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ABSTRACT
The purpose of the present study is to investigate the development of prospective mathematics teachers' problem posing competency using the general educational design model (ADDIE). Fifteen prospective teachers of Farhangian University of Karaj participate in the training course in 9 workshops for two months in winter of 2020. This course is designed based on ADDIE model with the aim of teaching mathematics problem posing based on the Stoyanova framework and the Vistro-Yu model. Data is collected from pre-test and post-tests and Student tasks during the course. Qualitative analysis of data show that during this period, the percentage of the number of correctly problems are developed in structured situations from 80% to 84%, in semi-structured situations from 38% to 93%, in delicious problem posing, from 13% to 40%, in the nutritious problem posing, from 4% to 40% and in delicious and nutritious problem posing from 0 to 11%. In Vistro-Yu problem posing method, in all components of problem posing, the percentage of the number of correctly posed problems was from 87% upwards. With quantitative data analysis of t-test of two dependent samples shows that in addition to problem posing in structured situations, the average score of problem posing in semi-structured situations, delicious problems, nutritious problems and delicious and nutritious problems in the post-test is better than the pre-test. Results of qualitative and quantitative analysis of data and our observations of students' performance during the course and interviews, showed that the problem posing education to prospective mathematics teachers scheme based on ADDIE, has led to a favorable development in their mathematics problem posing.

Keywords: Mathematics Problem Posing competency, Elementary School Prospective Teachers, ADDIE Model

1. INTRODUCTION

In recent years, there has been a lot of emphasis on giving students problem posing opportunities in the mathematics classroom. Mathematics teachers have recommended that students, in addition to solving pre-formulated problems, they should have activities that produce problems themselves (NCTM, 2000; Silver Cai, 1999). Problem posing is one of the basic aspects of teachers' work; both when they pose problems for studnts and when they help students become better problem posers (Olson & Knott, 2013; Crespo, 2015; Cai et al., 2015; quoted by Li et al., 2020).
Problem posing tasks can help teachers assess students' understanding of mathematical concepts.
According to the OECD (2006) program, one of eight competencies in mathematics is to pose and solve mathematical problems. Problem posing is an important part of applied mathematics and pure mathematics and an integral part of modeling real-world phenomena (Mester, 2002 As Kilpatrick (1989) stated, problem posing has been identified as an important part of the nature of mathematical thinking. The National Council of Teachers of Mathematics (NCTM, 2000), on the other hand, emphasizes problem posing activities and suggests that teachers use problem posing activities in their classrooms.
Implementing problem posing activities in the classroom requires the professional development of teachers. Thompson Carlson & Silverman (2007) have stated the following two important aspects in the professional development of mathematics teachers in tasks design instruction: A) They help prospective teachers and mathematics

teachers to integrate the mathematics concepts they have learned; B) Creates contexts for prospective teachers and mathematics teachers that provide an opportunity to discuss the understanding created in students and their use.
According to Lee et al. (2018), problem posing should be considered as an important mathematics activity in the preparation and professional development of teachers. Because, the results of research conducted in the field of prospective teachers' problem posing suggest that some teachers and prospective teachers have poor performance in mathematics problem posing. For example, pre-service primary and mathematics teachers were found to pose word problems that were mainly derived from mathematics textbooks and rarely reflected creativity (Korkmaz & Gür, 2006).
However, it is clear that students' problem posing methods depend on learning teachers' problem posing methods. What is the quality of the problem posed by the teachers? What model is suitable for teaching problem posing? Certainly, the use of educational models will have a direct effect on prospective teachers learning. Due to the importance of developing the prospective teachers' problem posing, it seemed necesorry to evaluate the effectiveness of this modeles in teaching their problem posing. The purpose of the present study was to examine how to develop the prospective teachers' math problem posing by using ADDIE model in problem posing education and evaluating the effectiveness of this model. Using of the ADDIE model in problem posing is one of the innovative aspects of this research.

2. RESEARCH LITERATURE

2.1. Problem posing

NCTM (2000) introduces problem posing as posing new questions in the context of a context-based problem, stating that the teacher must develop problem posing skills. Problem-posing ability has been considered a school math goal in the United States since at least 1998, and has been added to school math goals in China since 2002 (Yuan and Sriraman, 2011).

