

**Considerations on Educational
Technology Integration: The
Best of JRTE. Edited by Lynne
Schrum. International Society
for Technology in Education
(ISTE), 2011. Pp. xi + 314. ***

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ملخص:

«اعتبارات إدماج التكنولوجيا في التعليم» هو مجموعة دراسات طموحة عالية الجودة وأوراق ومشاريع بحثية مشتركة نشرت بين الأعوام 2005-2010 في المجلة الفصلية «بحوث في تكنولوجيا التعليم» التي تصدر عن الجمعية الدولية لتكنولوجيا التعليم. وتمثل هذه البحوث والدراسات نتاج تربويين وخبراء يولون اهتماماً خاصاً بعملية دمج التكنولوجيا في التعليم الصفي، ليظهروا كيف يمكن للبحوث العلمية أن تسهم في ربط النظرية مع التطبيق لتطوير الممارسات التربوية ودفعها قُدماً نحو الأمام. وقد قامت لين شرام بتحرير هذا الكتاب عام 2011م ليضم بين دفتيه مجموعة متميزة وحديثة من الأبحاث والمقالات والدراسات التي نشرت في مجلة «بحوث في تكنولوجيا التعليم» مثل المصادر الرقمية الأولية، أجهزة الحوسبة المتنقلة استخدام المعلمين للتكنولوجيا في الممارسات التعليمية، وتنفيذ مبادرات حاسوبية من فرد إلى فرد. ونجد أن جميع هذه الأبحاث والدراسات يهدف إلى المساهمة في الأدبيات التي تركز على المهارات اللازمة توافرها لدي المعلمين والمتعلمين على حدٍ سواء لكي يقرؤوا ويستخرجوا معنى لما يبحثون عنه من خلال مصادر معرفية متنوعة.

من جهة ثانية تحقق مراجعة الكتاب هذا هدفين رئيسين، أولهما: أنه يتجاوز مسألة تلخيص الفصول الثلاثة عشر التي يضمها الكتاب إلى التركيز على تقديم وصف نقدي شامل لمحتويات الكتاب وفصوله الثلاثة عشر، متناولاً كذلك جمهور القراء المستهدف، وخبرات المحرر في موضوعات الكتاب. وحين يتحقق ذلك فإنه يهدف إلى تزويد جمهور القراء المتوقع - بمن فيهم معلمي المدارس ومحاضري الجامعات والتربويين والباحثين وغيرهم من العاملين في المجال التربوي- بنبذة مهمة عن الكتاب ومحتوياته حتى يوفر الجهد والوقت على القارئ الذي لن يضطر لقراءة ثلاثة عشر فصلاً. والهدف الثاني والأكثر أهمية للمراجعة هذه يكمن في أنه يحاول أن يقدم للقارئ تحليلاً مفصلاً لأدبيات دمج التكنولوجيا في التعليم من خلال تقديم دراسات وأبحاث وتصاميم بحثية تجريبية ونماذج بحثية ومبادرات خلاقة قام بها 31 باحثاً وخبيراً لهم مساهماتهم في هذا المجال البحثي المهم. وهذه الأهداف المبتغاة تشير إلى أن مراجعة الكتاب يراد بها أن تكون مراجعة نقاشية شاملة وليس مجرد تلخيص تقليدي لكتاب حديث، وعليه، تأتي هذه المراجعة لتحقيق هدفين معاً: تقديم مراجعة تحتوي على ما يسمى بأدب الدراسات السابقة في مجال إدماج التكنولوجيا في عملية التعليم والتعلم.

كلمات مفتاحية: مراجعة كتاب، اعتبارات إدماج التكنولوجيا في التعليم، دمج التكنولوجيا في التعليم.

Considerations on Educational Technology Integration: The Best of JRTE. Edited by Lynne Schrum. International Society for Technology in Education (ISTE), 2011. Pp. xi + 314 .

Abstract :

Considerations on Educational Technology Integration is an ambitious compilation of high-quality research studies, joint projects and articles presented in the quarterly - published Journal of Research on Technology in Education (JRTE) between 2005-2010. These research studies were carried out by experienced researchers and experts who give special attention to classroom technology integration, demonstrating how research can be used to connect theory to practice so as to move educational practices forward. The compilation was remarkably edited by Lynne Schrum in 2011 to bring together some of the best contemporary and fashionable JRTE articles and topics including digitized primary sources, mobile computing devices, teachers technology use on instructional practices, and implementation of one-to-one computing initiatives. The compilation, therefore, aims to contribute to the growing body of literature on the skills that teachers and students need to “read” and make meaning from a wide variety of source materials”.

