



Research

Pharmacy students' perceptions of ExamSoft® as the primary assessment tool in an integrated therapeutics course

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Abstract

Rationale and objective: Computer-based testing using ExamSoft® became the standard policy for the College of Pharmacy in spring 2012. In order to better understand student-related factors following implementation of this policy, an investigation of the causal relationship between student perceptions of computer-based testing, acceptance, and ease of use was undertaken.

Methods: A cross-sectional study was done using an online questionnaire based on a modified version of the technology acceptance model (TAM). The questionnaire included four scales: (1) perceived ease of use (PEOU), (2) perceived usefulness (PU), (3) attitude towards usage (ATU), and (4) predicted future use (PFU). It was administered to second-, third-, and fourth-year pharmacy students who used ExamSoft® as their primary method of assessment in an integrated therapeutics course series.

Results: Overall, 67 of 160 (42%) students completed the questionnaire. Associations among the four scales were determined using logistical regression analyses. It was found that PEOU had a significant influence on PU (path = 0.44, $p < 0.001$) and that both PEOU and PU significantly affected ATU (path = 0.41 and 0.52, respectively, $p < 0.001$). Moreover, PFU was significantly affected by ATU (path = 0.64, $p < 0.001$).

Conclusion: The findings suggest that student perceptions have the potential to impact ongoing and future usefulness of technology within an academic setting. Faculty should be mindful of this point when considering implementation of new technology and when evaluating its potential long-term benefits.

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Introduction

Howard University College of Pharmacy (HUCOP) is a university-based four-year program. Students attend

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didactic lectures for the first three years complemented by experiential education during the summer of their first and second years and throughout their fourth year. The integrated therapeutics course series is offered in three five-week modules per semester over the course of three consecutive semesters during the second and third year. Assessment in the course was traditionally carried out using manual grading of paper-and-pencil written essays and short answers by the faculty and through the utilization of Scantron answer sheets for grading multiple-choice question. This method proved tedious and laborious for faculty, and coupled with a long turnaround time due to multiple

health science disciplines' use of limited data analysis center resources, it created difficulty in providing timely student feedback. Thus, it proved quite a challenge to implement remediation in a well-timed manner during the five-week module. The proposed solution to this problem was to identify a software package that could be used to grade exams effectively and in a timely manner. After reviewing several vendors, ExamSoft[®] was chosen for this purpose.

ExamSoft[®] was developed in 1998 as an assessment management platform designed to facilitate academic program efforts to more efficiently create, deliver, analyze, and manage exams.¹ It purposes to assist academic institutions to improve learning outcomes for students, provide student feedback and engagement, as it helps students prepare for professional board exams.¹ The software was especially attractive because of its capability to lock down during an exam, thus mimicking a professional exam like the North American Pharmacist Licensure Examination (NAPLEX). This functionality made the software a reliable and secure way of delivering exams.¹

In early 2011, HUCOP began limited use of ExamSoft[®] software for student assessment for a variety of reasons: (1) following the trend of other graduate/professional schools on campus such as the law, dental, and business schools, (2) to make better use of the required laptop computers, and (3) to ease the growing burden of administering and grading examinations while acclimating students to computer-based examinations in preparation for the pharmacy board exams. Eventually, a college-wide change in policy requiring that all official core course examinations be given only via ExamSoft[®] was approved by the faculty. The transition from paper-based testing began with process elements developed in summer 2011, continued with pilot testing core courses during fall 2011 and became a mandatory requirement in spring semester 2012. The entire process of implementation and adoption of ExamSoft[®] has been adequately explained by Pawasauskas et al.² in a recent journal article.

The policy change was met with some resistance from both students and faculty based on select issues that arose primarily during the early use and pilot phases. For instance, from the student perspective, some cited computer configuration and compatibility issues that might jeopardize their ability to take the exam. Students most often voicing potential concerns were those using either a Toshiba PC or an Apple Macintosh machine. Students whose computer battery could not adequately hold a charge for the duration of the examination required having access to an electrical outlet. Unfortunately, not all electrical outlets in every classroom were deemed operable, possibly delaying the administration of the exam to some students based on number of students and exam room configuration. Additionally, wireless internet capacity proved challenging during certain times of day due to the number of total users online simultaneously. This became a particular

concern at exam conclusion when students tried to upload their exam answers.

From the faculty perspective, the time needed to prepare the examination was a primary issue since each question had to be directly typed into the database within a short window of time. However, this only presented a problem during the first year of use. Subsequent question preparation required considerably less time as the faculty member could make modifications in the system of a previous question using a copy while keeping the old question intact. Limited faculty knowledge and experience of the software made it difficult to troubleshoot technical problems during an exam. Both faculty and students had only one semester in which to become acclimated to the ExamSoft[®] software environment.

Numerous studies have compared the difference in outcomes between paper–pencil and computer-based testing. Each approach has strengths and weaknesses, resulting in outcome differences known as the “mode” effect.³ One 2002 study evaluated how differences in test takers affect results of each mode such as the test taker's comfort level with using a computer.⁴ Other studies have examined the types of tests taken using the different modes and the role played. Studies looking into various content areas in K-12 examinations offer mixed conclusions in that a computer-based test was more difficult than a paper–pencil test and vice versa⁵ while another suggested that they were comparable.⁶ Overall, the findings appear inconsistent but do reveal an increasing trend toward the use of computer-based testing.⁷

Perceptions regarding the value and utility (ease and usefulness) of new technology have been found to influence propensity toward future use.^{8–10} This concept applies to whether considering an examination situation or the use of any software on a computer. The term “self-efficacy” describes the relationship between an individual's belief about their own abilities and the belief that by accomplishing a task, a desired outcome is gained, leading to an impact on their behavior.^{7,8}

The technology acceptance model (TAM) has been used to observe the causal relationships between perceived usefulness (PU), perceived ease of use (PEOU), attitude towards usage (ATU), and behavioral intention to use (BIU) technology.⁸ Davis¹¹ described perceived usefulness as “the degree to which a person believes that using a particular system would enhance his or her performance” while perceived ease of use refers to “the degree to which a person believes that using a particular system would be free of effort.” Cognitive factors can be listed as perceived usefulness and perceived ease of use.⁸ In a 1993 piece, Davis¹² described attitude towards usage as “the degree to which an individual evaluates and associates the target system with his or her job.” An important factor in guiding future behavior or a specific situation that leads to a certain behavior can be attributed to attitude towards usage.⁸ Thus, regarding the technology acceptance model, Ajzen and

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