2.2. Mathematics problem posing frameworks

According to the results of some research in the field of problem posing, frameworks and categories have been proposed, some of the most important of which are: Silver (1996), Stoyanova and Ellerton framework (1999), English Framework (1997), Contreras Framework (2007), Christou et al. Model (2005), and Vistro-Yu method (2009).
According to Silver (1994), the new problem posing can occur before, during, and after solving a problem; he divided the new problem posing into three parts: problem posing during problem solving, problem posing before problem solving, and problem posing after problem solving. While the English framework (1997) is such that in his view, in the process of students 'problem posing, three components a) students' understanding of a problem b) identification of the problems they prefer and c) their ability to understand Mathematics situations play an important role. Also, Christou, Mousoulides, Pittalis & Pantazi, and Sirraman (2005) developed, described, and tested a theoretical model of problem posing. In their model, the problem posing processes were editing quantitative information, selecting quantitative information, understanding and organizing quantitative information, and translating quantitative information. In another context, Contreras (2007), what if not it was not strategy-based? Introduced by Brown and Walter (1993), they provide a framework for new problem posing from a base problem, and the intention, from the base problem, is any problem that can be changed to create related problems. According to Stoyanova and Ellerton (1996), problem posing situations are divided into three categories free, semi-structured, and structured: A) the situation of the free problem: the problem posers are asked to pose the problem for a real or contextual situation. B) the situation of the semi-structured problem posing: Tasks are problem posing in which posers are given an open situation and asked to examine the structure of the situation and use their knowledge, skills, concepts, and connections of their previous mathematical experiences to complete them. C) The situation of the structured problem posing: In this situation, the problem posing activities are based on a specific problem. The goal is to help students understand specific problems, problem posing structures, and explore the possibility of a relationship between the appearance of the problem and ideas for solving it. Wistro-Yu (2009) introduces a method for problem posing innovation by taking the idea of an innovation approach to a story in the science of literature. The titles of Vistro-Yu methods in new problems posing are replacement, addition, modification, problem contextualizing, Turning the problem around or reversing, change of viewpoint.

2.3. Delicious and nutritious problems

Natalie and Sinker (2008) categorized posed problems in two categories: delicious and nutritious problems. The nutritious and delicious distinction using a food metaphor is explained, while most people believe that nutritious food is important, that is, they do not want foods that are good for their health, (and in general, no one) always eats food

for their nutritional value, many people are interested in eating things that are delicious. Similarly, in the mathematics classroom, there are problems that may be nutritious for students.
Delicious problems are problems that are somehow interesting and attractive to elementary school students. For example, the use of words such as characters of cartoon, movies, sports, food, names in stories, etc., or problems that quickly stimulate their curiosity and attract them. Nutritious problems are a) Problems that is more complex than the base problem text in structured problem posing situations and more complex than the text or figure or diagram or data in semi-structured problem posing situations. b) Problems that relate to mathematics concepts other than the mathematics concepts in the base problem or text

2.4. General Education Design Model (ADDIE)

The design of the educational system has been described as the systematic development of educational specifications using learning and educational theories to ensure the quality of education. It includes the overall process of analyzing educational and learning needs and the learning objectives and development of an educational system that responds to those needs. Most educational design models have systematic and similar components, but can vary greatly in a number of stages (Briggs, 1997; Dick & Carey, 1996; Merrill, 1994). Seels and Glasgow (1998) identified five common components of educational design and developed the general ADDIE model. ADDIE stands for (1) Analyse, (2) Design, (3) Develop, (4) Implement, and (5) Evaluate. Therefore, due to the general nature of this model, it can be used in all learning situations (Siemens, 2002). This model is based on a student-based approach that pays the most attention to the needs of students (Stevens, 2000).
The results of research conducted in the field of prospective teachers' problem posing indicate that some teachers and prospective teachers have performed poorly in mathematics problem posing. Although research has shown that some students and teachers are able to pose interesting and important mathematics problems, wes also found that some students and teachers posed non-mathematics problems, unsolvable problems, and inappropriate problems (such as Cai & Hwang, 2002; Cai and Silver, 1996).
Abolvan (2001) also studied the effect of problem posing strategies on the performance of math prospective teachers. He pursued three main objectives of this study: to investigate the effect of using problem posing strategies on the problem-solving performance of math prospective teachers, to identify the required problem posing skills, along with four steps to solve the problem of polia problem solving to improve student math problem-solving performance And developing educational activities to pose and solve math problems as part of a curriculum for prospective teachers. He used 64 prospective teachers for his study, including the control and experimental groups. He designed a test consisting of 9 open-ended answer questions. Each problem contained a question that students were asked to solve; Also, the part that asked them to generalize and develop the main problem, to pose a new problem and to solve this problem. Students in the experimental group could use the techniques of changing the amount of data in a given problem, changing the context of the problem, and changing the number of conditions in the main problem to formulate new problems based on the main problem. Finally, he performed a progress test simultaneously from both groups and analyzed the obtained data using t-test. The results of this study showed that the implementation of the course, including problem posing activities, caused a significant difference in the mean scores of problem-solving and problem posing, and the sum of problems (solution and design) of the two groups was in favor of the experimental group.
In an exploratory study, Grandmire (2015) presented a way to develop prospective teachers' problem posing ability and examined the results. He taught 19 prospective teachers who took math content courses in one part of each class session to do math problem posing. Examination of pre-test and post-test results reported prospective teachers progress during the academic weeks. The students' views on the usefulness of the problem posing scheme for use in the classroom were also examined and showed that their views have changed throughout the course.
Lavy and Sheriki (2007) also examined the performance of 25 prospective teachers' mathematics teachers (8 males and 17 females) who were in the third year of their B.Sc. mathematics education period and passed the mathematics education unit in order to develop mathematics knowledge and student problem posing skills. During the period, they focused on problem solving and problem posing in mathematics. They found that incorporating problem posing processes into educational activities provided a good opportunity to develop mathematical knowledge and consolidate basic concepts in the prospective teachers' mind. They also believe that teachers need to experience these situations in the first place in order to build knowledge and develop enough confidence in teachers to carry out problem posing activities in the classroom.
According to the importance of problem posing as a strong strategy in the process of teaching and learning mathematics and its benefits for teachers and students, there was a need for more research in the country, which according to the researcher, the use of an educational model of mathematical problem posing prospective teachers and review the results were tangible.