The objectives of this book review are twofold. First, going beyond just summarizing a book of 13 chapters to give a critical comprehensive description of this edited compilation including a brief summary of its 13 chapters , audience level, and the editor’s area of expertise. Doing so, it aims to tell the expected audiences, including school teachers, university teachers, teacher educators, researchers and other educational practitioners something substantial about the book to spare the reader from having to read the 13 chapters. Second, and more importantly, the book review aims at providing a more detailed analysis of existing literature in the field of educational technology integration through presenting studies, projects, scientific experiments, models, research methods, and promising initiatives carried out by 31 researchers and experts who contributed to this important research field. These objectives reveal that the book review is hoped to be in-depth commentary one , not merely traditional brief summary of a book or a conventional book review. The aim, then, is “kill two birds with one stone” through providing a book review that incorporates a kind of literature review in the field of educational technology integration.

Key words: Book Review, Considerations on Educational Technology Integration, Integrating technology into education. .

Considerations on Educational Technology Integration, edited by Lynne Schrum in 2011 is an outstanding compilation of research articles and studies published between 2005-2010 by experienced educators and researchers who give special attention to the use of Information and Communication Technology (ICT) in education so as to pave the way for more successful classroom technology integration, demonstrating how research can be used to connect theory to practice and move education forward. The purpose of this compilation of research articles from JRTE, according to Schrum, is to "provide a context and trail of where we have been and what our research base has established thus far" (p.6) through bringing together some of the best JRTE articles and topics including digitized primary sources, mobile computing devices, the influence of teachers technology use on instructional practices, and implementation and effects of one-to-one computing initiatives and the like. To achieve such objective, the introductory paragraph reveals that Schrum calls for "a comprehensive plan with complementary comprehensive research to document what we find" (p.5) because, as it is indicated in the introduction "there is no area in which well-conceived and effectively implemented research could be of greater value than in the area of technological innovation" (p.2) especially when the increased accessibility to technology has resulted in increased educational use in many countries throughout the world and that "the advances in technological capacity would be matched by parallel enhancements in learning" (p.2).

However, Schrum, in the same introductory chapter and although she strongly believes in the importance of educational technology integration, she maintains that despite its positive impact, technology has not facilitated the wholesale educational reform and has not yet resulted in wholesale educational transformation. She believes that there are still larger issues that have not yet been addressed and leading educational technology researchers in particular are tasked with investigating their purposeful educational uses to identify ways these technological tools may affect student engagement and academic achievement. Such insights and beliefs might form a logical reason which explains why Schrum intended to offer this compilation of articles from the well-known quarterly - published Journal of Research on Technology in Education (JRTE) to contribute to "the preparation of teachers these days since there are many still not changing their teaching to take the advantage

of technology” (p.5) especially when it is obvious that the introduction of technology into schools has not resulted in the expected educational reform as mentioned previously. . According to Schrum, one reason for that may be “ the missing relationship between educators and their burning questions and the questions educational researchers chose to investigate” (p.6).

Hence, Schrum concludes the introduction by calling for a strong link between teaching and learning which requires support from the teacher in designing an educational environment , and that technology must be embedded in thoughtfully planned ongoing instruction to be effective in supporting student outcomes. She finally maintains that “educators and researchers have common goals, and synergy between them would benefit all” (p.6.)

What makes this edited compilation distinctive and outstanding are the following considerations. Firstly, Lynne Schrum, the editor of this book , is an expert in the field of information and communication technology and educational technology integration. She is the Dean of College of Education and Human Services at West Virginia University. Previously, she was a professor and coordinator of elementary education in the College of Education and Human Development at George Mason University. Her research and teaching focus on preparing teachers for the 21st century, appropriate uses of information technology, and leadership in a digital world. She has written eleven books and numerous articles on these subjects; the most recent is How 2, Web 2: How to for Educators. Schrum served on AERA s Council, was editor of the Journal of Research on Technology in Education (JRTE) (2002-2012), and is a past-president of the International Society for Technology in Education.

Secondly , (ISTE) , the publisher of this edited compilation is well-known trusted source for professional development, knowledge generation, advocacy and leadership for innovation in USA. ISTE is the premier membership association for educators and education leaders engaged in improving teaching and learning by advancing the effective use of technology in PK-12 and teacher education. ISTE, however, represents more than 100,000 professionals worldwide who devote their good experience and practice to develop and produce practical resources and materials for classroom teachers , teacher educators and technology leaders.

Thirdly, ISTE’s Journal of Research on Technology in Education (JRTE)is an ambitious scholarly journal for the field focusing entirely on research

and development in educational technology. It publishes original research, literature reviews and syntheses, methodological reviews, policy analyses, and theoretical or conceptual positions that relate to the efficacy of instructional uses of education technology from around the globe. It features blind, peer-reviewed articles that report on original research, system or project descriptions and evaluations, syntheses of the literature, assessments of the state of the art, and theoretical or conceptual positions that relate to instructional uses of educational technology. International in scope and thorough in its coverage, JRTE defines the state of the art and future horizons of learning and teaching with technology in educational environments.

