ORIGINAL ARTICLE

COMPARISON OF THE EFFECT OF LEARNING BASED ON VIRTUAL EDUCATION AND TRADITIONAL EDUCATION ON THE CRITICAL THINKING OF NURSING STUDENTS OF ISLAMIC AZAD UNIVERSITY OF BABOL BRANCH

Mohammad Zakeri Ghadi[1*], Hamed Hosseinzadeh[2]

[1] *Department of Executive Management, Payame Noor University (PNU), P.O. Box, 19395-3697, Tehran, IRAN*
[2] *Master of Knowledge and Information Science, Ayatollah Rouhani Hospital, University of Medical Sciences, Babol, IRAN*

ARTICLE INFO

*Correspondence to Author:
Mohammad Zakeri Ghadi

Department of Executive Management, Payame Noor University (PNU), P.O. Box, 19395-3697, Tehran, IRAN

E-mail:
m_zakeri65@yahoo.com

ABSTRACT

Objective: The objective of this study was to investigate the effect of learning based on virtual education and traditional education on the critical thinking of nursing students.

Methodology: The research method was quasi-experimental and two groups design with pre-test and post-test. The subjects consisted of 55 nursing students (2016-2017) from the Islamic Azad University of Babol, 30 of who were selected as the experimental group for learning based on virtual education and 25 as the control group for traditional education. The instrument used in this study was California critical thinking questionnaire and t-test was used to analyze the data.

Findings: The findings of this study showed that the tendency to critical thinking was higher in the group that was trained by virtual learning based learning method than the trained group that was trained in the traditional way.

Conclusion: The results showed that learning based on virtual education not only affects students' academic performance, but also improves their clinical skills in health care centers in the future.

INTRODUCTION

One of the main objectives of nursing education is to educate people who can use their knowledge and skills to provide appropriate services to healthy people and patients at community level (1). Nurses have critical thinking in this regard, so that critical thinking is an essential component of nursing (2). Critical thinking is a deliberate and self-regulated judgment that can be formulated through clinical reasoning and patient problem solving (3). Educational scholars have long believed that one needs to learn and think for the preservation and continuation of his life (4-5). The goal of teaching and learning and its ultimate destination is to cultivate the power of reasoning and to grow judgment; critical thinking focuses on the division, analysis and application of information (6). Regarding the new scientific and medical advances in the present era, adaptation and coordination with complex health care and sanitation systems is an important priority for providing better services, which requires training professionals with critical thinking (7). Access and mastery of the communication and information technology and its utilization in the strategic and important training of human resources is one of the most important components of power in the present age, which should not be neglected (8). The ever-increasing advances in technology and especially in information technology have led to a lot of changes in e-learning, such as such as reducing the cost of education, ease of attendance in virtual classes, the diversity of courses, the timing of choosing it, reducing the cost of travel, and the great flexibility of e-learning to make this phenomenon unaffected (9). E-learning in modern industrialized Iran is based on distance learning and education technology, but centers and educational institutions, especially universities, are working to provide a model for e-learning in the field of e-learning as soon as possible (10). In addition to the advantages that e-learning has in its essence, one of the most important reasons for the organization of centers and e-learning institutes in Iran is the increasing demand for education, especially higher education in the country, which has become a specific social issue due to the limited resources and educational capacity in the current educational system (11). Efficacy of e-learning can solve some of these problems. Therefore, with regard to the goals defined for university education and education in Iran, the importance of addressing the structure of e-learning centers and institutions, especially virtual universities in Iran, is clearly evident (12). There is no doubt that the traditional educational system in the present day could not meet the needs of today's intelligence community, so it was necessary that this amorphous system undergo transformation within its configuration and that the process of adaptability would meet the needs of today's societies (13). But what is the need to address this issue? There is no doubt that in going to the intelligence community, many of the hidden and obvious aspects of the formation of society will undergo structural changes; the education category is not immune to this change, but this is just one coin. It should also be borne in mind that societies, in their time of day and in the aftermath of these developments, will have a growing need for education and skills as well as specialist skills (14). Information is a powerful tool in the hands of the power-owners through which hegemony develops in a variety of cultural and social segments (15). Experienced and efficient human resource, as well as day-to-day information, is the main and programmable capital of any government. But this has another sub layer, with the expansion of societies, people's need for education is enhanced, with a new generation that needs education, expertise and training, but the ability of governments to cover this whole potential is not enough (16). Accessing and mastering the communication and information technology and taking advantage of it in the strategic and important training of human resources is one of the most important components of power in the present day, which should not be ignored. On the other hand, the unceasing and costly expansion of the electronic learning system around the world proves the necessity of using this educational method (17). But in the traditional ways that today are considered as inactive methods, the teacher has an active role in teaching and expresses the content in class and students listen to their speeches only and maintain their content, and in this context, the fields for academic achievement and intellectual growth are not provided. For this reason, today the subject and methods of active learning and education have found a special place in educational issues. According to the education experts, students learning through active learning not only learn better but also enjoy more learning, because they are actively involved in the learning process rather than being listeners, and they consider themselves responsible for their learning (18).

