Teachers' Perceptions of the Use of EduWave E-Learning System in Public Schools in Jordan

Dr. Muhannad Al-Shboul, The University of Jordan, Amman, Jordan

ABSTRACT

E-Learning is not about technology itself; the effective integration of e-Learning into the educational system should aim to enhance the teaching and learning process. E-Learning will not, nor should it, replace the teacher. It will, however, assist in instruction, guidance, and support both inside and outside the classroom. Thus, the success of e-Learning systems depends on the adoption of users, especially teachers in schools.

EduWave, a Web-based K-12 e-Learning system, was fully designed and developed by Jordanian company called Integrated Technology Group (ITG); it was deployed in the Hashemite Kingdom of Jordan in March 2003 as part of the Kingdom’s educational reforms drive. EduWave is a comprehensive e-Learning system implemented by the Ministry of Education (MoE) of Jordan to meet the unique needs of educators and learners in a K-12 public schools environment. It provides access to the right content from any place, at any time. EduWave comprises three main components, an e-Learning Management System (ELMS), an Authoring Tool, and a Portal. Currently 1.78 million Jordanian users, including students, teachers, and parents, are using EduWave e-Learning system in K-12 schools across Jordan.

This study is aimed to identify teachers’ perceptions toward the use of EduWave e-Learning system in the teaching and learning process in K-12 public schools in Jordan. Also, this study attempts to investigate the factors influencing teachers’ adoption and integration of EduWave in their instruction. The study utilized a survey applied to 1300 teachers in 24 Jordanian public schools at the beginning of September, 2012. The findings of this study revealed that there are several factors that positively or negatively influence teachers’ use of EduWave, which may affect the successful integration of such technology into the curriculum. Conclusions, implication of the study, and recommendations for future research are addressed as well in the paper.

Keywords: EduWave, e-Learning, Jordan, Human Resources Development, Education, ICT.

INTRODUCTION

EduWave is a user-friendly e-Learning and educational management system. It offers innovative and compelling ways in education, allowing stakeholders to engage in virtually every aspect of the teaching and learning process (ITG, 2012). The EduWave e-Learning system brings many benefits to its stakeholders which including students, teachers, parents, and administrators at the school, district, and ministry levels. Furthermore, EduWave allows for full interactivity between users, so they can interact, communicate and collaborate through multiple channels including e-mail, discussion forums, online study sessions, and others as shown in Figure 1.

For students, a number of comprehensive tools and learning resources are provided in EduWave, to help students track their progress, improve their performance, and enjoy their learning experience. With EduWave, students can access their learning material and textbooks, personalized and in rich media.
format, from any computer, anytime and anywhere. Students can interact with their teachers and with each other through multiple communication and collaboration tools. They can also perform online tests and access their assignments, grades and learning material at all times (ITG, 2012).

For teachers, the administrative and educational tools provided in EduWave, help teachers to better manage and utilize their time allowing for higher efficiency, and more room for innovation and creativity. EduWave provides an extensive collection of instructional design, authoring, and professional development tools and resources, to support the role of educators. In addition to the ability to manage learning content and curricula, teachers can easily create their own teaching material. They are also able to interact with their students through the system’s various communication channels. Teachers are also provided with a variety of assessment and evaluation tools that help them measure individual student performance and progress (ITG, 2012).

![Figure 1: EduWave Users Interactivity](image)

For administrators, EduWave provides administrators with tools that help them develop and maintain comprehensive and accurate information, monitor development and performance, and plan and adjust resources, resulting in more effective decisions. Through EduWave, administrators are able to easily and securely develop and manage administrative data files, build the organizational hierarchy, define all related resources, create users’ profiles, authorize and control access to users, develop schedules, and provide a database of examinations, test results, and statistics such as student attendance (ITG, 2012).

For parents, with EduWave, parents can keep track of their children’s progress and development at school through the ability to access their assignments, grades, attendance, and even their school activities. Parents can also interact and follow-up with the teachers and school administrators as needed through the various communication tools (ITG, 2012).

