The Quantitative Impact of Students Using Computer Device in a Third Year Undergraduate Nursing College to Learning of the Diseases Rehabilitation

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ABSTRACT

This study informs the quantitative impact of students using computer in a 3rd year undergraduate Nursing College. From a group of 30 students completed the study. Using a pre-post random division research design, students were divided to an experimental group and control group depend on a 28-question multiple-choice exam. The experimental group then listened to movies by computer about diseases rehabilitation over eight weeks; while the control group were not provided with any movie on computer but depended on teacher explain. After eight weeks, both groups were re-examined using the same test. Data were analyzed using the impact size statistic and 90% confidence intervals. The control group improved their exam performance by 33%, whereas the experimental group improved by 55%. The alteration between the groups on the post-test was a mean impact size of 0.21 (92% CI: -0.17 to 0.56 [trivial to positively small]). There is nearly no chance that the real influence in the population is dangerous. The results of this study suggest that using computers provides little quantitative advantage for students over and above written text when learning diseases rehabilitation.

Keywords: Quantitative impact, Computer device, Nursing college, Learning, Diseases rehabilitation.

1. Introduction

A computer is a general purpose device that can be programmed to carry out a set of arithmetic or logical operations. Since a sequence of operations can be readily changed, the computer can solve more than one kind of problem. Conventionally, a computer consists of at least one processing element, typically a central processing unit (CPU) and some form of memory. The processing element carries out arithmetic and logic operations, and a sequencing and control unit that can change the order of operations based on stored information. Peripheral

devices allow information to be retrieved from an external source, and the result of operations saved and retrieved. The first electronic digital computers were developed between 1940 and 1945. Originally they were the size of a large room, consuming as much power as several hundred modern personal computers (PCs) (Fischer et al, 2003). In this era mechanical analog computers were used for military applications. Modern computers based on integrated circuits are millions to billions of times more capable than the early machines, and occupy a fraction of the space (Apple, 2007a). Simple computers are small enough to fit into mobile devices, and mobile computers can be powered by small batteries.

Young people have grown up with computers and technology. Sometimes described as the Net generation (Oblinger, 2005), they are assumed to be digitally literate and accustomed to using the Web for supporting learning. Given the creative freedom this allows, computer is being embraced by educators, providing another method for supporting students in their learning. The possible values of computer as an integral part of students' learning 'toolkit' are that they are mobile and easily accessible, popular and non-threatening. The technology is probably not a barrier to learning as students are familiar with using computer for downloading and viewing movie. For example, Newnham and Miller (2007) found that 88% of information systems students agreed or strongly agreed that accessing computer was easy. However the question of whether these digitally literate students will be willing to embrace the use of computer technologies within the educational context requires further research. Campbell (2005) believes that students will be comfortable with using computer technologies for learning, but recent studies from the University of Washington and RMIT University have shown that 81% and 85% of students respectively viewing movie on their personal computers (Lane, 2006, Atkinson et al, 2007). It is not the purpose of this study to assess the computer of using movie but the effect of viewing educational movies on exam performance. While studies examining the use of computers have contributed valuable information on the many qualitative aspects of their use (Belanger, 2005, Lane, 2006, Bell et al, 2007), recent advice has suggested that more studies should report changes in desired (quantitative) learning outcomes, rather than just qualitative measures (Michael, 2006). To that end, we are not aware of any quantitative studies examining the effect of computers on student achievement. As universities wish to promote independent modes of study and increase learner autonomy the aim of the current study was therefore to examine whether students could enhance their knowledge of disease rehabilitation, leading to a quantitative improvement in exam scores by giving them greater control over aspects of their own learning in terms of time and place to learn.

2. Methods

The researchers used experimental approach because it is suitable to their study and goals.

2.1 Subjects

Students from a 3rd year undergraduate Nursing college volunteered for the study reported here. Students were initially provided with a verbal explanation as to the nature of the study, including risks, benefits and the time commitment required. From a total of 35 students in the group. Because some students failing to take the post-test, the final sample size was 30 with 15 in the experimental group and 15 in the control group. The students were a mix of sex (12 males, 18 females) and age (range 20–23 years).