METHODS

The subjects consisted of 55 nursing students (2016-2017) from the Islamic Azad University of Babol. Their age average was ($\bar{x} = 20$) and their standard

deviation was (S=3.27). In this research, Critical Thinking Disposition Inventory (CTDI) was used to measure critical thinking. The questionnaire consists of 75 items that measure the seven components of the tendency to critical thinking, namely, truth-seeking, open mindedness, analyticity, systematic, inquisitiveness, self-confidence, and maturity. The questionnaire has been prepared at the University of California, and the questionnaire's recipe in a five-point Likert range is very agreeable, so strongly disagree. This questionnaire was translated by the researcher and then translated into two of the masters who graduated from the universities of the English-speaking countries, to translate it into English, and the translated text was approved, and in the sense of formal validity, it was confirmed by experts. In the study of Facon (1992), on the 164 students obtained the reliability of Cronbach's alpha for the whole tool (0.90) and for the Seventh Index

($\alpha = 0.71 - 0.8$).In this study, a pre-test and post-test quasi-experimental design with unbalanced groups was used. A class of 25 persons was selected as the control group and the group of 30 was selected as the experimental group. In the control group, one of the master trained in the traditional teaching method and in the experimental group of one of the researchers using virtual learning education, and both lecturers have the same education and training record, and in the previous evaluations obtained by the University's center for evaluations, they were awarded equal privileges.

Findings

As shown in Figure (1), the highest mean of critical thinking tendency in self-confidence component and the lowest mean in inquisitiveness component were obtained in the virtual learning method group.

Figure 1. The descriptive indexes related to critical thinking tendencies in the control and experimental groups in the pretest stage

As shown in Figure (2), the highest mean of critical thinking tendency was in self confidence component and in the learning group based on problem solving, and the lowest mean in the element of open mindedness in the traditional teaching methodology group.
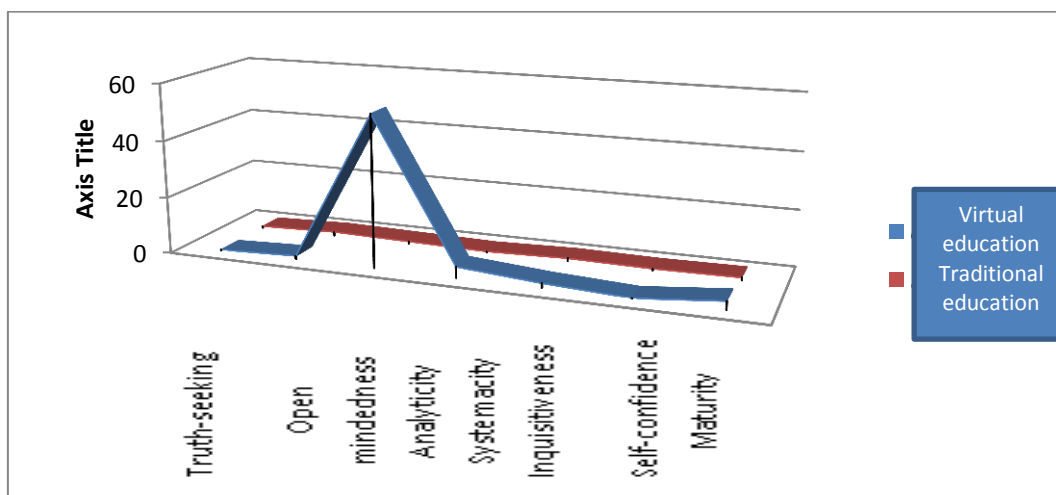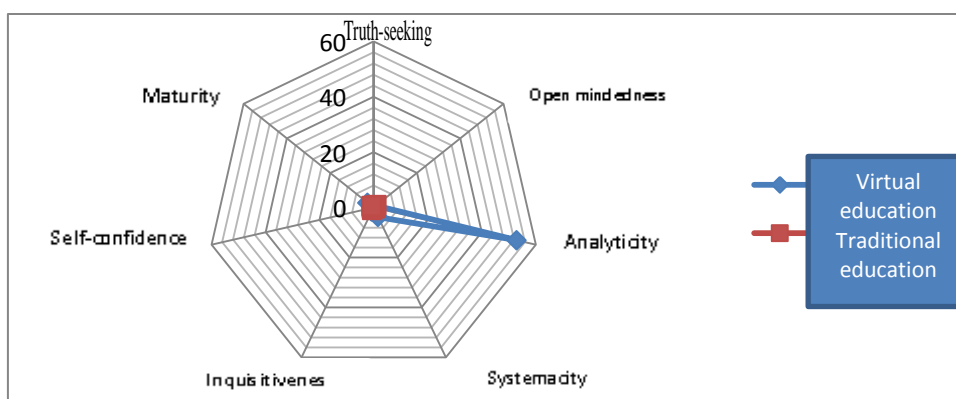