Therefore, we decided to use the ADDIE for this purpose. Therefore, the purpose of the present study was to investigate how to develop the ability of student elementary school mathematics problem posing (according to the frameworks of Stoyanova and Ellerton and Vistro-Yu's method) using the ADDIE educational model. The study also focused on delicious and nutritious problems. The main question of this research is that, how does a prospective math teacher's problem-posing competency changes by using the general educational design model (ADDIE)? This study was based on a hypothesis that by using the ADDIE model in teaching mathematics problem posing, the competency of prospective teachers' mathematics problem posing develops.

3. RESEARCH METHOD

3.1. Research design

This research was a mixed research (quantitative and qualitative). This research was conducted in the form of a quasi-experimental study (one-group design) with pre-test and post-test.The whole training course was designed based on the General Educational Design Model (ADDIE). During 9 workshops, students were trained in problem posing according to the Stoyanova and Ellerton framework and the Vistro-Yu method using the ADDIE educational model. Here, the activities performed in 9 workshops are briefly described:

First workshop: the researcher introduced the general course and Some theoretical literature was presented.

Second workshop: In this workshop, we gave a general training on the topic of problem posing (DE).

Third workshop: In short, the content of this workshop was expressing some of the research literature of problem posing (DE), teaching problem posing according to the framework of Stoyanova and Ellerton (DE) and giving extracurricular task 1(E).

Fourth workshop**:** Considering that in previous workshops the researcher had found that the level of some tasks and examples for some students is high and beyond the level of elementary mathematics, in this workshop he also tried in teaching problem posing and giving tasks to students, use simpler examples (such as fourth grade elementary) (DE). In this workshop, some problems and points of students' problem posing were displayed on the smart board and the researcher explained them.

Fifth workshop: We decided to repeat the problem posing training of Stoyanova and Ellerton framework (DE).

Sixth workshop: the researcher started teaching Vistro-Yu problem posing (DE).

Seventh workshop: the researcher reviewed the prospective teachers' problem posing tasks and annotated them. Margins contained problem posing weaknesses or strengths. A PDF file was then prepared from the annotated papers, and in this workshop, the researcher displayed it on a smart board (DE). A class discourse was held on these tasks. At the end of the workshop, they were given 3 (E) extracurricular tests.

Eighth workshop: According to the students' welcome to the method of analyzing annotated tasks and displaying them on smart boards and class discourse about problem posing (in the previous workshop), researcher analyzed and annotated Vistro-Yu method tasks, and in this workshop, its PDF file was displayed on the smart board (DE). The quality of this problems posing was discussed in class, and students and researchers expressed their views.

Ninth workshop**:** The content of this workshop was to review the framework of the Stevianova and Ellerton method and the Vistro-Yu method, to pose the problems by students in the workshop, to solve the problems of future teachers in problem posing and to answer their questions about problem posing.