2.2 Research design:

Random distribution used in research design of this study, where students were randomly divided to the experimental group and control group. Those students included in the study were primarily tested using a formative multiple-choice exam (explained in more detail later). Students in the experimental group (n = 15) were then asked to viewing to a series of movies over eight weeks that supplemented their regular teaching and lecture material. Students in the control group (n=15). After eight weeks, all students then repeated the assessment using the same questions and exam format as used for the pre-test.

2.3 Movies

A total of eight movies produced for the study were recorded in a movie style format incorporating a question and answer discussion between the two authors and images. Movies ranged in duration from five to 14 minutes. Each movie related to the study of the diseases rehabilitation being taught during the eight-week period. The eight movies were titled (1) Chronic obstructive pulmonary disease rehabilitation, (2) Asthma rehabilitation, (3) Bronchitis rehabilitation, (4) Blood pressure rehabilitation, (5) Diabetic rehabilitation, (6) Obesity rehabilitation, and (7) Recovery, (8) Study and Exam Tips.

2.4 Teaching

The experimental group and control group were provided with the different instruction over the eight-week period as was practically achievable. The 1st author was the module leader and conducted all lectures during the period of the study. These lectures were one hour in duration, presented to all students enrolled on the module and consisted of traditional slide-based presentations in a lecture theatre. However, two tutors were used to teach the laboratory sessions. The laboratory sessions were conducted in the hospital of morjan laboratory with a one-hour duration. Consequently, all students (experimental group and control group) received 16 hours of face-to-face instruction over the eight-week period. Within the School of Nursing, students are encouraged to engage in approximately four hours of independent study per week for each module.

2.5 Exam

Students' performance was assessed by a 45-minute formative exam. The exam consisted of 28 multiple-choice questions that examined the students' knowledge of diseases rehabilitation such as the COPD rehabilitation, Blood pressure rehabilitation and recovery. Examples of the questions are listed in Table 1. The eight-week period of study was during semester 1 of the 2012-20013 academic years. The 3rd year undergraduate nursing module is a full-year module worth 20 credits. A pass mark of 50% was used, which is normal in most Iraq universities.

Table (1) Samples from the multiple choice question exam administered both before and after the movie intervention

Question Possible Answers Topic Assessed	
The prime function of the rehabilitation is to?	Treatment of patients Recovery of patients Improving functional outcomes
A person who assists the disabilities is?	Addiction counseling Group counseling Family and Couple counseling Rehabilitation counseling
The recovery oxygen uptake reflects which of the following effects of exercise?	Anaerobic metabolism Respiratory adjustments Thermal adjustments Circulatory adjustments All of the above
Disparities in effective pain management for racial and ethnic minorities appear most frequently under which of the following settings?	Rehabilitation therapy. Physical therapy. Cancer therapy. Preoperational therapy.

2.6 Statistical analysis:
    Study used SPPS to extract the results.

3. Results and discussion:
    The mean ± SD for both the experimental group and control group are shown in Figure 1. There was a slight alteration between groups on the pre-test (Control group – 11.5 ±4.1 v experimental group – 12.5 ±3.2; ES = 0.21). The post-test showed that the control group improved their exam scores to 12.4 ±3.6 (33% improvement), whereas experimental group improved their exam scores to 19.7 ±3.4 (55% improvement). This intended that the experimental group improved their post-test exam score by 1.4 marks more than the control group (92% CI: -0.17–0.56). This alteration as an ES was 0.17 (trivial), with a 90% confidence interval of -0.18 to 0.58 (trivial to positively small). That is, the true (but unknown) effect of view to the movie when extrapolated to the population ranges from trivial to positively small. Moreover, we have calculated that the chances of the effect being trivial are 50% (possible), or being positively small is 47% (possible). The chance of the effect being negative (harmful) is 4% (very unlikely).
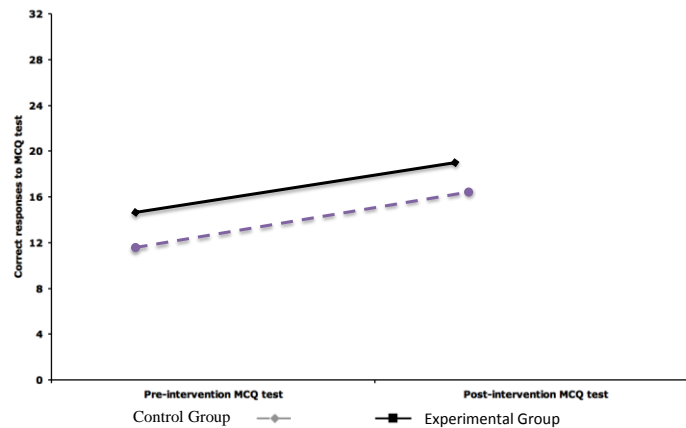
Figure (1) The MCQ exam score for both the control group and experimental group before and after the eight-week movie intervention. The difference between the groups on the post-test was an ES of 0.17 (trivial [92%CI: -0.17 – 0.56; trivial to positively small]).

