

**PRE-SERVICE SOCIAL STUDIES TEACHERS' VIEWS ON DESIGN THINKING APPROACH<sup>1</sup>****Arcan AYDEMİR***Res. Asst., Artvin Çoruh University, arcan.aydemir@hotmail.com**ORCID:000-0001-8110-954X***Turhan ÇETİN***Prof. Dr., Gazi University, cetinturhan@gmail.com**ORCID:0000-0002-2229-5255**Received: 12.09.2018**Accepted: 10.12.2018***ABSTRACT**

Design thinking approach, which focuses on both needs and problems, has been used in the field of education as well as business and management in recent years. Within the scope of this study, design thinking approach was applied to pre-service social studies teachers and then their opinions on the approach were obtained. The study group is composed of pre-service teachers studying in the social studies (n=19) teacher program at Artvin Çoruh University, Faculty of Education. In the study, where qualitative research method was used, focus group interviews were conducted with interviews with pre-service teachers after the implementation. The data were analyzed in descriptive and content analysis. The data were divided into categories and codes and visualized in different ways. As a result of the study, the participants considered design thinking as a method, process and approach, indicated the benefits of the process as to gain experience in design processes, to determine the needs in educational environments, to make practical materials, stated the difficulties as unable to focus on the process and creating content, focused on the skills such as criticizing, multi-dimensional thinking, manual skills while explaining the approach, and explained the difference from other design approach processes as in design thinking the product is designed at the end of the process and mostly need-focused design is created.

**Keywords:** Design thinking approach, social studies, design.

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## INTRODUCTION

Design as a result of any thought emerges towards a purpose and acts as bridge between concept and perception. Design is an important process in obtaining information, which draws attention to important points rather than unnecessary details. The concept of design includes both an integrity in itself and a planning feature in this whole (Şentürk, 2014).

The scope of design determines the target audience. Designs that focus on the whole universe are shaped according to the universal design content. Universal design is the design of space, products and equipment for all people. In a universal design, a single solution is offered to everyone without discriminating individuals. It is also important that the design is usable and accessible (Hacıhasanoğlu, 2003).

Designs are also important for educational (learning-teaching) environments. Well-designed and effectively applied materials allow learning needs to be met, allowing learners to draw their attention and practice. In addition, materials make it easier to understand complex, abstract, and difficult to understand phenomena and events. Thus, they both enrich the educational environment and provide permanent learning (Fer, 2011: 255).

Social studies education, which has an interdisciplinary approach, is the only discipline that includes intangible concepts within its nature (Ulu Kalın, 2011). It is very important to use teaching materials to teach values, skills and concepts in the social studies curriculum. The use of teaching materials in the social studies course coincides with the constructivist approach as it enables the student to participate actively in the process. In addition, the teaching materials used in the social studies lesson are important tools for increasing students' interest in the course by providing permanent learning, increasing the quality of education and embodying abstract information (Örten, Keskin & Ekici, 2013: 70).

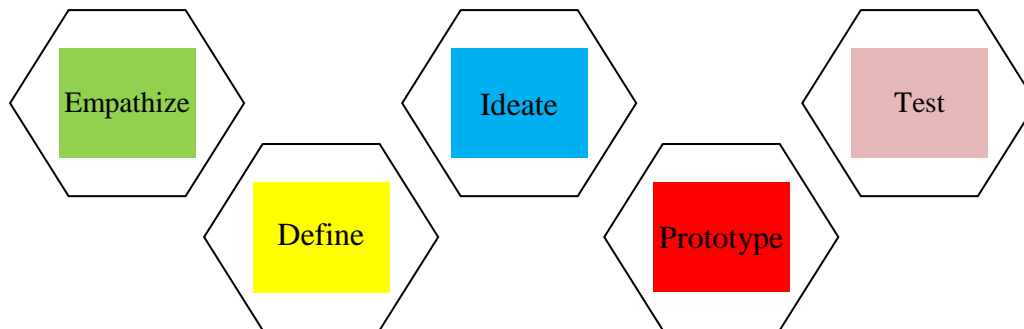
Different design approaches need to be examined to make designs for the social studies course. Design thinking approach focusing on needs and problems is one of them .Design thinking is both a mentality and an approach that is used to produce creative alternatives on human behavior, needs and preferences. (Diefenthaler, Moorhead, Speicher, Bear & Cerminaro, 2017).

Design thinking is an approach that touches everyone's own capacity. The approach, beyond being human centered, treats people in depth (Brown, 2009, p.4). Design thinking is a process that focuses on collecting user-need feedback, experimenting, generating prototype models, gathering feedback, and redesigning in a cyclical way. Design thinking is a way of thinking that was first developed and applied to design tasks (Darbellay, Moody & Lubart, 2017, s.xvii). Designer thinking is a distinctive mental process that manifests itself in the form of shape, configuration, color, pattern, image used for a product, service, process, user experience or organic change (İlipinar, Johnston, Montaña, Spender & Truex, 2011).

