaction, and student reflection activities. According to Allen and Seman (2006) and Pollanen (2007), online learning environments have to fulfill learners' expectations. They are expected to offer advanced interface and features to suit a myriad of learners, and at the same time they are also expected to be flexible and user friendly to suit various learning styles and educational requirements. In these settings, the role of teacher becomes that of an educational facilitator (Sherry & Wilson, 1997), because the teacher provides guidance and allows students to explore the course materials as well as related materials without restriction. Student's role on the other hand becomes knowledge generator (Palloff & Pratt, 1999), in that, the learner actively interact with the e-learning environment seeking solutions to problems confined within the knowledge are being studied with guidance from their teacher. They expected to work collaboratively and cooperatively to generate deeper levels of understanding of the course materials (Khan, 1997).

Substantial attention has been paid in the literature to focusing upon interaction within teacher-paced online environments characterized by teacher-led discourse (Maor, 2003; Ho, 2005; Ouzts, 2006). Yet, the perspective of learners concerning their experiences regarding interactions within online learning environments characterized by learner-center discourse is notably absent from the literature (Anderson et al., 2005). Knowledge about learners uses and gratifications of the online learning initiative will provide a clear picture of the online learning environment they experienced, and could be vital for the development of online initiatives and optimization of online learning environments, because successful interaction with online learning environment increases learner satisfaction and productivity and strengths acceptance of the innovation (Lazar, 2001; Shneiderman, 1998). Online learning initiatives that incorporate a more open and self-paced approach incorporate unique learning environments (Ngwenya, Annand, & Wang, 2004). This study uses use and gratification approach to measure the quality of learner's experience when interacting with a web-based e-learning platform in web-based math course. The results of this study provide guidelines for instructional designers developing instructional media for online environments when neither the instructor nor course requirements impose pace upon the learners.

## **BACKGROUND TO THE RESEARCH**

The concept of Online Learning, commonly understood as an innovative approach for course delivery through network technologies (Garrison & Anderson, 2003), has emerged across some Jordanian experimental schools as a viable alternative to traditional face-to-face instruction. To study Jordanian students on their web based e-learning platform use in a math course is to explore and evaluate the performance of the web based from their perspective, which is based on learners' expectancy to the web based e-learning platform and the gratification obtained in using it. The investigation of the learner's experience and concerning the use of these new tools is essential to realizing the full pedagogical implications and best practices for implementation (Sims & Salter, 2006). The work of Moore (1989) laid the foundation on which successive researchers have sought to explain the principles of interaction. Varying frameworks have resulted, each seeking to explain the dynamics of interaction within learning environments. For example, Garrison and Anderson (2000) focused on the structure of the teaching and learning transaction while simultaneously using the principles of interaction to form the theoretical basis of their seminal work concerning communities in inquiry (Garrison, Anderson, & Archer, 2000; Rourke, Anderson, Garrison, & Archer, 2000). These early efforts at examining interaction within online learning sought solely to analyze the substance and frequency of interpersonal interactions, with

hopes of gleaning clues as to the motivation for participants and their subsequent experiences. Uses and gratifications approach recognizes that both the web-based e-learning platform and its interaction with personal characteristics of the learner are potent determinants of learning experiences (Fraser, 1998a; Friesen & Anderson, 2004; Keenan, 2002; Su, 2006; Swan, 2002; Wallace, 2003).

Initial research on technology and tools uses and the gratifications created has focused on issues such as media user and his or her motives for media selection, media gratifications sought, and gratification outcomes (Windahl, 1981), and the impact of online technologies on the audience (Kiesler & Kraut, 1999; Silverman, 1999).

Some researcher use uses and gratifications to determine learners' perspective on web-based learning (Howland & Moore, 2002; Hara & Kling, 1999; Petride, 2002; Vonderwell, 2003; Woods, 2003; Clark, 2002; Dwyer, 2003; Garrison et al, 2004; Thurmond et al, 2002). Petride's (2002) used uses and gratifications approach to evaluate learners experiences with web-based learning environments, he concluded that: (1) Web-based users are assisted by information placed in an enjoyable e-learning context; (2) Web-based users are assisted by organizational ideas that make sense in a terms of the strategic purpose of the web-based; and (3) Web-based users are assisted by efficiently executed interface design. Usability of online learning environment was also reported by Chizmar and walber's (1999) study, he reported that students experienced easy of uses of technology used in web-based environment. On the other hand, Howland & Moore (2002) investigated learners' perceptions and uses of web-based learning environment. Their findings highlight four relationships associated with online learning were a critical issue contributed to negative perceptions of web-based learners: (1) Interaction between students and teachers; (2) Interaction between student and student; (3) Interaction between student and technology tools; and (4) Interaction between student and features of the interface.

