

Menaces and Panaceas of Technology Based Learning in the Delivery of Instruction in Classroom

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Abstract

This paper is on the menaces and panaceas of technology-based learning in the delivery of instruction in classroom. The impending menaces and factual panaceas in the usage of technology for the teaching and learning process in the classroom were highlighted. Technology is used to support both teaching and learning, it infuses classrooms with digital learning tools, such as computers and handheld devices; expands course offerings, experiences, and learning materials; supports learning, and builds 21st century skills; increases student engagement and motivation; and accelerates learning. The paper highlighted various concepts of technological tools such as computers, radios, televisions, projectors, internet, e-learning and otherwise. This is to facilitate the teaching process to be effectively delivered with the use of projectors, televisions, radios, e-learning (on-line), internet, intranet, and usage of other social media for learning engagement for the promotion of quality education. It was recommended that the use of different technological tools should be apprehended in the delivery of instruction in classrooms in order to promote learning.

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Background to the Study

Everyday life has experienced changes and educational settings are not exceptions. This change is more remarkable and rapid with the advent of modern technologies. Learners, for centuries, have experienced various instruments and method to learn more effectively and rapidly. Teaching in educational settings may be influenced by diverse factors. One of these factors is employing modern technologies in teaching environments. The potential of each technology varies according to how it is used. Technology is the application of scientific knowledge to the practical aims of human life or, as it is sometimes phrased, to the change and manipulation of the human environment. Haddad and Draxler (2002), identify at least five levels of technology used in education; presentation, demonstration, drill and practice, interaction, and collaboration. Each of the different ICTs print, audio/video cassettes, radio and TV broadcasts, computers or the internet may be used for presentation and demonstration, the most basic of the five levels. Except for video technologies, drill and practice may likewise be performed using the whole range of technologies. On the other hand, networked computers and the Internet are the ICTs that enable interactive and collaborative learning best; their full potential as educational tools will remain unrealized if they are used merely for presentation or demonstration. Radio and television have been used widely as educational tools since the 1920s and the 1950s, respectively. According to Perraton and Creed, (2002), there are three general approaches to the use of radio and TV broadcasting in education (direct class teaching, where broadcast programming substitutes for teachers on a temporary basis; school broadcasting, where broadcast programming provides complementary teaching and learning resources not otherwise available; and general educational programming over community, national and international stations which provide general and informal educational opportunities.

Technology based learning (TBL) is transforming training and education by providing new technological opportunities to address new learning needs. Technology-based learning programs come in different delivery modes and forms. They can include online tools, such as discussion boards and e-mail, and real time events, through videoconferencing and web conferencing. They can be self-paced, and have a varying focus of instruction. With the right mix of delivery modes and methodologies, TBL offers more than a repository of learning resources online or a new way of reaching learners at a distance. When done well, TBL offers a way to complement any learning process and, in some cases, it can bring learning to places where it has not traditionally been accessible (Greitzer, 2002). Learning is becoming more personal and also sociable that enables collaborative, networked and portable processes. Moreover, learning is becoming ubiquitous and different types of learning happen outside of the classroom through social cooperation and collaboration between learners to improve construction and sharing of content and knowledge.

Technology-based platforms facilitate easy and quick transference of links to study materials. The high availability of teachers to the learners' questions can potentially enhance the learning process. Technology-based instruction enables learning beyond the

classroom's borders. On technology-based platform, learners get to go over the material again at home and return to the classroom with additional knowledge. Technology based learning or communication-driven learning tasks increasingly include both in-class and out-of-class online programs involving websites, internet-based project works, emails, chats, blogs, podcasts, and electronic portfolios. New online tools and devices (e.g., smart-phones) become more widely available and more versatile, new possibilities will exist for learners to access and produce knowledge in innovative ways online. Moreover, live tutoring systems and other social networking tools enable learners to practice using the knowledge with others around the world. Learners and classes in different locations can meet online via email, skype, or other programs through formal or informal class exchanges or partnerships. Teachers and learners in more self-directed learning contexts must carefully select sites, activities, and texts to ensure that they are appropriate for the cognitive, social, and linguistic levels of their learners. According to Hartoyo, (2009), different facets of evaluation include measuring learners' satisfaction with the experience, measuring their skill gains through pre- and post-tests (sometimes in comparison to learners who received traditional classroom approaches), gauging how learners applied their new knowledge in work settings, and estimating how the institution itself benefited from employee learning. In return-on-investment calculations, the latter entails an assessment of whether the benefits are commensurate with the cost of providing the training. Although rigorous wide scale research evaluating TBL's effectiveness by any of these criteria is sparse, the available evidence seems to suggest that TBL generally seems to work at least as well as traditional approaches and is often less costly.