The concept of design thinking is a concept used in both theory and practice (Johansson-Sköldberg, Woodilla & Çetinkaya, 2013). Design thinking is a term used to describe how designers approach problem-solving methods.

Design thinking combines discrepancies by using interdisciplinary teams, allowing a balance between work, technical and human dimensions of innovation (Holloway, 2009).

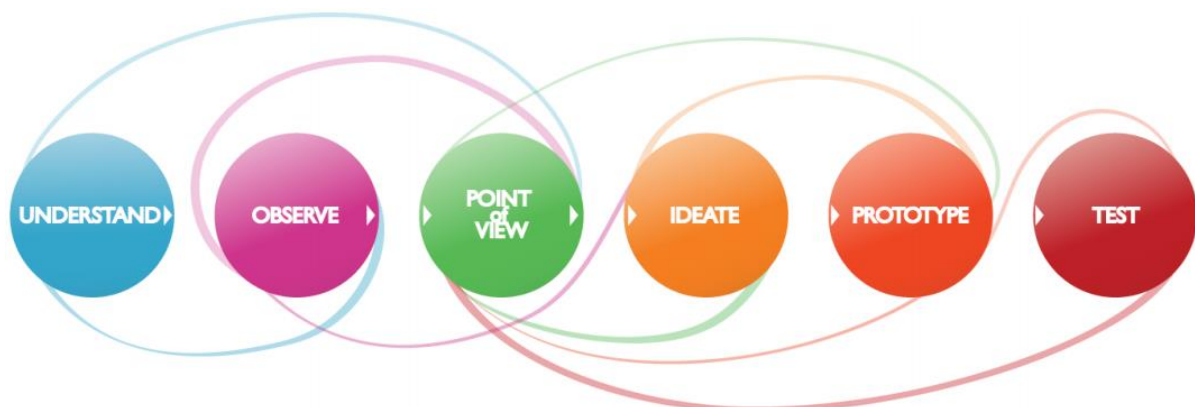
Design thinking consists of several stages and helps to understand the problem (de Souza, Ferreira & Conte, 2017). Stanford University (2014), which provides examples of the design thinking approach, divided the design-oriented thinking stages into five, namely empathy, definition, ideate, prototype and test. Figure 1 shows the stages of Stanford University's design thinking approach (as cited in Reinecke, 2016: 153).



**Figure 1.** Stanford University (2014) Design Thinking Approach Stages (As cited in Reinecke, 2016: 153).

IDEO, is the most important design thinking approach practitioner, has basically divided the approach into five. Accordingly, design thinking approach consists of discovery, interpretation, ideation, experimentation and evolution (Ideo & Riverdale, 2012: 15).

The Hasso Plattner Institute, which takes the design thinking approach into the education program and presents examples of the implementation of the approach, has approached the approach in 6 steps. Figure 2 shows the design thinking approaches used by the Hasso Plattner Institute.



**Figure 2.** Hasso Plattner Institute Repetitive Design Thinking Model

In Figure 2, it is seen that the Hasso Plattner Institute' design thinking process consisting of understand, observe, point of view, ideate, prototype and test stages.

Design thinking is a problem-solving method that relies on skills, processes and mindsets that helps people produce novel solutions to problems. Design thinking can result in new objects, ideas, narratives or systems (Goldman & Kabayadondo, 2017: 3).

### Research Purpose

The main aim of the research is to apply its approach in the field of social studies through explaining the fundamentals of design thinking approach and to reveal the views of the participants about the process experiences and the approach. Within the scope of this aim, this study seeks for answers to following research questions.

- How did pre-service social studies teachers define a design thinking approach?
- What are the difficulties experienced by pre-service social studies teachers?
- What are the opinions of pre-service social studies teachers on the benefits of the approach?

### METHOD

The study is considered as a case study of qualitative research methods. The case study involves an in-depth investigation of one or more cases (Yıldırım ve Şimşek, 2008: 77). In qualitative research the process can be carried out by answering the following questions (Yıldız, 2018: 79-80):

- Which patterns (main themes) or similarities stand out?
- Is there a connection between the identified themes?
- What kind of narrative does themes and relationships bring out?
- Are there any sections in the narratives that need further examination or need additional research?
- What are the situations that conflict with the similarities separated from the patterns?
- Are there any narratives of these contradictions?

In this study, the opinions of the pre-service teachers in the study group about the approach were examined after the design thinking approach was implemented.

### Study Group

The study group was formed on a voluntary basis. In the 2016-2017 academic year, the primary study group of the study was the pre-service teachers studying in the second year of the Social Studies Teacher Education in Artvin Çoruh University, Faculty of Education. Table 1 contains information on pre-service teachers participating in the design thinking process.