Some researchers investigated learner characteristics that influence learners' experiences. Howland and More (2002) study concluded that students who were the most positive in their perception of online learning were those with attributes consistent with constructive learners. In contrast, the students who reported more negative perceptions of their online learning experience had expressed the need for more feedback from their teacher. Garrison et al (2004)) suggested that online learning should be viewed as more cognitive or internally oriented, online learner must take more responsibility, adjust to a new climate, adjust to new context, synthesize ideas, learn how to participate, and apply ideas to be successful in online course. On the other hand, Clark (2002) suggested that the content of online learning should be well designed, organized and personal.

Some researchers have used uses and gratifications approaches to investigate the effectiveness of web based learning environments. Dwyer (2003) assessed whether the effectiveness of web-based learning is a function of the information design and appeal. He found that visualization in learning environment are effective when it's designed according to the type of learning objectives and the type of visualization. He also found that when learning environment is varied, students feel more satisfied with learning. Thurmond et al (2002) study students' satisfaction using web-based learning environment. Their findings asserted that the technology and tools used in the virtual environment are motives to predict satisfaction. Song et al.'s (2004) survey study also asserted that the design of the course content is a motive to predict satisfaction.

Evaluation of web-based learning environment can benefit from uses and gratifications research and many initiatives encourage web developers to increase the level of usability of web documents and encourage self reflection of the learning process (Koohang, 2004; Taylor & Maor, 2000). Research has shown that implementation of uses and gratifications principles can assist

teachers in enhancing the learning experiences for students in online learning environments and it can influence student learning process and learner effectiveness (koohang, 2004).

Work on web-based learning environments in Jordanian classrooms has not been published; thus a comprehensive body of research has not been established. Indeed, successful online instruction depends on its quality learning environment (Chin & Ng Kon, 2003), this study examined the learning process and the relationships created when Jordanian students using an e-learning platform in teaching and learning in their math course.

### **Rationale**

The concept of e-learning is seen as a system that allows educational bodies to shape their learning process while sharing vast knowledge and resources through network technologies (Garrison & Anderson, 2003), In line with this, the Ministry of Education (MOE) of Jordan has been striving to improve the country's quality of education, and accordingly the following four policy orientations were formulated (MOE, 2005):

- Structuring the educational system to ensure lifelong learning.
- Ensuring responsiveness of the educational system to the economy.
- Accessing and utilizing information and communication technologies (ICT) to secure effective learning and system management.
- Ensuring quality learning experiences and environments.

In the fulfillment of these four policies, an open source e-learning platform (ELP) developed and deployed by the Jordanian's integrated technology group (ITG) was launched in December 2004 into some Jordanian experimental schools (MoE, 2005). The schools were reinvented in terms of hardware, software, connectivity, school management, and technical support systems such as computer labs, networks including LAN, WAN and Wireless Internet connection to allow teachers to freely move between classes and access the e-learning platform. Teachers were given laptops and projectors to practice the new learning strategies which rely on the blended learning approach where the ICT tools could play a significant role in facilitating the interaction between teachers and students through the utilization of the Web based content. However, the ELP is an innovative K-12 instructional and electronic comprehensive learning system that included: learning Management System (LMS), a Content Management System (CMS), an Instructional Management System (IMS), and a Student Information/Management System (SIS) / (SMS). These features were integrated into one solution, allowing related educational elements to work together to engage students and teachers in virtually every aspect of the teaching and learning process (MoE, 2005). As such, The ELP is one such technology that can provide new opportunities to engage students in e-learning Math inquiry. Such informal learning environments provide a more open venue for learners to connect with others who may be interested in math inquiry.

Certainly, it would appear to be crucial to investigate the process of learning and the relation created in this process (Haynes, 2002). It is worth studying Jordanian tenth-grade Math students' using e-learning platform tools, assuming that active participation and interactivity are the most important characteristics of e-learning platform use. This study also assumes that the construct of the Web Based math course as well as the individual preferences of learners may influence the development of the online learning environment, the learning process, the interaction and the relationships created. This study examined the experiences of Jordanian students who participated in online math course incorporating an e-learning platform, focusing on the learning activities and the relationships created when learners interacting with the e-learning platform.

