

Teachers' Perceptions on E-Media Adaption in Basic Electronics Technology

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ABSTRACT

This paper presents the extent of adopting E-media in the Electronics Technology curriculum as an alternative instructional tool in developing the students' competencies in measuring instruments, symbols, and circuit diagrams. The study found out that the five competencies under Safety were all given a descriptive rating of Very Satisfactory. This implies that the instructors observed the highest degree of safety protocols in their respective shops in the activity's conduct. The adoption of E-media in electronics, technology classes serve to improve students' learning capability to master the subject matter. Using the E-media facilities as an instructional tool, it facilitated the learning process. E-media's adoption as an additional instructional tool supplemented the identified competencies in the safety shop subject. It allows students to learn the basic principles of electronics technology, whereby interaction is encouraged and theories are put into practice in actual hands-on activities. The study suggested that the adoption of E-media in Electrical technology classes is continually done and practiced. Regular monitoring and updating of materials are also necessary for ensuring that the use of E-media is properly implemented.

KEYWORDS

E-media; electronics technology; manual and exercises; instructional tool; laboratory manual; shop instruction; adoption

INTRODUCTION

Electronic Media or E-Media in teaching and learning has proliferated since the start of the new millennium and has expanded rapidly since then. The integration of files, documents, sounds, videos, and animations in E-Media provided many learning avenues. Electronic media has provided a great advantage in education and massively benefited the curriculum's implementation with computer software development. Tire and Militwa (2008:142) maintained that the benefit of ICT use is not restricted to the classroom environment but orientates and introduces learners to ICT practices in the post-school technology-based information economy. Duhaney (2000) argued that the infusion and integration of technology in the education process had presented new avenues by which teachers can enrich and enhance teaching and learning activities.

According to Sudarsana et al. (2019), the world has entered the era of globalization making a competition to master, create and implement new technology. One of the most effective ways is to introduce technology in the world of education. Education systems in some underdeveloped countries also embraced ICTs in education to overcome their educational shortcomings and develop the 21st-century competencies which include critical thinking skills, problem-solving skills, inclusivity, life-long learning, global interaction, collaborative teamwork, and cooperative learning (AACTE, 2010:9; DBE, 2004:16). The changes in the characteristics of shape evolution of higher education entering students, by

the development of new methods of teaching and learning, and by shifts in the knowledge that society values. Rapid advances in information technology are influencing each of these factors, as the standard interface for computers and telecommunications that brings distant experts and archives to one's desktop is increasingly complemented by "Alice in Wonderland" interfaces to virtual environments and "Ubiquitous Computing" infusions of digital information into real-world settings (Dede, 2002). Higher education institutions can prosper by basing their strategic investments on using these emerging educational technologies to match the increasingly "new millennial" learning styles of their students. Moreover, according to Chris Dede (2005) "Rapid advances in information technology are re-shaping the learning styles of many students in higher education." As a result, advances in technology create new opportunities for higher education; emerging technologies can be used to deliver instruction matched to the learning styles of the new genre of students. Therefore it is critical for Higher education to make use of modern technologies in a manner that encourages and optimizes learning. A study examining the differential learning effects of offering a lecture on physics to students in a traditional classroom versus internet video formats indicate enhanced transfer of lecture information in the video formats relative to the live condition, with students also responding more positively to personalized video presentation (Dey, Burn, Gerdes, 2009).

The development of computer software in education has to lead to the significant capabilities of E-media as an instructional tool for the effective delivery of instruction. Thus this paper explores how E-media can be incorporated in Electronics Technology courses as an instructional tool. It presents the extent of E-media adoption in laboratory manuals in Electronics Technology courses as perceived by the teachers handling Basic Electronics Technology. It describes the adoption of E-media in the laboratory manual and exercises in the General Curriculum for Secondary Education and the Electronic Workbench software to create circuits and diagrams as a tool in formulating different exercises. Specifically, it presented the teachers' perceptions on E-media adaptation in Basic Electronics Technology, particularly in the safety classes.

LITERATURE REVIEW

The use of technology in the delivery of instruction has provided different findings as different perspectives come into view. The demand for the development of instructional software to enrich educational methods and resources to facilitate learning (Borabo, 1997) and use of technology to expand instructional options for faculty (Dey, Burn, Gerdes, 2009) has made education more convenient. Electronic media is used to provide access to both content and pedagogy as it employs varied electronic communication processes like multimedia presentations and all forms of electronic media. Sleeman (1987) and Burton (1988) cited the use of multimedia instruction as an intelligent tutoring system that combines the attractive multimedia interface and the adaptability of individual student's need. Moreover, Brown and Warschauer (2006) found out the peripheral role of technology in teacher preparation experience leading to a positive shift in student attitudes toward technology use, and the pivotal role of mentor teachers in technology integration at the field placement sites. As Nagata (1997) noted that computer assisted instruction, in conjunction with contemporary method of teaching, holds out the promise of unlimited immediate feedback.

Luo's (2020) study, espoused that the educators' use of multimedia information technology to carry out teaching activities resulted to college students' interest in learning English, stimulate their enthusiasm, enhance the interaction between teachers and students, and cultivate their autonomous learning ability. The research suggests that colleges and

universities should strengthen the hardware support and software facilities of multimedia-assisted teaching to promote the significant improvement of students' language ability.