Figure 2. The descriptive indexes related to critical thinking tendencies in the control and experimental groups at the post-test stage

As shown in Figure (3), the highest difference was in the systematic component in the virtual education group and the lowest difference in the component of maturity and judgment in the traditional teaching method.
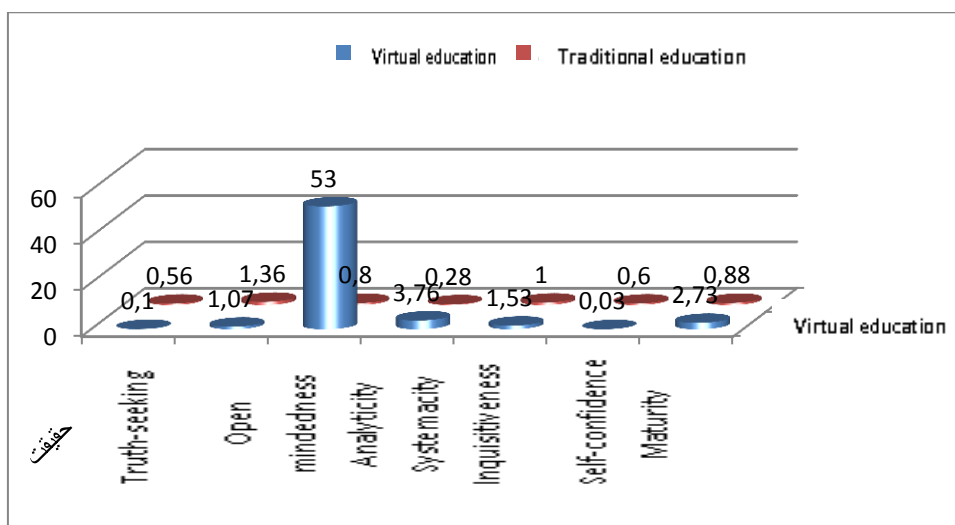

Figure 3. Pretest and posttest difference in seven components of critical thinking

As shown in Table (1), the mean difference between the pre-test and post-test scores of the traditional teaching method group did not have a significant effect on any of the components of critical thinking.

Table 1. Effect of traditional method on different components of critical thinking

Components	Pre-test		Post-test		Mean differen ce	t	d.f	sig
	Average	Standard deviation	Average	Standard deviation				
Truth-seeking	41.36	4.68	41.92	4.81	0.56	0.781	24	0.44
Open mindedness	39.68	5.12	41.04	6.28	1.36	1.02	24	0.31
Analyticity	41.88	5.93	42.68	6.89	0.8	0.8	24	0.68
Systematic	42.96	4.14	42.68	4.7	-0.28	-0.27	24	0.78
Inquisitiveness	44.44	3.48	45.44	4.47	1	-0.917	24	0.36
Self-confidence	49.32	6.62	48.72	6.29	-0.6	-0.518	24	0.60
Maturity	42.88	5.51	42	4.81	-0.88	-0.88	24	**0.385**

As can be seen in Table (2), the mean difference of the pre-test and post-test scores of the learning group based on virtual learning was significant in the components of systematic in thinking and research, and the components of maturity in judgment at the level ($\alpha = 0.01$). However, in other components of critical thinking tendency (truth-seeking, open mindedness, analyticity, inquisitiveness, and self-confidence) there was no significant effect.