### **Significance of the study**

The sound value of this study stems from its attempt to analyze the learning environments created when Jordanian math students using an e-learning platform in teaching and learning in their math course. Knowledge about their uses and gratifications of e-learning platform will provide a clear picture of this selective population and could be vital for the development of e-learning platform and optimization of learning activities. It is hoped that the results of this study will inform leaders of education of the effectiveness of tactics and strategies they are employing in online learning environments. Successful interaction with an online learning environment increases learner satisfaction and productivity and strengthens acceptance of the product (Lazar, 2001; Shneiderman, 1998).

### **STATEMENT OF THE PROBLEM**

It is clearly evident that large expenditures and great efforts are being made by the MoE in Jordan to transform investments in e-learning into successfully productive experience. This study is carried out particularly because of an e-learning implementation in Jordanian schools may not be currently documented due to the almost absence of available scholarly investigations that dig into the underneath facts of the actual reality of online learning environment in Jordanian schools. However, a great deal of the Ministry of Education technical reports portrays such experience as a rewarding one. Attempts to adopt an open e-learning platform (ELP) were seen by many school teachers as a form of continuing reform rather than response to teaching and learning needs. Technical reports as reviewed by the researcher are by no means a conclusive proof of successfully fruitful investment of school e-learning projects. As University professor of "Educational Technology" teaching ICT courses for student teachers in their ICT diploma, the researcher had frustrating experiences with large number of students enrolled in such courses. Many student teachers whom are teachers in the discovery schools perceived such experiences are not rewarded.

More specifically, the present study attempts to answer the following research questions:

- What are the experiences of Jordanian students who are using an e-learning platform presented by ITG's group for supporting teaching and learning in a Web based tenth grade math course?
- How do Jordanian students perceive the quality of online learning environments using an open e-learning platform presented by ITG's group for supporting teaching and learning in a Web based tenth grade math course from their experiences?

Two important factors were considered important in answering the research questions in this study. First, the features and functionality of an open e-learning platform as a tool with respect to its potential to influence the way students were able to make use of the Web based learning environment. Second, the ways in which e-learning platform was integrated into the math course with respect to its potential to influence both student perceptions and student use of e-learning platform.

### **Objectives of the Study**

The study attempted to assess the quality of Jordanian tenth grade student's experiences when interacting with an e-learning platform presented by ITG's group for supporting teaching and learning in a Web based tenth grade math course based on the following:

- Gender
- Online learning environment

- Learning experiences
- Learners perceptions

The findings of this study are hoped to help teachers, administrators, and policy makers to know how their students behave in math using web-base online learning environments based upon their own perception and their actual learning experiences. It is further hoped to contribute to the literature of online education in terms of uses and gratification, the results of this study should hopefully enable the school system of Jordan to evaluate their programs based on the findings and the recommendations of this study.

## **METHODOLOGY**

**Research Design:** It was the purpose of this study to investigate both the learning process and the relationships created between math students and the learning environment using web-based e-learning platform. To successfully analyze the range of learning environments created when using the web-based e-learning platform in teaching and learning, qualitative research techniques (interviews, direct observations, and documents) were used to provide understanding of the learning environment created (Fraenkel & Wallen, 2003; Glesne, 1999). Data-triangulation approach was used to provide cross-data validation (Patton, 1990).

**Research instruments:** A variety of data gathering instruments (viz., interviews, direct observations and documents) were used to collect data. Semi-structured interview instrument was prepared in participants' native language (Arabic language), based on the work of Clayton (2003), Chang and fisher (2001) and Newhouse (2001). The interview consisted of eight prepared questions: (1) to what extent students feels comfortable and enjoying using Computers and the Internet; (2) to what extent the technology used are adequate and user friendly; (3) the extent to which student work together and are friendly to each other; (4) to what extent teachers guide students in their learning; (5) to what extent computer activities support students in their learning and provide relevant feedback; and (6) to what extent class activities are well organized and support comprehension; (7) to what extent class materials are visually pleasing to the students; and (8) to what extent reflective activities are encouraged and how students enjoyed learning.

The direct observation traces students' learning activities and the relationship created in classroom. The focus is on learners' interaction with the web-based e-learning platform and their gratifications.

The observation was intended to gain more qualitative data while the interview was intended to reinforce the data obtained by the direct observation. Fraenkl and Wallen (2003) have suggested that interviewing is an essential method for checking the accuracy of the impressions that a researcher has gained through observations (p. 455). The documents were intended to collect information to help characterize the usability of the e-learning platform to substantiate information that was already collected and witnessed during the observations and interviews.

