

The Effect of Electronic Courses in Instructional Support to Increase Medical Students' Enthusiasm^{*}

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Current medical students need an ongoing basis of updated skills and knowledge to be compatible with the development of health care systems in the hospitals. The student engagement in thinking about the better way for learning a new information and skills will create safe and comfortable learning environment, which act as a golden key to starting point, leading to highest quality learning outcomes. The medical education instructor should recognize the e-learning technology gadget suited the required learning environment and compatible with intended learning objectives for each lecture. No doubt that the instructor plays a vital role in the student support, which needs an intellectual efforts to provide them with appropriate needs and guide students to become active and creative members in the university, their profession, and community. This research aims to find out what is the impact of electronic courses (e-courses) in instructional support, to increase medical students' enthusiasm. Across sectional descriptive analytical study conducted in King Saud University, Riyadh, Kingdom of Saudi Arabia (KSA), the study population was undergraduate radiological sciences students. A well-designed questionnaire was distributed to students and then received their feedback. In the first part of the course, they exposed to traditional methods, while in the remaining part, the e-learning and interactive lectures were introduced. Statistical analyses were performed with Statistic Package for Social Science (SPSS software version 20). Out of 50 students, 31 (62.0%) preferred the interactive power points files, 33 (66.0%) more enthusiastic to use learning management system (LMS) to find out their course contents. Regarding the level of students satisfaction in different types of pre-test, 30 (60.0%) students were unsatisfied when using paper and pen style, while 38 (76.0%) were satisfied when performing an electronic tests. Twenty-nine (58.50%) favoured an interactive mind map for each lecture contents. Majority of students decided that both classical and electronic instruction methods offer usable and relevant support for students. In conclusion, the e-courses offer the opportunity to integrate teaching, learning, and assessment which play a vital role in instructional support, to increase medical students' enthusiasm. The web utilization supports both faculties and students with a very strong and dynamic communication method, to set up a vital learning community. The e-courses provide students with multiple ways to prove mastery, offer more options and opportunities for presentation and participation, become creative and critical thinkers, and continue self-directed learning.

Keywords: component, e-courses, instructional support, radiological sciences, medical students' enthusiasm

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Introduction

Within few years, the e-learning transfer to be part of majority medical colleges' mainstream (Ward, Gordon, Field, & Lehman, 2001). The classical instructor-based teaching is yielding to students focused model that set learners in their own learning control. Newly shifted curriculum based on competencies to confirm the learning outcome (Izet, 2008). The medical education term define as gaining, knowledge, psychological skills, and psychomotor skills, while clinical practice means positive attitudes and values acquisition (Rosenberg, 2001). For under/post graduate radiological sciences technology students, it is difficult to achieve all required knowledge in the limited years. So, the medical education should have bases which lead to high standard required by National Commission for Academic Accreditation & Assessment, Kingdom of Saudi Arabia (KSA).

The National Qualification Framework provides five learning domains that focused on the description and explanation of all issues that need to be developing at the end of each course, the acquired knowledge, cognitive skills, interpersonal skills, and responsibility and psychomotor skills, and the most important domain that need more concentration is communication and information technology, numerical skills need to be developed.

When students gain the acquired cognitive knowledge and standard level of requested psychomotor skills, and then they were surrounded with good ethics and values. At this time, the evaluation of this program revealed it is good (Rosenberg, 2001). The usage of Internet technologies to create a wide array of means help in support of learner's knowledge and also performance level known as e-learning (Wentling, Waight, Gallaher, La Fleur, Wang, & Kanfer, 2000; Rosenberg, 2001). All of the following are the other terms for e-learning computer-assisted instruction, Internet-based learning, Web-based learning, and online learning (Ward, Gordon, Field, & Lehman, 2001). The creation of suitable advance electronic academic environment is the university responsibility to achieve learning and research in an optimal manner (Masic, Novo, Kudumovic, & Masic, 2005; Engelbrecht, Ingenerf, & Reiner, 2004; Hovenga & Bricknell, 2004; Mantas, 2004; Glinkowski, 2006). The education political atmosphere tends to be changed when using e-learning which settles the earlier student and instructor relationships, it leads to equality among all discussion board members. Through the provision of shared communication tools by e-learning, it enables students to be more active and organized. For example, the online environment helps students to develop more confidence or fluency than the instructor do. There were an excited findings by many studies showed that there were some differences of student importance online effectiveness less than face to face method (Joint Information Systems Committee, 2007). This is one of the well-known topic "economics of presence" (Davies, 2006).

