Brief Communication

The Effect of Using the Wiki to Learn the Concepts and Terminology among the Students of Pharmacology

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Abstract

Information and communication technologies play a fundamental role in modern life. In current study, statistical sample consisted of 46 pharmacy students of Kermanshah University of Medical Sciences who had been admitted in 2010 and randomly assigned into two groups for this study. Both groups were trained in two ways. In the beginning and in the end of the training period all students took a pre-test and post-test and a month later a test retention was performed. The data collection tool was a researcher made test which was used in all three stages. The results showed that there was no significant difference between the mean learning scores in the experimental group and the control group ($p = 0.308$) and between the retention scores of the two groups ($p = 0.784$). Based on the results of this study, the effect of using the wiki on higher levels of learning is recommended.

Introduction

Through the history, a variety of techniques and skills in the field of teaching methods has been considered as expertise of technical and professional educators and the art of educator was in quality of selection and performing (1).

Information and communications technologies, ICT, have a fundamental role in modern life. With the advent of information and communication technologies in education sector the role of technology became more highlighted and teaching methods evolved. The teaching method (collaborative and active teaching, learning method) inevitably lead the educational system to one of the most useful tools of the web 2, i.e. Wiki (2). Wiki is a free extensible set of Web pages; a hypertext system to store and modify data in a database, each of which page is easily editable by any user (3).

The results of a research emphasizes on the effects web-based training on high levels of learning, and suggests that web-based learning doesn't have a significant effect on low levels of learning (4). In addition, another meta-analysis study showed that e-learning is 6% more effective than face to face teaching in terms of presenting knowledge. Also, web-based education which is combined with continuous feedback is 19 percent more effective than face to face education (5).

Benjamin Bloom' taxonomy categorized educational objectives in three domains of cognitive, affective, and psychomotor. The cognitive domain has six levels; the goals are arranged from the easiest level namely retention and recall toward the most sophisticated mental activities. Lowest level is knowledge, and then understanding and realization, implementation, analysis, composition and evaluation (6).

According to the researchers' studies, to this date no semi-empirical research has been done in the Iran on the use of wiki in education. The question of the current study is whether it is possible to promote the knowledge of the students about the concepts and terms of pharmacology through a wiki that is designed and produced by them? Does this method have any superiority over the conventional method in terms of learning and retention, or not?

Methods

This is a semi-empirical with pre- and post-test study. The statistical population includes all 2010 newcomer students of pharmacy which all were considered as statistical population regarding the low number of students (the criteria for entering into study was taking Pharmacology Unit 1 course for the first time). Samples consisted of 46 students who were randomly assigned to two groups of 23 students each. In order to assess the learning and retention, a teacher-made test was used which consisted of two parts: demographic information and knowledge. Knowledge section includes 20 multiple choice questions each had four possible answers (in three stages, questions were identical). In the knowledge test the scores were between 0-20. Validity was assessed by the views of 5 experts in pharmaceutical field. The reliability of test obtained using Kuder - Richardson method was 0.82. In this study, the results with 95% level of confidence were accepted.

The resources used in this study include Katzung, Rang & Dale books, which were used for both groups during 12 educational sessions. Both experimental and control groups were studied during the academic year (two semesters in a row). In the first semester the control group and in the second semester the experimental group was studied to prevent the probability of contamination bias. At first, all of the students were given knowledge pre-test in the context of terminology. In the control group, along with conventional methods, students were encouraged to use their resources. The experimental group received a two-day training course to learn how to use the wiki environment, and during the semester in case they faced

difficulty in how to use the resources, they were provided with telephone or face to face guidance.

In the experimental group, along with traditional methods including lecture and the use of Power Point presentations, the students were asked to enter 5 words into the wiki and provide half-page explanation for each session. Each student was required to edit 5 words from the words of other students. At the end, knowledge tests (post-test) for the two groups were conducted once again. One month later, the recall test (knowledge re-evaluation) of the two groups was made. Data were analyzed using the SPSS 16 software after collection, and the descriptive statistics including frequency percent and inferential statistics including independent samples T test and paired samples T test and ANOVA were analyzed and $P<0.05$ was considered significant

Results

A total of 46 people in two groups of 23 participated in this study. In the experimental group, 65.2% were resident students, 30.44% were native, and 4.35% were non-native and home owner, 47.83% female and 52.7% were male. In the control group, 78.26% lived in hostels while indigenous were 21.74%, and 48.73% were male and 52.7% female. Between the control and experimental groups there was no significant difference in terms of age (p = 0.935), sex (p = 0.774) and state of residency (p = 0.412). The mean age in the experimental group was 22.044 ±1.92. In the control group the mean age was 22.044±1.604.

Mean pre-test score for the experimental group was 7.04 and standard deviation was 1.718. In the control group, these figures were 6.87 and 1.58, respectively. The mean and standard deviation of the post-test in the experimental group was 10.13 and 1.18 respectively, and in the control group was 10.22 and 0.95, respectively. In the experimental group $p<0.001$ and the test statistic was 135.86. In the control group, these values were <0.001 and 153.16 respectively.

ANOVA results showed that there is a significant difference among the mean scores of the pretest, posttest and retention in both groups, which indicates that there is a positive impact of education on learning in both methods.

The paired samples t test showed that there is a significant difference between the scores of pre-test and post-test in both two groups (Wiki group $p<0.001$ and t = 22.114 and in the control group p <0.001 and t = 15.887), which

indicates a positive impact of education of both methods on learning.

Discussion

The results of this study indicate that there was no significant difference between the post-test scores of the two groups. This means that in learning terminology in terms of knowledge level there is no significant difference between the use of wiki and the traditional method. The findings of O'Bannon et al. research showed that based on the teachers' viewpoints on performance of wikis during the term in reading, writing and editing activities, the students did not have much activity, and the reason in reading and writing activities was lack of motivation, shortage of time and lack of understanding (7) which is partly consistent with the current research.

The results of Amanloo and Didehdar which showed that there was no statistically significant difference between the mean total scores of the control group and the test group (p = 0.65) (8), and research Anderson and Avery which showed no significant difference between the scores obtained through face to face training and web-based training (9), are consistent with the results of the current research.

The results of the present study is not consistent with the result of the researches done by Miller et al., Mirk et al., Yiu and Eugenia which indicate a positive effect of Wiki on learning (10, 11, 12), Baghaie et al. (13) research and also the result of Sitzmann et al. research which showed that e-learning is 6% or higher more effective than face to face education in providing knowledge (5).

Results showed that there was no significant difference between the mean scores of the two groups' retention. Since in this study we examined the learning and retention at knowledge level, the results of this research is consistent with the results of Ibrahim Abadi's study which emphasizes on the effect of web-based education on high levels of learning, and suggests that web-based education has no significant effect on low levels of education (4); however, it is not consistent with the results of Erickson (14), Vasily et al. which represents more retention of knowledge and attitudes compared to lecture and health belief methods (15), and the results of Farshi et al. which shows the effectiveness of e-learning method compared with lecture method in retention stage (16).

Conclusion

In the studies conducted so far by the researcher in Iran, no research has been done on the use of wikis in education, which is the strength of the present study.

Based on the results of this research, it is suggested to study the effect of education through wiki along with the current learning method in higher levels of learning (application and reasoning),and to investigate the effects of wiki on teaching and learning process, different Wiki scenarios in education become utilized.

Acknowledgments

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