Fourthly , whatever published in this journal is subject to strict criteria to be the state-of-the-art in this field. This explains why, for example, in 2009 approximately 85% of submissions to the Journal of Research on Technology in Education were ultimately rejected” Schrum gives two main reasons for this. The primary reason was related to quality, methods, and focus. But many were rejected because they did not deepen, expand, or push the envelope on our literature base, nor did they help develop new knowledge that added to what we already know” (p.2).

Fifthly, this collection and compilation covers first –class articles , practices, experiences and research methods on technology integration over the past six years especially when we read on the pages (iv- viii) about the 31 contributors to this compilation. Going over these 31 biographies indicates that this edited compilation brings together a community of educational researchers who work for the advantage of first-hand collective knowledge in the field of educational technologies. Such concern offers the book a good opportunity to appeal to a variety of audiences including teachers , teacher educators, researchers and other practitioners who are involved and interested in classroom technology integration and in how research can be used to connect theory to practice-moving education forward.

Sixthly, this edited, depending on what has been previously mentioned, has the potential to attract and encourage a variety of audiences especially the community of teachers in the Arab World and in Palestine whether in schools or in universities who are still not changing their teaching methods and styles to take advantage of technology for the purpose of meeting the needs and interests of their students on one hand, and for preparing students for the 21st century skills on the other hand. This seems to harmonize with

Iding , Crosby, & Speitel (2002) who stated that “ In order for technology to positively affect teaching methods-and therefore student learning-teachers must possess the technology related skills needed to use technology and must actively use these tools in their classrooms”. Again , this view is consistent with Cheng (2013) who stated that new technologies that influence how information is created, shared and connected holds promise for education, especially in the online distance education mode.

Going back to the components of this edited compilation , the intended reader notices that in addition to the eight—page introduction, the book comprises thirteen chapters preceded by an acknowledgement and a five-page section which talks about the editor and the thirty-one contributors. Since each chapter presents a refereed article , a study, or a joint research project published in JRTE between 2005-2011, all chapters begin with an abstract that aims to offer a brief summary of the given research to help the reader quickly ascertain the paper’s purpose, acting as the point-of-entry for the given paper/study. Each chapter, furthermore, includes a final section entitled “ author update” in which the authors/s present/s recent comments or other suggestions written for the purpose of enriching and updating the results of the study. Finally, each chapter ends with a list of references used throughout the article which range from 1977-2011, the year of book’s publication.

As mentioned above , the book opens with an introductory chapter entitled “ ***Revisioning a Proactive Approach to an Educational Technology Research Agenda***” written by the editor Lynne Schrum who aims to provide a brief overview of why it was important to publish this collection. Schrum also gives background on the educational research landscape and discusses where educational research needs to be in the future. In this introductory chapter, Schrum seems optimistic when she maintains that “ the steady advance in speed and capacity has produced powerful computers available at modest prices, along with a wide variety of handheld technologies that can accomplish remarkable tasks”.

Chapter one, entitled “***Rethinking the Technology Integration Challenge : Cases from Three Urban Elementary Schools*** “ offers three case studies conducted in three urban elementary schools for the purpose of documenting the integration of technology. The analysis of these cases provides a greater understanding of the complex interplay of curriculum, technology and professional growth and development activities. Of particular importance are

the case studies with concrete examples that can help the intended reader to understand the perspective of how new technology resources are absorbed into an existing, normative ecosystem, namely, the school culture. The researchers Amy Staples, Marleen C. Pugach and Dj Himes give us good examples of schools and projects which succeeded in educational technology integration. For example, one of the schools in the case study chose to use its funds to support teachers who were already employed by the school. A teacher with an interest in technology became the official technology specialist, shifting from her role as a part-time physical education teacher and part-time technology support person. What seems encouraging in this study is that an instructional technology consultant to one school continued to develop ideas for sound, high-quality technology projects, at the school, as well as to provide staff development so the teachers felt capable of using technology effectively (p.18). Data sources for this qualitative study included participant observers, field notes and journal entries, school personnel interviews, timeline and chronicle of technology-related priorities and events, and children's and teachers' technology artifacts. The analysis identified three scaffolds that appear to have a significant influence on-and redefine the challenge of technology integration: alignment with the curriculum /mission, teacher leadership, and public/private roles for technology recognition.

