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Students' perception of technology-assisted learning in undergraduate medical education – A survey

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ABSTRACT

The use of technology assisted learning (TAL) has widely increased over the last decade. TAL has become a significant part of many universities' curriculum delivery or at least a necessity for both teachers and learners to aid in the learning process. A learner's attitude toward, and acceptance of, training methods are important precursors to the success of any educational method, which in turn may be determined by factors such as individual learning style, type of technological tool available, learner's general perception about using technological assistance, technological complexity for use, etc. Although previous studies have focused on the influence and effectiveness of technology in aiding the teaching–learning process, it is also important to study these factors. Therefore, this study was conducted with the objectives to identify undergraduate medical and health science students' preference for use of various TAL tools, their perception about the effectiveness of technology in aiding the learning process, and to investigate the influence of learning style on students' perception of TAL. This cross-sectional study was conducted as a survey. The survey questions were directed toward identifying students' learning style, and their perception of TAL. Student volunteers were provided with two self-administered questionnaires, the index of learning style (ILS) questionnaire (test–retest correlation coefficient 0.7–0.9) and a pre-tested questionnaire to measure perception of TAL. Majority of students have a strong component of visual learning style, and therefore preferred interactive animations and videos to aid in their learning. They also demonstrated increased acceptance of TAL as measured in terms of their attitude, and perceived knowledge gain. Nevertheless, students' perception of TAL and their learning style existed independent of each other.

Technology assisted learning (TAL) is increasingly becoming important for both formal education and corporate training (Tai, 2007). Previous research has compared different learning media and produced some evidence suggesting that TAL, if adequately designed and implemented, can generate learning outcomes comparable to or even better than those attainable by traditional, classroom-based learning (Bernard, Abrami, Lou, Borokhovsk, &Wozney 2004; Hu, Hui, Clark, & Tam, 2007).

Numerous studies have been done to evaluate TAL methods. In a meta-analysis (Cohen & Dacanay, 1992) a "medium-sized effect" of computer-assisted instruction on student learning was identified, and more

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research was recommended to identify specific features of computer-assisted instruction that lead to improved student performance (Cohen & Dacanay, 1992). A review of literature by Chumley-Jones, Dobbie, and Alford in 2002, studied four domains. Domain 1: studies evaluating knowledge gains, Domain 2: learners' attitudes, Domain 3: studies evaluating efficiency of learning and Domain 4: studies evaluating costs of WBL programs. They found that web based learning (WBL) methods can result in student gains but cautioned that although WBL is a valuable addition to the educational armory, but it does not replace traditional methods and therefore educators must define WBL's unique educational contribution (Chumley-Jones et al., 2002). In a 2006 David Cook summarizes several years of research in Web-based learning (WBL) to illustrate that, in general, research fails to address the questions that will inform the use of this powerful tool. He also stated that WBL has many advantages it is not inherently better than other media. The author suggests that learning outcomes be defined first and WBL be used only when it appears to be the most effective means of achieving these outcomes (Cook, 2006).

Web-based teaching is said to provide a new paradigm for imparting knowledge (Sanz, Iskander, & Yu, 2000, Zahorian, Swart, Lakdawala, Leathrum, & Gonzales, 2000), whereby students are able to learn any time, even when they are at home. As a result, learners can progress on their own initiative to study the content of the course. However studies did not compare the students learning styles with these TAL. At University Tunku Abdul Rahman (UTAR), numerous technological resources (database) and materials, such as e-books, videos, interactive animations etc., are used by the faculty of medicine and health sciences (FMHS) to enhance student learning. This is with the intention of helping the students understand the concepts better and clear, to make the method of delivery easy and interesting, and to facilitate easy access to education materials at the convenience of learner.

Though incorporating TAL in the teaching–learning process may benefit in terms of easy delivery and easy access to information, it is questionable whether TAL guarantees knowledge gain. Also, it is worth noting that learning engagement underscores the importance of participation in study and often has a positive association with emotional engagement, as signified by learning interest or satisfaction. Therefore student attitude and acceptance of a training method are important precursors to the success of any educational method (Jwayyed et al., 2011).

Another important determinant of the effectiveness or satisfaction with the use of TAL is student learning style (Eom, Wen, & Ashill, 2006). Students' academic achievements are highly related to their learning style as every individual have their distinctive learning style in which they feel comfortable (Wei, Hoo, & Jasmine, 2011). Some consider this determinant as only a moderating factor (Eom et al., 2006; Hu and Hui, 2012; Neuhauser, 2002).

The objective of this study was to identify the various TAL tools preferred by the undergraduate medical and health science students of UTAR, their perception of the use of TAL method, and to investigate the influence of student learning style on their perception of TAL. We stated the null hypothesis that student perception of TAL is not influenced by their learning style.

1. Methodology

This exploratory cross-section study was conducted through a student survey using two questionnaires, one to identify student learning style and the other to determine student perception. Prior to the commencement of study approval from university scientific and ethical review committee was obtained. Hundred and thirteen ($N = 113$) undergraduate students from year 1 to year 3 of study in Medicine, Physiotherapy and Nursing courses at FMHS volunteered to participate in this study. Participation ranged.

1.1. Learning style

Learning style was identified using the ILS questionnaire developed by Richard Felder and Linder Silverman. The test–retest reliability of this questionnaire scores is satisfactory (0.7 and 0.9), with an internal consistency $\alpha = 0.5$, and Pearson correlation coefficient relating preferences of 0.2 or less (Felder & Spurlin, 2005). Therefore the current version of this instrument may be considered reliable, valid and suitable.

1.2. Student perception of TAL

Common approaches to understanding perceptions in schools include the use of questionnaires, focus groups, and interviews. While each of these approaches provides good information, questionnaires may be the best way to assess perceptions because they can be completed anonymously and readministered to assess changes in individuals' experiences and thinking over time (Bernhardt).

The questionnaire for this study was constructed with the intention to measure student perception in 2 main domains, knowledge gained with TAL and their attitude toward TAL. There was 12 items on each domain which was scored on a 5-point response option of strongly disagree (0), disagree (1), neither agree nor disagree (2), agree (3), and strongly agree (4). The score on each domain ranged from 0 to 48. The questionnaire also gathered other information such as demographic data, some information regarding their computer skills, computer usage, preferred use of technological resources (TR), awareness of learning style, and ILS questionnaire. To maintain anonymity and to ensure honest response, information that may identify the student was not asked. A pilot study was conducted to test the questionnaire prior to its actual implementation. Components that were considered inappropriate or repeatedly tested were either modified or deleted. At the completion of this study, the student volunteers were given information on various learning styles, and the strategies to improve learning as given by Richard M. Felder.

2. Results

In this study, 65.5% of the respondents were female. Majority of student participation was from medicine (68.1%) followed by physiotherapy 30.1% and nursing 1.8%.