3.2. *Participants*

Fifteen prospective teachers of Farhangian University of Karaj participated in this study during 2019-2020. Due to the researcher's limitations, participants in this study were selected from the available samples. The statistical population of this study was the whole prospective teachers of Alborz province of persia.

3.3. Data collection tools

The data of this research were obtained from the initial and final tests and the problem posing tasks of the training course. Tests designed according to the literature and the overlap of most problem posing frameworks and the lack of knowledge of research participants about problem posing frameworks. Pre-test includes 5 problem posing tasks, including 4 tasks in semi-structured and 1 task in structured situation in accordance with the framework of Stoyanova and Ellerton (1996) and post-tests includes 5 problem posing tasks, including 4 tasks in semi-structured and 1 task in structured situation in accordance with the framework of Stoyanova and Ellerton and Vistro-Yu (2009) problem posing. It is noteworthy that, due to the lack of knowledge of the participants about the problem-posing frameworks, and their unfamiliarity with the Vistro-Yu method, the researcher avoided the problem-posing tasks of the method. The content of the pre-test and post-tests in elementary mathematics included concepts related to fractions, geometry, mathematical calculations, and coordinate systems. The validity of the pre-test and post-tests was approved by a group of mathematics teachers and mathematics education specialists. Performing several tests with different groups of students and conducting interviews and reviewing observations and repeating the results of these activities brought researchers to the saturation point and the reliability of the tests was proven for us. Tools of this research were problem posing tasks, pre-test and post-tests.

3.4. data analysis method

In order to qualitatively analyze the data, categorize the data obtained from the initial and final exams and students' problem posing tasks during the prospective teachers' training course, these data were coded as follows:

1. Correctly posed problems in the situation of Stoyanova and Ellern (1999) structured problem posing
2. Properly posed problems in the situation of Stoyanova and Ellerton (1999) semi-structured problem posing problems
3. Delicious posed problems
4. There were two types of nutritional problems.
5. Delicious and nutritious posed problems, problems that are both delicious and nutritious.
6. Properly posed problems according to Vistro-Yu table (2009)

In addition, the following code was considered for the ADDIE stages.
A: Analyse stage, D: Design stage, DE: Develop stage, I: Implement stage, E: Evaluate stage.
For quantitative analysis of the development of their problem posing, the paired t-test was used. To qualitatively analyze the development of prospective teachers' problem posing. the researcher evaluated the process of developing prospective teachers' problem posing throughout the course. However, in order to summarize the development process, the percentage changes of the number of correctly problems in the problem posing components from the pre-test to the post-test were examined. In addition – in particular – to examine the development of problem posing components in the pre-test and post-test (separately for students), We scored the problem posing test. Problem posing scores and the Percentage of scores are shown in Table 3-1.

Table 3.1. Pre-test problem scoring table includes 4 semi-structured and 1 structured situations

	score	Percentage of score
The correct problem posing in a structured situation	1	5%
The correct problem posing in a semi-structured situation	4	20%
Delicious problem posing	5	25%
Nutritious problem posing	5	25%
Delicious and nutritious problem posing	5	25%
Total score	20	100%

3.5. Findings

3.5.1. Pre-test, Task1 and Task2 test results (E)

The pre-test, Task 1 and Task 2 tests consisted of 5 problem posing tasks, 4 semi-structured situation problem posing tasks, and 1 structured situation problem posing task according to the Stoyanova and Ellerton (1999) framework. The results of the percentage of the number of correct problem posing are shown in Table 3-2:

Table 3.2. the percentage of the number of correct problem posing in pre-test, Task1and Task2

Prblem posing components	Initlat Test	Task1	Task2
Structured situation	80%	50%	84%
Semi-structured situation	38%	76%	69%
Delicious problem	13%	43%	38%
Nutritious problems	4%	14%	45%
Delicious and nutritious problems	0%	14%	23%

3.5.2. Results of problem posing of task 3 (E)

We analyzed tasks with the Vistro-Yu method given to the students in the sixth workshop (Test 3 (E)). The results of the analysis of their posed problems in task are shown in Table 3-3.

Table 3.3: The percentage of the number of correct problem posing in task 3

Prblem posing components	Percentage
Replacement	100%
Addition	100%
Modification	90%
Contextualizing	90%
Reversing	80%
Change of viewpoint	60%

3.5.3. Post-test problem posing results (E)

The post-test is similar to the pre-test. Also included in problem posing tasks based on Vistro-Yu method. The results of their Percentage problem posing with the results of the analysis of their posed problems in the post-test are shown in Table 3-4.