Nonetheless, it also seems clear that, to realize its full potential, TBL should not dispense with opportunities for human interaction (either face to-face or electronically), and that it should provide opportunities for the active engagement of learners, provide content that is relevant and linked with what learners already know, and offer opportunities for feedback and support.

Objectives

This paper is set to identify the following:

1. Types of technology-based learning;
2. benefits of technology-based learning;
3. Menaces of technology-based learning;
4. Panaceas of technology-based learning; and
5. technological methods and tools in the delivery of instruction

Types of Technology Based Learning in the Delivery of Instruction

Full-time online schools: The following online or virtual schools enroll students on a full-time basis. Students enrolled in these schools are not attending a bricks and mortar school; instead they receive all of their instruction and earn all of their credits through the online school.

Blended learning: Blended learning opportunities incorporate both face-to-face and online learning opportunities. The degree to which online learning takes place, and the way it is integrated into the curriculum, can vary across schools. The strategy of blending online learning with school-based instruction is often utilized to accommodate students' diverse learning styles and to enable them to work before or after school in ways that are not possible with full-time conventional classroom instruction.

Open educational resources: Open educational resources are teaching, learning, and research resources that reside in the public domain and are freely available to anyone over the Web. They are an important element of an infrastructure for learning and range from podcasts to digital libraries to textbooks and games. It is critical to ensure that open educational resources meet standards of quality, integrity, and accuracy as with any other educational resource and that they are accessible to students with disabilities.

Use digital resources well: Schools can use digital resources in a variety of ways to support teaching and learning. Electronic grade books, digital portfolios, learning games, and real-time feedback on teacher and student performance, are a few ways that technology can be utilized to power learning.

Presentation Software: It is helpful to provide visual aids to complement teaching, stimulate discussion, or allow out-of-class teaching. Tools designed for this purpose, such as PowerPoint, can be used effectively for the delivery of instruction.

Online Projects and Collaboration Tools: Technology can support student collaboration on creating new knowledge, reflecting on what they are learning, or working together to achieve a deeper understanding of course material.

Mobile Learning or Mobile Assisted Learning (MAL): Employing technological devices in learning improves the quality of education. Social network is a new and updated trend in the technology world that has been referred to networked tools that allow learners to communicate, interact and share their ideas and interests with each other (Anderson, 2010). Social networking sites like Facebook, twitter, and mobile social networks such as WhatsApp, Viber, and Line attract and support networks of people and facilitate connections between them. Social networks such as WhatsApp have opened up new interaction opportunities among teachers and learners. The use of social networks is becoming popular in everyday communication. It is even used for collaborative learning tasks, especially in language learning. Contemporary educational policy, curriculum designing, and instructional pedagogy have been profoundly affected by impressive new global information and communication technologies (Allen, 2002). New modern competencies include the ability to collaborate with others on processes of problem-solving, textual construction, negotiation, and cooperative production and presentation even when working in different locations and connecting only by these new technologies. Like other fields of study, teaching have also influenced by new teaching sources and software (Chipunza, 2013). They stated that wireless technologies such as laptop computers, mobile phones, especially smart-phones, create a revolution in education that transform the traditional classroom-based learning into lifelong learning.

Flipped Classroom: The flipped classroom describes a reversal of traditional teaching where students gain first exposure to new material outside of class, usually via reading or lecture videos, and then class time is used to do the harder work of assimilating that knowledge through strategies such as problem-solving, discussion or debates (Zhou, 2016). The term flipped classroom entails response to a realization that class time would be best spent guiding knowledge and providing feedback rather than delivering direct instruction. Zemsky (2014) reasoned that direct instruction could be delivered by recording video content for students to engage with before class and any time freeing up class time for activities that allow deeper exploration of content (Hew and Cheung, 2014). Since then, the flipped classroom has grown in popularity in higher education as a potential model to increase student engagement, leverage technology and provide greater opportunities for active learning in class.

