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DETERMINATION OF THE EFFECTIVENESS OF A TEMPLATE FOR LESSON PLANNING BASED ON INQUIRY¹

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ABSTRACT

Planning a lesson according to the inquiry method which is conducted in the laboratory is a challenging process for pre-service teachers. The reasons for the difficulties of pre-service teachers are their inexperience and not knowing the method well. In this study, the effectiveness of a template that takes into account the basic components of the inquiry process that pre-service teachers can use in their lesson planning processes will be determined. The feature of this template is that it allows the pre-service teacher to construct the lesson from the end to the beginning. In this context, the research aims to determine the difficulties experienced by the pre-service teachers in the lesson planning process and the opinions of the pre-service teachers about the template. This research was conducted with the case study method. 19 pre-service teachers studying in the chemistry education program of a state university in Ankara/Turkey participated in the research. A pre-service teacher's diary, reflective written opinion form, and mentor observation notes were used as data collection tools. The data were analyzed with the content analysis technique. It was determined that pre-service teachers had difficulties in the planning (constructing) of the lesson regarding the learning outcomes of the curricula, the appropriateness of the outcome - experiment, the appropriateness of the outcome - method, and method knowledge. It has been determined that the use of templates during lesson planning is beneficial in terms of gaining method and pedagogical knowledge. According to these results, the template is effective in solving the problems experienced by facilitating the lesson planning process.

Keywords: Lesson planning, template, inquiry, pre-service teachers.

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INTRODUCTION

The teaching process consists of three stages pre-class preparation, in-class activities, and after-class activities. Pre-class preparation is the teacher's preparation of the course planning and necessity, in-class activities are carried out with appropriate methods and techniques, and after-class activities are the evaluation of the teaching (Haynes, 2007; Haynes, 2010; Singh, 2008). The planning of a course takes place in the first stage of the teaching process and is an important element in teaching as it shapes learning outcomes and in-class communication (Beyerbach, 1988). The teacher must have some skills to prepare an effective lesson plan. These skills are related to the teacher's ability to transform the factual, conceptual, and scientific knowledge he/she has learned into appropriate models (Kablan, 2012).

When the course plan is mentioned, written materials come to mind explaining the learning outcomes/gains of the unit, the materials to be used in the course, how to process the course and how to make the evaluation. Such a plan is defined as the "traditional lesson plan format". In such plans, teaching is a series of successive events in which the teacher manages the process for a specific purpose (Jalongo, Rieg & Helterbran, 2007). However, lessons may not go as planned by the teacher. In the preparation of the lesson plan, two different main opinions prevail on the stage. At first sight, the content and information in the unit are important in the plan. In second opinion, it is important to gain experience instead of knowledge in the plan. In science classrooms, especially in classroom environments where student-centered approaches are at the forefront, it is argued that the second opinion prevails (Singh, 2008).

Inquiry method has been frequently used in recent years to implement student-centered approaches in science classes. Over the past few decades, many countries have attempted to renew their curriculums to support inquiry in laboratory teaching and have carried out programs for pre-service teachers (Brown & Melear, 2006). One of these countries is Turkey (Sarica & Cetin, 2020). In 2004, changes made by the Ministry of National Education (MNE) to the curriculum for primary and secondary education institutions in Turkey encouraged teaching based on inquiry, especially in the field of science (MNE, 2005).

Science educators have considered inquiry as an effective teaching strategy to give students science literacy (Abd-El-Khalick et al., 2004; NRC, 2013). Although "inquiry" is used in many different ways as a concept, the National Research Council (NRC) expressed its meaning in science education in the most descriptive way.

"Inquiry is a multifaceted activity that involves making observations; posing questions; examining books and other sources of information to see what is already known; planning investigations; reviewing what is already known in the light of experimental evidence; using tools to gather, analyze, and interpret data; proposing answers, explanations, and predictions; and communicating the results. Inquiry requires identification of assumptions, use of critical and logical thinking, and consideration of alternative explanations" (NRC, 2000, p. 23).