Moreover, EduWave EMIS -Educational Management Information System- serves the management level of educational institutions, providing reports and online access to actual performance and historical records. It acts as the core for planning, control, and decision support systems. Figure 2 shows a total of 96% of schools (4243) in Jordan, as of 2011, reported that they can access EduWave and use it from schools (MoE, Ministry of Information and Communication Technology (MoICT), & Jordan Education Initiative (JEI), 2012).
Figure 2: Percentage Distribution of Schools that can Access and Use EduWave from Schools

The Queen Rania Al Abdullah Center for Information and Educational Technology (2012) statistics showed the number of EduWave users in Jordan reached 2,100,735; data are as of the end of November 2011. Table 1 illustrates various types of EduWave users and their numbers.

| Table 1: EduWave users in Jordan |
|-------------------------------|--------------------------|
| **Users**        | **Number**       |
| District Administrators | 57                       |
| School Principals      | 6,314                |
| Teachers               | 129,625             |
| Students               | 1,728,974          |
| Parents                | 235,765             |
| Total                  | 2,100,735          |

Many countries have a central education authority such as a MoE that handles curriculum and assessments for K-12 schools. A centrally developed curriculum, traditionally textbook-based, now can include additional technological resources; teachers may provide supplemental materials but must at minimum abide by the national curriculum. Assessments typically include nationwide exams that may be required for entry into college or university (ITG, 2012). Thus, e-Learning systems have been designed to meet the needs of all stakeholders in most nations' K-12 educational process: students, teachers, parents, and administrators at the school, district, and ministry levels. For this reason, in 2003, EduWave was deployed to 1.7 million users in K-12 schools across Jordan. Though, it is available in two editions K-12 and Higher Education.

Due to the large number of EduWave users in Jordan, this study approaches the two essential questions in regard to the successful deployment of EduWave e-Learning system by teachers in K-12 public schools in Jordan through analyzing teachers' perceptions toward the use of such e-Learning system, and overall factors that may affect their uses from teachers' point of view. Relevant data were gathered from 24 K-12 public schools from different regions in Jordan, six schools from the northern part of the country located in the city of Irbid, four schools from the southern part of the country located in the city of Al-Karak, and 14 schools from the middle part of the country (five schools located in the city of Al-Zarqa and nine schools located in the city of Amman).

Specifically, this study focuses on teachers' perceptions regarding the use of EduWave e-Learning system in K-12 public schools in Jordan. It firstly reviews literature, which points out the role of Information and Communication Technology (ICT) in boosting knowledge diffusion processes and in
sustaining learning practices, as well as the motivational factors affecting the integration of Learning Management Systems (LMS), by teachers, into the traditional teaching. It also explains its research methodology. Then its center of attention is given to the main purpose of this study and explores the factors that may influence the use of EduWave e-Learning system as perceived by teachers in K-12 public schools in Jordan; as well as examines teachers' acceptance and adoption to such e-Learning system. In addition, it discusses the findings and makes conclusions. Finally, implications of the findings and recommendations for future studies are mentioned.

**LITERATURE REVIEW**

Many school teachers are using ICT tools to supplement their traditional classroom instruction (Nelson, 2003). ICT allows teachers in K-12 schools to manage their classes electronically and to use technology tools in teaching (Warner, 2003). EduWave e-Learning system is fairly new software tool that have been used in an educational setting for around a decade. EduWave is Internet-based software that manage student enrollment, track student performance, and create and distribute course content electronically. In this way, the EduWave allows teachers in K-12 public schools in Jordan to manage their classes and use technology tools in their teaching, as well as enables them to extend the classroom beyond its traditional boundaries of time and space (Al-Shboul, 2011).

Current research indicates that many school teachers choose to integrate EduWave for a variety of reasons. Some are interested in the convenience factor the EduWave (EduWave Live version) provides for communication with students, while others are motivated because of administrative pressure. Therefore, it is important to review relevant literature to the integration of such technology in K-12 education to guide research questions and establish investigations of importance.

**The Integration of ICT into Classroom Teaching**

In terms of integrating ICT into education, Abuhmaid (2011) stated that "ICT is increasingly having pervasive role and presence in the educational milieu as it continues to shape all aspects of our lives. Numerous reform projects have been in place aiming to infuse ICT across education systems" (P. 195). Teachers are widely believed to be the key agents of any educational change. Accordingly, the Jordanian MoE adopted several ICT training courses aiming to prepare teachers to integrate ICT effectively across the curriculum.

Schools, as all other social institutions, are rapidly embracing ICT. Globalization and the knowledge-based economy have forced education systems worldwide to adopt ICT and weave it into their educational milieus (Gulbahar & Guven, 2008), and the Jordanian education system is no exception. The system has adopted several ICT-related education initiatives aiming to reform the system towards the knowledge-based economy.

In recent years, ICT-related initiatives are adopted and implemented by education systems with greater appreciation of their complexity. A major aspect of the complexity involved with ICT integration into education systems is based on the many factors involved with it including factors associated with the human side of the integration (e.g. teachers, trainers, and administrators) and the technological side of it (e.g. access to computers, technical support, and the e-materials) (Abuhmaid, 2010).