To ensure the validity of the interview items in the Jordanian student's native language (Arabic), they were rated by a panel of seven experts in the field of education and information technology from Yarmouk University. Experts' suggestions were focused on the re-wording of some items and their applicability on Jordanian students.

**Population and sample of the study:** The population of the study consisted of all tenth-grade students enrolled in the discovery schools (100 schools choused as experimental schools by the Ministry of Education in Jordan to use the online math curriculum) in Amman directorates of education in the academic year 2006/2007. One male school and one female school were randomly selected to conduct this study. The school principal and math teachers in both schools

agreed to cooperate with the researcher to conduct this study. Each school had two tenth grade math class sections. One male section (32 males) and one female section (29 females) were selected randomly as the sample for this research study. All students (males and females) were invited to participate in the interviews part of the study, but participation was voluntary. Twenty three students (12 males, 11 females) were willing to participate in the interview. All participants received online math instruction delivery via Web CT and compact CDs. Approximately 50% of class material was taught using the World Wide Web, and approximately 50% taught using face-to-face instruction. A CMS was used to provide online lecture notes, assignments, and instructions to submit and discuss student work, and to record student grades. The course consisted of fifty five minutes of class activities for four days per week. The course, which was a required course for tenth grade students, focused on principles of mathematics, including trigonometry, and equations.

**Procedures:** Two male and two female graduate students enrolled in research seminar class at Yarmouk University were selected as research assistants to help the researcher to collect data from participants. This was done because the participants were males and females. Female participants need a females' research assistant to collect data from them; this is the situation in Jordan. Mobile phone and broadband Internet service are widely available: 62% of interview participants have a computer at home. Thirty nine percent of interview participants have Internet access. Only 12% have a home network linking two or more computers.

Twelve females and eleven males indicated a willingness to participate in the interviews, fourteen in-home interviews were conducted, and the rest of the respondents were interviewed at their schools. The interview schedule was developed by the researcher and his assistants between March and May 2006. Each interview was first conducted and tape-recorded lasted approximately 30 minutes. Data on each tape-recorded Interview was transcribed for analyses then results were given back to participants for reliability purposes. Feedback from the interviewees indicated that they were satisfied with what he/she had said and the data consisted with their views, concern and understanding.

Information about the process of online learning and the relationships created in this process was gathered by having the interview participants elaborate on the following activities: (1) the features of the interface created that enhance/inhibit their learning and navigation; (2) how they communicate specific learning activities in which to engage with each other, and why and when they do that; (3) how they engage with digitally stored information and how they relate to the information presented; (4) how they encouraged to reflect on their learning, how they relate to the environment created, and if they are satisfied with the environment; and (5) how, why and when they communicate with their teacher/ tutor and what is the nature of this communication. Our selection of online learning activities to discuss was based on Taylor and Mar (2000), Newhouse (2001), Chang and Fisher (2001); Clayton (2003).

For each classroom observed, two observations were conducted with one week apart. The second observation was intended to confirm whether or not there had been any change in participants' behavior. Each observation lasted the length of the session (45 minutes). During the process of the first and second observation, digital video camera was used in classrooms, and various documents were collected. Some other documents such as syllabus, discussion posting messages were also collected during this stage of the process.

**Data Analysis:** Interview tape-recorded transcripts were analyzed by the researcher and his assistants (Miles & Huberman, 1994). Interviewees' responses were explored, unit of meaning were identified, and codes were developed and arranged under the predetermined categories (Ezzy, 2002): (1) computer competence; (2) material environment; (3) student collaboration; (4) teacher support; (5) active learning; (6) reflective thinking; (7) order and organization; and (8)

information design and appeal. And then, constant comparative method of analysis suggested by Merriam (1998) was employed to examine the predetermined categories in light of the two major questions.

A similar analysis procedure was used for data on the video tapes. In combination with the interview and observation data, the documents (field notes) from direct classroom observations were used as a source to validate and crosscheck findings (Patton, 2002).

## **FINDINGS AND DISCUSSION**

Data were analyzed and categorized for uses and gratifications. Findings are presented according to the two major research questions of interest in this study. However, in nearly all cases, when interview participants report using the Computer and Internet, they mean using the e-learning platform in math course placed on the Web.