Both the experimental group and control group improved their exam grades by 55% and 33% respectively. This study indicates that supplementary material delivered either in the form of a movie or written transcript enabled the students to improve their knowledge of disease rehabilitation. The main finding of a mean ES of 0.17 (trivial effect) suggests that the use of movies in an undergraduate setting may not lead to a worthwhile development in student attainment over-and-above the use of written material. It must be remembered that the calculated ES is the clear improvement in the experimental group, and therefore represents the size of effect above the 'normal' amount of learning (the control group improved by 33%; the experimental group improved by 55%). However, depend on the confidence interval; there is a 48% chance that the effect is useful, although that effect would be 'small' at best. There is very little chance of a harmful effect from students using movies. Given this, it could be argued that students have nothing to lose by using movies for learning, as there is almost no chance of a unsafe effect and some chance (48%) of a 'slight' gain. However, this must be weighed against the time and resource commitment required to improve and support the use of movies for students. As students devote most of their time with printed texts it may not be amazing that there was little clear effect on exam performance in the experimental group.

In the present study we have used movie to support formal learning that is then provided on paper or through web resources. In using movies we have aimed to make the process of learning more active and attractive by involving multimedia. Greer (2006) describes the necessity to make the pleased relevant to the context of the individual learner and encourage learner interest. In designing these activities we have attempted to adapt the content to the medium in a way to motivate students and provide a flexible 'just in time, just enough' format (Pritchard, 2004). Although our aims were admirable we did not including the students in the design of the content in the movies. Brittain et al (2006) report that actively involving the students in the estimation and design of a learning technology project improved the success of movies their lectures. Similarly Kirkwood and Price (2005) state that

student's essential to know not only what they are supposed to do, but why they are expected to do it and how it will increase their learning if they are to employ with new mobile technologies.

Furthermore, many researchers have reported that learning is unlikely to be enhanced by the mere application of a new technology (Alexander and McKenzie, 1998, Kirkwood and Price, 2005). It is important to estimate the context within which the learning took place. The tests used in this study were formative in nature and hence students' perceptions of the importance of them may have been decreased as they did not contribute to their final mark. Research by Bolger and Somech (2002) claims that students are motivated to complete their degree with the minimal effort and Kirkwood (2003) reports that valuation that counts towards their final grade influences the choices they make when attractive in learning activities. It may be that although all students stated that they watched to all movies on at least one occasion, the current intervention may not have been enough to make a larger impact on learning than reading the same material.

The results of our study seem to be at agrees with other studies examining the use of computers and iPods (Belanger, 2005, Brittain et al, 2006, Lane, 2006, Rudel, 2006, Bell et al, 2007, Dale, 2007), although none of these studies directly compared the use of movies with the same content transported in another form (e.g. written transcript).

At current a majority are using personal computers to view the educational movies indicating that mobility is not the prime drive for using this media format. A state structure for the variety of formats that movies are distributed in is required and how these formats influence pedagogy. The current study supports the idea that learning in higher education will not be enhanced simply by the application of a new technology. It is crucial that new innovations take into account pedagogical design, the learning context, prior student experience and institutional support mechanisms.

4. Conclusion

The present study has showed that undergraduate nursing students have added a direct advantage from being delivered with extra material in the form of printed text and movies. Nevertheless, the use of movies delivered little further assistance over and above the printed text. That being said, viewing to movies looks to have no harmful effect on learning and there is a chance (48%) of a useful effect. Consequently, individual academics or departments must weigh this up against the time and resource commitment required to improve and support the use of movies for students. While the use of movies seems to offer little benefit over written text, there may be other 'qualitative' assistances that arise from the use of movies, and these have been shown in other studies. Given the infancy of moving and its use within education there are a range of questions that future studies need to address.

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