ORIGINAL ARTICLE

The Impact of Using E-Portfolio on Nursing Students' Learning in Physiology Course

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Background: The Modern Electronic Technologies have had a deep impact on traditional methods of education and brought forth new methods for effective education. Electronic portfolio is one of the newest methods of teaching. Therefore, the purpose of the present research was to study the impact of using e-portfolio on Nursing Students' Learning in Physiology Course.

Methods: The design of the study was a pre-test/post-test one with an experimental group and a control group. The population of the study included all Nursing students of Nursing Faculty of Malayer city in the academic year 2014-15. The sample of the study was selected using available sampling and included 30 students who were placed in an experimental group (n=15) and a control group (n=15). The instrument used in this study was a learning test of basic Physiology Course developed by the researcher himself; the face validity of the test was judged by experts of subject and the pre-test and post-test method showed that the reliability of the test is 0.78 & 0.81, respectively. In order to collect data, at first, Pre-test learning were taken from experimental and control groups. Then, the control group, educational content related to physiology course was instructed through traditional methods and experimental group, the same content were instructed through the e - portfolio method (with Use google chrome) during one academic semester. Finally, Learning post-test were taken from both groups. The obtained data were analyzed through the SPSS software and an independent t-test used to analyze the data.

Results: The results of the study demonstrated that Using an e - Portfolio method to increase in the amount of learning in nursing students of the experimental group (t: 10.38, P: 001).

Conclusions: According to the results and effectiveness in the use of an electronic portfolio of the teaching-learning process in the physiology course, the use of this electronic technology in nursing education and consequently medical education is recommended.

Keywords: E-Portfolio, Learning, Medical Education

تأثیر استفاده کارپوشه الکترونیکی بر یادگیری دانشجویان پرستاری در درس فیزیولوژی

مقدمه: فناوری‌های نوین الکترونیکی تأثیر عمیقی بر روش‌های سنتی آموزش داشته و موجب گسترش روش‌های نوین آموزشی اثربخش شده‌اند. کارپوشه الکترونیکی یکی از این روش‌های تدریس نوین است. بنابراین، هدف از پژوهش حاضر، بررسی تأثیر کارپوشه الکترونیکی بر یادگیری دانشجویان پرستاری در درس فیزیولوژی بود.

روش‌ها: طرح پژوهش پیش‌آزمون-پس‌آزمون با گروه کنترل بود. جامعه‌آماری پژوهش شامل کلیه دانشجویان پرستاری، دانشکده پرستاری شهرستان ملایر، در سال تحصیلی ۹۴-۱۳۹۳ بود. نمونه آماری شامل ۳۰ دانشجو با استفاده از روش نمونه‌گیری در دسترس انتخاب و در دو گروه کنترل (۱۵نفر) و آزمایش (۱۵نفر) گماشته شد. ابزار مورد استفاده در این پژوهش شامل آزمون یادگیری محقق ساخته از درس فیزیولوژی و دارای پیش‌آزمون و پس‌آزمون با تأیید روایی متخصصین موضوع و پایایی ۰/۷۸ و ۰/۸۱ بود. برای جمع‌آوری داده‌ها، در ابتدا پیش‌آزمون یادگیری از هر دو گروه کنترل و آزمایش گرفته شد. سپس گروه کنترل محتوای مربوط به درس فیزیولوژی را با شیوه سنتی و گروه آزمایش همان محتوا را در قالب کارپوشه الکترونیکی (با استفاده از گوگل کروم) در طی یک نیمسال آموزش دیدند. در پایان آموزش، پس‌آزمون یادگیری از هر دو گروه گرفته شد. برای تحلیل داده‌ها از آزمون آماری تی‌مستقل به کمک نرم‌افزار spss استفاده شد.

یافته‌ها: نتیجه پژوهش نشان داد که استفاده از کارپوشه الکترونیکی میزان یادگیری دانشجویان گروه آزمایش را افزایش می‌دهد (۱۰/۳۸=t، p=۰/۰۰۱).

نتیجه‌گیری: بر طبق نتایج و اثربخشی استفاده از کارپوشه الکترونیکی در فرآیند یاددهی-یادگیری در درس فیزیولوژی، استفاده از کارپوشه الکترونیکی در آموزش پرستاری و آموزش پزشکی توصیه می‌شود.

