Evaluating Technology-Based Instruction (TBI)

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INTRODUCTION

Decades ago, instructional evaluation has in most cases focused on the objectives of the lesson, methods of delivering instruction, and outcome learning. This form of evaluation focuses primarily on teaching and learning process within the confines of the classroom and does not include all the factors that impact learning outcome. Instructional practice and its evaluation process are becoming more complex with the application of technology into pedagogy. In order to identify areas of success or failure, all aspects of technology-based instruction need to be evaluated. It is therefore important to evaluate instructional technology as part of a pedagogical process and not as a single, isolated unit. It is also important that technology being used to facilitate instruction be evaluated to determine its appropriateness in meeting the needs of the students and the goals of the instruction.

We live in a technological world and as such education cannot isolate itself from technological advances and influences; to do otherwise will render education outcome obsolete. Therefore, technology integration is not an option; it is a necessary mandate in a world that depends on technological skill. Technology-based learning is a dynamic and complex phenomenon unlike the use of blackboard and chalk in a traditional classroom. Amirian (2003) shows that using technology to facilitate instruction requires changes in instructional plan and the possession of new skills.

BACKGROUND

Evaluation of technology-based instruction does not only involve pedagogy, teachers, students, and groups that have vested interest, it also involves the nature and quality of technical and electronic equipment including the overall quality of the environment where the technology-aided instruction will be implemented. Effective evaluation of technology-based learning must examine each individual component as a unit and then assess them on how well they contribute to the success or lack of success of the technology-based learning activities. Detweilter (2004) and Zemsky and Massy (2004) explain that technology integration has not made positive impact because technology has not fully adapted to the process of pedagogy. Some writers in the field of technology do believe that technology infusion can be used to develop authentic learning setting (Carnevale, 2003; Siegel, Schmidt, & Cone 2004). Reviewing the impact of technologies in teaching and learning, Sexton (2002) argues that using technology to support learning as a social activity meant that participants negotiate among themselves. This view is also supported by Chou (2003). The importance of evaluating all aspect of technology-based learning is to examine the totality of all the pedagogical practices and technological components that may impact on technology-based learning and make changes as necessary. Evaluating one aspect of the technology-aided learning will not provide comprehensive data upon which constructive judgment will be based.

According to Oliver (2000), evaluation is "the process by which people make value judgments about things. In the context of learning technology, these judgments usually concern the educational value of innovations or the pragmatics of introducing novel teaching techniques and resources" (p. 1) Guba and Lincoln (1981) perceive the purpose of evaluation as fourfold: "Improvement of the entity, critique of the entity, adapting the entity to a particular context and certification of the entity in the new content" in Alexander and Hedberg (2007 p. 1) http://ncode.uow.edu.

au/info/org/alexander.html). Evaluation by nature involves probing, searching, and making judgments based on the purpose of evaluation and sometimes judgment may involve criticisms. Basically, evaluation involves gathering evidence to make informed a judgment which could lead to the identification of what works, what does not work, loopholes in the system, and changes that needed to be made for improvement.

Providing meaningful evaluation data requires an assessment of those involved in technology-based instruction and examining resources and materials used for instruction. Evaluation in the field of education has invoked continuous debate. Tyler (1949) focuses on curriculum evaluation which is based on determining the degree to which the instructional objectives are achieved. Alexander and Hedberg (2007) criticize objective-based evaluation as narrow and restrictive, it does not cover all aspects of the program being evaluated. Stufflemean (1975) looks at evaluation from the point of view of how the program is developed and how it can be improved. This type of evaluation is concerned with process and output as a means of program improvement and it is decision-making driven. Due to the complexity of technology-based instruction, evaluation should not be narrowly conceived; it should be inclusive to cover the scope of what is involved in technology-based learning.

EVALUATING PEDAGOGICAL PROCESSES

Pedagogical processes refer to teaching and learning activities which include developing lesson objectives, selecting appropriate instructional methods, providing feedback, engaging in follow-up activities, and providing opportunities for transfer learning. In evaluating technology-based learning, the evaluator should examine how these pedagogical processes complement technologies used for instruction. The teacher must have the skill to make sure that the technology selected supports the instruction planned. A skillful teacher must develop the skill to select appropriate software technologies at the onset of instruction bearing in mind the desired outcome of instruction and methods for reaching such outcome. Evaluation of technology-based learning needs to focus on the relationship among pedagogical practices, outcome learning, and technology. The application of technology in teaching/learning must be based on sound theoretical foundation and it is important to examine such a foundation when evaluating technology-based instruction. Evaluation should also focus on how well various pedagogical practices and activities and technology are coordinated. There should be a harmonious relationship between technology and instructional processes and this should be considered during evaluation. Teachers' skills to integrate technology into instruction needs to be assessed. Successful evaluation of technology-based learning requires data with which to make judgment about all the aspects of pedagogy and instructional technology.

Teachers' ability to teach creatively needs to be addressed when evaluating technology-based instruction. Skillful teachers are required to develop course enrichment materials using technology to assist students in exploring issues relevant to the course objectives. Teachers' ability to select appropriate follow-up activities to help students consolidate what they have learned in the classroom needs to be examined. It is also beneficial that classroom is dynamic, colorful, exciting, interactive, and energetic; this will allow students to take advantage of multimedia technologies as they engage in learning.

Evaluating Software for E-Instruction

Software used for instruction should be evaluated in terms of age appropriateness. It should also be evaluated for cultural and gender bias as well as its suitability for classroom use. Students' developmental stage should equally be taken into consideration when evaluating technology for instruction. Technologies used in the classroom need to be user friendly and they should be evaluated as such. The level of technical support for each software technology used for instruction should be considered during evaluated. Ability of students to have access to the technology needs to be assessed. If students are not able to have access to computer software technologies outside the classroom, it is difficult for parents and significant others to provide assistance when needed. It is also difficult to continue learning outside the confine of the classroom. Software technologies must be evaluated for cost effectiveness including the cost of updating the technologies. It is very important that schools have relevant hardware technologies that are compatible with the software they intend to use. Majority of the school programs could run on basic computer system or set-up. It is necessary to make sure