In general, there is a growing demand on educational institutions to use ICT to teach the skills and knowledge students need for the 21st century. Realizing the effect of ICT on the workplace and everyday life, today’s educational institutions try to restructure their educational curricula and classroom facilities,
in order to bridge the existing technology gap in teaching and learning (Buabeng-Andoh, 2012). This restructuring process requires effective adoption of technologies into existing environment in order to provide learners with knowledge of specific subject areas, to promote meaningful learning, and to enhance professional productivity (Tomei, 2005).

Global investment in ICT to improve teaching and learning in schools have been initiated by many governments. For example in the United Kingdom, the government spent £2.5 billion on educational ICT in 2008–2009, in the United States, the expenditure on K-12 schools and higher education institutions was $6 billion and $4.7 billion respectively in 2009 (Nut, 2010), and in New Zealand, the government spends over $410 million every year on schools ICT infrastructure (Johnson, Hedditch, & Yin, 2011). All these investments on ICT infrastructure, equipments, and professional development are to improve education in many countries.

Jordan as a resource-poor country seeks to build a strong ICT sector to realize its vision of being a regional ICT hub. In the past few years Jordan has been working extensively both with local and external organizations to modernize its ICT infrastructure, promote ICT awareness and alleviate business climate to attract more local and foreign direct investments in the ICT sector (Assaf, Elia, Fayyoumi, & Taurino, 2007).

In terms of integrating ICT into education in Jordan, the Jordanian MoICT in conjunction with MoE, and the support of the Canada International Development Agency (CIDA) have developed a comprehensive e-Learning strategy. This strategy aims to provide teachers training, project coordination, implementation and technical assistance, such as equipping schools with computers in ratio of 1 computer to every 6 students (1:6), to have at the end an estimated number of 140,000 computers to be installed in all Jordan’s public schools. Synchronously, all Jordan’s 3500 public schools currently are connected to the intranet (Al-Zaidiyeen, Mei, & Fook, 2010).

The Importance of E-Learning in Education

In today's era of technology and Web-based learning, as the knowledge has changed, so also the generation availing this education has become more ambitious. It will be the responsibility of e-Learning to satiate the need for education, because this field is going to make available huge resources of knowledge at a mere click on the Web (the internet). Hence, there is no doubt that the future of e-Learning in the field of education is certainly bright (Subhash, 2012).

The use of e-Learning in education means tremendous addition in our knowledge or information. Through the medium of Information Technology, a number of novel concepts were brought forth in the field of education. Along with the concepts, newer and newer challenges are kept facing teachers. As a result, a teacher's role has not remained limited only up to the traditional classroom, but scope has expanded and it got transformed into a global classroom. This is because of the integration of e-Learning in education system. The new concepts introduced by e-Learning include novel concepts such as e-content, e-book, e-training, distance learning, virtual classroom and so on.

E-Learning technologies are progressively fostering the means used to deliver and share knowledge. They can play a major role in modernizing the educational system by overcoming the limitations of distance and time required to access and deliver knowledge. The benefits of using e-Learning tools in education are tremendous: they can provide immediate access to information, increase the speed of locating and retrieving information. In addition, the use of Internet in education can provide learners with continuously updated information, as well as student-teacher online interaction (Assaf et al., 2007).
In this perspective, Rosenberg (2006) defined e-Learning as the use of Internet technologies to create and deliver a rich learning environment that includes a broad array of instruction and information resources and solutions, to enhance individual and organizational performance. E-Learning in the context of education can be defined as the use of technology to enable students to learn anytime, anywhere; it makes the learning materials available to the learner 24 hours a day, 7 days a week. According to Assaf et al. (2007), e-Learning gives learner more authority over learning environment, and autonomy to access their courses in their free time. Teachers, in some specific occasions, can then access training in the manner and time convenient to them.

Tomasegovic, Elias, Baracic, and Mrvac (2011) stated that through e-Learning, a new educational environment can be set and an environment can be constructed in the direction of interaction, processing information, researching and problem-solving. Moreover, the findings of Tomasegovic et al. (2011) study revealed that e-Learning provides direct students’ involvement in planning and development of the class; enables students to learn and memorize up to 80% more information than they do when just reading or listening since e-Learning includes video materials and lots of practical exercise; and at the same time e-Learning gives the students an opportunity to make their own schedule of managing given assignments.