As the definition shows, teachers and students have different roles in the inquiry. While students try to learn scientific principles by a scientific method like a scientist, the teacher follows the process and slows it down in the necessary parts, guiding the student to learn. In these environments, the success of students and their achievement of the desired skills depends on the skill and effective guidance of the teacher (Harris & Rooks, 2010; Shanmugavelu, Balakrishnan, Parasuraman, Ariffin, Kannan, & Vadivelu, 2020). The inquiry model developed by J. Richard Suchman in 1962 is the most preferred model for training inquiry (Reed, 2003). However, this model is used to teach students the inquiry process, it can be used by teachers in understanding inquiry as it summarizes the inquiry process step-by-step.

Although inquiry should be moulded into a standard mould and not applied through a single model, a joint decision was made by the researchers on the basic components that should be when conducting teaching with an inquiry (Kipnis & Hofstein, 2008; NRC, 2000; Suchman, 1966). Teachers plan their lessons considering these components. These basic components are (i) asking the research question, (ii) creating hypotheses, (iii) planning experiments /research, (iv) making observations and recording data, (v) analyzing and interpreting data, (vi) evaluating of the validity of the research result for new situations and (vii) announcement of the results of the research.

In an inquiry-based laboratory, students perform many activities. For example, asking a research question, forming a hypothesis, planning research, using different procedures and tools, making observations, collecting and analyzing data, evaluating the model, testing, validating, or renewing (Lunetta, Hofstein & Clough, 2007; NRC, 2006). While there are so many different skills and activities of the students, teachers should know the inquiry process and anticipate everything that the students will do for the laboratory process to be carried out successfully. However, since teachers have not experienced or applied inquiry-based laboratory practices before, they encounter different problems or difficulties in this process and do not prefer to use this approach (Cheung, 2008; Newman, Abel, Hubbard, McDonald, Otaala & Martini, 2004; Yalcin-Celik, Kadayifci, Uner, & Turan - Oluk, 2017).

One of the challenges teachers encounter while teaching an inquiry-based course is the lack of pedagogical education, and school and management support required to carry out the course. (Cheung, 2008; Kim & Chin, 2011; Lister, 2015). Teachers' lack of content and pedagogical knowledge makes it difficult for them to plan an inquiry-based lesson. For example, teachers have difficulty managing the lesson, especially when students get away from the purpose of the lesson and lose the subject (Gillies & Nichols, 2015). To minimize such situations, teachers should know the purpose of the lesson, anticipate at what stage students may need guidance, and plan what questions to ask. This can only be achieved by planning the lesson effectively. These skills are also skills that should be acquired during teacher education.

Planning an inquiry-based lesson is especially difficult for new teachers or pre-service teachers (Adams & Krockover, 1997; Hashweh, 1987; Yalcin-Celik et al., 2017). Yalcin-Celik et al. (2017) identified the problems faced by 25 pre-service teachers in the process of planning and conducting an inquiry-based laboratory lesson.

According to the results of the research, pre-service teachers have difficulties in subject area & connections, laboratory & experiment, learners, instructional planning & implementation, and general teaching qualifications. Similarly, Edelson, Gordin & Pea (1999) determined that teachers have difficulties in motivating students to take an inquiry course, using different techniques, lack of student prior knowledge, classroom management, and teaching the relevant subject. For this reason, especially pre-service teachers or inexperienced teachers need helpful templates to get through this process more easily (Garcia-Carmona, Criado & Cruz-Guzmán, 2017). In the literature, templates prepared for students who will experience the inquiry process are more frequently encountered (e.g. Hermann & Miranda, 2010, White & Frederiksen, 1998). However, the templates for the teacher who will manage the course process are fewer (Garcia-Carmona, Criado & Cruz-Guzmán, 2017; Schwarz & Gwekwerere, 2007). These templates should be specifically aimed at the departments where teachers are struggling and should take the course to the steps to make the lesson process more understandable for teachers.