These case studies with their final results would be useful to those who have a keen interest in technology integration and who are willing to learn or develop their understanding of the technological advances available for learners and teachers to assist with integrating technology into the curriculum on one hand, and to enhance teacher professional development on the other hand. In this regard, we read on page 35 "to be integrated successfully, there must be a clear understanding that technology creates a new layer for professional development". Technology, as the researchers make clear, can be a powerful tool for moving schools toward their fundamental goals of supporting student learning. The researchers believe that "the task for schools became that of determining how technology and curriculum would operate to strengthen student learning (p.10). However, it seems that such objective requires teachers to get involved to a greater or lesser extent depending on their personal interest and motivation in addition to the students who can play a major role in technology use. This belief seems to agree with what Barron; Kemker; Harnes and Kalaydjian maintain in chapter four when they claim that "when students are able to choose and use technology tools

to help themselves obtain information, analyze, synthesize, and assimilate it, and then present it in an acceptable manner, then technology integration has taken place (p.101). It also agrees with the results of Bill Tally and Lauren B. Goldenberg whose research in chapter four suggests that if primary source documents are going to significantly enhance students' understanding of content, students need to be both cognitively active and emotionally engaged when working with them (p.60).

One important section in this chapter is the one which talks about barriers to technology integration .The researchers discuss the issue of preparedness of teachers to respond to the influx of technology resources as the first barrier, and of schools to keep up with the mechanical functioning and maintenance of equipment as a second barrier. A third barrier lies in the fact that many teachers had not been prepared to utilize technology in their teacher preparation programs. Other barriers were identified such as time for professional development, lack of systematic planning, lack of support for networks and hardware at individual school sites (p.11).

To overcome these barriers, the researchers offer some conditions for technology integration to best occur including providing ample professional development for teachers, making certain that technology supports the curriculum, and providing a solid infrastructure to support the technology itself. These recommendations agree with Dawson & Rakes (2003) and Fuller (2002) who maintained that “teachers need appropriate , research –based training; opportunities to practice these skills ;access to technology tools; and support, both in terms of encouragement from school administration.”

In chapter two, the intended reader is introduced to the topic of “**Fostering Historical Thinking with Digitalized Primary Sources**”. Offering data from different sources, the chapter presents a pilot study carried out by Bill Tally and Lauren B. Goldenberg for the purpose of examining middle school and high school student performance on an online historical thinking assessment task. The task is part of evaluation of a professional development program which aimed at helping teachers use online primary source materials in their teaching so as to help students use new technologies and primary sources, especially visual sources. In this regard , McKenzie (2001) argues that the challenge should be about using new tools to help students master the key concepts and skills embedded in the science , social studies, art, and other

curriculum standards. It is not so much about PowerPointing , spreadsheeting or word processing (p.144).

After the teachers received training in the use digital historical archives, students from all groups engaged in historical thinking behaviours (e.g., observation, sourcing, inference, evidence, question-posing, and corroboration) in response to an open –ended document analysis exercise. The study revealed that educators seeking to take advantage of digitalized primary source documents need activities with clear curriculum linkages and small exercises that give students guidance in working with different kinds of documents (visual, textual , and audio). As a result, educators can benefit a lot form the given well-designed software to support teachers and students in working closely with documentary sources , and thereby improve history teaching and learning.

Karen Swan; Mark van ‘t Hooft; Annette Kratcoski and Darlene Unger in chapter three provide us with a preliminary study that employed mixed methodologies to explore *students’ uses of mobile computing devices and its effects on their motivation to learn, engagement in learning activities , and support for learning processes*. Data collected from students in four elementary and two seventh grade science classes included usage logs, student work samples, student and teacher interviews and classroom observations. Findings highlighted the personalization of learning afforded by such devices both in terms of individuals and individual classroom cultures, as well as their usefulness in extending learning beyond the classroom. This means that the usage tends to be personalized as individual students adapt the use of mobile computing devices to their own needs. Mobile computing devices were used most frequently for writing activities. They also suggest that increased motivation due mobile device use leads to increase in the quality and quantity of student work. The use of mobile computing devices can be beneficial for learning inside and outside the confines of the classroom. The findings suggest that special attention needs to be paid to classroom logistics, equipment maintenance, technical support, and perhaps professional development for teachers using mobile computing options.

Ann E .Barron; Kate Kemker; Christine Harnes and Kimberly Kalaydjian in chapter four explore *technology integration in K-12 school* using a survey in one of the largest schools districts in Florida, focusing on teachers’ instructional modes related to technology integration as outlined

in the National Educational Technology Standards for Students . The study was conducted to determine the extent to which individual teachers in a large school district were using technology as a tool for their students' education. In particular, the research addresses the use of technology as a classroom tool for research, communication, productivity, and problem-solving. In order to investigate teachers' use of technology in the classroom and to relate that use to the National Educational Technology Standards guidelines, a survey was designed and sent to all teachers in the school district. Four domains were selected as focal points of the survey-integration; support; preparation; confidence; and comfort; and attitude toward computer use. In this regard Penuel maintained in chapter 5 that “ beyond facilitating more frequent use of technology in class, many argue that providing students with better access to computers can provide students with more equitable access to up-to-date learning resources and learning opportunities .This of course has the potential to transform learning environments and improve student learning outcomes” (p. 109). The study provided data that indicate many teachers are implementing technology as a classroom tool for research, communication, productivity , and problem-solving and that students' motivation to learn and engagement in learning activities was improved by their use of mobile computing , which resulted in increased student productivity and improved quality of work.

