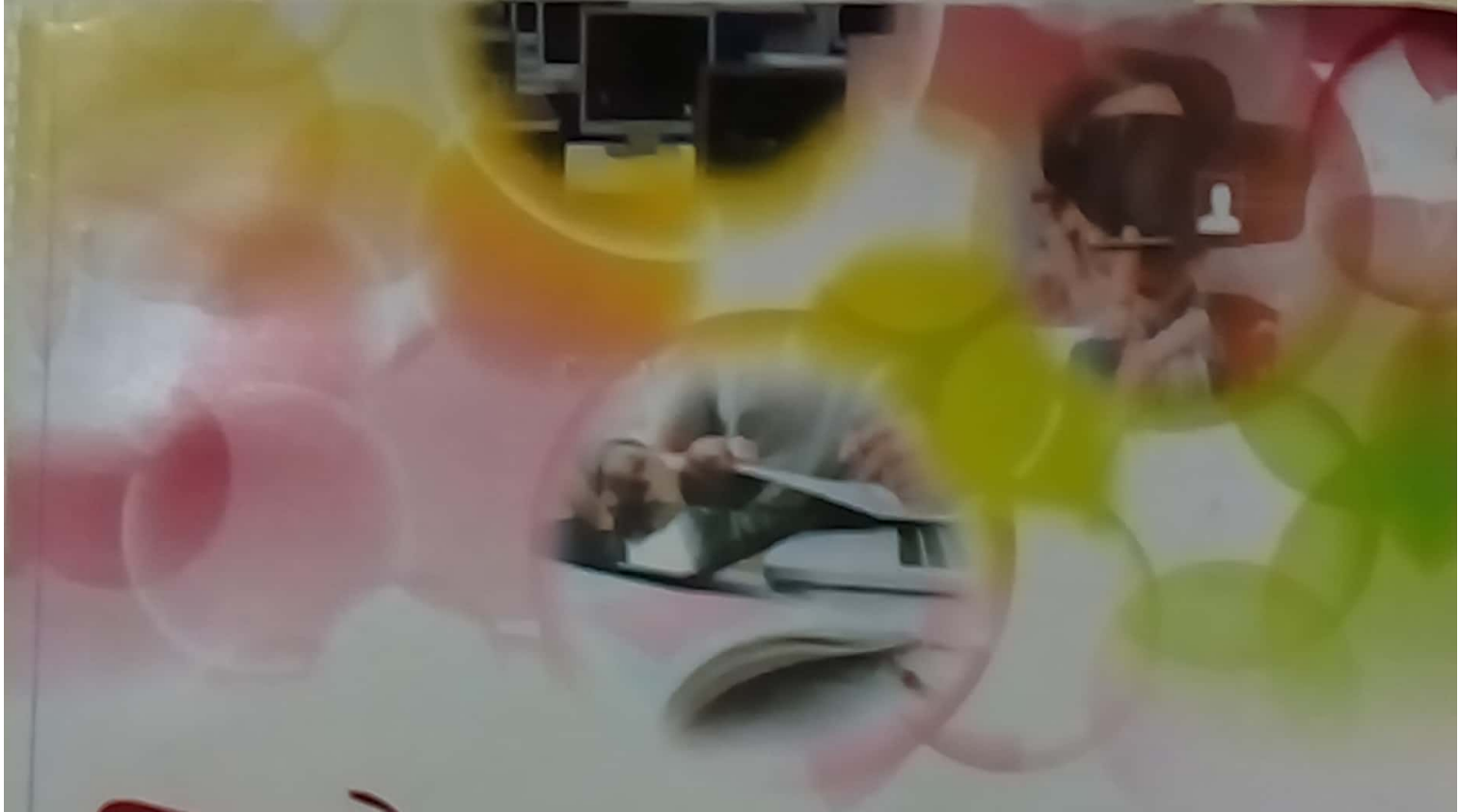

Teaching with Technology

Perspectives, Challenges and Future Directions

Marthe Artois
EDITOR

EDUCATION IN A COMPETITIVE AND GLOBALIZING WORLD

NOVA

EDUCATION IN A COMPETITIVE AND GLOBALIZING WORLD

TEACHING WITH TECHNOLOGY

PERSPECTIVES, CHALLENGES AND FUTURE DIRECTIONS

EDUCATION IN A COMPETITIVE AND GLOBALIZING WORLD

Additional books in this series can be found on Nova's website under the Series tab.

