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Brief Communication

Impact of students' use of technology on their learning achievements in physiology courses at the University of Dammam

Mohammed T. Al-Hariri, PhD [a,*] and Abdulghani A. Al-Hattami, PhD [b]

[a] *Department of Physiology, College of Medicine, University of Dammam, KSA*
[b] *Bahrain Teachers College, University of Bahrain, Bahrain*

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Abstract

Objective: This study was conducted to investigate the possible relationship between students' use of technology and their achievements in physiology courses at five health colleges of the University of Dammam.

Methods: This study was conducted on 231 students studying physiology during their 2nd year at one of five health colleges (Medicine, Dental, Clinical Pharmacy, Applied Medical Sciences, and Nursing). An online survey was sent to the students regarding their use of technology and the devices they use. The Pearson correlation coefficient and descriptive statistics were implemented to study the frequency of, and relationship between, technology and learning achievement in physiology courses.

Results: This study observed a significant relationship between students' use of technology and their achievements in health colleges. The study also demonstrated that the most-used devices are laptops (50%) and phones (42%) followed by tablets (7%) and desktop computers (0.5%). This paper reports on the results of the survey, documenting what was revealed regarding how technology is used among students at the health colleges, as well as the important benefits on their achievements during physiology courses.

Conclusions: Technology usage might produce comparatively more significant increases in academic achievement than would non-usage. Further research is warranted to examine its effects.

Keywords: Achievement; Health colleges; Learning; Physiology; Technology

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Introduction

Incorporating technology usage within Saudi university education is an initiative of relatively new provenance and one that has been struggling to secure rights and recognition, similar to how a new country struggles to establish internationally recognized sovereign boundaries.[1] It has been suggested that the application of technology should indeed encouraged and even be incorporated, routine part of students' daily activities within clinical activities and basic sciences.[2] The most important element that supports the use of technology in the educational system is the Internet. E-learning has become one of the fastest-moving trends in education and poses a promising alternative to traditional learning.[3] Studies have shown that people learn considerably better from a combination of both words and images (which technology enables) than merely from words alone.[4] Technology helps students become independent, proficient member and researchers.

The changing role of physicians in the new health care environment provides a stronger impetus than ever before

* Corresponding address: Department of Physiology, College of Medicine, University of Dammam, P O Box 2114-31451, Dammam, KSA.
E-mail: mohd_alhariri@yahoo.com (M.T. Al-Hariri)

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for these ideas to be incorporated. Nevertheless, using technology in the classroom is a methodology not widely implemented in Saudi universities. Abouchedid and Eid stated that "The overwhelming traditional knowledge delivery system for higher education in the Arab world demonstrates the pronounced information (IT) gap between Arab countries and the developed world".[5]

Research has indicated a need to change and revise the curriculum within health colleges to cope with this revolution in technology[6] because technology is becoming a highly important source of maintaining currency and gaining knowledge within the health profession.[7] Research has demonstrated that smartphone applications and the Internet are introducing a new degree of responsiveness and flexibility within educational processes. This responsiveness is facilitated by the ease with which content can be updated, instruction can be personalized, information can be accessed, information can be distributed, and content can be standardized.[7,8]

Increased implementation of technology will increase students' comprehension of content and development of skills in such areas as analytical reasoning, problem solving, information evaluation, and creative thinking.[9] In KSA, there is a dire dearth and paucity of information regarding the effect of technology usage on learning achievement. Rather, studies conducted within KSA have found that students are used to a comparatively more traditional model of learning.[6,10] However, the comprehensive use of technology would create a good environment facilitative of learning. This approach would shift education from the classical approach (which has not prioritized students' pursuit of understanding) toward the deep-meaning approaches that would help students seek a true understanding of the central principles, themes, and applications of any given area of study.[11] Using technology would support the active learning of students in an educational environment designed to help students achieve meaningful learning – which, in turn, could result in positive, cumulatively progressive gains in learning outcomes.[12]

Technology has been argued as having a positive impact on our way of thinking. Steve Johnson (2005), in his nationally bestselling book *Everything Bad is Good for You*, posited that technology is making us more intelligent due our means of obtaining, interpreting, and processing information. Many studies have discussed how technology affects our brains and impacts how much its use affects the way that we think and perform.[13,14]

The present study involves physiology courses taught in five University of Dammam colleges of health: The College of Medicine, College of Dentistry, College of Nursing, College of Applied Medical Sciences, and College of Clinical Pharmacy. Lectures using PowerPoint presentations are used regularly in the classroom. The presentations are then uploaded on Blackboard (an online system). Course websites function as resource centres, providing access to all related documents along with links to additional resources, as well as group e-mail lists and an interactive discussion board. In addition, AD instrument recordings have become an integral component of laboratory teaching sessions, making them comparatively more interactive and even more valuable learning experiences than previously.[15]

The present study's principle aim was to identify the impact of technology usage on student learning achievement in the physiology courses taught in five colleges of health. The study attempted to answer the following research questions:

1. Is there a relationship between students' use of technology and their achievements in physiology courses in the health colleges?
2. Which device is most used by participating students?

Materials and Methods

An online survey was sent to all second-year students (231 students) in the five colleges of health. The respondents comprised 219 students, per a response rate of 95%. The survey consisted of six questions with five Likert-scale response options (ranging from 1 = Strongly Disagree to 5 = Strongly Agree) regarding the use of technology and the smart devices that they use. The sum of the sub-questions constituted a total score for their use of technology. Each of these total sums was correlated with students' final cumulative physiology course score. The measure of students' performance-based achievement in the physiology course included Final Exam 35%, Mid-year Exam 25%, Quizzes 20%, Lab Exam 10%, Self-Study 5%, and Tutorials 5%.

The questionnaire was developed in consultation with two experts in the medical profession, each of whom validated the objectives-based content and questions of the measure. A psychometrician also checked the internal consistency of the questions. The reliability coefficient was found to be 0.73.

Statistical analyses were performed using the Statistical Package for the Social Sciences (IBM SPSS Statistics, Version 20.0).[16] The Pearson correlation coefficient and descriptive statistics were implemented to present the frequency of, and examine the relationship between, technology and learning achievement in physiology courses.

Results

The study was conducted for five colleges of health. The sample of the study included 219 male Saudi second-year students. The distribution of the students in the five health colleges is presented in Table 1. The focus of the study was to find out if there is a significant relationship between students' use of technology and their achievements in physiology courses in five colleges of health. The most used devices were indicated by the participants, which may indicate that

Table 1: The distribution of participants in the five health colleges.

Colleges	Frequency	Percent	Valid percent	Cumulative percent
Clinical Pharmacy	13	5.9	5.9	5.9
Dentistry	46	21.0	21.0	26.9
Medicine	89	40.6	40.6	67.6
Nursing	23	10.5	10.5	78.1
Applied Medical Sciences	48	21.9	21.9	100.0
Total	219	100.0	100.0	

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