Findings from analysis of the data related to issues involving the web Based e-learning platform and the learning environment created when math students used the platform revealed that the e-learning platform had an impact on the learning environment nature of the school. Because students identified the level of interaction that occurred their teachers and classmates as a function of the student performance data provided by the web based e-learning platform. There is not enough evident within this study to support the notion that e-learning platform increases the level of interaction producing a positive outcome. When tenth grade math students were interviewed and observed, they responded the following:

**Technology Competence:** When participants questioned the extent to which they feel comfortable and enjoy using the new technology, almost all interview male participants reported that they enjoyed using the online technology to learn math. Female participants on the other hand reported uncomfortable. Interview male participants maintained that using the Internet is a way of getting good resources. For example, one participant says: "We have no difficulty accessing the Internet to access information, including curriculum, lesson plans, and materials...". Another male participant said, "I am very interesting with technology; you see I am lucky because I have internet at home and when I have the time I spent it on the internet searching for ideas, knowledge to keep me abreast of current and emerging technologies. Though, I think many classmates they missing a lot because, they do not have access to the internet at their homes or Internet café near their homes ... especially those living in small towns or villages".

All male participants indicated that they live in the Capital Amman. Most of them came from rich families. Sixty percent of male participants indicated they have Internet at their homes and 21% have Internet Café near their homes. Seventy four percent of female participants say they have difficulty with using Navigation devices, Media, etc. Furthermore, 21% of female participants mentioned they are often less independent in individualizing learning and more dependent on the instruction of their teachers. Nerveless, 74 % of female participants reported that they have Computers at their homes. Of those, 59 % have access to Internet. It is interested to note that some girls mentioned that they have made their computers at home not to work, so they could have incuses to go to the internet cafés. When questioned this situation, they instead, went out with their friends for fun. Almost all participants reported that they had no difficulty using technology. Other girls also reported: "The easy of access to computer and internet does not stimulate my interest to use it for learning ....We has Internet at home but we use it to chat with our classmates. We talk about many personal things ...we love it... we wish every classmate have internet at their homes". Another participant indicated, "With this online environment passing this course is impossible".



To confirm the extent to which participants feel comfortable or not using technologies in their online environment, we observed the participants in their classrooms, focusing on using the web for learning. Male participants were very comfortable using the Web trying hard to learn math. The situation was different for girls, they were observed not relaxed and class was unorganized, they showed less gratification. Observation male participants seemed to prefer activities that related to their preferred learning style and characteristics, and the learners seemed to experience a positive and gratifying learning. Observation female participants seemed to lack confidence in their technical abilities and are uncomfortable with accessing and browsing the information on the Math course Web pages. They were more dependent on immediate gratification and exhibited more difficulty with basic technology skills.

**Material Environment:** When interview participants questioned the extent to which the new technology (hardware and software) were adequate and user friendly, they reported negative experiences. Seventy two percent of interview male participants indicated that the system does not provide time enough for students to practice and master the technology needed to interact with one another. Interview female participants also indicated that the system does not create opportunities for us to use technology to interact with one another. For example, Fifty seven male participants indicated:

*"Our teachers do not allow us to have their e-mails"; "You see I asked my teacher for his e-mail.... He refused to give it.... He got real mad".*

One male participant said, *".....my teacher when asked for his e-mail .....He responded ....no no no".*

For female participants, of those who were interviewed indicated :

*"Most of us don't have an e-mail, teachers didn't assign us to an e-mail", "We can't contact our teachers, and we don't have their e-mails".*

When we questioned about this situation, we found no e-mail distribution list was automatically set for students in the course, and when we analyzed the course syllabus and other course documents, we did not find any practice assignments set up as first component of the course to enable students to use technology features available in the online environment. We asked interview participants about online discussion and chat, they simply say: "We do not have it.....They got angry".

The findings of this study reveal that students expressed their dissatisfaction on the support from the Web activities, frustrations of helpless, and no orientation before the online classes were given. One of the most common complaints from most of the interview participants is disorientation. One interview male participant said: *"the structure of course design is not logic....Too much time is wasted looking for information ...flipping pages around....some links are not activated"*. One interview female participant indicated: *"moving back and forth caused us difficult following"*. It was also observed inconsistent design of the math course from the archival data documents. This inconsistency caused students' confusion and frustration in finding information they needed, students were complaining of delayed feedback or no feedback at all. \_

When classrooms observed, we did not see much differences from the traditional classroom environment; the classes used printed materials placed on CD's and demonstrated through the whiteboard and the Data show. The teachers controlled the session while students setting down and lessening to their teachers. The interesting thing was that "While teachers explaining the concepts presented through the data show, large number of students were logging to their favorite sites". It was observed that learners were lost. They have difficulty to move from one viewed screen to another .We did not notice any opportunity for students to participate in any electronic discussion, or any form of online conferences, e-mail attachments, and chat. Moreover, class observation revealed that material did not show evidence of originality and

creativity in the visual design and layout. The links provided were irrelevant and some were inactive and invisible. The Help system included in the material appeared on the homepage. Interviewees complained of difficult navigation for the whole class design.