Objectives

This study was designed to study the impact of a well-design e-course in instructional support, to increase medical student's enthusiasm.

The Significance of This Paper

This study will try and pursue actively to shift the teaching compass pointer to meeting the students needs and incorporating different well-design e-courses to support the classical teaching methods which known as blended learning.

Settings and Design

The sectional descriptive analytical study was conducted in King Saud University, Riyadh, KSA, Collage of Applied Medical Science, and Department of Diagnostic Radiology.

Material and Methods

The study population was undergraduate radiological sciences students. A well-designed questionnaire distributed among student to students, and then received their feedback. After they were studied Accident and Emergency Radiography course, the first part of the course was taught by classic teaching method, and then the e-learning and interactive lectures were introduced in the remaining part of the course. Statistical analyses were performed with Statistic Package for Social Science (SPSS software version 20). Categorical data were summarized as percentage.

Results

The current study of 50 students revealed that 19 (38.0%) students prefer PDF lecture files, while 31 (62.0%) prefer PPT files (see Figure 1).

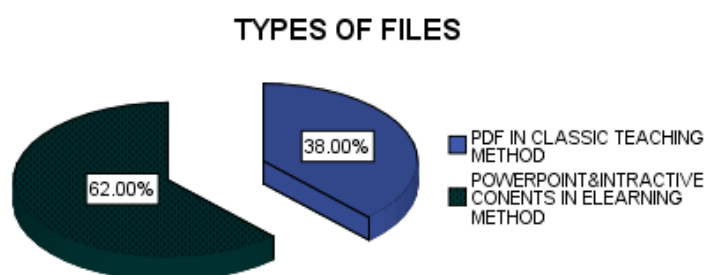


Figure 1. Types of lectures files.

Seventeen (34.0%) students liked to receive the course handout through e-mail, while 33 (66.0%) through learning management system (LMS) (see Table 1 and Figure 2).

Table 1

Hand out for Students

Handout for students		Frequency	Percent (%)
Valid	Through e-mail	17	34.0
	Through LMS	33	66.0
	Total	50	100.0

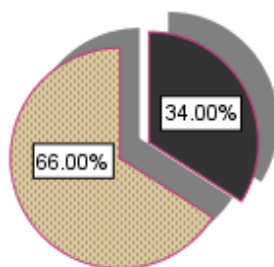


Figure 2. Methods to receive handout for students.

Level of satisfaction in different types of pre-test: In case of using paper and pen style for tests, 20 (40.0%) students were unsatisfied, while 30 (60.00%) were satisfied (see Table 2 and Figure 3).

Table 2

Paper & Pen Pre-Test

Paper & Pen		Frequency	Percent (%)
Valid	Satisfy	20	40.0
	Unsatisfy	30	60.0
	Total	50	100.0

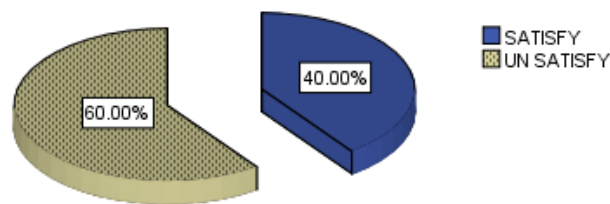
PRE-TEST IN PAPER & PEN STYLE

Figure 3. Student satisfaction & paper and pen tests.