In this research, a template that teachers can use in lesson planning (or constructing) processes will be introduced and the effectiveness of this template will be examined, taking into account the key components of the inquiry process. In this context, this study aims to reveal the views of pre-service chemistry teachers about the effectiveness of a “work backward template (heuristic method)” developed to identify and eliminate the problems they encounter in the process of planning a lesson suitable for inquiry.

METHOD

Research Design

This research was conducted with the case study method, which is one of the qualitative research designs. A case study is defined as a suitable method for obtaining the description, exploratory, and analysis of a system. This system may consist of a unit, individual, program, or group (Merriam, 1998). This study aimed to determine the challenges pre-service chemistry teachers encountered while preparing a lesson plan that included an inquiry and their opinions on a template that would address those challenges.

Participants

The research was conducted with 19 pre-service teachers (5 boys, 14 girls) studying in the chemistry education program of a state university in Ankara/Turkey. The ages of the participants ranged from 21 to 23. The study was conducted during the 2016–2017 academic year's fall semester in a course called "Teaching in Chemistry Laboratory (TCL)". This course aims to provide pre-service teachers with an environment that will enable them to gain knowledge and experience in the teaching of approaches, methods, and techniques that can be applied in the chemistry laboratory. The course focuses on inquiry-based instruction, and pre-service teachers are asked to plan and implement a learning outcome by inquiry, combining content knowledge and pedagogical knowledge. This course is 4 hours per week. Before this course period, the participants took the subject matter knowledge courses (general chemistry, organic chemistry, analytical chemistry, physicochemistry, and inorganic chemistry) and pedagogical (educational psychology, classroom management) courses. They have taken “special teaching methods”, “learning approaches”, and “measurement and evaluation” courses together with this

course. Before conducting the study, the participants were informed about the content and duration of the research and that participation was voluntary, that they could withdraw from the study at any time and that their identity would be kept confidential. The participants also provided their written consent.

Research Procedure

The research took a total of 14 weeks. This process was divided into three parts (Figure 1). The researcher also conducted the course throughout the whole process. Below, these parts were described.

