Original Article

Validation of Educational Design Pattern for Teaching Research Methodology

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Abstract

Educational design of the science and art and art is defining detailed features for developing, evaluating and preserving situations that facilitate learning and performance. Educational design is one of the very active areas of educational technology that seeks to facilitate learning and performance. Research is one of the most important issues that educational systems deal with. In order to achieve the educational goals in teaching research methodology, we need the appropriate methods of teaching. The purpose of this study is to provide an educational design model for teaching research methodology.To this end, a blendedresearch method of exploratory type with a plan of designing and validating the pattern was used. For this purpose, at first, the concepts in the field of teaching the research methodology were studied and after classifying, map and conceptual framework were designed and, finally, educationaldesign pattern for teaching Research methodology was provided. Then the content of teaching the research methodology was designed based on this pattern and was implemented on master's students. The results showed that this pattern affected the growth of research skills in students.

Key words: Educational design, Pattern, Teaching research methodology

INTRODUCTION

Research, as one of the strongest means for developing potential talent, is one of the most important issues that university planners need to consider. Research in universities makes universities different from other educational centers in the educational system, such as primary schools and high schools. Without the student's familiarity with research in life and daily learning activities, developing their creative talents in science production and participation in the development of the country would be impossible (Nickrouz et al., 2012). Accordingly, the issue of economic and social development, along with the development of research, is an inseparable set. The growth of science and technology depends on effective comprehensive research planning, and economic and social growth in turn provides the necessary content for

the further growth of science and technology (Hamidi, 1997). Research in educational system is the only tool used to improve and make profitable changes in the quality of educational programs and practices. No improvement in education can be considered without the intervention of this tool (Mehrmohammadi, 2000). Since the research is a newly planted seedling in the educational system, there should be efforts to grow and reinforce it. There is no doubt that there are problems in teaching research methodology because most of the teachers complain aboutteaching the research in colleges and the evidence suggests that there is a huge crisis in the human sciences of our country that comes from this issue thatresearch expertsaren't educated in this field. They teach their students issues such as research methods, methods of studying, methods of writing articls, scientific methods, and philosophy of science, but in the end, they do not see the effectiveness of their many efforts, and they wonder why the books we have written carefully and issues we have taught, have never been effective. Certainly, this issue questions the fundamental principles of education. So, in order to get rid of the problems of teaching the research methodology in our country, we need educational programs with a reflection-based structure instead of memory-based. Today, traditional methods of training can't meet the growing needs and continuous

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development of instructional skills. New technologies offer more, newer and more attractive opportunities for learning. If the dominant method of teaching and learning has been the teacher's teaching in the classroom, but with the advent of new educational technologies, new communication practices and environments are provided that can make the teaching-learning process possible even out of classroom (Klopping&Mckinney, 2004). Recent advances in the computer and information industry have brought about the emergence of local, national, regional and international information networks, especially the Internet, multimedia, communication technologies, tools and new approaches for designers, planners, administrators and executives of educational programs. Thus, e-learning has been able to address many of the inadequacies of educational systems by creating fundamental changes in the concepts of traditional education, and has created major changes in education and learning; but pure e-learning has always been associated with problems such as lack of human and emotional interactions, lack of face to face communications in the classroom and the lack of proper understanding of virtual educational spaces, so that learners work alone with no interactions with an educator or other learners (Twomey, 2004). Accordingly, the new generation of e-learning, titled Intercultural Education, based on Internet technology, combining face-to-face and electronic education, is a new mechanism that emphasizes on the diverse and widespread use of educational methods and technologies (Osguthorpe& Graham, 2003).Blended training, combining the strengths and weaknesses of e-learning and face-to-face education, improves interaction in educational environments, increases flexibility and effectiveness, and reduces distance between learning and practice. And it's an appropriate solution for elevating the quality of education (Bonk & Graham, 2006; Eddy & Tannenbaum, 2003). In fact, the ultimate goal of blended education is to provide realistic practical opportunities for learners and instructors in order to learn independently, useful, sustained, and growing, which creates an environment for learning and teaching more effectively (Graham, 2006). Considering the above-mentioned issues, using a model based on blended learning as a theoretical framework of the study, the design of an educational pattern will be developed to enhance the skills of the research methodology.