کلید واژه ها: کارپوشه الکترونیکی، یادگیری، آموزش پزشکی

تأثیر استخدام الملف العملی الالکترونی علی مستوی التعلیم عند طلاب التمریض فی درس الفیزیولوجیا

المقدمة: إن التقنیات التعلیمیه الحدیثه لها اثر کبیر علی الاسالیب التقلیدیه فی مجال التعلیم و سببت فی نشر الاسالیب التعلیمیه الحدیثه و المؤثره.

احد الاسالیب الحدیثه هو استخدام الملف العملی الإلکترونی. لذا الهدف من هذه الدراسه هو تقییم تأثیر استخدام الملف العملی الالکترونی علی مستوی التعلم عند طلاب التمریض فی درس الفیزیولوجیا.

الاسالیب: أسلوب الدراسه کان من نوع قبل الإختبار و بعد الإختبار مع فریق الضبط. تمت الدراسه علی کل طلاب التمریض فی کلیه التمریض فی مدینه ملایر عام ۹۴-۱۳۹۳ الدراسی. کان عدد الطلاب ۳۰، و تم التقسیم الی فریقین. ۱۵ فریق الضبط و ۱۵ فریق الإختبار. الادوات المستخدمه کانت اختبار محقق و مصنوع لمادة الفیزیولوجیا یحتوی علی اسئله قبل الاختبار و بعد الاختبار تم التأیید من قبل المتخصصین و بنسبة ۰/۷۸ , ۰/۸۱ فی البدایه تم تجمیع المعلومات بواسطه اختبار تعلمی من کلا الفریقین و بعد ذلک تم تعلیم فریق الضبط باسلوب تقلیدی و فریق الإختبار بواسطه اسلوب الملف العملی الالکترونی (عبر گوگل کروم) لمدة فصل تعلیمی و فی نهایه التعلیم تم اخذ اختبار من کل الفریقین و بعد ذلک تم تحلیل المعطیات بواسطه برنامج SPSS و اختبار تی المستقل الإحصائی.

النتائج: اشارت نتائج الدراسه الی أن استخدام الملف العملی الالکترونی رفع المستوی التعلیمی عند طلاب فریق الاختبار (T=10.38 , P=0.001)

الإستنتاج: حسب النتائج الحاصله نوصی بأستخدام أسلوب الملف العملی الإلکترونی فی مجال تعلیم طلاب التمریض و الطب.

کلمات المفتاح: الملف العملی الالکترونی، التعلم، التعلیم الطبی.

فیزیالوجی کے موضوع میں نرسنگ اسٹوڈنٹس کا الیکٹرانک پورٹ فولیو استعمال کرنے کے مفید اثرات

بیک گراونڈ: جدید ٹکنالوجیوں سے حصول علم میں بہت مدد ملتی ہے اور ان سے آسانی بھی ہوتی ہے، نئی ٹکنالوجیاں تعلیم کے نئے طریقوں کے وسیع پیمانے پر استعمال ہونے کا سبب بنی ہیں۔ ان جدید روشوں میں الیکٹرانک پورٹ فولیو بھی ہے۔ اس تحقیق میں یہ دیکھا گیا ہے کہ نرسنگ اسٹوڈنٹس نے فیزیالوجی کے موضوع میں یہ روش اختیار کی تھی انہیں کیا فائدے حاصل ہوئے۔

روش: یہ تحقیق دوبار چودہ ۔پندرہ میں انجام دی گئی تھی ۔اس تحقیق میں تیس طلباء نے شرکت کی تھی، پندرہ پندرہ طلباء کے دو گروپ بنائے گئے تھے اور اس تحقیق میں پری ٹسٹ اور پوسٹ ٹسٹ روشوں سے استفادہ کیا گیا ہے۔ ایک گروپ نے الیکٹرانک پورٹ فولیو سے استفادہ کا اور دوسرے نے روایتی طریقے تعلیم جاری رکھی۔ ثم کے آخر میں دونوں گروپوں سے ٹسٹ لیا گیا اور اس کا تجزیہ ایس پی ایس ایس سافٹ ویر سے کیا گیا۔

نتیجہ: اس تحقیق سے پتہ چلتا ہے کہ الیکٹرانک پورٹ فولیو سے استفادہ کرنے سے طلباء کو فائدہ ہوتا ہے۔

سفارش: اس تحقیق کے پیش نظر یہ سفارش کی جاتی ہے کہ میڈیکل تعلیم میں الیکٹرانک پورٹ فولیا کا استعمال رائج کیا جائے۔

کلیدی الفاظ: الیکٹرانک پورٹ فولیو، میڈیکل تعلیم، پری اینڈ پوسٹ ٹسٹ ۔

INTRODUCTION

The emergence of new theories of learning and education and a paradigm shift from being teacher-centered to student-centered alongside with the advancement of novel communication technologies have set the grounds for modern human to use new methods of teaching-learning and free himself of the chains of time and place and keep on learning everywhere and according to his needs [1].