Benefit of utilizing technology-based learning

The essentialities of utilizing technology based include but not limited to the following:

1. Technology provides numerous tools that teachers can use in and out of the classroom to enhance student learning.
2. Technology ushers in fundamental structural changes that can be integral to achieving significant improvements in productivity.
3. Used to support both teaching and learning, technology infuses classrooms with digital learning tools, such as computers and hand-held devices; expands course offerings, experiences, and learning materials; supports learning 24 hours a day, 7 days a week; builds 21st century skills; increases student engagement and motivation; and accelerates learning.
4. Technology also has the power to transform teaching by ushering in a new model of connected teaching. This model links teachers to their students and to professional content, resources, and systems to help them improve their own instruction and personalize learning.
5. Online learning opportunities and the use of open educational resources and other technologies can increase educational productivity by accelerating the rate of learning; reducing costs associated with instructional materials or program delivery; and better utilizing teacher time.

Menaces of Utilizing Technology Based learning in the classroom

Digital technologies caused many changes in the delivery of instruction; and this issue arise many debates regarding the effectiveness of such apparatuses in educational environments and their possible barriers. The adaptation of open e-Learning systems for local contexts and cover local needs has often failed so resources are not used in many projects. Richter and McPherson (2012) claimed that open e-learning resources are not meaningful to learners if the digital apparatuses and their practices fail to personify socio-cultural characteristics of the particular learning context. Similarly, Hsu and Wang (2014) stated that research efforts are directed to define how socio-cultural contexts influence the use and development of open E-Learning systems and resources.

Greene, Oswald, and Pomerantz (2015) numbered three main menaces of conducting technology-based learning system. The first one is the lack of resources to realize projects. The second one they considered it as a subcategory, is the lack of finances to invest on this cost-effective solution of education. The authors believed that a lack of budget can impede the realization because investments are delayed. The third menace, according to the authors, is the lack of time. Since employees have a high workload and they face difficulties to conduct learning sessions during work. Probably, this is the most important barrier of traditional educational settings; and Imlawi, Gregg and Karimi (2015) believed that this remains even in the modern educational environments. But Kent, Laslo, and Rafaeli (2016) believed that the main barrier can be political or the managerial coordination on a policy level. This barrier embraces the lack of regulatory frameworks for collaboration with other organizations and also the lack of coordinated implementation. In the view of Laslo and Rafaeli (2016); yet, there are so many factors that hinder the effective utilization of technological tools in education. These factors have been grouped into the following categories.

Infrastructure related challenges: A country's educational technology infrastructure sits on top of the national telecommunications and information infrastructure. Before any technology-based programme is launched, policymakers and planners must carefully consider the following: in the first place, are there appropriate rooms or buildings available to house the technology? In countries where there are many old school buildings, extensive retrofitting to ensure proper electrical wiring, heating/cooling and ventilation, and safety and security would be needed. Another basic requirement is the availability of electricity and telephony. In developing countries large areas are still without a reliable supply of electricity and the nearest telephones are miles away. Although this is currently an extremely costly approach, other developing countries with very poor telecommunications infrastructure should study this option. Education programmes that use cutting-edge technologies rarely achieve long term success. It is cheaper, and easier, to introduce a form of technology into education, and keep it working, where education is riding on the back of large-scale developments by governments or the private sector.

Capacity Building Challenges: There are various competencies that must be developed throughout the educational system for technology integration to be successful in the delivery of instruction.

Teachers: Teacher professional development should have five focuses. Skills with particular applications; integration into existing curricula; curricular changes related to the use of IT (including changes in instructional design); changes in teacher role; and underpinning educational theories.

Education administrators: Leadership plays a key role in technology integration in education. Many teacher or student-initiated ICT projects have been undermined by lack of support from education administrators. For technology-based integration programs to

be effective and sustainable, administrators themselves must be competent in the use of the technology, and they must have a broad understanding of the technical, curricular, administrative, financial, and social dimensions in the use of technological tools in education.

Technical support specialists: Whether technological tools are provided by in-school staff or external service providers, or both, technical support specialists are essential to the continued viability of technology-based learning in a given school. While the technical support requirements of an institution depend ultimately on what and how technology is deployed and used, general competencies that are required would be in the installation, operation, and maintenance of technical equipment (including software), network administration, and network security. Without on-site technical support, much time and money may be lost due to technical breakdowns. In some extreme cases involving schools in remote areas, disabled computers take months to be repaired since no technician is available in the immediate vicinity and so the computers have to be sent to the nearest city hundreds of kilometers away (Tinio, 2002). Similarly, in Nigeria technicians are not within the country, and this pose as a threat in times of systems breakdown.