In chapter five, William R. Penuel , the director of evaluation research at the Center for Technology in Learning at SRI International, carried out a research study to examine *how technology can support classroom assessment and the implementation and scaling of technology-supported innovations in science and mathematics education*. The paper then attempted to synthesize findings from research and evaluation studies that analyzed implementation and effects of one-to-one initiatives from a range of countries. Factors related to successful implementation reported in the research included extensive teacher professional development , access to technical support, and positive teacher attitudes toward student technology use. For the purpose of his review, Penuel chose three core features common to a wide variety of initiatives as defining characteristics of one-to-one computing in the classroom: (1)providing students with use of portable laptop computers loaded with contemporary productivity software (e.g., word processing tools, spreadsheet tools, etc.). This would be helpful since “beyond facilitating more frequent use of technology in class, many argue that providing students with

better access to computers can provide students with more equitable access to resources and learning opportunities (p.109), (2) enabling students to access the Internet through schools' wireless network, and (3) a focus on using laptops to help complete academic tasks such as homework assignments, tests, and presentations. The study ends with the conclusion that “ teachers need to spend enough time in educational technology professional development activities so as to feel well or very well –prepared to use computers and the Internet for instruction (p.111).

In chapter six, the reader is introduced to a study that aimed to investigate the *relationship between technology use and skills and the use of constructivist instructional practices among teachers in rural schools*. To achieve this objective, Glenda C.Rakes ; Valeries S. Fields and Karee E. Cox asked a purposeful sample of 186 fourth and eighth grade teachers to respond to a fifty-item instrument on Levels of Technology Implementation (LoTi) which measures authentic classroom technology use in seven categories. The LoTi was administered in 11 school districts to determine if levels of classroom technology use and personal computer use predicted the use of constructivist instructional practices. Results indicated a significant positive relationship between both levels of classroom technology use and personal computer use and the use of constructivist instructional practices , with personal computer use being the strongest predictor. As the results showed, training students on how to use technological tools and devices is an obvious requirement to move forward towards educational technology integration. This of course might explain why the educational institutions including those in the Arab World such as Al-Quds Open University in Palestine decided to give specific attention to training students how to use technology for educational purposes. This focus seems to agree with Moersch (1999) who maintained that the appropriate use of technology can reinforce higher cognitive skill development and complex thinking skills such as problem solving, reasoning, decision making and scientific inquiry.

Chapter seven, presents another important study on technology integration in which Loretta Donovan ; Kendall Hartley and Neal Strudler investigated the *concerns of teachers in the early stages of a one-to-one laptop initiative*. The initiative aimed to place laptop computers into the hands of each student and teacher in an urban middle school in the Southwestern United States. One goal of the schools was to provide an environment of enhanced technology integration to support the preparation of students for the 21st century. The

school received funding for a one-to- one laptop initiative that included funds for teacher training, encouraging parent involvement, and developing more student- centered learning activities through the integration of technology into teaching and learning. Results indicated that teachers fall into two relatively well-defined categories in terms of their concerns regarding the innovation. The majority of teachers have genuine concerns about how the introduction of laptop computers into the school environment will impact them personally. A lesser number have concerns about how to best use the laptops to meet the needs of the students.

Chapter eight provides the expected reader with a study carried out by S.Kim MacGregor and Yiping Lou for the purpose of obtaining a better understanding of *how to enhance the pedagogic effectiveness of WebQuests and of how students interact with the various features inherent to informational websites*. The WebQuest is an approach to organizing Internet-based learning tasks for students. With its six major components, including introduction, task, resources, processes, evaluation, and conclusion, the WebQuest model was created by Dodge (1995) and his colleague Tom March (1998) as a framework for teachers to structure student-centered learning using Internet resources. These resources do not teach as textbooks often do, but provides candidate information to be engaged and interpreted. Resource-based learning, furthermore, has great potential to improve the development of higher –order cognitive skills, critical thinking, and problem-solving skills that the fast-paced information age demands. A major objective was to examine the effect of providing instructional scaffolds to support fifth grade students’ WebQuesting experiences. The researchers suggested that using WebQuests for inquiry –based learning represents a higher-order use of technology requiring students to exercise information seeking, analyzing, and synthesizing strategies. Their beliefs lie in the fact that “learning is facilitated when multimedia elements such as graphics provide illustration of the concepts , readability is appropriate for the target learners , and when screen design is appealing and easy to read and navigate (p.191). Regarding the nature of learning and its definition , Chen and Bradshaw in chapter four propose that “ learning is an active process by which students construct their own knowledge in light of their existing knowledge and through a process of generation, integration, and transformation of their experiential world (p.199). The findings of the study indicated that conceptual scaffolds in the form of a study guide and a concept mapping templates coordinated with the research

tasks enhanced students' free recall and application of acquired knowledge as they were engaged in learner-centered resource-based learning.