METHODOLOGY

In this research, the continuous exploratory hybrid research method was used to provide the pattern and validation after obtaining the pattern. In the qualitative part, the method of theoretical foundations review was used and in the quantitative part, the quasi-experimental research was used. In reviewing the theoretical foundations, all the patterns

of the blended learning environment and the methods of teaching research methodology were reviewed and categorized based on a specific logic. After categorization, a conceptual model was designed based on them. Through interviews with experts, internal validation of the pattern was achieved. For internal validation, interviews with experts in the field of research methodology, master's students in the humanities and also experts in the field of blended learning were used. The opinions of the interviewees were categorized according to the logic of the pattern and were included in the pattern. In the external validation section of the pattern, a quasi-experimental method with pretest-posttest design was used. This study was conducted as an interventional study to investigate the research education in the framework of the research method workshop. A total of 50 of master's students from the humanities field attended the workshop. Due to the length of the research and the need for the association of the educational staff, the available sample was used and the students who selected the course of the research method participated in the study. The students who could not attend half the workshop hours for any reason were removed. This educational program was planned for a 30-day workshop in February 2017 and included the following panels:

- First panel: Writing titles, goals and assumptions, discussing the statement of the problem.
- Second panel: Types of studies, information gathering method, discussing implementation method and information gathering problems.
- Third panel: Sampling methods, descriptive statistics, analytical statistics, determining the sample size.
- Fourth panel: Writing References, Ethics in Research and Plagiarism.

To evaluate the educational process of the workshop, the pretest was taken before starting the workshop and the posttest was taken after the completion of workshop. Pretest questions were designed based on the fundamental research concepts and posttest questions were designed based on the multimedia content presented in the workshop and all questions were validated by research experts. The internal reliability of the questions was designed based on Cronbach's alpha equal to 0.81 and 0.83, and was validated by research experts. The number of pretest and posttest questions in all panels was equal and a total of ten multiple choice questions were designed. 7 questions were designed from the first, second and fourth panels (all subjects except statistics), and three questions were designed from the third panel (statistics). In this workshop, we divided participants in the workshop into 10 groups of 5 people to enhance the student learning process. For each group, a member of the Research Committee who is an expert in the field of research was considered as group assistant. Also, before the start of the workshop, each group was

given a title and the teams were obliged to hand over the draft of the research plan about the proposed title at the end of the workshop. The data, which was the students' response to the statistical paneland other panels' questions, were analyzed by independent t-test, paired t-test and ANOVA using SPSS software version 20. Value of0/05 was considered as the significant level. Participants' scores were analyzed and evaluated considering the confidentiality of scores and were eventually announced to them.

FINDINGS

A total of 50 of master's students in the field of humanities participated at the research methodology workshop held in February 2017. The highest score in the tests was 16 and the lowest scores in the pretest and posttest were, respectively, 0 and 4. The mean scores of participants in the pretest and posttest were, respectively, 8 ± 3.6 and 9.75 ± 3, which the difference was significant (paired t-test- P-value, 0/007). There was no significant difference between the scores obtained by the participants by input separation in the pretest (One-way ANOVA, P-value > 0.05) (Table 1).

It was determined in analyzing the scores of the questions that the difference was significant in the mean score of the questions related to the panels of research methodology, goals, statement of the problem, the types of study methods, and other principles of the research methodology (P <0.05), but in the case of statistics panel, before and after education, there was no significant difference (P-value = 0/18). A total of 47 people participated in the pretest

and posttest of the workshop, of which 13 (27.7%) were males and 34 (72.3%) were females. The mean score of male participants in the pretest and posttest was not significant (Paired T-test, P-Value > 0.05), and the mean score of female participants in the pretest and posttest was significant (P-Value Paired T-test= 0.05). To investigate the effect of students' gender in the education provided by the research methodology workshop for students, using the repeated measuresplan, it was revealed that gender has no effect on education (Repeated measures, P-Value > 0.05). It means thatconsiderededucationwill have the same result in both males and females (Table 2).