**Collaboration:** What Collaboration might lead students to use the new technology for learning purposes, and what limitations and frustrations might lead them away from it? No collaboration tools were observed that would provide opportunities for students to engage in some type of collaborative learning activities. The only activity was observed is chatting with friends. However, participants in classrooms were observed watching their teachers presenting the material on the data show; the classes were much quiet, no communication, and no group work was seen. This was especially noticed in females' classroom. When participants interviewed, most females reported: *"Most of the time the class seemed to be very quiet....Every one seemed concentrating on the presentation of the topic; you could see some students went to sleep. Others logged on their favorite site"*. Another female participant also reported: *"The class seems like the traditional classes we used to have, but the difference is that no discussion no interaction provided like we used to in the traditional classes"*. Such quietness was not reported by males. One male participant said: *"The thing is when discussion began, you could see most of the students logged with their friend...chatting with them"*, *"The teachers have to check on almost every student to make sure of that"*. Another male participant reported: *"We miss out hands-on solving math problem in class, because we are not be able to interact with other students...no group work. No time for hands-on experiences....all we have to do set and lesson"*.

Sixty two percent of participants stated: *"The communication between us as students and between us and our teachers are limited in this type of learning environment"*. One female participant said, *"I wish to go back to our traditional classroom, especially in math"*. All participants seem to agree that the instruction provided does not provide tools an opportunities for students to engage in active and collaborative learning activities, suggesting that collaboration is a characteristic of the Web. This findings has implication for the design of e-learning platform in Jordanian Web-Based instruction, in that they need to re-consider the development of collaborative activities among learners.

**Teachers support:** When online learners receive stimulus, they need teachers to clarify the stimuli for them and direct their response. Also, research show that using technology in the classroom motivates students, encourage them to become problem solvers, and create new avenues to explore information. When investigated the extent to which teachers guided students in their learning and if teachers provided any encouraging support, the finding revealed that the majority of the observed participants shy away from asking their teachers for help, this was mostly seen when the male teacher instruct the students to switch to different resources; you could notice that several students remaining on the curriculum site, others rambling; they don't know what to do. The amazing thing is that the teacher noticed what was happening and did not do anything about it. The students on the other hand, did not ask their teacher any thing. This thing goes on and on like that.

When participants interviewed, most participants agreed that the technical support from the teacher was not available. One interview female participant said: *"We hardly receive any feedback from our teacher. It seems like no one to ask for help on things that we do not understand."* Another female participant said: *"Why do I need to come to class ....As long as I have computer at home and text placed on Cd, I could study at home ...Any how our teacher does not provide us any guide ness"*.

As interview data was analyzed, it became apparent that many students especially female students were somewhat skeptical of the teacher's support and were dissatisfied by the process of learning as heard in the voice of the interview participants.

**Active learning:** How does the process of communicating for learning activities online work? What type of communication tools lead teachers to use the Web to communicate with learners? Previous research reported that delay communication is one weakness of online education (Howland & Moore, 2002; Petride, 2002; Hara & Kling, 1999; Vonderwell, 2003). When we observed students in their classrooms were, we noticed the feed back was absence. In several occasions, Students were expected to receive timely feedback from their teachers; as a result, the teacher ignored them totally. Most feed back was seen at the end of the class session, and some times was not related. Peer feedback was also seen absence; most students were relying on the course content. Interview participants appreciate the efficiency and timelines of the Web. They value it because it allows them to keep informed. However, the overwhelming quantity of work load placed on teachers appears to leave many students without feedback. Seventy five percent of interview male participants said, *"we don't hardly get any feed back on our class projects from our teachers, though some times we get feed back on submitted assignments in classroom....not using email"*. Almost all male participants indicated *"Our teachers don't allow us to have their e-mails"; "You see I asked my teacher for his e-mail.... He refused to give it.... He got real mad"*. One male participant said, *".....my teacher when asked for his e-mail .....He responded ....no no no"*. For female participants, of those who were interviewed indicated, *"Most of us don't have an e-mail, teachers didn't assign us to an e-mail", "We can't contact our teachers, and we don't have their e-mails"*.