While using electronic tests, 38 (76.0%) students were satisfied and 12 (24.0%) unsatisfied (see Figure 4).

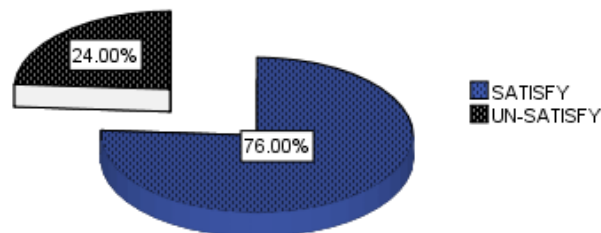
ELECTRONIC PRE-TEST

Figure 4. Students satisfaction & electronic tests.

In mind-map & students understanding question, the result showed that 21 (42.0%) students preferred only one generalized map for all course contents, while 29 (58.0%) preferred separate interactive mind-map for each lecture (see Figure 5).

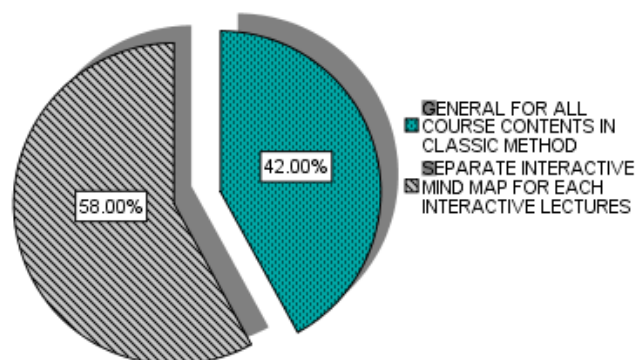


Figure 5. Mind-map & students understanding.

Twenty-two (44%) students were preferred communication through e-mail and telephone, while 28 (56.0%) students through LMS messages.

Regarding duties performance, 17 (34.0%) students like to printed paper style for each duty, while 33 (66.0%) preferred electronic performance.

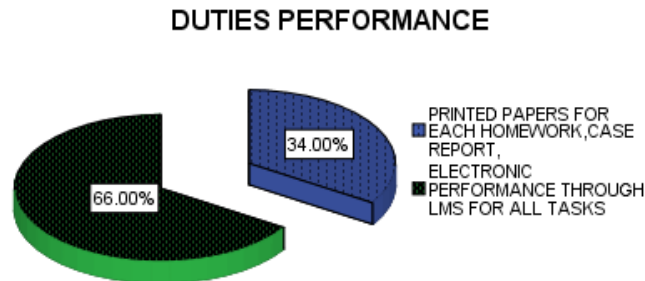


Figure 6. Students duty performance.

Role of virtual classrooms in student's achievement, 28 (58.0%) students thought VC lead to high academic achievement rate, 19 (38.0%) medium level, and 3 (6.0%) low.

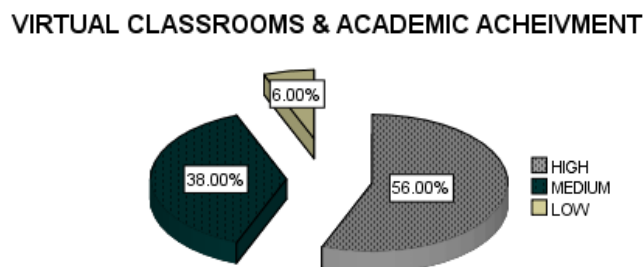


Figure 7. Virtual classrooms & academic achievement.

Regarding the question about videos and interactive contents availability and location, in a separate files or only URL in classic method was preferred by 19 (38.0%) students, and 31 (62.0%) preferred it was embedded in the lecture interactive file in suitable place with auto-play format.