Additional e-books in this series can be found on Nova's website under the eBooks tab.

EDUCATION IN A COMPETITIVE AND GLOBALIZING WORLD

TEACHING WITH TECHNOLOGY

PERSPECTIVES, CHALLENGES AND FUTURE DIRECTIONS

MARTHE ARTOIS
EDITOR

nova
science publishers
New York

Library of Congress Cataloging-in-Publication Data

ISBN: 978-1-53613-261-8 (eBook)

Published by Nova Science Publishers, Inc. † New York

CONTENTS

PREFACE

Teaching with Technology: Perspectives, Challenges and Future Directions opens by addressing with contemporary technologies used in schools for teaching and learning. Although teachers differ significantly in how they make use of technology, they all select technology with the goal of upholding teaching goals like facilitating students to present information in an interesting manner and offering students access to educational resources both within and without the school environment. Afterwards, the authors analyze the relationship between the constructivism and behaviourism learning theories concerning technology in teaching and learning. Several educators have developed theories describing the manner in which people can learn better, thus leading to this analysis. To supplement this, the book also examines how the knowledge of technology can be used as a medium for improving the 21st century educational institutions via technology. Some reports have shown that the varying state of affairs of technology is systemic, while other reports are centered principally on the portion of teachers, supervisors, inadequate funding and establishment, among others which brought about the decline in education to meet the technological trends in the 21st century. As prevalent adoptions of technologies in education increase, significant issues are preventing their widespread success. The authors examine these issues associated with

the use of technologies in education. The functions of computers in in schools are also analyzed, especially computer education and the potential for computers to act as a catalyst in school improvement. This book includes a study exploring the process of teaching mathematics with mobile technologies in some classrooms in the lower secondary level (pupils 9-14 years old) in Slovakia, with the goal of presenting the advantages of the constructionist design of the learning and teaching process with mobile technologies. The authors also suggest that mobile technology such as smartphones, tablets, and personal digital assistants (PDAs) allow nursing students to rapidly access current evidence-based resources at the "point of care" (POC) during the actual patient encounter, and that this technology should be introduced early in the nursing curriculum. Instructors can require use/purchase of specific apps as they would require any course resource, and many free cross-platform apps are available. Lastly, the practice, dialogue, and methods of integrating technology in teaching and learning are highlighted. Methods of instruction in any form of education play a significant role in facilitating analytical and artistic thought, improving student cooperation and guaranteeing that students observe problems from varied viewpoints.

Chapter 1 - Whatever learning theory a teacher may hold, several technologies exist in schools to ameliorate and reinforce teaching and student learning. Even though teachers differ significantly in the utilization of technologies, they select the most promising technology that will uphold their teaching goals such as establishing student research in making student inquiry rational, facilitating students to present information in an interesting form and offering student's access to educational resources in and outside the school environment. Therefore, this chapter deals with the contemporary technologies used in schools for teaching and learning.

Chapter 2 - Several educators developed theories describing the manner in which people can learn better so as to enhance understanding and to have good retentive memory. This leads to the discussion of the relationship between learning theories and the use of technologies in

teaching and learning. Thus, this chapter focused on the relationship between learning theories (the constructivism and behaviourism) with technology in teaching and learning.

Chapter 3 - As the 20th century draws to a close, the universal state of affairs of technological doings is varying in the 21st century educational institutions. Reports have shown that these changes are systemic while others are centered principally on the portion of teachers, supervisors, inadequate funding and establishment, among others which brought about the decline in education to meet the technological trends in the 21st century. Based on these established facts, this chapter examines how the knowledge of technology can be used as a medium for improving the 21st century educational institutions via technology.