Technical knowhow

It is widely known that some teachers lack the competency of using computers and other digital instructional materials in the delivery of instruction. Teachers need to be trained with the provision of on-the-job training in order to be acquainted with certain technological tools and promote learning in schools.

Other menaces include the following: higher attrition rates; cost of purchasing computers; accommodating individuals with disabilities; technology incompatibility; high development costs; lack of credibility; some technology based learning (TBL) courses lack auditory stimulation and in-person contact with others; some courses may be overbooked and skimp on student support; student may lack the technical skills they need to succeed; students may only stay enrolled until they have met their own personal objective and will then dropout, regardless of other future needs; and students may realize that TBL requires more effort than originally anticipated.

Panaceas of the use of technological tools in the delivery of instruction

Effectiveness, cost, equity, and sustainability are four broad intertwined issues which must be addressed when considering the overall impact of the use of technology-based learning in the classroom (Tinio, 2002).

Effectiveness: The educational effectiveness of technology-based learning depends on how they are used and for what purpose. And like any other educational tool or mode of educational delivery, ICTs do not work for everyone, everywhere, and in the same way. Effective could be viewed in the following manner.

Cost management: Educational television broadcasts and computer-based and online learning are more expensive than radio broadcasts (Blurton as cited in Tinio, 2002a) Blurton further said that there is disagreement, however, over whether television broadcasts are cheaper than computer-based and online learning. Categorical assessments of cost-effectiveness are difficult to make because of lack of data, differences in programs, problems of generalization, and problems of quantification of educational outcomes and opportunity costs. Specifically, computers and the Internet, Blurton argues that when considering whether ICT is “cost-effective” in educational settings, a definitive conclusion may not be possible for a variety of reasons.

Rapid E-Learning: Increased emphasis on rapid e-learning is likely to shift development of training content back to the subject matter experts and away from instructional training designers. This shortens the development cycle of new training content and reduces development costs. New, easy-to-use development tools allow content experts to develop professionally looking training content from their desktop.

M-Learning: With the wide availability of audio and video podcasting, iPods, MP3 players, and smart phones will become an increasingly popular delivery vehicle for e-learning content. This delivery mode may in the future integrate chapters, bookmarks, images, and video clips. E-learning will move from the home to the street, the gym and even the ski slopes and golf courses.

Human interaction is important. Interaction with instructors and peers can be important to learner satisfaction and can provide the reinforcement that learners need to gain competency. Interaction can be achieved electronically using synchronous means, but traditional face-to-face meetings might be preferred.

Provide opportunities for active engagement. Moyer (2002) rightly remarks, “e-learning that consists of reading material on a computer display or drill-and-kill exercises does not exploit the potential of TBL and is unlikely to be very effective.” Instead, learners should be provided with opportunities to the extent practical for discovery learning, peer activities and discussions, practice sessions, and the application of their knowledge. Indeed, although TBL generally has not been found to be overall any more effective than traditional learning, research does suggest that simulations can be particularly effective. Similarly, interactive multimedia programs seem to result in better comprehension, increased retention, and the effective transfer of skills and knowledge.

Make the content relevant and timely: Building off a constructivist approach to learning, e-learning as indeed traditional learning must be perceived as relevant to learners and, to be mastered and retained, content must be connected to things they already know.

Provision of feedback and support: Technology Based Learning (TBL) runs the risk of isolating learners as they proceed through their learning exercises. Pertinently, interpersonal interaction is critical to overcome this obstacle. Importantly, learners must

be provided with feedback and support. When learners make a mistake, it is important that they know they made a mistake, why it is a mistake, and how it can be avoided the next time. The field of technology-based learning is rapidly evolving in adopting these principles. New technologies emerge and old ones fall out of favor, as training designers and educators learn how to use these tools to increasingly better effect.

Technological Methods and Tools used in Delivering Instruction

Technology-based learning uses a series of delivery methods and hardware and software tools to manage and deliver learning content and manage and track learner progress, as well as learner to-learner and learner-to-instructor communication (Adams, 2005). Brief descriptions of each of the most common delivery methods and tools used in TBL and the role they play in a TBL environment include the following.