Concerning chapter nine, the audience is introduced to a study conducted by Ching-Huei Chen and Amy C. Bradshaw to examine *the effect of question prompts , knowledge integration prompts, and problem-solving prompts in a web-based learning environment on scaffolding students' conceptual knowledge and problem –solving processes in an ill-structured domain*. The researchers maintain that ill-structured problems often require solvers to get beyond what is represented in the problem statement and consider alternatives using more metacognitive skills (p.201). Knowledge integration prompts in this study, on the other hand, refers to a set of questions that prompted students to connect ideas , compare ideas, seek uncertainty evidence, transfer ideas, and summarize valid relationships. In this regard, many researchers have emphasized that knowledge integration is an important process in students' science learning because it engages students to monitor , actively reflect, evaluate, and modify their own knowledge (p.198). A mixed –method study was employed to investigate the outcomes of students' conceptual knowledge and ill-structured problem-solving. To achieve this objective, a web-based learning environment was created to provide the information students needed within the discipline as well as learning scenarios to engage them in authentic problem-solving activities and guide their learning process through scaffolding (p.198). The researchers used quantitative and qualitative methods to examine the results from different data sources and expand the scope and breadth of the study. The participants were 51 undergraduate students (32 female and 19 male) recruited from three sections of an introductory course in the Department of Educational Psychology at a south central U.S University.

The quantitative results indicated that students who received knowledge integration prompts had significantly higher scores in overall problem-solving performance, but the same was not true for prompts focused on conceptual knowledge. Furthermore, the qualitative findings revealed the positive effects of knowledge integration prompts in facilitating students to make intentional efforts to identify and explain major concepts and their relationship that are necessary for solving the ill-structured problem. Web-based learning has considerable promise in the development and facilitation of students' understanding.

In chapter10 , Karla V.Kingsley and Randall Boone aimed to investigate

social studies achievement as a result of *utilizing a multimedia –based American history software program to augment textbook and lecture materials* for 184 seventh grade middle school history students in an ethnically and linguistically diverse urban school district. They tried to use instructional software that is based on an interactive multimedia program designed to teach middle school students through video, song, animation , text and other media to develop critical- thinking skills while acquiring knowledge of required content strands. On page 218, they described multimedia as any system that combines two or more media into a single product or presentation , such as a software program or a web page (p.218)and therefore, interactive multimedia is considered to be one of the best technologies to help student learn especially when it’s known that sound, images , animation and interactivity in electronic books have been shown to increase motivation and comprehension scores as compared to students’ reading of printed texts (p.219).

The investigation examined whether there was a statistically significant difference between pretest and posttest achievement scores for students who used the American history software compared to students who did not use the program. Teacher and student activities, pretest and posttest scores, and instructional methods for experimental and control conditions were documented in order to provide a comprehensive understanding of the results. The results found that the use of a software program affected student achievement scores on a standards-based, multiple –choice test. Students in the control group increased their mean test scores an average of 6.1%, while students in the experimental group increased their mean test scores was statistically significant.

The researchers described briefly the so-called “ supported electronic text design that includes customized content, links to resources and related documents and media , alternate versions of content, descriptions and clarifications of content , visual representations of content, questions and testing (p.220). Such design can be adopted by Al-Quds Open University in Palestine to redesign special e-textbooks that meet the learners’ needs and interest on one hand, and the requirements of the open distance educational system. Additionally, QOU can make use of these features to redesign courses through ICT integration tools. It is worth mentioning here that QOU needs to keep looking for ways to make students feel confident about integration ICT in their learning practices as it is a prerequisite for students to accept ICT as a powerful learning tool.

Chapter 11 presents Charoula Angeli and Nicos Valanides's study which aimed at exploring *the effect of electronic scaffolding for technology integration on perceived task effort and confidence of forty-one primary student teachers* who were enrolled in a science education method course. The participants were divided into two groups and were instructed how to integrate certain Information and Communication Technology (ICT) tools in learning activities. Only one group was guided to use Filamentality to organize Internet information in a Hotlist and a Scrapbook. Filamentality is a fill-in-the-blank interactive website that assists learners in defining a topic and guides them through searching the web and collecting appropriate websites. It assists with turning these online resources into different types of learning activities such as Hotlists, Scrapbook, Treasure Hunts, Samplers, and WebQuests. A Hotlist, on the other hand, is a web page with links to text-based materials for a topic that are organized meaningfully into categories so as to minimize the time needed to locate relevant information. A Scrapbook, furthermore, is a web page with links to a variety of media, such as images, sound, video clips, and virtual reality tours as these relate to a topic (p.243).