Franklin and Peat (2001) look at the delivery of teaching and learning materials such as the management of laboratory classes in a peer mode model and the recent re-purposing of existing online resources to provide a Virtual Learning Environment (VLE) that offers a safe, student centered learning environment with access to synchronous and asynchronous communications, and access to learning and assessment materials.

Effective management of technology links engineering, science, and management discipline to address issues involved in the planning, development implementation of technological capabilities. This assertion by Badawy (1993) states that the strategic aspects of technology must be the enhancement of innovation as well as the performance of the technology. The adoption of E-media in the electronics technology is meant to improve the learning capability of students to master the subject matter. It is used as an instructional tool in the teaching-learning process. The adoption of E-media as an additional instructional tool was developed through the General Curriculum in Secondary Education (GCSE) software and Electronics Workbench as an additional tool for instruction. Using the GCSE and Electronic Workbench as a software, the E-media was adopted through guide lessons such as the course syllabus in the presentation of the discussion through the use of computer, LCD and the software. The presence of the E-media in the classroom prescribed the learning outcomes of the suggested instructional strategies and activities.

At the dawn of the 21st century, the prevalence of ICTs in all aspects of life and the need for the establishment of the knowledge society led many countries such as the United Kingdom (UK) (Livingstone, 2012:2), Malaysia (Kannan, Sharma and Abdullah, 2012:111), Turkey (Cavas, Cavas, Karaoglan and Kisla, 2009:200) and the Republic of Korea (Hwang, Yang and Kim, 2010:21) to introduce and expand the use of ICTs in their education systems to transform education and to establish knowledge societies. Technology is perhaps the strongest factor shaping the educational landscape today. Many school districts are showing support for increased levels of technology in the classroom by providing hardware such as tablets and computers, enhancing internet connectivity, and implementing programs designed to improve computer literacy for both teachers and students. (Johnson, Jacovina, Russell, and Soto, 2016)

According to Ertmer et al. (2012), the most commonly cited reason for lack of technology implementation in the classroom is inadequate professional development and training. The National Education Association (NEA) includes expanding professional development in technology as one of their policy recommendations (NEA, 2008). According to NEA results (2008) teachers today report increasing confidence using classroom technology, operating software, and searching the internet, but given that technology is constantly changing, it is more important than ever that teachers stay up-to-date with their technological expertise. Even if a school district were to hire only teachers who were literate in current classroom technology, countless new technologies will be developed during their teaching careers, and they will need to undergo additional training to keep their skills current. Without the necessary resources to provide continuous technological training, schools and districts will continue to cite inadequate professional development as a major barrier to technology implementation.

In the last years, there has been a growing consensus on the importance of digital and media literacy for twenty-first century teachers. Digital competence has been included in the new framework of key competences by the European Parliament and Council (2006), and recently a Proposal for a European Framework for the Digital Competence of Educators (Redecker & Punie, 2017) has been released by the European Union addressing six areas of

competences ranging from the capacities to identify and use digital resources and tools for professional development to digital teaching and facilitating students' digital literacy skills. However, research in the field is still at the beginning (Borthwick & Hansen, 2017; Koponen & Koti-lainen, 2017; Krumsvik, 2014; Meehan, Ray, Walker, Wells & Schwarz, 2015; Tømte, Enochsson, Buskqvist & Karstein, 2015) and it shows that even the new generation of teachers is substantially unprepared to form the digital and media skills of their students. Till now they have received inadequate or even no training about media and digital literacy education either in their initial or in-service education (Fernández-Cruz & Fernández-Díaz, 2016; Lund, Furberg, Bakken & Engelién, 2014; Prendes, Castañeda & Gutiérrez, 2010; Scull & Kupersmidt, 2011). Therefore, there is a total mismatch between the digital challenges that new teachers have to face in their profession and the preparation they receive during their academic training (Gudmundsdóttir, Loftsgarden & Ottestad, 2014; Lund, Furberg, Bakken & Engelién, 2014). Moreover, focusing on the training of future teachers, there are several issues which deserve consideration such as: How should be designed a curriculum on digital and media literacy in Teacher Education? What type of contents it should include and which pedagogical approaches should be adopted for teachers' effective initial training.

Early accounts of technology integration focused much of their interest on increasing the availability of computers in schools (Fisher, Dwyer, & Yocam, 1996). Certainly, the most basic step toward effective technology integration is widespread access to equipment necessary to run educational computer programs. If computer lab time is limited to one hour per week, persistent use of educational technology is not viable. While many schools across the country are making the transition to one-to-one (1:1) computing (Warschauer, Zheng, Niiya, Cotton, & Farkas, 2014), many students do not have regular and reliable access to a computer. Inconsistent computer access makes it extremely difficult for instructors to integrate technology into existing lesson plans. Routine access to hardware (i.e., laptops or tablets), software (e.g., reading and writing software, internet browsers), and internet connection is a fundamental requirement. <https://files.eric.ed.gov/fulltext/ED577147.pdf>

The use of educational technologies in teaching and learning presents pedagogical concerns and challenges to educators. Combining multimedia technologies with the Web has created new possibilities for the development of instructional materials to deliver course content (Juniu, 2006). According to Jonassen, Peck, and Wilson (2000), students do not learn directly from technology; the role of technology in instruction is to engage the learner more actively in the process of thinking and manipulating information which in turn facilitates the learning process. Thinking fosters learning. Mukhari (2016) states that education systems in some underdeveloped countries also embraced ICTs in education in order to overcome their educational shortcomings and develop the 21st century competencies which include critical thinking skills, problem solving skills, inclusivity, life-long learning, global interaction, collaborative teamwork, and cooperative learning (AACTE, 2010:9; DBE, 2004:16).