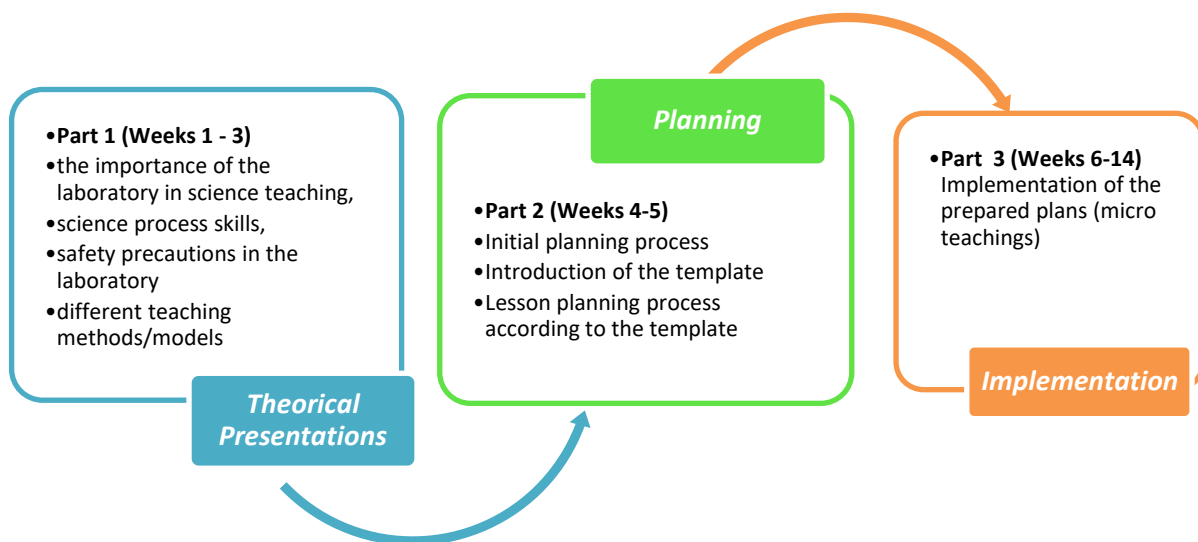


Figure 1. Research Procedure

Part 1- Theoretical Presentations: In the first three weeks, pre-service teachers were introduced by the researchers to the importance and place of the laboratory in science teaching, the types of experiments that can be performed in the laboratory, scientific process skills, safety precautions in the laboratory, and different teaching methods/models by the inquiry. At the end of the third week, students were asked to choose one of the chemistry topics in the secondary education curriculum and one of the teaching methods/models introduced in the course and to plan/construct the laboratory course according to this method/model. These teaching methods were not the traditional/ verification type methods that pre-service teachers are accustomed to, but open, guided, structured inquiry, and, argument-based inquiry.

Part 2- Planning: The pre-service teacher attempted to plan the lesson using her strategies. She approached the researcher for assistance as a mentor when she ran into problems while trying to find a solution, and she revised her strategy in view of the suggestions. At this stage, each pre-service teacher had to interview 2-5 times. Inexperienced pre-service teachers could not produce a complete solution for this complex problem despite much feedback. That is, they could not fully construct an inquiry-based lesson plan.

Then, a template was introduced to each pre-service teacher, which they can use individually to plan the inquiry-based laboratory lesson. According to the template introduced, pre-service teachers were able to plan a

laboratory lesson based on inquiry. At the end of this stage, it was observed that all participants planned the lesson easily by using the template.

Part 3- Implementation: During the implementation of the prepared plans, the participant, who performs the teaching practice, plays the role of the teacher; their peers took on the role of students. In this research, by the student, it is meant the peers in the student role. Each pre-service teacher had approximately 50 minutes for the laboratory lesson. Meanwhile, the researcher was an observer as a participant.

Lesson Plan Template Suitable for Heuristic Method

The template developed in this research is intended to facilitate pre-service teachers' ability to plan lessons in different models suitable for the inquiry because each step in the template is the key step that stands out in inquiry approaches. In Suchman Inquiry Model, five major steps which are contained in a typical inquiry lesson were introduced (Suchman, 1966). This inquiry model is used as a facilitator for students to understand the inquiry process. In this research, Suchman's model was chosen because it makes the lesson more systematic and organized for teachers (Takeshita, 1988). Although not all inquiry models require hypothesis development, attention is focused to the teacher's questions during the students' process (Garcia-Carmona, Criado, & Cruz-Guzmán, 2017), hence this template could be employed particularly in models where hypotheses are necessary (Banchi & Bell, 2008).

In the template planning process was divided into 6 main parts, and there are six questions guiding what the pre-service teacher should do in these parts of the course (Figure 2). When using the template, the pre-service teacher chooses an outcome for his/her subject from the curriculum and answers the question "What does the outcome mean". The main purpose of this question is to make the pre-service teacher understand the outcome. Throughout the entire course period, this answer should be kept in mind. The next question is "what am I aiming for". This question directs the pre-service teacher to the last stage of the lesson, namely the interpretation section. By answering this question, the pre-service teacher determines what he/she expects his/her students to learn at the end of the lesson. The third question is "What should I get students to do or measure what/how to achieve this goal". With the answer to this question, the pre-service teacher decides what kind of research/experiment the students should conduct. Another question is "what do I want students to think about getting these measures". The purpose of this question is to make the pre-service teacher aware of which hypotheses/predictions students should make. The fifth question is "what should I ask students so they can form these preliminary predictions (hypotheses)". With the answer to this question, the pre-service teacher will have asked the research question, which is the basic element of inquiry research. The last question is "what should I tell/show the students at the beginning of the lesson so that I can ask this research question". This question will shed light on what the pre-service teacher can do at the beginning of the course to motivate students on the relevant topic.