To achieve the study objectives, three questionnaires were administered to collect data related to students' perceived task effort as a result of integrating ICT in the learning environment, and their confidence levels in using ICT tools, while their initial attitudes toward ICT and its integration in the classroom were taken into consideration. The science education method course was designed around three major objectives: (a) to familiarize students with current trends in science teaching, (b) to capitalize on the interrelationships among science, ICT, and society, and (c) to integrate ICT tools for designing and developing interactive instructional activities.

The results indicated that Filamentality effectively scaffold particular aspects of ICT in learning and instruction, and significantly reduced learners' amount of perceived task effort, but there was not always a significant effect on learners' self-reported confidence levels. These findings indicate that students who were instructed to employ Filamentality in their work reported lower perceived task effort related to the use of the Internet, and confidence levels, the design of instructional activities using HyperStudio, and total PTE.

To explore the merits of technology integration, Barbara Means aimed in chapter 12 to examine *technology implementation practices associated with*

student learning gains. Interviews and observations were conducted with staff at schools where teachers using reading or mathematics software with their students attained above-average achievement gains and at schools where software-using teachers had below-average gains. Means stated that recent large-scale national surveys of teacher practices with technology found an increase in teacher use of technology as a productivity tool supporting their own work between 2005 and 2007 but no increase in the level of teacher-assignment of technology –based learning activities for students during the same time period. Furthermore, teachers and students were found to use technology more frequently outside of school than they do during class time. According to Means, technology adaptation and implementation require not just funding resources but also ongoing effort. Hence, to make technology an agent of education change, the field needs to understand the kinds of learning outcomes that technology can enhance and the circumstances under which that enhancement will be realized in practice (p. 258).

The findings of the study highlighted the importance of school practices in the areas of principal support and teacher collaboration around software use and of teacher practices concerning classroom management and use of software –generated student performance data.

James W. Pellegrino and Edys S. Quellmalz maintain in chapter 13, the final chapter in this compilation , that Information and Communication Technologies such as web browsers, word processors, editing, drawing, simulations, and multimedia programs support a variety of research , design, composition, and communication processes. They also stated that “in numerous areas of the curriculum, information technologies are changing what is taught, when and how it is taught, and what students are expected to be able to do to demonstrate their knowledge and skill” (p. 297). Hence, their study aimed to discuss ***uses of technology in educational assessment from the perspectives of innovation and support for teaching and learning.*** It attempted to examine assessment cases drawn from contexts that include large –scale testing programs as well as classroom-based programs, and attempts that have been made to harness the power of technology to provide rich , authentic tasks that elicit aspects of integrated knowledge , critical thinking , and problem solving . These aspects of cognition are seldom well addressed by traditional testing programs using paper and pencil or computer technologies. The paper also gives consideration to strategies for developing balanced , multilevel assessment systems that involve articulating relationships among

curriculum –embedded, benchmark, and summative assessments that operate across classroom, district , state, national and international levels. It discusses the multiple roles for technology in an assessment –based information system in light of the decision support needed from the multiple actors who operate across levels of the education system.

The researchers assured that these same tools can expand the cognitive skills that can be assessed , including the processes of planning, drafting, composing and revising (p.287) and that in addition to assessment of student knowledge and skills in highly structured problems with one right answer , technology can also support the design of complex , interactive tasks that extend the range of knowledge, skills, and cognitive processes that can be assessed (p.291).

According to James W. Pellegrino and Edys S. Quellmalz , simulation can assess and promote understanding of complex systems by superimposing multiple representations and permitting manipulation of structures and patterns that otherwise might not be visible or even conceivable. Simulation-based assessments can probe basic foundational knowledge such as the functions of organism in an ecosystem, and, more important, they can probe students' knowledge of how components of a system interact along with abilities to investigate the impacts of multiple variables changing at the same time. Moreover, because simulations use multiple modalities and representations, students with diverse learning styles and language backgrounds may have better opportunities to demonstrate their knowledge than are possible in text-laden print test (p.291).

Finally, the researchers conclude their article by stating that extensive technology –based systems that link curriculum , instruction, and assessment at the classroom level might enable a shift from today's assessment systems, which use different kinds of assessment for different purposes, to a balanced design that would ensure the three critical features of comprehensiveness, coherence, and continuity.