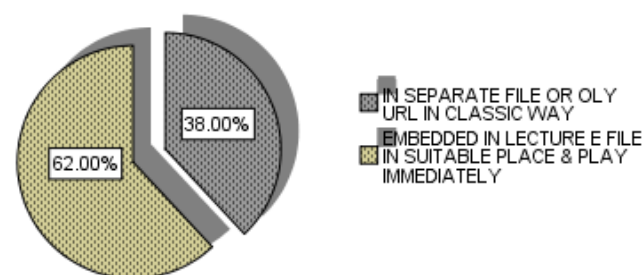


Figure 8. Videos & interactive contents availability & location.

Forty (80.0%) students agree with that the classic instruction method offers useable and relevant support for students, and 10 (20.0%) disagree with that.

Forty-seven (94.0%) students agree with that the electronic instruction method offers useable and relevant support for students, and 3 (6.0%) disagree with that.

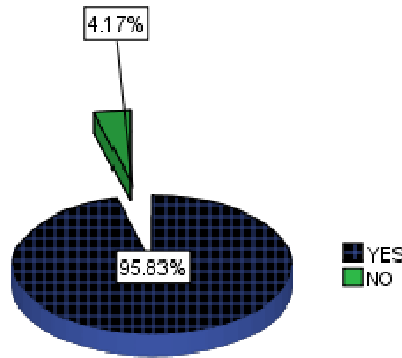


Figure 9. Does the e-courses offers useable and relevant support for students.

Seven (14.0%) students were preferred classic instructor-based learning and 10 (20.0%) e-learning technologies, while 33 (66.0%) preferred the integration of both types.

Table 3

Students Preferred Teaching Method

Students preferred teaching method		Frequency	Percent (%)
Valid	Classic instructor based learning	7	14.0
	E-learning	10	20.0
	Combination of both (blended)	33	66.0
	Total	50	100.0

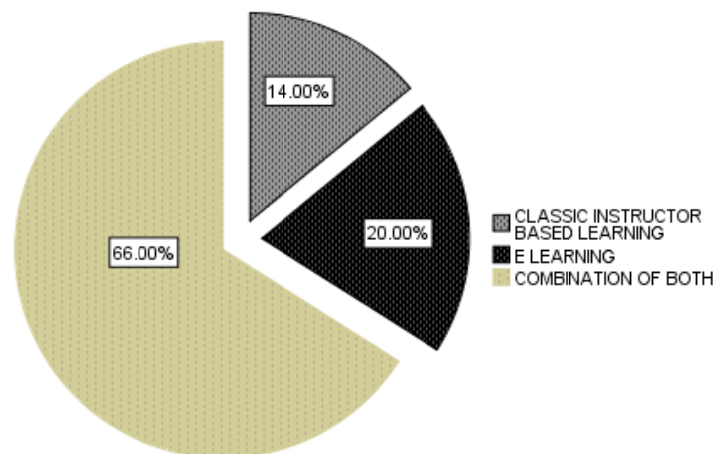


Figure 10. Students preferred teaching method.

Discussion

Our study takes place in King Saud University, KSA, which offers an updated LMS through the learners' monitoring and tracking process become easier and effective for evaluation by the course instructor, tracking all students enrolled in specific course to assess their knowledge and skills, effectiveness, and contribution in online discussion boards which will support the educational goals and objectives, because it offers maximum chances for interaction between the learners themselves and their instructor directly without any restrictions. It also aids in the assessment process for all skills that need to be acquired in an optimal manner. Online pre-test will give the instructor chances for the learners' level and help in good planning. It also assists in the KWL (K = What the

learners KNOWS about the theme; W = What they WANT to know; and L = How they want to use what they LEARN) application which is one of the most effective strategies used pre-learning to assist the learner's focusing on the article application by making it unofficially in short period insert their personal KWL (Carr & Ogle, 1987). Sangrà, Vlachopoulos, and Cabrera (2012) defined the e-learning as teaching and learning approach which represents the framework for part or all of the applied educational style, and are based on devices like computers and electronic media as means to create a developed and easy access for communication, training, and interaction by utilizing a recent methods for learning development and understanding (Sangrà et al., 2012). Deny and Sarah's (2018) study revealed that majority of students spent enjoyable time in e-learning system; they treated as a funny item, because materials were easily understood, flexibility in time and place play a vital role, and they have chance for discussion and direct questions for their classmates and the instructor.