In short, it can be concluded that utilizing EduWave e-Learning system in the education system in Jordan provides many benefits for both students and teachers in many different ways. Consequently, it is essential to investigate the attitudes and perceptions of teachers in public schools in Jordan toward the use of EduWave e-Learning system; and to identify potential issues and factors related to the use of EduWave in K-12 educational settings.

Teachers' Perceptions and Concerns about the utilization of ICT in their Classrooms

The use of ICT in the teaching and learning process is changing teaching in several ways. With ICT, teachers are able to create their own material and thus have more control over the material used in the classroom than they have had in the past. It seems that technology is requiring teachers to be more creative in customizing their own material. However, the changes caused by the introduction of ICT into learning environments, are not without some potential problems which must be considered by administrators. In this regard, Reid (2002) conducted a study regarding the concerns teachers have about the use of Technology in teaching, he stated that while recognizing that there were some concerns and problems with integrating the use of ICT, teachers thought it was beneficial to the educational process and should be continued.

Several concerns emerged from Reid's (2002) study: The problem most often noted by teachers was the maintenance of the equipment needed to operate a technologically enhanced school. Another frequently mentioned problem was the disparities between students who have access to the Internet at home and those who do not (inequalities). Teachers provided evidence of the importance of the efforts in-school to promote professional development in integrating information technology into classroom teaching (need for training). Teachers recognized that sometimes students are overwhelmed with the amount of information available and with the task of filtering through the information (information overload).

Wheeler (2000) pointed out that teachers have a hard time (stress) keeping up with the pace of change. Teachers pointed out the problem of increased plagiarism because technology was making it easy to reproduce and revise someone else's work. Another emerging issue is the possible loss of control of the education process to business partners. Furthermore, he stated that balancing the interests of these partners and that of the students might be an increasingly challenging role for administrators as business
involvement in education becomes more common. Finally, according to Wheeler, teachers declared that information technology was placing more demands on their time. Teachers noted that extra time was needed to learn new software and also to create new Web-based instructional materials for teaching because greater expectations were being placed on them.

Rogers (2000) found that barriers to successful technology adoption in education appear to have several sources; they may be summarized as “teacher attitude” or “perceptions” about a technology, teacher's actual competency level with e-Learning technology, the availability and accessibility of the Internet, the presence of technical support, lack of time, in addition to an appropriate and adequate training program for staff development and skill building.

Education Reform in Jordan

As a developing country, Jordan has witnessed an extensive educational reform movement since the late 1980s (Qablan, Jaradat, & Al-Momani, 2010). Jordan is a country attempting to develop using ICT in an increasingly globalized world. Although poor in natural resources, Jordan appears to be rich in its educated human resources. In 1999, king Abdullah II urged Jordan's private sector to prioritize the development of Jordan's ICT sector. The king's vision was to make Jordan a regional Information Technology center in the Middle East, especially among Arab countries. Inspired by this vision, Jordan has engaged in a number of initiatives to develop vigorous, export-oriented ICT services that can enable Jordan to become a regional leader and internationally recognized exporter of ICT products and services (Nusseir, 2001).

More than a decade ago, the Jordanian MoE, with the cooperation of JEI, has initiated the introduction of ICT and e-Learning resources into Jordanian classrooms to support innovative teaching practice (Light & Rockman, 2008). Jordan Education Initiative recently received the UNESCO prize on ICT use in Education. This pioneering education project in Jordan schools is based on utilizing the power of ICT with the proven methods of learning to transform the learning environment in schools.

Officials at the MoE believe that education reform will improve the Jordanian educational system; they also believe that ICT (and specifically the EduWave) will have a positive impact on education. Proponents of ICT integration into schools argue that ICT have the potential to improve academic results (Brown, 2004; Jordan, 2005) and whole school functioning (Davis & Venezky, 2002). The basis for this improvement is founded on ICT’s four key school enabling factors. It increases the school’s ability to prepare learners and teachers for the technology and knowledge-based society; it increases learners’ access to education; it supports new pedagogy practices; and it improves school and classroom administration (Miller, Naidoo, & Van Belle, 2006).

Factors Influencing Teachers’ Technology Integration in K-12 Classrooms

This section of the article reviews studies on the use of ICT by teachers and identifies factors that related to (affect or influence) their use of e-Learning systems. Several factors influencing the adoption and integration of ICT into teaching have been recognized by researchers. Additionally, most of the reviewed literature identified numerous factors that are related to the use of e-Learning delivery tools such as EduWave in teaching and learning process, and factors that teachers believe are important either in facilitating the use or in creating barriers that work against the use of such technology.