Table 3.4. The percentage of the number of correct problem posing in the post-test

Problem posing components	Percentage
Structured situation	84%
Semi-structured situation	93%
Delicious problems	40%
Nutritious problems	33%
Delicious and nutritious problems	11%
Replacement	100%
Addition	100%
Modification	100%
Contextualizing	100%
Reversing	87%
Change of viewpoint	87%

3.6. Data analysis

3.6.1. Quantitative data analysis

In the present study, in order to investigate the results of mathematics problem posing in structured, semi-structured situation, delicious problems, nutritious problems and delicious and nutritious problems in the pre-training and post-training situation, the paired t-test has been used (Table 3-5).

Table 3.5. Dependent t-test, comparison of the mean of the pre-test and post-test in the components of structured, semi-structured situation, delicious problems, nutritious problems and delicious and nutritious problems.

Statistical index/model	**Test**	**M**	**SD**	**L**	**DF**	**P**
Structured situation	Pre-test	4	2.07	0.54	14	0.001
	Final	3.46	0.63			
Semi-structured situation	Pre-test	1.53	1.18	2.60	14	0.001
	Final	4.13	0.35			
Delicious problems	Pre-test	0.66	0.72	2.94	14	0.001
	Final	3.60	1.54			
Nutritious problems	Pre-test	0.20	0.56	3.40	14	0.001
	Final	3.60	1.59			
Delicious and nutritious problems	Pre-test	0.00	0.00	1.46	14	0.001
	Final	1.46	2.19			

The results of the t-test of two dependent samples show that, except structured situation, mean of score of problem posing in semi-structured situations, delicious problems, nutritious problems, delicious and nutritious problems in the final situation were better than the pre-test situation because the significant level obtained was less than 0.05. Therefore, it seems that in general, the quantity and quality of problem posing are well developed.

3.6.2. Qualitative data analysis

We examined the process of change of the problem posing. We paid more attention to the the quality of the posed problems in terms of delicious, nutritious and delicious and nutritious together:

3.6.3 . Analysis of the results of problem posing of pre-test, task1 and task 2 tests

According to Table 3-2 students in structured problem posing performed better than semi-structured situations. Most of them used simple replacement, while more than half of the problem posing tasks in semi-structured situations did not have the correct answer or were not done at all (12). It is clear, in the nutritious and deliciousness of the problems (quality of the problems), the prospective teachers had a very poor performance, and in the structure of the findings, they changed the appearance of the problem more, and by changing the data, they had taken the same path as the base problem. In the semi-structured situations, the number of delicious and nutritious problems was very small, and in all the pre-tests, there were no both delicious and nutritious problems.

In Task 2, the number of problem posing in the structured situation decreased by 30%, and this decrease was significant, and it seemed that prospective teachers needed more training and practice in problem posing. Compared to the pre-test, in the semi-structured situation, the number of problems posing is increased by 28%, and it showed a reasonable increase. Interestingly, there was a 30% increase in the delicious problem posing, 16% increase in the nutritious problem posing, and a 14% increase in both. Given that this was the first task, it seems that in general, the quality of the prospective teachers' problem posing is better than the pre-test.

Based on the results obtained from the implementation of the training course and after retraining, In Task2, the student problem posing, with the exception of the number of problem posing in semi-structured situations and the number of delicious problems, which showed a slight decrease, was in all other cases more improvement than task 1. In addition, the percentages of increase in the three components of structured, nutritious and both delicious and nutritious, were higher than the percentages of decrease in the components of the prospective teachers' problem posing in delicious and semi-structured situations. In task 2, there was a significant improvement over the pre-test, except for a small improvement in the structured situations (E). In order to further qualitatively analyze the results, problem posing of task 2 was compared with the pre-test problem posing (E). Therefore, it seemed that compared to the pre-test, the ability to pose the problem of prospective teachers had a favorable development (E).

3.6.4. Analysis of the results of problem posing of task 3 (E)

We analyzed their task in problem posing using the Vistro-Yu method. Given that they were not familiar with problem posing frameworks at the beginning of the problem posing training course, it is clear that prospective teachers performed significantly in all cases of problem posing using the Vistro-Yu method, except for change of viewpoint.