Table 2. The effect of virtual education training method on critical thinking

Components	Pre-test		Post-test		Mean difference	t	d.f	sig
	Average	Standard	Average	Standard				

	deviation		deviation				
Truth-seeking	44.36	5.29	44.46	4.41	0.1	0.08	29	0.93
Open mindedness	41.78	5.89	42.85	4.39	1.07	1.32	27	0.19
Analyticity	42.86	3.81	43.4	5.19	0.53	0.64	29	0.52
Systematic	43.63	5.45	47.4	6.08	3.76	4.82	29	**0.0001
Inquisitiveness	44.1	4.38	45.64	3.55	1.53	1.75	29	0.08
Self-confidence	48.56	5.72	48.6	6.05	0.03	0.02	29	0.98
Maturity	40.6	4.45	43.33	4.51	2.73	3.19	29	0.003

As can be seen in Table (3), the mean difference of pre-test and post-test of both experimental and control groups shows that there is a significant difference between two components of systematic in thinking and research (t=3.19) and maturity in judgment (t=2.711).

Table 3. Comparison of the mean of the pre-test and post-test difference of the seven components of thinking tendency

Components	*Average*		Standard deviation		d.f	t	p
	Examination Group	Control group	Examination Group	Control group			
Truth-seeking	0.1	0.56	6.13	3.5	53	0.82	0.41
Open mindedness	1.07	1.36	4.26	6.6	53	-0.19	0.85
Analyticity	0.53	0.8	4.53	5.81	53	-0.19	0.84
Systematic	3.76	-0.28	4.27	5.13	53	**3.19	0.002
Inquisitiveness	1.53	1	4.77	5.45	53	0.38	0.7
Self-confidence	0.03	-0.6	7.28	5.78	5.	0.35	0.72
Maturity	2.73	-0.88	4.68	4.96	53	2.71	**0.008

DISCUSSION AND CONCLUSION

One of the results of this study is that the learning method based on virtual education has increased the tendency and readiness of critical thinking in the components of maturity in judgment and evaluation of students. In other words, students who have been trained learning based on virtual education methods have gotten more maturity in judgment and evaluation than those trained by traditional methods. This finding are consistent with previous research in this field, such as Kannayek (2010), Carbine & Collins (2009), Denick & Maxley (2008), Magnussen et al. (2013), Young Blood & Binz (2012), and Boam Burger (2012). In explaining this finding based on the viewpoint of social constructivism, it can be said that, basically, learning critical thinking is created through the ability to participate in discussions and actions related to the group, and therefore, students who have been trained in virtual education, since a particular issue has been raised and they have been discussed and studied in small groups about it, and in these meetings, they have defended their thoughts by referring to reasons based on the facts of scientific concepts and principles, and in this

process they have acquired the ability to analyze and evaluate their beliefs, their thoughts, and others, in fact, using problem solving method in group activity has strengthened the understanding of critical skills, including judging various thoughts, and have achieved a higher degree of maturity. Another finding of the present study is the effect of learning method based on virtual education on the systematic of students' thinking and research, in other words, the results of this study showed that students who have been trained in learning method based on virtual education have more organized thinking than students who have been trained in traditional education. In explaining the findings of this study, it can be said that critical thinking and problem solving are in terms of the nature of one thing, both of which are considered as a variety of thinking skills. According to Seyf, critical thinking is more in the process of thinking, and solving problems more in the product or outcome of thinking, and many psychologists have offered them the same learning and learning stages (Seyf, 2013), Therefore, considering the characteristics of the learning method based on solving the problem based on the pervasive axis, the activity in small learning groups, the role of facilitator, facing real issues, the problem as a tool for collecting knowledge and self-regulation during learning is a particular dynamism in the classroom (Douki, 2013) Therefore, students who have trained in this method have acquired a tendency and readiness or secretary who can be interested in studying and studying a problem in different ways from their point of view, and more willingness to identify different solutions and regular reviews, and in general, they obtained a special emotional readiness for systematic handling of complex tasks and tasks. One of the other findings of the present study is that the problem-solving method has not been effective on other components of critical thinking such as truth-seeking, open mindedness, analyticity, inquisitiveness, and self-confidence, and no significant differences were observed in the above mentioned components in the students of the two groups. This finding shows that critical thinking skills are a skill of higher levels of thinking, and, moreover, critical thinking is not just a skill, it is also a form. The readiness for judgment and the formation of the results and information does not depend only on the specific knowledge or position in which the individual mentally exercises it, but it is a set of personality factors that rests on perseverance, tolerance, ambiguity and doubt, readiness to restrain and stop, rationality, freedom to debate and imagine others (Smith quoted Shabani, 2014) and considering the complexity of critical thinking and the disagreement of education professionals in defining the concept and methods of teaching and learning of critical thinking (Beer, 2013) and the emphasis of some researchers (Washan, 2014) on the long-term nature of critical thinking and its beginning from schools and from the early years can be said that 14 sessions of virtual education did not suffice to develop the students' critical thinking and continuing research on the effects of educational methods in future research will lead to critical thinking skills dimensions.