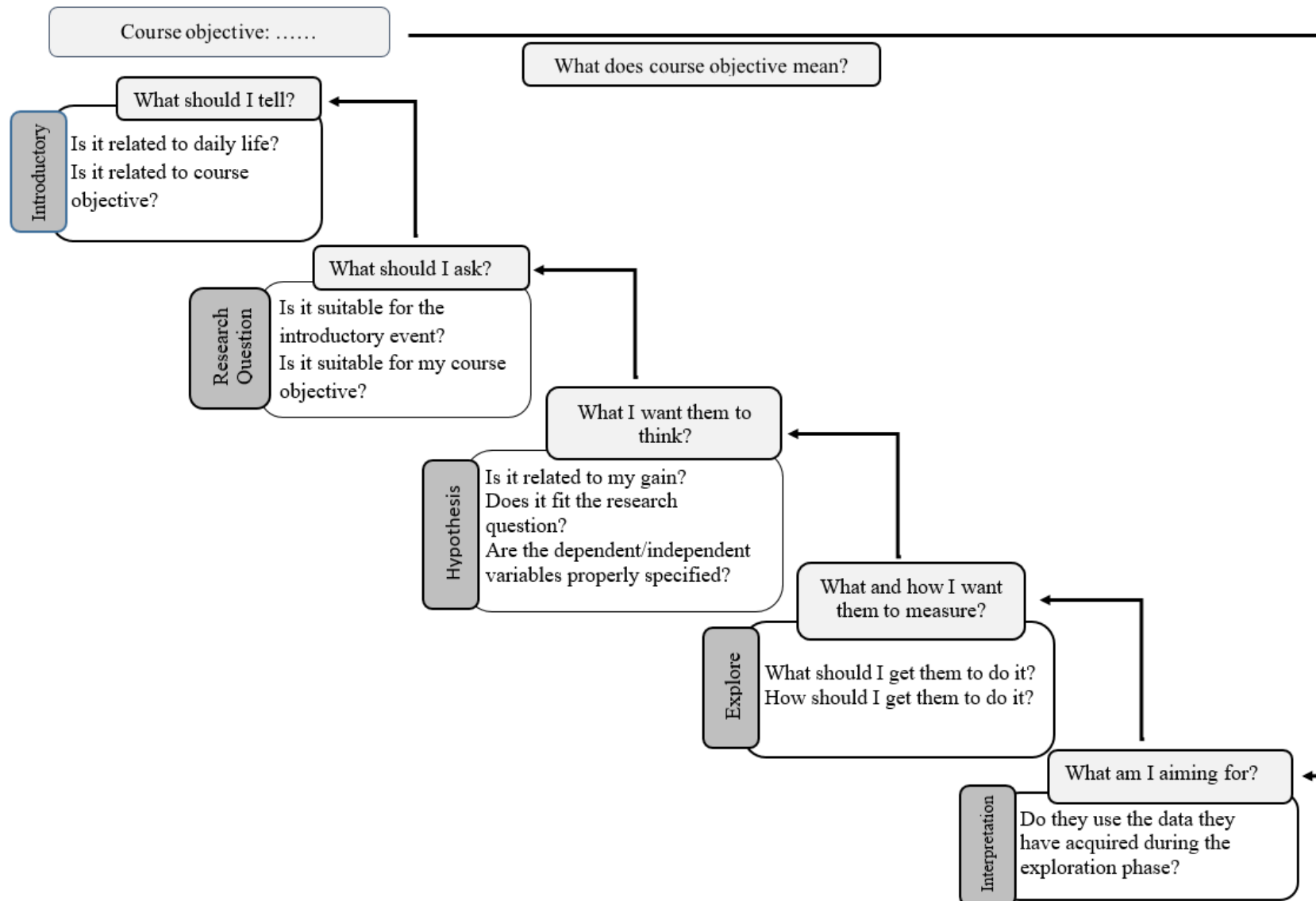


Figure 2. Lesson Plan Template for Heuristic Method

In this template; the element taken into consideration in the lesson planning process is the achievement of the lesson, and it was given importance to plan the parts of the lesson in such a way that this gain could be reached throughout the whole process. However, it is also important that the other parts of the course are compatible and related to each other. For this purpose, besides the basic questions specified in the template, there are also sub-questions so that the pre-service teachers can check their plans. For example, when it comes to the last stage of the lesson, the sub-question "Is the goal achieved by the students compatible with the findings/data they obtained during the exploration stage" questions the relationship between the exploration and interpretation sections. Another sub-question is "Was the measurement made by taking into account the variables specified in the preliminary estimation". These sub-questions define the relationship between the exploration and the hypotheses parts. Similar sub-questions are available for each section. Thus, coordination between the parts of the course is ensured.