The study findings show that while an e-learning platform is perceived as useful communication system techniques, teachers failed to use it as tools for providing feedback. This suggests that for many Jordanian students, the Web tends to satisfy curiosity rather than inspire it. There is one exception to this pattern. When the study participants were strongly interested in using the internet, they were more likely to go to internet cafés, suggesting that strong interest may lead to greater online activity in the area of that interest. This would help explain a wide range of collaborative filtering tools available on the Web. This can heard in the voice of some participants, they reported: *"The Whiteboard never worked. The data show most of the times disappeared from classrooms. Some times we had to wait for 10 to 20 minutes until the teacher bring the data show, participants complained about the principle keeping the data show in his/her office. Automatic grading for tests by the courseware was not activated. One female participant reported: "The test icon is not activated". Another interview participant questioned the automatic grading by the courseware, stating that it can be positive experiences to have the system grade you. "Tests were taken manual. Chat room never used in classes". Most interviewers indicated: "We did not use chartroom". Other participant said," I do not know if we really have one", others questioned, "How does it look like"; some female participant replied, "It will be so much better to meet in the chatting room". The e-mail instructional tool was another negative experience. Most participants indicated that they knew the e-mail and they knew how to use it, but they do not know how effective it is as an instructional tool. "We never used it for the purpose of this class"*.

**Order and Organization:** Of course, when course interface is poorly designed, class activities will be disorganized and may not assist learner comprehension. To determine the extent to which class activities are well organized and assist student comprehension, the observations revealed that the disorganization of class activities from his/her observation of classrooms. This disorganization caused students' the pace of the instruction. Participants' rating of class activities indicated that they had hard time to keep focused on what is to be learned. In addition, from their experiences, the class activities that they had participated in did not meet their expectations: One interview male participant reported, *" We lost interest in this environment....the organization of each lesson is hard to follow"*. *"Learning objectives are not well stated in each lesson"*. *"The scope of the lesson is not clearly stated"*. One interview female participant indicated, *" I always feel isolated at the end of each lesson"*.

**Information Design and Appeal:** Course content was observed as negative experiences, participants experienced a problem with course interface. Some participants were observed lost in seeking information. They were confused looking for pages; especially girls. Some female participants were complaining "*the design was not logic...it makes us frustrated and confused*". One interview male participant said, "*I got confused in finding information i need; the chapters' outlines and the content not arranged well, and.....*". When we observed classes, the presentation of Math content was not visually appealed. Most participants complained, "*The content was clearly presented on the Web*".

**Reflective Thinking:** When participants questioned the extent to which reflective activities were encouraged and how they enjoyed learning online and participating in this online learning environment, male participants observed having hand-on experiences using the Internet to create activities. They were engaged in inquiring, investigating, and solving math problems but, they were not excited and enthusiastic. Male participants were also observed experiencing activities with self-disciplined more than female participants. When interviewed, one interview male participant reported, "I enjoy learning in this environment". Other male participant said, "*Using the Internet makes us less motivated...you could see every one is concentrated on his own, even the teacher*".

Most Female participants interviewed indicated "*online learning is not convenient, we do not enjoy it ... the traditional course makes it easy for us... we have text book on hand ...*" Another female participant interviewed said, "*We all get engaged in problem solving, We have too.... it is boring, we always have problem to formulate an appropriated response .... Using the Internet does not encourage us to explore math concepts beyond our regular web based lessons...* ". Another female participant said, "*20 minutes are not enough to locate resources and link to appropriate information* ".

## IMPLICATIONS

As this investigation unfolded, it became clear that a deeper look into the process of implementing e-learning platform is necessary if serious learning environment reform is to occur. Many e-learning platform innovations are implemented with intent of learning environment improvement, but produce minimal results. Effective implementation of improvement projects such as Web-Base E-Learning Platform seems depend on a setting that is supportive and that can easily adapt to the innovation.

