Effectiveness of technology-based learning

Education, Teaching

Technology-based learning (TBL) is a pedagogical method to teaching and learning that makes use of electronic technology. It is the learning of content via all electronic technology, including the Internet, intranets, satellite broadcasts, audio and video tape, video and audio conferencing, Internet conferencing, chat rooms, e-bulletin boards, webcasts, computer-based instruction, and CD-ROM.

TBL has numerous advantages. Among these, it fosters greater accessibility to learning by offering anytime and anywhere delivery; readily scalable to both large and small groups since it can accommodate larger numbers of learners at little extra cost and smaller groups of learners that otherwise would not be able to participate in traditional classroom training for lack of enrollments; can be self-paced and matched to the learner’s needs; emphasizes the merits of discovery learning for it offers the prospect of promoting greater comprehension and retention, particularly for complex materials, because of its clear opportunities for the hands-on manipulation of course materials and the use of simulations and game-playing.

On the other hand, it has its challenges. Among the most important of these is the “ digital divide,” caused by low computer literacy rates and lack of access to technology among some learner populations; “ social loafing,” characterized by students who work less diligently than they otherwise might, or who become frustrated by course material or technology and thus less engaged, because of the relative absence of instructor-learner and learner-learner interaction; high attrition rates among learners; course developers face their own challenges, as they grapple with problems related to technological incompatibility, and they must be certain to make

appropriate accommodations to promote access for learners with disabilities; and still lacks credibility because some employers and academicians view TBL instruction as less credible than traditional face-to-face instruction and may be less likely to hire someone with a TBL certificate unless provided by an accredited institution. Likewise, some factors that influence a teachers' unwillingness to use mobile technology in the classroom include student access, cost, class disruption, lack of teachers' technical and pedagogical skills, compelling evidence of effectiveness and a lack of guidelines. In addition, funding is a major issue. Schools often do not have an infrastructure for allowing an entire school population to access the Internet without adding costly Wi-Fi access nodes. Teachers and students may find access slow and frustrating, wasting instructional time. Furthermore, students and teachers live in a society that is driven by technologies and innovations, therefore by understanding the technologies, infrastructure and architecture behind mobile applications, teachers can much better identify a successful implementation of these apps in education. However, teachers may not know the differences between types of apps, and this may lead to an unclear and uninformed decision in selecting the most suitable, flexible, effective app –that can cater to their students' needs, thereby offering interactive content in the most efficient and robust manner.

Studies show that TBL is an effective pedagogical strategy in teaching. Lee (2014) studied students' perceptions of self-directed learning and collaborative learning with and without technology. This study explored students' perceptions of self-directed learning (SDL) and collaborative learning (CL) with or without technology in an information and

communications technology-supported classroom environment. The factors include SDL, CL, SDL supported by technology, and CL supported by technology. An instrument was developed and two studies, a pilot study and a main study, were undertaken. The pilot study surveyed 219 secondary school students and established the factors through exploratory factor analysis with good validity and reliability. The main study surveyed 500 secondary school students to confirm the factors and to establish the relationships between these factors through structural equation modeling. The findings indicated that students' learning without technology support is related to their use of technology for learning. It may be advisable for teachers to develop students' learning processes in the face-to-face context without technology before engaging them in technology-supported learning.

Likewise, Hwang, Wu, and Fan-Ray (2013) studied the effects of touch technology-based concept mapping on students' learning attitudes and perceptions. Ninety two sixth graders were randomly divided into three groups. Experimental Group One was taught using the Interactive Whiteboard (IWB)-based concept mapping approach, Experimental Group Two learned with the touch screen-based concept mapping approach, while the control group learned with the traditional paper-and-pencil- based concept mapping approach. The experimental results showed that, in terms of learning attitudes toward the natural science course and the degree of acceptance of using concept maps to learn, the students were significantly more positive about the two touch technology-based interaction modes than they were about the traditional paper-and-pencil mode.