3.6.5. Post-test analysis (E)

The post-test of this study, in addition to the problem posing tasks is similar to the pre-test, included problem posing tasks using the Vistro-Yu method. According to Diagram 3-1 and comparing the percentage of number of correct problems posing of task 3, it was found for we that in the post-test, compared to task 3, their problem posing (according to Vistro-Yu method) was further developed and their weakness in change of viewpoint has also been resolved satisfactorily. It is noteworthy that according to our evaluation, before the pre-test (E), prospective teachers were not familiar with the problem posing method by Vistro-Yu method. Therefore, in the pre-test, we had pretended the ability to evaluate the prospective teachers' problem posing by the Vistro-Yu method and decided to conduct a qualitative evaluation of this method after teaching it.

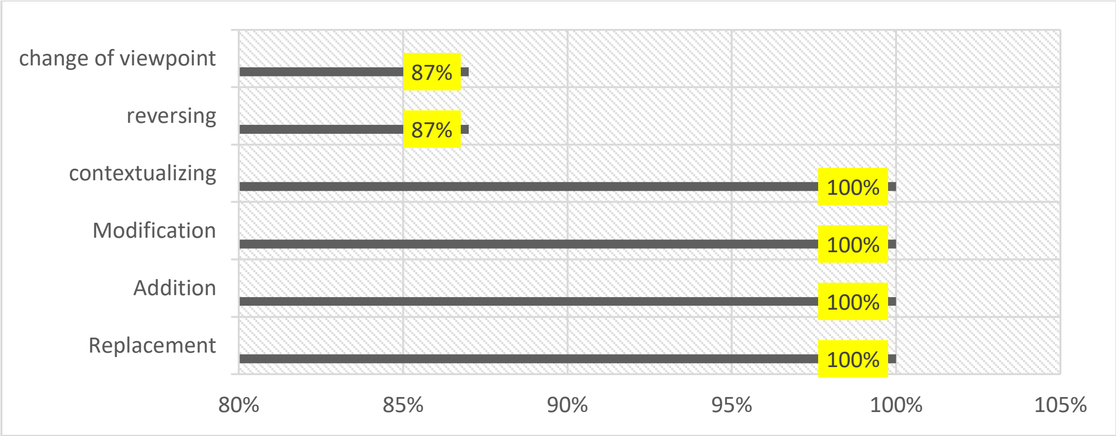

Diagram 3.1. The percentage of the number of correct problem posing in post-test

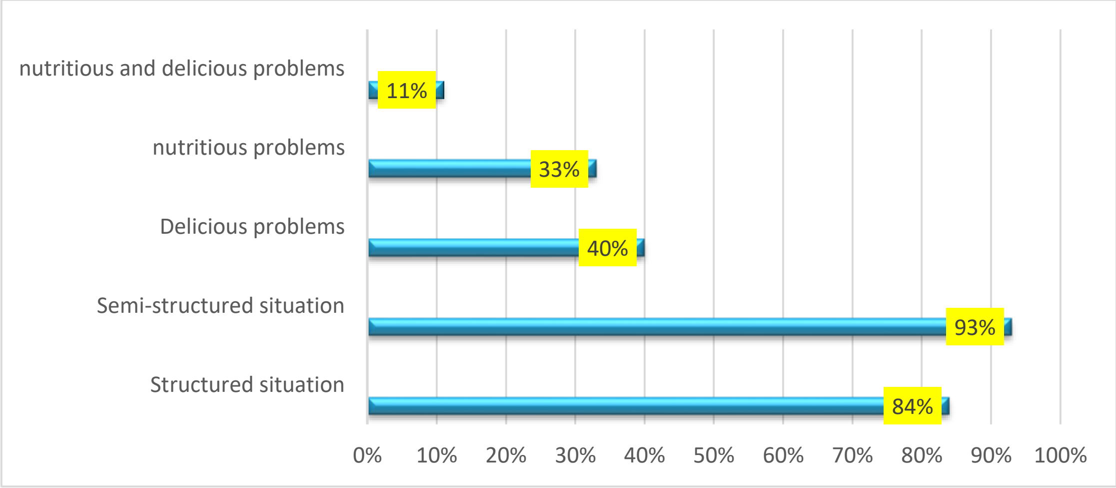

Diagram 3.2. The percentage of the number of of correct problem posing components in post-test

3.6.6. Development of problem posing components, from the pre-test to the post-test in structured and semi-structured problem posing situations by prospective teachers (E)

In order to have a deeper qualitative analysis of the development of the prospective teachers' mathematics problem posing, the percentage of changes in the problem posing components from the pre-test to the post-test (separately for the prospective teachers) was also examined. Therefore, we proceeded to score the problem posing. Diagram 3-3 shows a comparison of these scores by prospective teachers' ratio.