Nowadays, the traditional methods are not enough for effective education of students. The internet and other electronic technologies have had a deep impact on traditional methods of education and brought forth new methods for effective education. The use of an electronic portfolio is one of the newest methods of teaching.

Electronic portfolio is an instrument for learning and evaluation of the learning process-product with the ability to store, organize, provide feedback, and reform students' performance in a digital web-based network or computer. Unlike the traditional paper portfolios, electronic portfolios allow the users to store the information without any time and space limitations, and access it as well as update it at any desired time [2]. It can also be said that electronic portfolio is an instrument for learning and evaluation of the learning process-product with the ability to store, organize, provide feedback, and reform students' performance in a digital web-based network or computer and can be considered as an indicator of the student's growth, progress, and skills in a certain area [3].

Electronic portfolio includes works collected, contemplated, selected, and displayed by a learner in order to display his/her growth and change over time [4]. Many experts believe that the use of electronic portfolio can be an effective means of evaluation and education in online training courses [5 , 6, 7, 8]. Some other researchers also believe that portfolios provide an opportunity for self-evaluation, learning, and self-adjustment as well as contemplation and development of personal skills; hence they can be suitable learning instruments [9].

Aside from providing medical services, universities of medical sciences are also tasked with training expert and skillful human workforce needed in different sections of the society. This requires the medical education to be constantly reevaluated and upgraded. The process of medical training is affected by numerous factors and variables. Student, teacher, education medium, teaching methods, educational resources, and growing popularity of educational technologies and e-learning is among such factors. On one hand, timely response to rapid changes in modern technologies as well as proper management of educational programs in the age of communication and information can help learners to become up-to-date; on the other hand, having skillful doctors as the outcome of medical education systems would lead to improvement of health in the society [10]. For that reason, the necessity of using modern electronic methods such as the use of electronic portfolios in medical training becomes obvious.

On the other hand, nursing teachers had some challenges regarding teaching students to be a professional to have deep knowledge and decision making skills. E-learning methods cannot be a good substitute for teachers, but by e-learning methods combined with common methods, learning-teaching process facilitates nursing training and responds to rapid changes of science, knowledge and the requirements of students [11]. For innovation in nursing training, lecturers attempt to find the methods making teaching effective and easier] 12 [. Based on e-learning topics and new methods in the learning - teaching, electronic portfolio is one of the effective methods for this process. In advanced countries with higher education technology, the significance of different portfolios and their educational effects are investigated, but in our higher education and medical system, this solution is less considered [13]. In nursing training, more supports are made to apply portfolio assessment in the relevant studies [14]. Regarding its effects on learning of nursing students, a few studies have been *conducted [15]*. The present study aims to evaluate the impact of electronic portfolio on learning in nursing training. Various studies have been carried out regarding the use of electronic portfolio in education. Some of these studies are mentioned below.

Rezaei (2011) studies The Impact of Using E-portfolio on Attitude, Motivation and Academic Achievement of Students in K. N. Toosi University's E- Learning Center. The results of that study point out the positive impact of electronic portfolio on attitude, motivation, and academic achievement [2].

Dana Mazra'e (2013) studies the impact of using E-portfolio on university students' self-regulated learning strategies. The results of this study point out the positive impact of electronic portfolio of self-regulated learning strategies [16].

Chi Cheng (2010) studies Self-evaluated the effects of web-based portfolio Assessment for various student motivation levels. The result reveals that the web-based portfolio assessment system is more effective or useful in most of self-evaluated learning effects for low motivation students [17].

Also the study by Badali et al. (2014) reveals that the use of an electronic portfolio reduces test anxiety and increases self-esteem among university students. Some studies have suggested the influence of electronic technologies in Medical Sciences (18, 19 and 20). The purpose of the present research is to study the impact of using electronic portfolios on physiology learning of nursing students. The research hypothesis is: the use of electronic portfolios in the teaching - learning process improves the learning of physiology lessons in nursing students [3].