CONCLUSION AND DISCUSSION

As discussed in the beginning of this paper, the plan of the present research was based on exploratory findings regarding the inefficiency of teaching research methodology in Iran's educational system. Teaching research methodology has a complex process comparing to other educational fields. The survey showed that there was no serious research work in this regard in our country. The results of this study point to the fact that teaching research methodology is not effective with general and common educational patterns due to its multidimensionality. This conclusion confirms many of the approaches presented in the framework of this study. At all stages of the designing the pattern, which is designed based on the optimal pattern, it has been tried to make learners to think. One of the features of the optimal pattern in this study was to integrate ICT with curriculum elements in the designing process of teaching the research methodology to create better interaction

Table 1: Pretest and posttest results by input separation

Test	Input	Number	Mean score from 10	The lowest score	The highest score	P among different inputs	P among pretest and posttest scored
Pretest	92	4	7±1.1	6	8	P>0/05	P>0/05
	93	11	8±4.4	0	12		
	94	29	8.48±6.3	0	16		
	95	3	8±2	6	10		
	All inputs	47	8±6.3	0	16		
Posttest	92	4	13±5.2	10	16	P>0/05	
	93	11	9.27±6.3	4	14		
	94	29	9.5±7.2	4	16		
	95	3	8.6±1.1	8	10		
	All inputs	47	9.74±3	4	16		

Table 2: Comparing the results of posttest and pretest based on gender

Gender	Number	Mean score (Pretest from 10)	Mean score (Posttest from 10)	P (paired t) among pretest and posttest scores	P (independent t)among posttest scoresof both genders	P (Repeated measures) among posttest scoresof both genders
Female	34 (72.3%)	8.3±5.3	10.3±6.2	P<0/05	P<0/05	P>0/05
Male	13 (27.7%)	7.1±9.3	8.1±6.3	P>0/05		

with learners throughout the course. The results of this study showed the effectiveness of the designed pattern. It seems that some strategies should bedesigned to improve students' perceptions of research, to present projects that students are interested in doing, and to devote special time to research in the curriculum of universities. Students also need to acquire the skills required by correcting incomplete proposals and studying various articles and with practical engagement in the research process. While in this study, participants were from different inputs (different levels of education), the pretest showed that there was no significant difference between the level of research information and they were all at the same level. Also, the insignificance of the difference between students of different levels in the posttest showed that the effectiveness of the course is not related to the students' educational level and, like other studies, educational courses can be effective in teaching the research methodology. In evaluating the extent of responsivenessof students to the questions of pretest and posttest, it became clear that the most problems were about the statistical issues, and although there was an increase in the total score of the posttest of all panels, but regarding the score of several questions related to the statistic panel, the increase in the score of the posttest comparing to the pretest was small gain and the difference was not significant, so it is recommended that the workshop of statistics will be held separately and the use of active educationalwill be done over a longer period of time. Finally, it should be said that the students believe that the university is the most important research institution in every country. When existing needs and problems are not properly addressed and executive agencies are not aware of the process of research, what is going on is the imbalance between supply and demand, and that means wasting the resources. Based on what mentioned above, proper planning to improve the level of education of university instructors, in particular their practical and theoretical knowledge of the principles and methods of research, the allocation of suitable funding for research activities, the providing the field of cooperation between universities and higher education institutions with researchers and the use of experts in this regard can be a big step to institutionalize the culture of research in society. It is expected that utilizing collective wisdom and national capacities in decision making can provide a ground for comprehensive participation in research.

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