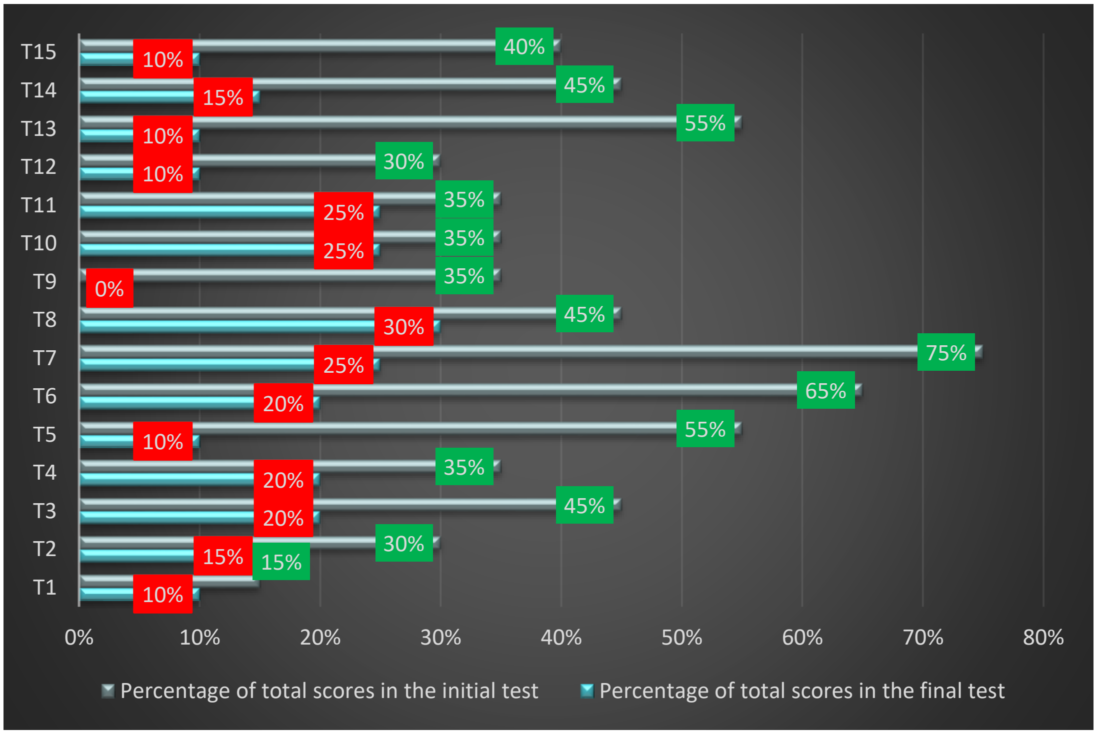

Diagram 3.3. Comparison of the percentage of correct problem posing scores in the pre-test and post-tests separately for prospective teachers

3.6.7. Comparison of the percentage of structured and semi-structured of correct problem posing scores in the pre-test and post-tests and Tasks 1 and 2

Diagram 3-4 compares the results of the pre-test to the post-test in the components of the structured and semi-structured problem posing. According to this diagram, the development of the prospective teachers' problem posing in these 4 Taks and in all components is clear and obvious.