METHODS

This study is a quasi-experimental with pre-test, post-test and control group. The study population is all nursing students of Malayer nursing college in academic year 2014-2015. To select the sample, convenience sampling method is applied. At first a 25-student class regarding physiology (freshmen of nursing school) is selected and 15 students are dedicated to experiment group. Sophomore students were used in control group taking physiology course already and 15 students were selected in the control group. Based on the methodology, the participants to experimental and control groups are at least 30. The participants are selected based

on their score in pre-test of physiology. It was attempted to select among 48 freshmen and sophomores of nursing as 30 students with similar scores in learning pre-test. The pre-test was performed with two purposes: a) The selection of required participants of the study, b) Considering the score difference of pre-test and post-test in learning. The participants were selected as genders in two groups were similar. The women in experiment group are 9 and in control group 9 and men in experiment group are 6 and in control group 6. The experiment group was trained physiology via electronic portfolio and control group trained the same content traditionally (lecture and textbook methods) in an academic semester. Finally, both groups performed post-test of physiology. The data were analyzed using independent t-test and SPSS software, version 19. The inclusion criteria were the tendency of participants to be included in the study. The subjects of both groups were participating in the study with consent. The measure is pretest and post-test of physiology. Pretest includes 20 items (4 choices) and post-test includes 20 items (4 choices) and were evaluated in terms of face validity by experts of physiology textbook. After verification of validity of pre-test and post-test questions by experts, to achieve reliability, the tests were performed on 10 students in nursing of nursing school not included in the study. After evaluation of data, reliability 0.78 was achieved in pre-test and 0.81 for post-test of learning via Cronbach's alpha.

RESULTS

Research hypothesis: the use of electronic portfolio in teaching-learning process improves the learning of physiology lessons in nursing students.

As demonstrated in table 1, the pretest scores of the two groups are not different. However there is a difference between the posttest scores obtained by the control group and the experimental group. While the mean posttest score shows an increase in both groups, the experimental groups demonstrates a higher increase in mean posttest score. Next, the results of the t-test are presented.

Based on the results presented in table 2, the calculated t for mean difference between the two groups equals 10.38, which is significant at the 0.001. Therefore, with 0.95 confidence level, the research hypothesis, i.e. the impact of using e-portfolio on physiology learning of nursing students is confirmed. In other words, the use of this teaching method in education of nursing students significantly improves their learning of physiology lessons.

DISCUSSION

As shown, the effects of e-portfolio on learning of nursing students is less considered and the purpose of the present research is to study the impact of using electronic portfolios on physiology learning of nursing students. The results suggest that the use of electronic portfolio in the process of physiology teaching-learning in the field of nursing improves the students' learning. The result obtained in this research is in alignment with the results of the studies by Rezei [2], Dana Mazra'e [16], Chang Chang [17], and Badali et al. [3]. The reason for the impact of electronic portfolio on physiology learning of nursing students can be stated in that by providing the required trainings and education via electronic portfolios, the students are free to learn the educational material at any time they desire, i.e. when the learner is active which is the time when the learning capability is at its peak. This is based on the very constructivism approach to teaching-learning process. Other reasons to explain these findings show that traditional methods (paper and pencil method) oblige the students to just memorize the books and they are not encouraged to learning and deep understanding. Thus, the educational goal as learning of learners is not achieved. In the new assessment method by e-portfolio, learners are encouraged to deep understanding, high level thought, independent learning and self-assessment and they achieve success in learning and academic achievement. E-portfolio helps the students to develop their organizing skills and recognize their skills, abilities and shortcomings. Also, they can know their own talents and can show their abilities, assess their achievements

Table 1. Learning scores in pre-test and post-test for non-intervention and intervention groups

Test	Group	Mean	SD
Pre-test	Control (Non-intervention)	8.50	3.37
	Experimental (Intervention group)	9	3.54
Post-test	Control (Non-intervention)	10	3.23
	Experimental (Intervention group)	16.30	3.67

Table 2. independent t-test scores in pre-test and post-test for non-intervention and intervention groups

Group	Number	Mean difference	T	Df	P-value
Control (Non-intervention)	15	1.50	10.38	28	0.001
Experimental (Intervention group)	15	7.30			

and show how their skill is developed over time. They can decide professionally and improve themselves professionally and make progress in learning. Therefore, the executives on medical training and education are advised to use this educational method in teaching-learning processes of the

students. The most convenient method of sampling and a limited number of sample members is among the limitations of this study.

Conflict of interest: None

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