White Paper no. 16 (2016-2017) on Culture for Quality in Higher Education highlights student learning and teaching and one objective is that all students should experience stimulating and varied learning and assessment methods. The White Paper further states that technological tools can help students get the best possible education and feedback, also in large student groups. <https://www.forskningsradet.no/siteassets/publikasjoner/1254035532334.pdf>

RESEARCH METHODS

This study made use of the mix method type of research that employed both the quantitative and qualitative research design that identified the extent of the identified competencies embedded in the Safety subject using e-media. Using the researcher-made questionnaire that solicited information on the identified competencies of the in electronics technology subjects, the perceptions of the faculty members on the adaptation of E-media in their basic electronics manuals and exercises. Safety is one of the subjects in Electrical Technology that was used in determining the use E-media in class. The method used in this study is both qualitative and quantitative study that investigates the teachers' perceptions in the use of E-media in electronics technology classes. This study was conducted in a state university in Cebu, Philippines. Teachers serve as respondents of the study. The adoption of E-media in the electronics technology is meant to improve the learning capability of students to master the subject matter. It is used as an instructional tool in the teaching-learning process. The adoption of E-media as an additional instructional tool was developed through the General Curriculum in Secondary Education (GCSE) software and Electronics Workbench as an additional tool for instruction. Using the GCSE and Electronic Workbench as a software, the E-media was adopted through guide lessons such as the course syllabus in the presentation of the discussion through the use of computer, LCD and the software. The presence of the E-media in the classroom prescribed the learning outcomes of the suggested instructional strategies and activities.

RESULTS AND DISCUSSION

The purpose of the adoption of E-media in the laboratory manual and exercises is to demonstrate the operation and function in adopting the E-media and its laboratory exercises that supplement a theoretical atmosphere in the shop room. Likewise, it allows students to learn the basic principles of electronics technology subject whereby interaction is encouraged and theories are put into practice in the form of actual hands on activities.

Table 1. Identified Competencies Embedded in Safety of E-Media

Safety	twp	Weighted Mean	Descriptive Rating
1. Observing safety in all aspects of the work.	61	4.07	Very Satisfactory
2. Caring and maintaining tools and equipment.	58	3.87	Very Satisfactory
3. Provides user-friendly input switches.	57	3.80	Very Satisfactory
4. Observe highest standards of safety in the shop.	59	3.93	Very Satisfactory
5. Apply first aid for minor injuries.	50	3.33	Very Satisfactory
Total		3.80	Very Satisfactory

The data on table 1. reveal that “observing safety in all aspects of the work” got the highest weighted mean of 4.07 rated Very Satisfactory followed by observing highest standards for safety in the shop with weighted mean of 3.93. All five competencies under safety were given a descriptive rating of Very Satisfactory. This implies that the instructors were observing the highest degree of safety in their respective shop in the conduct of the activity. Tileston (2000) reports that technology is a tool that can help teachers embody best practices to create an enriched and collaborative learning environment, meet a variety of learning style needs, support learning transfer, assist with the attainment of long term memory and deep understanding of the subject matter. Duhaney (2000) argues that the infusion and integration of technology in the education process have presented new avenues by which teachers can enrich and enhance teaching and learning activities.

Although the new technology has significant impact on most segments of our society-work, leisure, culture and social interaction-the same degree of its uptake has not been seen in the higher education classrooms. Many educators believe that technology has the potential to solve many of the pressures associated with the societal change in attitude and delivery of education (Franklin and Peat, 2001).

CONCLUSION

The study suggested that the adoption of E-media in Electrical technology classes are continually done and practiced. Regular monitoring and updating of materials is also necessary for ensuring that the use of E-media is properly implemented. The extent of E-Media Adoption in Laboratory Manuals in Electronics Technology in Cebu Technological University determined the effectiveness of E-media when embedded in the identified competencies as used in the laboratory manuals and exercises. The extent of the E-media adaptation in the laboratory manual and exercises provided the theoretical atmosphere in the shop room. Likewise, it allows students to learn the fundamental principles of electronics technology subject whereby interaction is encouraged, and theories are put into practice in the form of actual hands-on activities. However, it was found out that E-media application in designing laboratory exercises for the identified competencies in electronics, technology needs further development with a contextualized implementation scheme to have the potential to enhance the teaching and learning experiences and further improve the students' technical skills across the curriculum and likewise its application to real-life situations.

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