Chapter 4 - Technology seems to be the most prevalent teaching aid and central focus in 21st century educational activities to succor learning processes in the schools so as to increase learning outcomes. Additionally, it saves time by suiting the theme of the class. This chapter deals with the effect of technology in 21st century education.

Chapter 5 - As prevalent adoptions of technologies in almost all facets of education increase, momentous issues are thwarting their widespread successful implementation. Nevertheless, a number of these issues are systemic while others are linked to the teachers, technologies and supervisors. Thus, this chapter discusses the issues associated with the use of technologies in education.

Chapter 6 - The computer plays an important role in the teaching and learning process. We exist in a world where transformations are made with elevated steps; for this reason, we must keep up with these transformations. The computer can be used in teaching and learning playful ways interesting to children. As such, computer use in school has and will have a great role in the presentations of lessons, and for communication and information. This chapter discusses the functions of computers in acquiring skills and knowledge in schools,' remaining cognizant of computer education and using computers as a catalyst in school improvement.

Chapter 7 - The significance of technology is, to a certain extent, confirmed from an educational standpoint. Nevertheless, the radio/television, textbooks, film and chalkboard have been used for teaching and learning purposes over the years, and none has impacted more on educational development than technology. This chapter highlighted the emerging trends and prospects in the use of technology in teaching and learning.

Chapter 8 - The importance of integrating technology into teaching and learning has an extremely motivational significance, giving the students the prospect to develop communication skills, imagination and critical thinking. Thus, the principal goal of technology in education is to facilitate teaching and learning. This chapter deals with the importance of technology in teaching and learning.

Chapter 9 - The aim of this chapter is to present a study focused on exploring the process of teaching mathematics with mobile technologies in classrooms in the lower secondary level (pupils aged nine to 14 years old) in Slovakia. This scientific study was based on the realization of inquiry-based learning in concrete topics from school mathematics. During the experimental teaching in the classroom, the authors used mobile technologies for the preparation of an educational video, which helps to explain basic concepts. The pupils worked in groups, while mobile technologies provided immediate feedback for the teacher. The authors used a combined qualitative and quantitative educational research approach with questionnaires for teachers, parents and pupils. The authors would like to present the advantages of the constructionist design of the learning and teaching process with mobile technologies.

Chapter 10 - Mobile technology such as smartphones, tablets, and personal digital assistants (PDAs) allow nursing students to rapidly access current evidence-based resources at the "point of care" (POC) during the actual patient encounter. The setting can be bedside, hospital or outpatient, or telehealth. The term "mHealth" refers to the application of mobile technology in healthcare, which includes clinical nursing practice and nursing education. Web/software resources for healthcare personnel

include videos, podcasts, practice guidelines, clinical calculators, clinical databases, diagnostic applications (apps), and systems navigation. Some mobile apps are designed for patients as tools for disease self-management and monitoring. Integrating this technology into the nursing curriculum supports application of knowledge and reinforces the importance of safe care and health literacy. Barriers to curriculum implementation include software and hardware cost, multiple device operating systems (OS) platforms, low technology literacy, internet connection availability, small screen size, and faculty resistance. This technology should be introduced early in the nursing curriculum. Instructors can require use/purchase of specific apps as they would require any course resource, and many free cross-platform apps are available. Examples of active learning opportunities are using case studies in the laboratory and classroom, and simulation scenarios mimicking patient encounters. These can incorporate role-modeling of healthcare team members. A theory model for this teaching innovation is based on simulation as a teaching and learning tool, identifying three themes: preparedness, activation and reflection. The literature reports many studies with positive outcomes when incorporating mobile technology and POC resources in the classroom, laboratory, and community settings. These studies involve undergraduate as well as graduate nursing students, as well as healthcare students in other disciplines. In the fully online setting, POC technology can be integrated into learning activities for healthcare students at all levels. For instance, students can consult clinical databases, access clinical practice guidelines, utilize clinical calculators, and complete clinical case studies. Since role-modeling by faculty is an integral aspect of this teaching method, faculty proficiency and acceptance of the technology is essential. This validates use of mobile technology as a best practice when caring for patients in the real world. Thus, program support for faculty training is imperative, including access to the software. This type of technology is well-accepted by both students and patients and reinforces the delivery of safe, current, and evidence-based care as a best practice.