1. Tutorials are self-paced training programs delivered online or from a CD-ROM. They may contain audio and video and allow learners to control key aspects of the learning experience. They may track progress and include quizzes and a competency assessment. Typically, they are modular and are accessed in sequence or out of sequence, depending on the learners' needs.
2. Web Conferences are synchronous meetings in a virtual environment. They are usually centered around a website where visual and text content is displayed, and include audio and sometimes video. A single facilitator may drive the visuals or they may involve interaction among multiple participants. More advanced web conference environments try to mimic most typical classroom interactions and allow for polling, live chat, and other interaction among participants. Smaller web conferences sometimes are called Webinars. Both may be archived for later asynchronous delivery.
3. Online Forums (also called bulletin boards, discussion groups, or news groups) allow learners to interact with each other and the instructor through threaded discussions by posting messages on specific subject areas, starting new threads and sub-threads, or posting replies to others. Online forums are either self-moderated or moderated by an instructor or expert facilitator, and the threads are typically archived. In order to participate in a forum discussion, a learner has to visit the specific online location to review the postings of others and post messages.
4. Electronic Mailing Lists (also called listservs) allow members to send messages to other members of the same mailing list. They are different from online forums in that postings are delivered to e-mail boxes and are not typically archived in a communal online space.
5. Wikis and Virtual Collaborative Workspaces allow members of a group to share a virtual space on the web where they can store reference documents, add and edit documents and track progress on a collaborative work effort.
6. Blogs (Weblog) are web-based journals and are usually a component of a larger personal or corporate website. Some are more topical and others are highly personal. They typically allow readers to post replies or to be promoted to a co-contributor role. In an online learning environment, they can take on the role of a learning journal.

7. Simulation allows learners to model or role-play in a scenario as a way to practice or test learning. Applications range from simple scenarios to complex, highly scripted, and interactive games.
8. Goal-Based Scenarios are simulations in which learners assume a major role in the pursuit of a well-defined mission or task. In order to achieve the goal, the learner needs to acquire particular skills and knowledge, which is where the learning occurs.
9. Gaming involves more complex simulations with: formal rules in which players engage in artificial conflict with variable and quantifiable outcomes and both game play and learning objectives; A narrative which provides cues, context and relevance for the activities, and a simulation which represents the learning space necessary to support the activities and narrative.”
10. Learning Management Systems (LMSs) typically register, track, and deliver content to learners; report on learner progress, assessment results, and skill gaps for instructors; enroll learners; and provide security and manage user access for administrators. LMSs typically handle courses by multiple publishers and providers. They are similar to Learning Content Management Systems (LCMS) that are especially designed to handle content objects in modular form for learner use.
11. Integrated Learning Systems (ILSs) are different from LMSs in that they are fully integrated around a specific learning content and are not designed to handle learning objects from disparate sources. ILSs typically include hardware, as well as curricula and lessons organized by competency level. They usually include a number of tools such as assessments, record keeping, report writing, and user information files that help to identify learning needs, monitor progress, and maintain student records.

On this premise, the objectives of the study, which has been reviewed and discussed, were achieved with the authentication of proper use of technological tools in the delivery of instruction in classrooms.

Conclusion

Learning with the utilization of technology-based tools encourages learning experiences among students in schools. Pertinently, utilization of technologies helps learners to create learning communities that are able to construct knowledge easily and to share it with other members. In addition to the social interaction between learners in such social networks, the interactions of learners with their online teachers should not be overlooked. The online teachers facilitate effective learning. Therefore, technology-based instruction allows the users to send and receive messages synchronously and asynchronously; besides, it is simplistic, intuitive, and very easy to use.

Recommendations

The following recommendations are raised to guide the study.

1. The use of different technological tools should be apprehended in the delivery of instruction in classrooms in order to promote learning.

2. Computers and other technological tools should be utilized in schools in order to promote the delivery of instruction in schools
3. School managements should be able to maintain technological gadgets or devices assigned to them in order to foster learning among students
4. Government should provide teachers with adequate technological (ICT) facilities like computers, projectors, etc to enhance learning in the classroom
5. Teachers should be able to handle and utilize the available computer devices to practically facilitate the teaching and learning process in schools

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