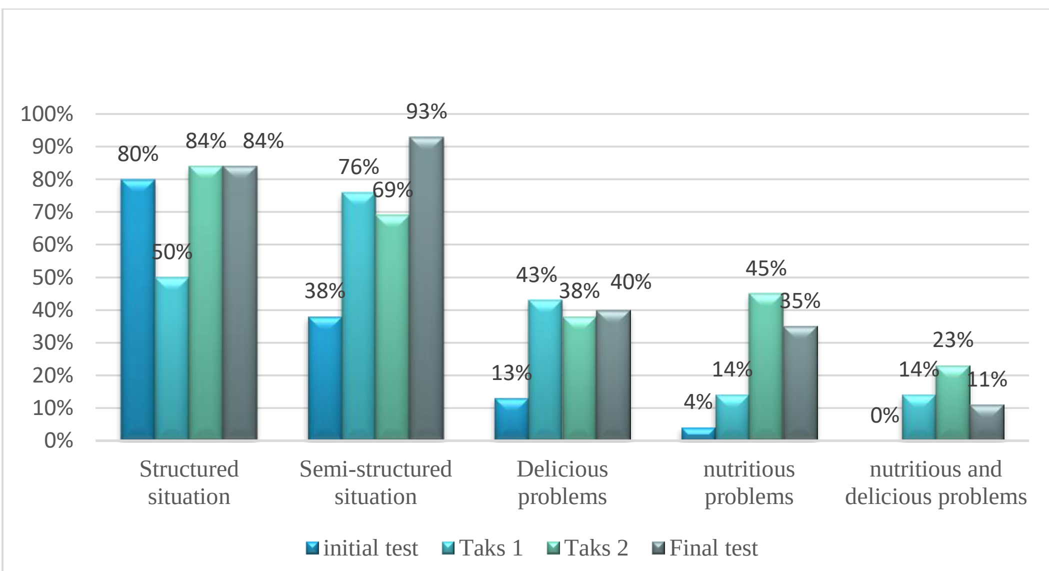

Diagram 3.4. Comparison the percentage of the number of correct problem posing components in pre-test and post-tests and Tasks 1 and 2

4. DISCUSSION

Considering the role of teachers' pre-service training in their professional development, the researchers examined the ability of prospective teacher's problem posing by using the general educational design model in teaching math problem posing training to develop their problem posing ability. According to the relevant studies of the background of this research, namely, the studies of Abolvan (2001) and Grandmir (2015) and other similar studies, the hypothesis of the researchers of this study was that the implementation of this problem posing training course will lead to desirable progress in prospective teacher's problem posing ability. The results of that research showed that the implementation of the course, including problem posing activities, caused a significant difference in the mean scores of problem solving and problem posing, and the sum of problems (solution and design) of the two groups, in favor of the experimental group, which is consistent with the present study. Lavy and Shriki (2007) also stated that incorporating problem posing processes into educational activities improves students' ability to articulate definitions, ratios of mathematical objects, and the relationship between mathematical objects and sound reasoning. Their results are consistent with the results of the present study. Eskandari's research (2013) had also shown that developing problem posing skills has a positive effect on students' problem posing performance, which is in line with the present and the results of his research; Because in both studies there is a strengthening of problem posing ability and positive results. in addition, Soleimian (2014) research had shown that teaching answering problems has caused significant progress in students in problem posing. The results of the present study are also consistent with his results.Therefore, the results of this study were consistent with the results of these studies. However, in the mentioned researches - both in foreign researches and in internal researches - no model was mentioned for prospective teacher's problem posing and in the researches done in Iran, holding a training course of mathematical problem posing and examining their problem posing ability It was not done after the training course. In fact, the use of general educational design model in teaching mathematical problem posing was one of the innovations of this study. After reviewing the results, the researchers of this study concluded that by implementing this model in teaching mathematical problem posing, desirable changes in The ability of prospective teacher's mathematical problem posing has been created.

5. CONCLUSION

In the findings section of this study, the findings were divided into workshops. In order to answer the research question and test the hypothesis of this study, after analyzing the post-test and considering the analytical results of the workshops and comparing the results, we concluded that the hypothesis of this research was correct and the prospective teachers' problem posing of the elementary school was well developed using ADDIE model in problem posing education. Due to the importance of developing the prospective teachers' problem posing, it seemed very appropriate to evaluate the effectiveness of this model (ADDIE) in teaching their problem posing. An example of qualitative data analysis was that the percentage of number of correct prospective teachers' problems posing in the components of structured and semi-structured problem posing situations in all tests and tasks, from the pre-tests to the post-test, was calculated. The results of this calculation indicated that, at a glance, the percentage of number of correctly posed problems from the pre-test to the post-test has been increasing. After examining these percentages, the change in the scoring problem posing of each prospective teachers from the pre-test to the post-test was calculated. According to the findings and analysis of this study and in order to answer the research question, it is observed that the score of the problem posing of all students in the post-test is higher than the pre-test. The results showed that the score of the problem posing of pre-test to the final students was 1.5 times for T8, T0 and T11, 2 times for T1, T2, T3, 3 times for T7, T12, T14, 4 times for T5 and T6, 5 times for T13 and more than 5 times for T9. Also, by quantitative analysis of data (by prospective teachers) in the two pre-test and post-tests, it was found that, except the structured situation component, there was a significant difference between the mean scores of problem posing in semi-structured situations, delicious problem posing, nutritious problems, delicious and nutritious problems in the post-test better than the pre-test. These results we observations of students' performance during the course and interviews, showed that education the prospective teachers mathematics problem posing scheme based on ADDIE, has led to a favorable development in their mathematics problem posing and the implementation of this model can have a positive effect on performance of prospective teachers problem posing.

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