Chapter 11 - The method used for active teaching and learning is a point of grave interest to educators and teachers. Methods of instruction in any education circumstance deliver a lively role in exciting analytical and artistic thought, improving student cooperation and guaranteeing that students observe a problem from varied viewpoints. They are planned to give scholars the chance to watch, interlace in and develop or identify expert's procedures in circumstances. Therefore, this chapter highlighted drill and practice, dialogue, and tutorial as methods of integrating technology in teaching and learning.

In: Teaching with Technology
Editor: Marthe Artois
ISBN: 978-1-53613-260-1

Chapter 1

CONTEMPORARY TECHNOLOGIES USED IN SCHOOLS FOR TEACHING AND LEARNING

Ibrahim Yakubu Umar, PhD,
Tswanya Moses Saba, PhD and Aliyu Mustapha, MD*
Department of Industrial and Technology Education,
Federal University of Technology Minna, Niger State, Nigeria

ABSTRACT

Whatever learning theory a teacher may hold, several technologies exist in schools to ameliorate and reinforce teaching and student learning. Even though teachers differ significantly in the utilization of technologies, they select the most promising technology that will uphold their teaching goals such as establishing student research in making student inquiry rational, facilitating students to present information in an interesting form and offering student's access to educational resources in and outside the school environment. Therefore, this chapter deals with the contemporary technologies used in schools for teaching and learning.

* Corresponding Author Email: aliyu21m@gmail.com.

Keywords: contemporary technologies, importance, learning and teaching

INTRODUCTION

Technology refers to tools and machines that may be used to solve real-world problems in teaching and learning. In this usage, a variety of technologies such as the Interactive television (ITV), Internet and video conferencing give students the chance to take part in a class that is located in a different school and location. Technologies can also function as the instructional needs of students that are incapable of attending classes in a public setting (that is, homeschooled); in instances like this, coursework is offered over the Internet. Similarly, through an online program, students can acquire high school certificates without attending a particular school through virtual high schools, online college credit courses and for-profit companies and organizations, which all make courses accessible to students through the Internet.

Technologies supply students' access to classroom instruction. For example, students with limitations (physical or cognitive disabilities) can use a variety of helpful technologies so as to be an active member of the class.

Also, various switches allow students with limited mobility to use a computer to speak for them and complete assignments. These switches (similar to a computer mouse) manipulate the computer through a touchpad, by the movement of the head or eye, or even by breath; for instance, handheld computing devices equipped with braille allow students with visual learning disabilities to participate actively in the classroom activities. Thus, this chapter focuses on the student research, student inquiry and Constructing New Knowledge (CNK) as the contemporary technologies used in schools for teaching and learning.

STUDENT RESEARCH

Students once relied upon their printed reference materials in the local and school libraries to investigate issues. Currently, on the other hand, technologies give accession to the digital type of printed reference materials to libraries worldwide in the form of digital, text, audio, images, videos and also make available the Global Positioning Satellites (GPS) and live web cameras.

STUDENT INQUIRY

The student inquiry expands beyond data collection to the prospect, explore and widen the student scope of learning about a contemporary phenomenon. In this manner, technologies allow students to get in touch with experts such as political leaders, researchers and scientists and increase the probability of prompt responses; thus, these present technologies, consider education wants to be factual and reliable for students. For instance, in the field of sciences, electronic investigations allow students to bring together clear-cut data and digitally mark out trends and answer theory.