Data Collection Tools and Data Analysis

Pre-service teacher's diary: During the process, participants kept diaries to record the difficulties they experienced. In these diaries, there were questions about the work (task), what/why/how it was done, and what difficulties were experienced. Each participant detailed the plan preparation process, taking these questions into account, and specifying the date. This diary was also brought to all meetings with the mentor.

Mentor observation notes: Similarly, the researcher (mentor) took note of the difficulties that the participant expressed or noticed during the interview process.

These two measurement tools were analyzed to determine the problems experienced by pre-service teachers.

Reflective written opinion form (reflection papers): After the planning stage was finished, participants were asked to write reflectively about the benefits of the template. The findings of the research were created by content analysis of these diaries, notes, and reflective written opinions. The content analysis method was used to analyze the data. The expressions and reflective written opinions in the diaries were coded by two independent experts after they observed the difficulties pre-service teachers encountered and the advantages of the template to increase internal validity. The intercoder reliability was calculated separately by using the formula of Miles and Huberman (1994). According to this formula, the consistency between researchers in determining the problems experienced by pre-service teachers was 0.89; the consistency between the benefits of the lesson planning template was calculated as 0.96. In creating the categories, each pre-service teacher's data was analyzed using the continuous comparison technique and the emerging themes were named.

FINDINGS

Difficulties Experienced During the Lesson Planning Stage

For most of the participants, planning a lesson and inquiry-based teaching in the laboratory was a new experience. These courses provided them with a first-time experience with this approach to science teaching in the laboratory. From participants' dairies and instructors' observation notes, 12 different difficulty categories were determined as a result of appropriate coding. These challenges were grouped under four themes (Table 1).

Table 1. Difficulties Experienced During the Lesson Planning Stage

Frequency of Difficulties(n)		Category	Theme
Observed (by the researcher)	Denoted (by participants)		
9	10	Determination of learning outcome/gains	Learning outcomes of the curricula
4	2	relationship between subject – outcome/gain	
1	2	Experiment mismatch with the research question	The consistency of learning outcomes and experiment
3	0	Manage the experiment process/variables	
4	5	Start planning by setting an experiment	
5	11	Learning outcome - experiment mismatch	Learning outcome method compliance
5	14	Setting a research question	
0	2	Assessment the learning outcome	
3	7	Introduction to the course (motivation)	
5	7	Hypothesizing	
1	3	Explanation phase	Method knowledge
5	6	Lacking knowledge of the	
43	69		Total

It is seen that pre-service teachers have the most problems with the theme of learning outcome -method compatibility while planning a laboratory lesson based on inquiry. This theme includes the problems related to the fact that pre-service teachers can reflect on a method based on an inquiry into their plan to achieve this outcome after choosing an appropriate outcome from the relevant unit/subject. Problems are related to motivating students or attracting their attention to the subject at the beginning of the lesson and making an appropriate assessment at the end of the lesson so that the process of asking the students appropriate questions, forming appropriate hypotheses/predictions, asking research questions and forming hypotheses to initiate the inquiry can proceed properly collected in this category. A pre-service teacher expressed the problems experienced in this category as “PsT3:... I mostly had difficulty arranging the appropriate research question that would make students form hypotheses. Accordingly, I could not predict the hypotheses that the students would establish, and I could not determine the experiment”.