Rogers (2003) identified five technological characteristics or attributes that influence the decision to adopt an innovation: relative advantage, compatibility, complexity, trialability, and observability as perceived by individuals. Stockdill and Moreshouse (1992) also identified user characteristics, content
characteristics, technological considerations, and organizational capacity as factors influencing ICT adoption and integration into teaching. Balanskat, Blamire, and Kefalla (2006) identified the factors as teacher-level, school-level and system-level. Teachers’ integration of ICT into teaching is also influenced by organizational factors, attitudes towards technology and other factors (Chen, 2008; Tondeur, Valeke, & Van Braak, 2008; Lim & Chai, 2008; Clausen, 2007).

Sherry and Gibson (2002) claimed that technological, individual, organizational, and institutional factors should be considered when examining ICT adoption and integration. Neyland (2011) found that factors such as institutional support as well as micro factors such as teacher capability influencing the use of online learning in high schools. Schiller (2003) pointed out that personal characteristics such as educational level, age, gender, educational experience, experience with the computer for educational purpose, and attitude towards ICT can influence the adoption of a technology.

Jones (2001) indicated that teachers are requested to adopt and integrate ICT into teaching and learning activities, but teachers’ preparedness to integrate ICT into teaching determines the effectiveness of the technology and not by its utter existence in the classroom. The attitudes of teachers towards technology greatly influence their adoption and integration of ICT into their teaching. According to Russell and Bradley (1997), anxiety, lack of confidence and competence and fear often implies avoids ICT and grasps of traditional learning mechanisms. Therefore, an understanding of personal characteristics that influence teachers’ adoption and integration of ICT into teaching is relevant.

Buabeng-Andoh’s (2012) study showed that personal characteristics such as teachers’ attitudes, knowledge, ICT competence, computer self-efficacy, gender, teaching experience, and teacher workload; institutional characteristics such as accessibility, technical support, leadership support and training; and technological characteristics such as consistent with teachers’ existing values, past experiences and needs, and ease to use influence teachers’ use of ICT and e-Learning systems.

RESEARCH METHODOLOGY

As a developing country in the Middle East and North Africa region, Jordan is striving to improve its education system for the knowledge era (Abuhmaid, 2011). The Jordanian education practices need sound and grounded research to guide decisions and strategies that are related to integrate ICT, particularly EduWave, into the classroom teaching, improve teachers’ performance for the information age, and improve educational practices as they empower teachers with knowledge and skills required for a successful integration of ICT in the classroom. Thus, the current study can provide a clear picture for decision makers, and other research, of issues associated with EduWave e-Learning system deployment in K-12 public schools in Jordan.

Purpose of the Study and Research Question

The primary purpose of this study was to explore Jordanian teachers’ experiences with EduWave e-Learning system adopted by the MoE. Large expenditure and great efforts were dedicated by the Jordanian education system to updating itself in order to become more compatible with the knowledge-based economy. Furthermore, the heavy reliance on external aid in order to initiate and implement education reform projects requires extra and careful planning for such projects (Abuhmaid, 2011). The efforts need to be aligned with clear vision into what is aimed for and how it is achieved. It is well documented that ICT-related initiatives in Jordan lack scholarly investigations to guide them (Al-Omari, 2009); rather, they rely on official reports which usually portray patches of success within educational
initiatives. Hence, the major research questions the study seeks to explore were as follows: (1) what are teachers’ attitudes and perceptions toward the use of EduWave e-Learning system in K-12 settings; and (2) what are the factors that influence teachers' utilization of EduWave e-Learning system in their instruction?

Research Design

Descriptive research was used as a methodology to answer the research questions; the target population that the researcher would like to generalize about is all teachers at K-12 schools in Jordan. However, the accessible population for this study was K-12 teachers from 24 different public schools drawn from three regions in Jordan: North, Central, and South. Thus, the sample of this study consisted of 24 schools that were randomly selected from the actual population to represent all geographical regions in the country. The accessible population for the data collection included 1300 teachers who were employed full-time during September, 2012 at 24 public schools in different parts of Jordan (n=1300) as shown in Table 2. Data obtained from this survey was coded and entered into the Statistical Package for the Social Sciences (SPSS) software, version 17.0.