This research has a significant implication for a theoretical base for schools to properly adopt an e-learning platform in their effort to apply effective online learning activities and practices to improve their online education; in the long run, this improves their learning environment capabilities. Utilizing a Web-Base E-Learning Platform in a productive way requires an understanding of the complexities of implementation and the potential for users. This implication could be based within a particular course, after refining the design of the learning activities to more fully incorporate use of the following requirements for successful online learning environment:

- Identify, understand and develop technology competence to meet learners' requirements and strive to exceed learner expectations;
- Establish adequate and user friendly material environment;
- Provide, train and maintain effective communication strategies between student – student and student – teacher that would emphasize their roles in the learning process;
- Identify, design, develop and manage content and related resources that meet learners' characteristics; and

- Manage class activities and related resources as a process.

Once successful implementation has been reached, and a majority of school teachers is utilizing the tools that the Web-Base E-Learning Platform provides, more appropriate interaction within the learning environment can occur, ultimately leading to enriched learning experiences. The problem appears to be that many teachers have little experiences to adequately use the system. It is crucial to provide information and training on how to implement usability for usability into the e-learning platform content, design and the creation of online learning environment. As implementation of e-learning platform continues to increase across the Jordanian schools, research need to be conducted in order to determine the following:

- The effect culture can have on the implementation of an e-Learning Platform;
- The type of interaction produced by an e-Learning Platform that can contribute the most to improve classroom instruction;
- The relationship between teacher' experiences with ICT and level of interaction produced as result of the implementation of an e-learning platform; and
- Changes in learner's motivation as result of the implementation of an e-learning platform.

### **LIMITATIONS AND EXTENSION OF THE STUDY**

As stated by Marshall and Rossman (1999), "no proposed research project is without limitation; there is no such thing as a perfectly study" (p. 42). This study is no exception. Due to the e-learning platform deployment constraints, the study has only covered students in tenth grade math course, and not students in other subjects, in certain two experimental (discovery) schools, in Jordan. The coverage of a wider area and the involvement of students in different subjects in a future study would provide more reliable information on the effectiveness of the learning environment that uses web-based e-learning platform. Views from teachers and parents may be important but do not full within the scope of the present study.

Further investigations on the competence of teachers and students could be a good extension of the current study. Further research might explore their capability of being ICT teachers, and assist in formulating measures less competent ICT teachers to improve themselves

Further investigations in the challenges and barriers of the e-learning process could also be a good extension of the current study. Further research might explore the factors that affect the quality of online learning environments in Jordan.

Finally, the nature of the course had a large focus on skills development and sharing of individual, creative work. Further research using a course that is more discussion based, collaborative, and cooperative may also provide additional insight into the effectiveness of online learning environments.

### **CONCLUSION**

The specific purpose of this study was to assess the quality of Jordanian tenth grade student's experiences when interacting with an e-learning platform presented by ITG's group for supporting teaching and learning in a Web based tenth grade math course. This study examined the belief that an open source e-learning platform can provide new opportunities to engage students in a successful Web-based learning environment.

In a country like Jordan where e-learning is forming in schools, students' role with the new learning environment is demanding, and in light of the usability principals, judging by what

students reported and their actual experiences in the process of learning and the relationships created in this process, the vision of Web-based learning environment supported by e-learning platform was left unrealized. Students in this study encountered significant challenges. The challenges faced by the Jordanian students in utilizing the open source e-learning platform to support their teaching and learning has brought to the fore a number of issues that can be useful for developers of e-learning platforms.

However, this study in conjunction with existing research suggests that usability factors are vital elements in online learning environments. E-learning platform developers should implement use and gratification guidelines when creating interface design for e-learning environments. The findings of this study help to provide an understanding of the importance of e-learning platform usability by learners and the relationships created. Jordanian students clearly valued computers, multimedia, collaboration, teacher support, class activities, computer activities, class materials, and reflective activities that these learning environments provide. Considering the growing presence of online learning environments and web-based e-learning platform learning environments in schools, it is important to increase awareness about the role of uses and gratifications in online learning process.

Many e-learning platform developers have little or no experiences with regard to learners' characteristics. It is crucial to provide information and training on how to implement usability guidelines into the creation of web-based e-learning platforms.

In Jordan, however, teachers have no influence on the choice of tools and the design of the actual web-based e-learning platform used in online instruction. Therefore, it is important to provide teachers with tools to analyze and improve the learning environments created when using web-based e-learning platform in teaching and learning. This study can provide an easy use tool for teachers to use in web-based math course.

However, our results do not rule out the possibility of improving online education in schools in Jordan, but it indicate that integration of usability factors into online learning environments can assist in improving the teaching learning processes. Though the implementation of usability principles in web-based e-learning environments, e-learning platform developers can support higher levels of usability and improve the online environment.

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