In the field of mathematics, graphing software, calculators and spreadsheets provide the students with the skill to see in the mind's eye complex mathematical model. In the field of social sciences, e-communication tools such as the e-mail, internet conferencing allow students to be in touch with one another worldwide. In the languages and the arts, students make use of the wireless networks and iPads to form a cooperative script writing exercises to walk around related issues. In the arts, students can search musical composition or images of novel artwork via the internet.

In the field of human kinetics and health education, the students use digital surveys to gain knowledge concerning the connection between the impact of physiological and physical changes.

CONSTRUCTING NEW KNOWLEDGE (CNK)

The domino effects of student inquiry typically take the form of oral presentations or written reports. In the company of highly developed technologies, students can present their reported data by incorporating digital text, audio and video into web-based, word-processed documents, multimedia presentations and videos. The following are the contemporary CNK technologies used in schools for teaching and learning:

Radio

Radio is an example of the earliest technologies used for distance education (Stevens, 2001). Programmes in radio can either be an interactive or a broadcast form. The former also known as the (Interactive radio instruction (IRI)) is an interactive lesson where an external teaching component is required in classroom exercises by radio. This permits the students to associate with the class lesson advances. For a classroom lesson to be interactive, it can have intervals to enable the students to imagine, receive responses, consult other students preferentially and have the chance to let the knowledge absorb while the latter reflects the regular classroom-based representation where the teacher teaches by the radio programme and learners are typically serve with printed materials. This method of instruction can be considered as "stern" teacher centred (Stevens, 2001).

Radio instruction comprises the creation, communication, and acceptance of the radio programmes. Lucky and Achebe (2013) identified electric radios (transistor radios), battery-powered radios, and solar-powered crank radios as the types of radios accessible to students. Hence, educational organizations and students can select a radio that adequately accommodates their state based on the supply of batteries and availability of power. In few circumstances, it is durable and cost-effective to use a solar-powered crank radio. Radio is beneficial considering it is relatively

cheap and accessible for individuals in developing countries and has the potential to extend to a large number of students (Stevens, 2001).

Videotapes

Videotapes attract both the visual and audio senses. Realistic conditions can properly be displayed and represented via video as objected to audio and text (Nunes & Gailbe, 2002). This can be used while starting a new topic to contextualize and motivate learning when a topic has been discussed to students in utilizing the knowledge acquired, or after an intact module is achieved to prove links to other disciplines and subjects (Nunes & Gailbe, 2002). The student has the versatility to replay, halt, and rewind recordings and can return lessons as frequently as they crave. Videotape can promote the teaching of practical abilities through open and distance learning (ODL). Additional advantages incorporate simplicity of use for the student, economical duplication costs, comparatively full access to the playback technology, and educational strength for giving practical knowledge (Stevens, 2001). It also captions visual cues to assist the hearing-impaired.

CD-ROMs and DVDs

CD-ROMs (Compact Disc-Read Only Memory) save information digitally and can work on any computer equipped with a CD-ROM drive. DVDs (Digital Video Disk or Digital Versatile Disk) are similar to CD-ROMs and can be used the same way as CD-ROMs but hold more information. The DVD and CD-ROMs have an extended capacity and can store information in different formats including animation, audio, video, graphics and text. Therefore, learning resources can be shown in diverse forms. Regarding the storage of learning resources digitally, it is long-

lasting and the property does not deteriorate after recurred use. Nonetheless, damaging the surface may obstruct it from being read by the CD-ROM drive (Abutu, Saba, Raymond & Adamu, 2016).

Internet/Web-Based Training

Internet/Web-Based training yields an atmosphere where students' access learning materials online. It may include the use of vital e-learning media such as online whiteboards, Internet telephony, discussion boards, chat and messaging programmes and application sharing, which enable real-time synergy between teachers and students. It can also be used to transfer animation, text, images, video or graphics. The requisite tools for Internet/Web-Based learning include a computer and an Internet connection. There are numerous ways a user can join to the Internet network such as the cable modem, standard analogue modem (56 Kbps), wireless broadband (fixed wireless and satellite) Integrated Services Digital Network (ISDN), Digital Subscriber Line (DSL), Local Area Network (LAN) and cellular. All connections besides standard analogue modem connection are regarded broadband connections. All of these methods permit connection to an Internet Service Provider (ISP) that gives a gateway to the rest of the Internet. The merit of this system is that students can learn anytime at their own pace and everywhere as long as there is a computer connected to the Internet (Abutu, Saba, Raymond and Adamu, 2016).