<table>
<thead>
<tr>
<th>Area</th>
<th>No. of Schools</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amman</td>
<td>9</td>
<td>200</td>
<td>280</td>
<td>480</td>
<td>36.9%</td>
</tr>
<tr>
<td>Zarqa</td>
<td>5</td>
<td>110</td>
<td>180</td>
<td>290</td>
<td>22.3%</td>
</tr>
<tr>
<td>Irbid</td>
<td>6</td>
<td>150</td>
<td>190</td>
<td>340</td>
<td>26.1%</td>
</tr>
<tr>
<td>Karak</td>
<td>4</td>
<td>80</td>
<td>110</td>
<td>190</td>
<td>14.7%</td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
<td>540</td>
<td>760</td>
<td>1300</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 2: Participants per Area, Classified by Gender (n=1300)

In choosing the sample for this study, the researcher considered several criteria to ensure the representation of the sample to the whole study population. The first criterion was the school location; among the 24 schools, 19 schools were urban schools, while 5 schools were rural schools. The second criterion was the school gender (male, female). The third criterion was the school classification (primary/elementary school, secondary school, high school). The fourth criterion was the type of school (Public/Private). The fifth criterion was the level of school enrollment (students enrolled in schools from grades 1 through 12).

The survey was distributed on September 10, 2012, and it was completed on October 17, 2012. A total of 940 surveys were received out of the 1300; among the 940 surveys there were 130 incomplete surveys, consequently, they were dropped from the study. As a result, 810 surveys were completed and considered to be the main data for the study analysis; consequently, the research study return rate was 62.3%. The respondent group consisted of 338 male teachers (41.7%) and 472 female teachers (58.3%).

A paper-based survey was utilized as a main source for data collection purposes for the study, where teachers rated their perceptions towards using the EduWave e-Learning system as part of their teaching practices. The study used a 5-point Likert-type scale, the participants were asked to rate on a 1-5 scale the extent to which they agree the factors listed in the survey are related to their use of EduWave system, as well as their attitudes towards a number of variables, among them: intention to use EduWave, perceived effectiveness, perceived ease of use, perceived trust, and perceived institutional encouragement, support, and incentives.

Within the quantitative approach of this study, the researcher analyzed the data collected by the survey instrument by utilizing the SPSS 17.0 for the computation of descriptive statistical measures. The
survey, consisted of closed-ended questions, was numerically coded and analyzed using SPSS statistics software. Data analysis included the use of frequencies, percentages, means, standard deviations, Pearson Correlation Coefficient, confidence interval, and power. Then, the results were reported based on the analyzed data.

**FINDINGS AND DISCUSSION**

This study identifies prevalent teachers' attitudes and perceptions toward the use of EduWave e-Learning system in K-12 settings, particularly in public schools in Jordan. The following sections discuss major research findings of this study within the context of Jordan.

**How Eduwave e-Learning System and ICT Equipment are Used in the Classroom**

The use of Eduwave e-Learning system and ICT equipment, whether used in computer labs or in classrooms, included a number of applications: simulation, animation, word processing, creative work, and multimedia. On a Likert-type scale with ranges "Used" and "Not Used", teachers were asked to rate the use of computers and ICT equipment for each of the above applications (i.e. simulation, animation, etc.). The results of the analysis of data collected revealed that around 75% of the respondents reported that Eduwave and ICT equipment are not used in simulation in their schools, whereas only 25% stated that in their schools Eduwave and ICT equipment are used in simulation. The results from the completed surveys revealed that around 65% of respondents reported that Eduwave and ICT equipment are used in animation in their schools, whereas 35% stated that in their schools Eduwave and ICT equipment are not used in animation.

A large percentage of respondents (around 89%) reported that Eduwave and ICT equipment are used in word processing in their schools, whereas only around 11% stated that in their schools Eduwave and ICT equipment have not been used in word processing. Using Eduwave and ICT equipment in creative work is almost the same as using Eduwave and ICT equipment in simulation. Around 74% of the respondents reported that Eduwave and ICT equipment are not used in creative work in their schools, whereas only 26% stated that in their schools Eduwave and ICT equipment are used in creative work. The results revealed that around 71% of respondents reported that Eduwave and ICT equipment are used in multimedia in their schools, whereas 29% stated that in their schools Eduwave and ICT equipment are not used in multimedia.

**Perceptions of Teachers regarding the Use of EduWave e-Learning System and ICT in the Classroom**

It is important to point out that this study does not intend to measure the perceptions of Principals, Students, or Parents. Its purpose was to investigate teachers' opinions regarding the perceptions, attitudes, and concerns toward the use of EduWave e-Learning system in teaching. On a Likert-type scale with ranges 1 (strongly disagree) and 5 (strongly agree), teachers were asked to rate their agreement with five items: intention to use EduWave; Perceived effectiveness; Perceived Ease of Use; Perceived Trust; and perceived institutional encouragement, support, and incentives. All items on the survey were worded positively.