The compatibility relationship between the learning outcomes chosen by the pre-service teachers from the relevant topic and the experiment that the students were expected to perform was examined under the consistency of learning outcome and experiment. Problems such as the pre-service teacher's determination of an experiment without examining/deciding on the learning outcomes on the subject of interest or not being able

to determine the appropriate variables in the experiment to be carried out to realize this learning outcomes, and the unrelatedness of the research question and the experiment to be carried out constitute this theme. A pre-service teacher said, “PsT 5: ...I could not match the experiment I was planning to do with any achievement. The experiment was very interesting, I was going to do a full show in the lesson, but I did not know what the students would learn from this experiment.

In the category of method knowledge, there are problems in making the transition between the parts of the course because they do not know the stages of the method. For example, planning to have the lesson do the experiment and explain the subject later, or planning to explain the subjects that are not related to the achievement after the students answer the research question according to the findings obtained in the experiment are examples of problems in this category. The problems experienced in this category were experienced by a pre-service teacher: “PsT 7: I planned my lesson according to the inquiry. I preferred to talk about the subject at the beginning of the lesson.”.

Opinions on the Heuristic Template

After the pre-service teachers' efforts at the planning stage, a template suitable for the heuristic method was introduced. They were asked to try to prepare their plans by using this template. After the planning phase was completed, the opinions of the pre-service teachers about the benefits of the template were received. Opinions were gathered under 2 themes of benefit (Table 2).

Pre-service teachers state that the template is most useful for them to learn the stages of the method. A pre-service teacher expressed this idea as “PsT 12: When I used the template, when I thought about it during my research but couldn't decide exactly what to do where and at what stage, the lesson I wanted to do was exactly planned”. Another pre-service teacher expressed the benefit of the template in this category: “PsT 3: Before this template, there were questions such as where to start and how to associate the parts of the lesson. This template helped plan the lesson correctly.”.

Table 2. Opinions about the Template

Frequency of expressions (n)	Category	Theme
5	Asking a research question	Method Information
3	Hypothesizing	
3	Determining the appropriate experiment	
9	Learning/applying the steps of the method	Pedagogical Knowledge
3	Goal orientation	
7	Time management	
6	Gain/outcome oriented	

In addition, pre-service teachers think that the lesson has reached its goal when they start planning the lesson, taking into account the learning outcome. A pre-service teacher expressed the benefit of the template in this category as “PsT7:... I learned from the template that the outcome and the students should be the same as the comments made at the end of the experiment”.

Asking research questions, establishing hypotheses, determining the outcome, and establishing a relationship between the outcome and the experiment were among the most common problems faced by the pre-service teachers (Table 2). The template, which was prepared by the heuristic approach, helped pre-service teachers in solving these problems. For example, a pre-service teacher said, "PsT 5: I had difficulty in finding the right research question and establishing a hypothesis. I had doubts about where and what to give. I overcame these problems by following the order in the template." Similarly, another pre-service teacher stated, "PsT 9: where the template was most useful to me was that it allowed the student to form hypotheses."

If the usefulness views of the pre-service teachers regarding the problems identified in the research and the template prepared for the solution of these problems are evaluated together; The template, which was prepared according to the heuristic method, was beneficial to the pre-service teachers in the lesson planning process, taking into account the inquiry.

CONCLUSION and DISCUSSION

Considering the responsibilities and workload of teachers inside and outside the school, lesson planning is an important concern for them (Jalongo, Reig & Helterbran, 2007). Effectively planning a lesson, especially in the laboratory, is a task in itself. In teacher training institutions, pre-service teachers are given training on planning instruction and they are asked to plan a lesson successfully. However, studies have shown that preparing lesson plans is also a problem for pre-service teachers (Yalcin - Celik et al. 2017). Similarly, pre-service teachers use the traditional confirmatory method in laboratory courses related to their fields and do not experience different methods such as inquiry. For this reason, conducting a laboratory course by considering the inquiry is a very challenging situation for pre-service teachers. In this context, this study aims to identify the problems experienced by chemistry pre-service teachers during the planning phase of an inquiry-based laboratory lesson and to determine the effectiveness of a template used for solving problems.