REFERENCES

1. Paryad E, Javadi N, Atrkar Roshan Z, Fadakar K, Asiri S. [Relationship Between Critical Thinking and Clinical Decision Making in Nursing Students]. Iranian Journal Nursing 2011; 24 (73): 63-71.

2. Habibzadeh H, Khajehali N, Khalkhali H, Mohammadpour Y. Effect of evidence-based nursing training on Urgia University of Medical Sciences Urmia University of Medical Sciences. 2013; 11 (4): 284-92.

3. Zohari S. Thought Education. Hayat 2009; 7 (4): 33-7.

4. Simpson E, Courtney MD. Critical thinking in nursing education: Literature review. International journal of nursing practice. 2002; 8 (April): 89-98.

5. Abrami PC, Bernard RM, Borokhovski E, Wade A, Surkes MA, Tamim R et al. Instructional interventions affecting critical thinking skills and dispositions: A stage 1 meta-analysis. Review of Educational Research 2008; 78 (4): 1102-34.

6. Esmaeili R, Izadi A, Esmaeili M, Omidi K. [Assessing the effect of Critical thinking education on the caring process of nursing students]. Modern Care Journal 2011; 8 (1): 1-6.

7. Sayadi N, Rokhafroz D. [Nursing Students' Perspectives on a Mobile Software is a Nursing Process for Bedside Use]. Iranian Journal of Medical Education 2013; 12 (12): 975-81. [Persian]

8. McMullen MA, McMullen WF. Examining patterns of change in the critical thinking skills of graduate nursing students. The Journal of Nursing Education 2009; 48 (6): 310-8.

9. Ghanbari A, Monfared A. [Survey of Clinical Evaluation Process Based on Logbook and Cognitive and Psychomotor Learning in Nursing Students]. Research in Medical Education. 2014; 6 (2): 28-35.

10. Noohi E, Abaszadeh A. [Effect of patient-centered collaborative learning on student's scores of nursing process and critical thinking of nursing trainers]. The Journal of Medical Education and Development 2013; 8 (3): 53-62.

11. Taylor C, Lillis C, LeMone P, Lynn P. Fundamentals of Nursing: The Art and Science of Nursing Care. 7th ed. Philadelphia: Lippincott Williams & Wilkins; 2010.

12. Huckabay LM, Editor, Clinical reasoned judgment and nursing process. Nursing Forum; 2009: Wiley Online Library.

13. Timby B. Fundamental Nursing Skills and Concepts. 9th ed. Philadelphia: Lippincott Williams & Wilkins; 2008.

14. Potter PA, Perry AG, Stockert P, Hall A. Essentials for Nursing Practice.8th ed. Philadelphia: Mosby Elsevier; 2015.

15. Roozbahan B, Dehghanzade S. [Nursing Fundamentals]. Tehran: Jamenagar-Salemi; 2010.

16. Noohi E, Karimi H, Najmai E. [Application difficulties of nursing process from view of nursing managers and intern in Kerman University of Medical Sciences]. Journal of Qualitative Research in Health Sciences 2010; 10 (1): 52-8.

17. Akbari M, Shamsi A. [A Survey on Nursing Process Barriers from the Perspective of Nurses in Intensive Care Units in Hospitals of Tehran]. Iranian Journal of Critical Care Nursing 2011; 3.

18. Oswandi K, pourYousef S, Bikmoradi A, Yousefzadeh MR. [The Effects of Inquiry-Based Clinical Instruction of Nursing Students on Applying Nursing Process Skill]. Scientific Journal of Hamedan Nursing & Midwifery faculty 2013; 21 (1): 5-14.

****