The aforementioned summary of the thirteen chapters indicate that they cover a variety of topics and disciplines being examined in conjunction with technology integration. The new ideas, the concrete examples, the case studies, and the practical tips found in these chapters contribute to the connectedness of its various topics which enhance its readability and make it worthy of reading as it makes a link between theory and practice in the

field of educational technology integration. In relation to the content, the 31 contributor in addition to the editor herself offered in-depth research literature supplemented by quantitative and qualitative data collected from different contexts and different disciplines. These disciplines include history as in chapter two and ten, science as in chapter three, English, math , science and social studies as in chapter four, science education method as in chapter 11,

Being a welcome contribution to the field of educational technology integration , the book, is highly recommended to both teachers and students who are involved in Distance and Open Education everywhere and at QOU in particular. This is because the book suggests a range of tools and technologies that can be effectively used for technology integration aiming at enhancing students' learning . Some of these tools and technologies suit the classroom situation such as digitized primary sources, mobile computing devices, laptops, one –to-one computing devices, and multimedia software electronic scaffolding and new trends of educational assessment , while others can be used as virtual communication tools especially web-based learning, web-based question prompts, and mobile technologies. This might be understood as a promising endeavor that encourages educators to avoid treating technology as a separate , fragmented activity in the school, instead technology should be seen as a tool that has the potential to improve instruction and students' learning in particular.

Furthermore, reading through the thirteen chapters, the intended reader can gain some knowledge of the best educational practices and some challenges and barriers faced by students , teachers and decision makers in many educational contexts. The book, therefore, seeks to encourage teachers and learners to play a major role in technology use or technology integration as it is mentioned throughout the book so as to move towards the 21st century skills which are based and greatly influenced by technology integration and then how to move towards students-centered approaches.

Regarding the references used in this compilation , the reader notices that there is a list of references at the end of each chapter since each chapter represents a research article or a study by itself . The number of the references in each chapter ranges between 19, as in chapters 1 and 78 as in chapter five . A quick review of the nature and types of the references indicates that the authors did their best to use different types of sources including, professional books, refereed journals, publications, documents, manuals, periodicals,

literature reviews, educational websites ,electronic databases, summaries of workshops and conference proceedings. All of these types aim to provide detailed information of current research, theories and methodologies in addition to a general knowledge of what has been discussed in each chapter.

Since Schrum hopes that the book will be of great value to teacher educators, researchers, academic libraries and other people who are interested in the major topic of the compilation or in a specific domain given in one particular chapter, we may add other audiences related to the Palestinian educational context the most important of which is Al-Quds Open University since it adopts the philosophy of open distance education which strongly emphasizes technology integration to provide a useful resource. Using technology in this case represents an integrated component of distance open education. Distance education operations have evolved through the following four generations: first, the Correspondence Model based on print technology; second, the Multimedia Model based on print, audio and video technologies; third, the Telelearning Model, based on applications of telecommunications technologies to provide opportunities or synchronous communication; and fourth , the Flexible Learning Model based on online delivery via the Internet. The fourth generation of distance education initiatives has already paved the way for the inevitable emergence of the fifth generation which is based on further exploitation of new technologies to capitalize on the features of the Internet and the Web. This generation is called by The Intelligent Flexible Learning Model in which Interactive multimedia (IMM) , Internet-based access to WWW resources , Computer-mediated communication, automated response systems and Campus portal access to institutional processes and resources are employed and used by both students and instructors (Taylor, 2001).

Moreover, researchers, MA students and even PhD students who are ambitious and qualified to tackle one of the abovementioned topics can gain first-class knowledge of various scientific methods, quantitative and qualitative ,data collection sources and procedures based on videotaped observation, e- portfolios, journal entries, interviews, student work samples, student and teacher interviews and classroom observations, questionnaires, open- ended questions, population and sampling, data analysis, tables and figures , and the like. In addition, the intended readers are challenged to analyze and discuss the represented information through focusing on flowcharts, graphs, figures, and tables which are meant to help the readers grasp the

objectives and the results of each study. Going over the abstracts, ambitious researchers and teachers can also find out problems in their area of interest i.e. educational technology integration, that have already been investigated in the past to examine what other specialists and researchers have found out about educational technologies and how they have done when they have emphasized the unique importance of technology integration into education.

A final word, keeping its positive points in mind, the reader of Schrum's ambitious compilation can choose to read any individual chapter without being lost or confused since each chapter is meant to deal with a specific area of interest. This means that the book, being a well-structured compilation, does not need to be read in a traditional way. In fact, the reader may eventually choose, for instance, to read all chapters on aspects of doing one research first or only those which concern special interest. Thus, teachers and researchers will find the case studies, the experiments and the techniques used throughout the 13 chapters in addition to the practical tips very useful especially when the book attempts to bring the reader closer to a variety of research studies and methodologies related to educational technology integration from different contexts. Last but not least, the book's major strength, lies in its comprehensive coverage and diversity of issues and controversies related to the very important and contemporary issue of technology integration into the teaching and learning process in the 21st century.

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