The mean values and standard deviations for the five items of the perceptions scale were calculated and assessed and the statistical meaningfulness was tested. It was noticed that four items out of five had mean values more than 3.82, indicating that overall teachers tended to agree with those items except that for the fifth item which it had a mean value of 1.48 indicating that teachers tended to disagree with that
item (perceived institutional encouragement, support, and incentives). The average mean value is 3.55, which indicates positive perceptions toward usability and reliability of EduWave e-Learning system.

With regard to the teachers' perceptions about the usability and reliability of EduWave, quantitative data of this research study shows that most of them demonstrated strongly positive attitudes toward employing EduWave in the process of teaching and learning. However, the majority of them complained about the unreliable and weak internet connectivity. That barrier, however, limits them from making a full use of internet educational resources in general and from the Eduwave content, in particular. In parallel, teachers in ten schools only indicated that their schools have strong connectivity to the internet but the majority suffers from slow and interrupted internet connectivity.

On a Likert-type scale with ranges 1 (Hardly or Never), 2 (Partially), and 3 (Completely), teachers were asked to rate their perceptions toward the degree of EduWave and ICT utilization in schools for four items: Teachers' EduWave and ICT utilization in teaching; EduWave and ICT utilization for special needs students; EduWave and ICT utilization to promote students' self learning; and Students' utilization of EduWave and ICT as a learning aid. All items on the survey were worded positively. It was noticed that all items, except the second one, had mean values greater than 2.00, indicating positive perceptions of teachers toward the utilization of EduWave and ICT in schools. The average mean value is 2.00, which indicates a partial utilization of EduWave and ICT in public schools in Jordan.

**Obstacles Facing the Use and Utilization of EduWave e-Learning System and ICT**

The introduction of EduWave and ICT to Jordanian schools has greatly enhanced the process of teaching and learning in schools (Abuloum & Qablan, 2008). Most teachers, who participated in this study, indicated that they like to make more efficient use of EduWave as it motivates them to improve their performances and encourages them to search for more information that may benefit their students. However, according to the respondents, there are some factors that hinder the use of such e-Learning system in K-12 classrooms.

The survey had 15 items of prospective obstacles; respondents were asked to rate the items on a 2-point Likert-type scale, with 0 (Not-Obstacle) and 1 (Obstacle). The first three obstacles that received teachers' highest ranking were as follows: (1) Absence of incentives for teachers: This obstacle received ICT teachers' highest ranking (91.7%, 743 teachers). (2) Heavy teaching load: This obstacle received ICT teachers' second highest ranking (87.9%, 712 teachers). (3) Insufficient teachers' training programs, and Insufficient encouragement from school administration: These two obstacles received ICT teachers' third highest ranking (80.1%, 649 teachers). However, it is important to point out that the respondents have added a new obstacle to the survey that was not included in the proposed list of obstacles as one of the problems they encounter, that is, unavailability of high speed internet at some schools in rural areas.

**The Degree to Which Teachers are Satisfied with Eduwave e-Learning System**

All schools participated in this study were connected with Eduwave e-Learning system. Despite the high percentage of schools connected with Eduwave, the results of this study showed that only minority of teachers (approximately 36.4%) of these schools were satisfied with its uses, whereas the majority of teachers (approximately 63.6%) expressed their dissatisfaction with the use of Eduwave e-Learning system and its educational material. When inquired about the reasons of that dissatisfaction, many teachers attributed that to the technical problems (i.e. slow and interrupted internet connectivity) that they face while using the EduWave e-Learning system. However, other participants attributed their dissatisfaction to the old and poor educational content that the EduWave has.
CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Rapid changes in technology will ensure that ICT and e-Learning systems will proliferate in the classroom. It is predicted that there will be many benefits for both the learner and the teacher, including the promotion of shared working space and resources, better access to information, the promotion of collaborative learning and radical new ways of teaching and learning (Abuloum & Qablan, 2008). Consequently, the use of EduWave e-Learning system in public schools in Jordan will require a modification of the role of the Jordanian teachers, who in addition to classroom teaching will have other skills and responsibilities. Many will become specialists in the use of distributed learning techniques, the design and development of shared working spaces and resources, and virtual guides for students who use electronic media. Ultimately, the use of EduWave e-Learning system will enhance the learning experiences for students, helping them to think and communicate creatively.