Kisanjara and Tossy's (2017) study concluded that the role of e-learning had huge effect in student engagement and achievement.

The finding of this research agrees with the finding of study done by Jorge G. Ruiz (2006) who reported that "There is an strong evidence of e-learning acceptance in the medical education community, when integrated with classical instructor-based learning".

Out of 50 students, 31 (62.0%) preferred the interactive power points files. Thirty-three (66.0%) had more enthusiasm and desire to gain knowledge when using LMS to find out their course contents. Regarding the level of students satisfaction in different types of pre-test, this study revealed that 30 (60.0%) students were unsatisfied when using paper and pen style, while 38 (76.0%) were satisfied when performing an electronic pre-test.

No doubt that mind-map plays an important role in medical students understanding and memorization of the huge knowledge amount they need to achieve. Out of this study, majority of students 29 (58.0%) preferred an interactive mind-map for each lecture contents, while only 21 (42.0%) students preferred only one generalized map for all course contents. McDermott and Clarke (1998) reported that the mind-map is an educational tool to encourage medical students critical thinking by guiding them to merge information's among disciplines and well understanding of the basic and clinical sciences relationships. In Annemarie MSN, MPA, and APRN-C's (2015) study, there was an open-ended question in the evaluation for their students concern with the role of mind-mapping to enrich their knowledge; they found that mind-mapping give them precious chance for discussion, hands on participation, in addition to that let them focus and understand a specific ideas.

Anthony, Genevieve, Valerie, and Terrence's (2010) study revealed that mind-map act as an easy teaching method for medical students who do not have background in mind-mapping. In addition to that, mind-mapping is an attractive, no cost resource that assist medical students in their learning and organize the information (Anthony et al., 2010). Davies's (2010) study, which was clearly specified that processing of information visually and pictureatically facilitating learning.

The role of virtual classrooms in student's achievement, 28 (56.0%) students thought VC lead to high academic achievement rate. This finding agrees with Shi et al.'s (2014) study indicated that the computed teaching method as in virtual classrooms have great potential to provide assistance in learning for all medical undergraduate students.

Cook's (2012) study revealed that the audio-visuals aids have a vital role in teaching and learning of medical students. It should be supportive and an integral part of the original science inquiry. But there are some requirements to let students get more benefits from visual presentation in the lecture room. It should include visuals and verbal information, merging visual and verbal information's temporally and spatially, and utilize

novel via text as suited, maintaining simplicity and provision of guidance (Cook, 2012). Regarding to this study, 31 (62.0%) students preferred that videos were embedded in the lecture interactive file in suitable place with auto-play format.

Regarding duties performance, almost most of students 33 (66.0%) preferred electronic duties performance, while 17 (34.0%) only like to printed paper style for each duty. Najeeb, Rifat, Josip, Azeem, and Erica's (2015) study demonstrated higher satisfaction rate among students exposed to computer-based learning (CBL).

Majority of students agree with that classic and electronic instruction methods offer useable and relevant support for students, so they preferred the combination of both which known as blended learning. Najeeb et al.'s (2015) study revealed that the result of knowledge evaluation in 33 out of 40 studies comparing e-learning versus traditional learning, here, was statistical significant knowledge gains for students applied the CBL more than traditional learning methods.