Web-Based Training (WBT) Programmes

Many subject development tools are forthwith available and allow teachers with no computer programming skills to develop noble web-based training programmes. The most regularly used platforms are Desire2Learn,

Blackboard and WebCT. All these platforms are server-based and support access via a web browser to give e-learning explanations via the Web (Abutu, Saba, Raymond and Adamu, 2016).

These platforms have the following merits: manage enrolment and registration; provide course materials, develop evaluation material such as assignments, quizzes and test; communicate with teacher(s) and students online via an advisory section, an interactive whiteboard, conference boards, e-mail, e-class rooms, real-time chat sessions; take and save notes; provide links to related websites; present critical dates by means of a calendar tool; as well as manage grades and present the grades to the students.

Audio Conferencing

This allows two-way, real-time interaction between teachers and students by means of audio (Stevens, 2001). The main benefit of audio conferencing is that it supports for direct, two-way communication between students. Discourse transpires in a real-time situation where students can ask questions and teachers can answer instantly. It also has low set-up and running cost.

Audio Graphics

Audio graphics are really audio conferencing conducted by graphical and visual aids. "Graphics can be conveyed by still video system, electronic drawing systems (such as electronic whiteboard), fax machine or computers (text or graphics display) which enable a student to sketch or write on a computerized screen which is broadcasted to a distant site where other students may view it. This also presents similar advantages of audio conferencing while possessing an appended advantage of a visual aid for students.

Interactive Television

The interactive television (ITV) refers to instruction happening over performance television. It enables students to acquire real television instruction remotely, off from the real teacher. The teacher(s) are found in a telecast studio and the students observe the teacher(s) on a television. The students can ask questions and/or give feedback to the teacher (Stevens, 2001). The merit of the ITV is that instruction can be given in many situations, and therefore it is likely to reach a considerable number of students applying existing broadcasting infrastructure.

Video Conferencing

This enables participating students in separate locations to discuss and understand each other in real-time (Stevens, 2001). The benefit of video conferencing is that it permits real-time, two-way interaction between students in separate locations. Everyone in the educational system from the curriculum developers, teachers, policymakers and students can participate in a video conference. It can be employed in teaching sessions, course delivery, presentations and discussion (Perraton et al. 2002). Meanwhile, during a subject presentation, teachers can measure a student's growth and responsiveness instantly while answering questions and giving feedback promptly.

References

Abutu, F., Saba, T. M. Raymond, E. and Adamu, M. J. (2016). Literature evidence on the application of ICT in teaching and learning in TVET programmes and it's implication for sustainable development in Nigeria. *Benue State University Journal of Education*, 16(2), 91-100.

Lucky, A. T. and Achebe, N. E. E. (2013). The effect of the digital divide on information accessibility among undergraduate students of Ahmadu

Bello University, Zaria. *Research Journal of Information Technology*, 5(1), 01-10.

Nunes, C. A. A. and Gaible, E. (2002). Development of Multimedia Materials. In W. D. Haddad and A. Draxler (Eds.). *Technologies For Education Potentials, Parameters, and Prospects*, 7. (pp. 94–117). Canada: Knowledge Enterprise Inc.

Perraton, H., Creed, C. and Robinson, B. (2002). *Teacher Education Guidelines: Using Open and Distance Learning*. Retrieved July 13, 2016, from http://unesdoc.unesco.org.

Stevens, G. (2001). *Distance learning for Technical and Vocational Education in Sub-Sahara Africa*. The World Bank. Retrieved July 9, 2016, from http://www.gtz.de/wbf.