Research has shown that teachers’ attitudes towards technology influence their acceptance of the usefulness of technology and its integration into teaching (Huang & Liaw, 2005). Most of the reviewed literature identified several factors that are related to the use of ICT and e-Learning tools, factors that school teachers believe are important either in facilitating the use or in creating barriers that work against the use of such technologies. Based on the reviewed literature, the most common factors that prevent school teachers from using e-Learning tools in their teaching are a lack of time to learn new technology (workload); the lack of adequate training in the use of technology; and, most importantly, a perceived lack of institutional support and incentives.

Even though, EduWave has a group of powerful tools that can transfer the school environment into cradle of discovery and creativity, the use of these tools and the utilizing of EduWave are still under aspiration for many reasons. Most of these reasons are the same in many research studies. Practical solutions must be implemented by the MoE based on the recommendations of the specialized studies in this field. That will enrich the e-Learning experience in Jordan, which has been considered successful. This study has highlighted on factors that positively or negatively influence teachers’ use of EduWave e-Learning system, as well as factors that are essential for successful integration of EduWave into teaching in K-12 public schools in Jordan. These factors are personal, institutional, and technological factors. Factors (barriers) that discourage the use of EduWave by teachers in K-12 settings in Jordan were also reviewed. These factors are categorized into teacher-level, school-level and system-level barriers.

Teacher level barriers include lack of teacher ICT skills, lack of teacher confidence, lack of pedagogical teacher training, lack of follow-up of new ICT skills, and lack of differentiated training programs. The school-level barriers comprise absence of rewards and incentives; old or poorly maintained hardware; lack of suitable educational software; limited access to ICT, and lack of school’s ICT strategy. Finally, the system level barriers include rigid structure of traditional education systems, traditional assessment, and restricted organizational structure. Knowing the extent to which these barriers affect individuals (teachers) and institutions (schools) may help in taking a decision on how to tackle them (Jones, 2004).

In general, the incorporation of ICT and EduWave e-Learning system into the learning system has led in changing the way teaching and learning that is happening at schools. However, throughout conducting this research study, there are some important issues that should be considered. The researcher believes that considering these issues would result in complementing the success of incorporating EduWave e-Learning system in Jordan educational system.

The study findings have implications for the officials at the MoE of Jordan and may provide areas
of consideration for educators in the higher education institutions and, specifically, for e-Learning Management Systems practitioners. The findings imply that teachers' dissatisfaction with the available Eduwave's educational material was attributed, by most schools, to several reasons. The first reason is the shortage of computers, meaning the small number of computers comparing to the large number of students. The second reason has to deal with the problems with the computers themselves and their need for continuous maintenance, which is not available for all schools in the required short time. So, providing better technical support solutions is essential.

The issue of slow and unreliable connectivity was a critical problem that faces the full utilization of EduWave in the process of teaching and learning. In order to overcome the deficiencies of the existing fixed line infrastructure, MoE of Jordan have to bypass their local fixed line infrastructure and establish wireless Internet access. The professional development of teachers sits at the heart of any successful technology and education program. As indicated in the findings section of this study, many teachers lack of adequate training on how to utilize the suitable educational software available in Eduwave e-Learning system.

Also, the findings of this study imply that providing schools with e-content by creating an offline copy for each school is important to overcome slow Internet issues; providing sufficient time for teachers is essential to use EduWave effectively; raising the principals’ awareness about the importance of a school environment is imperative to support the implementation of EduWave and other technology in education; and adopting a clear strategy on the employment of technology in classrooms is vital to a successful integration of ICT in schools. Additionally, it is important to note that, teachers need not only formal training, but also sustained and ongoing support to help them learn how best to integrate educational software into their teaching. Finally, offering rewards and incentives for using EduWave system can be effective way to encourage the positive behavior of teachers toward an optimal implementation of such innovation into the classroom teaching.

Lastly, based on the discussions and conclusions mentioned above, the results of this study suggest several areas for future research. First, conduct a study from the principals and students perspectives that will be useful to identify additional constructs that would account for teacher attitudes toward the use of EduWave e-Learning system. Second, conduct a study at private K-12 schools to identify how participation in the use of EduWave e-Learning system compares to that of public K-12 schools. Third, conduct a study to investigate the administrative leadership role in shaping and encouraging teachers' use of EduWave e-Learning system. Fourth, conduct a similar study at different schools around Jordan with a larger sample size to examine the identified factors related to teachers' attitudes toward the use of EduWave e-Learning system.
REFERENCES