According to the research findings, the pre-service teachers stated that they had problems with the knowledge of learning outcomes, the appropriateness of the outcome and experiment, and the appropriateness of the method/strategy. These problems mean that pre-service teachers do not know the importance of learning outcomes in the planning process of a lesson. The process of planning a lesson is a complex one for new teachers (Santoyo & Zhang, 2016). The fact that pre-service teachers tried to conduct the lesson according to a method they did not have much experience with may have prevented them from focusing on the lesson planning process. Thus, they did not focus on the outcome, which is the starting point of the lesson planning phase. The outcome is the starting point in the planning phase of the lesson, it explains where to reach the end of the lesson (Jalongo, Rieg & Helterbran, 2007).

Calderhead (1996) also reported that the planning stage is influenced by teachers' student knowledge, content knowledge, pedagogical knowledge, and curriculum knowledge. Although pre-service teachers have taken pedagogical knowledge courses before this course, they have problems with an inquiry. However, it was helpful

for them to learn the stages of the inquiry with the template they used in the lesson planning process. Unlike traditional approaches, inquiry brings different roles to the teacher. Trainees may not realize these stages and roles without experiencing the inquiry process. As trainees were able to plan their lessons step-by-step using templates, they were able to focus more on the inquiry process during instruction. In their study with pre-service teachers, Zhou and Xu (2017) stated that pre-service teachers' experience of the inquiry process supports their understanding of the inquiry process.

Considering the opinions of the pre-service teachers about the benefits of the lesson plan preparation template, learning the steps of the method and using the time effectively is the most expressed benefit. This means that pre-service teachers were able to understand the necessary steps in an inquiry lesson and plan their lesson in a short time, thanks to the template. Especially for new teachers or pre-service teachers, effective time management during lesson planning and execution is an important problem (Zhou & Xu, 2017). Thanks to the template, pre-service teachers were able to manage the process effectively. The benefits expressed by pre-service teachers regarding the use of templates are related to their awareness of the stages of the inquiry method. The pre-service teachers benefited from considering the outcome by using the template, asking the research question, enabling the students (actually their peers) to form related hypotheses, and choosing the appropriate experiment. In addition, they stated that the heuristic they used helped give importance to the learning outcome and in establishing valid relationships between the learning outcome and the experiment. Another important role of lesson plans is to ensure that the teacher focuses attention on teaching objectives and takes this into account throughout the whole process (Ball, Knobloch & Hoop, 2007; Singh, 2008). From this point of view, it may have emphasized to the pre-service teachers what they should plan the lesson by considering the heuristic lesson used, as it emphasizes the achievement of the lesson.

RECOMMENDATIONS

Pre-service teachers and new teachers take into account many elements (time management, classroom management, concept teaching, teaching method techniques) during their teaching activities, which can sometimes cause them to neglect to follow the lesson plan. However, a lesson plan is important for a teacher, and every teacher needs to plan their lesson to achieve the objectives of the lesson. It is necessary to support new teachers or pre-service teachers in their lesson planning processes. If a course will be held outside of the usual course processes, as in this research, the templates in which the stages of the method are listed may be useful. Assistants who can guide the pre-service teacher to achieve the objectives of the lesson, in which the outcome of the lesson is prioritized, can be useful in the planning phase of the lesson. In this research, a heuristic template was used for an inquiry-based course to be conducted in the laboratory. With this template, the pre-service teacher plans the lesson from the end to the beginning. Similar templates should be prepared by different teaching methods and their effectiveness should be investigated.

ETHICAL TEXT

In this article, the journal writing rules, publication principles, research and publication ethics, and journal ethical rules were followed. The responsibility belongs to the author for any violations that may arise regarding the article. The research was conducted in the fall semester of the 2016-2017 academic year. For this reason, there is no need for ethics committee permission. However, all participants who participated in the research were informed about the research and their permission was obtained.

Author(s) Contribution Rate: The author's contribution to this article is 100 %.

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