Conclusion

Both classic and electronic instruction methods offer useable and relevant support for students as follows:

1. The e-courses offer the opportunity to integrate the teaching, learning, and assessment, which play a vital role in instructional support, to increase medical student's enthusiasm;
2. E-learning will establish an open-relationship and create various channels of communications with learners in a professional manner, good opportunity to gain their confidence, so they will never hesitate to seek any help, guidance, and support at any time;
3. The Web utilization supports both faculty and students with a very strong and dynamic communication method, to seating up a vital learning community;
4. The e-courses provide students with multiple ways to prove mastery, offer more options and opportunities for presentation and participation, become creative and critical thinkers, and continue self-directed learning.

Recommendations

Further studies should be done to recognize the medical students' attitudes toward introduction of electronic technologies.

Medical sciences instructors should focus on the e-learning integration with the traditional methods (blended learning) to dominate their instruction.

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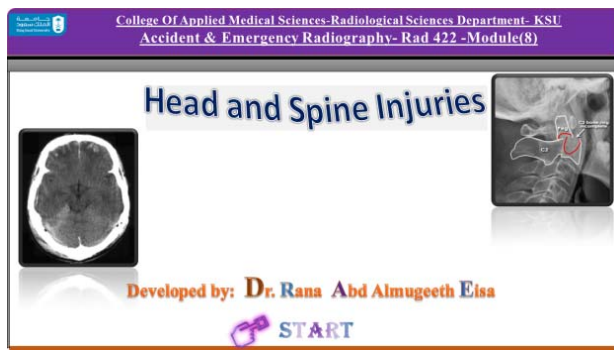
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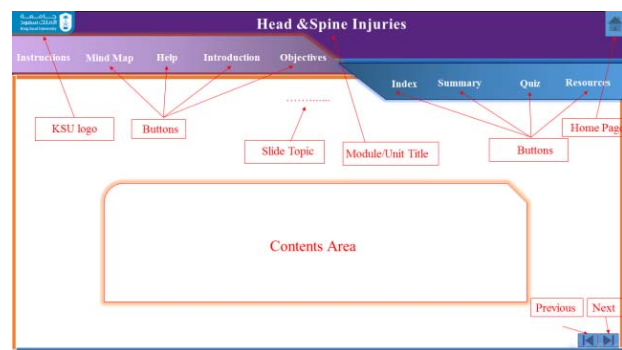
Appendix

This figure contains an example of one an interactive lecture and then published in LMS:

- (a) Head page;
- (b) All this contains items indicated by arrows were interactive;
- (c) Example of video embedded inside the lecture;
- (d) Example of an interactive mind mapping;
- (e) Interactive quiz at end of each lecture.



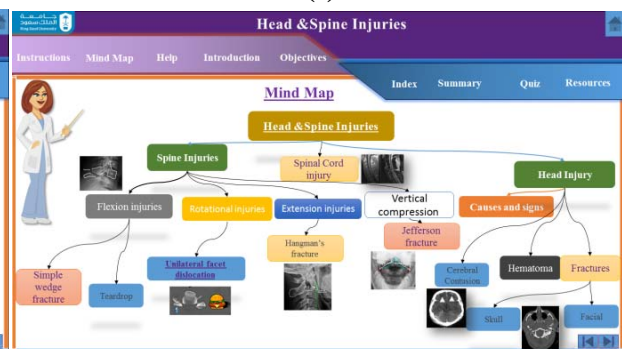
(a)



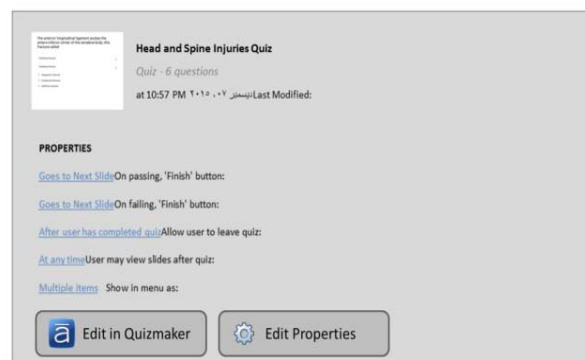
(b)



(c)



(d)



(e)