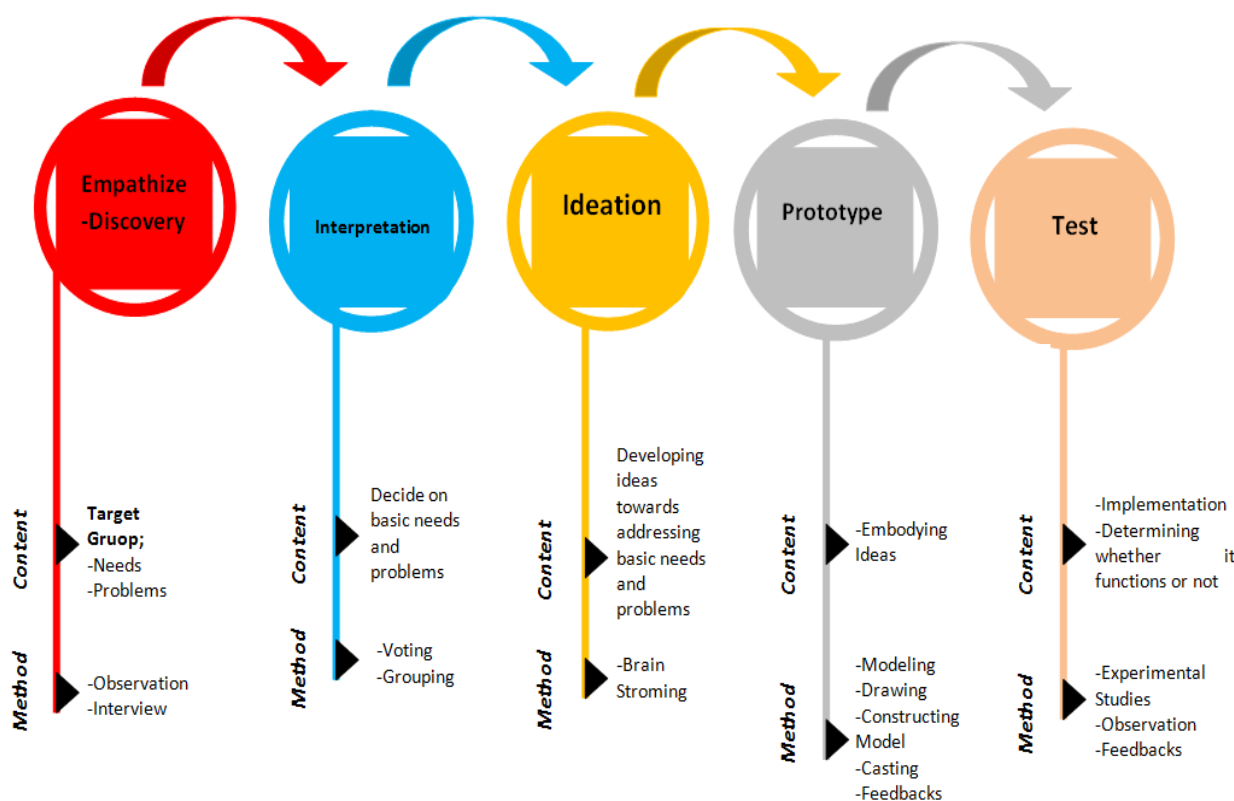
**Table 1.** Findings Related to Participants in the Design Thinking Process

Gender	Age Groups				Total
	21 Years old and Under	Between 22-24 Years old	Between 25-27 Years old	28 Years old and above	
	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>
Female	7	5	1	1	14
Male	4	1	-	-	5
Total	11	6	1	1	19

When Table 1 is examined, it is seen that there are 19 students in total, and 14 were female in the study group.

**Implementation Process**

In the scope of the research, the process shown in Figure 3 was applied to pre-service social studies teacher.



**Figure 3.** Design Thinking Process implemented in the Research Process

In the below, the implementation stages of design thinking within the scope of the study was given in detail.

*Empathize-Discovery*

At this stage, firstly, deficiencies in social studies education and problems are aimed to be determined. For this purpose, the opinions of the pre-service teachers were obtained. Then, the participants made observations in schools, social studies courses, and interviewed social studies teachers and experts in the field of social studies in order to better identify the problem or deficiency.

### *Interpretation*

Experiences and information obtained were shared. After sharing, the needs and problems for the social studies course were determined.

### *Ideation*

At this stage, the ideas about the deficiencies or problems that were decided during the interpretation phase were produced. Brainstorming technique was used in the ideation stage.

### *Prototype*

At this stage, the ideas developed were put into drawings and models. The choices were made according to the level of suitability for the aim. Feedback was received for the created prototypes. Designs were renewed and implemented in schools according to feedback. By observing the implementation phase, the problems were redesigned by identifying the deficiencies.

### *Test*

The test phase was repeated twice. Firstly, the developed products were tested and the deficiencies and problems experienced in the application phase were corrected and then tested again.

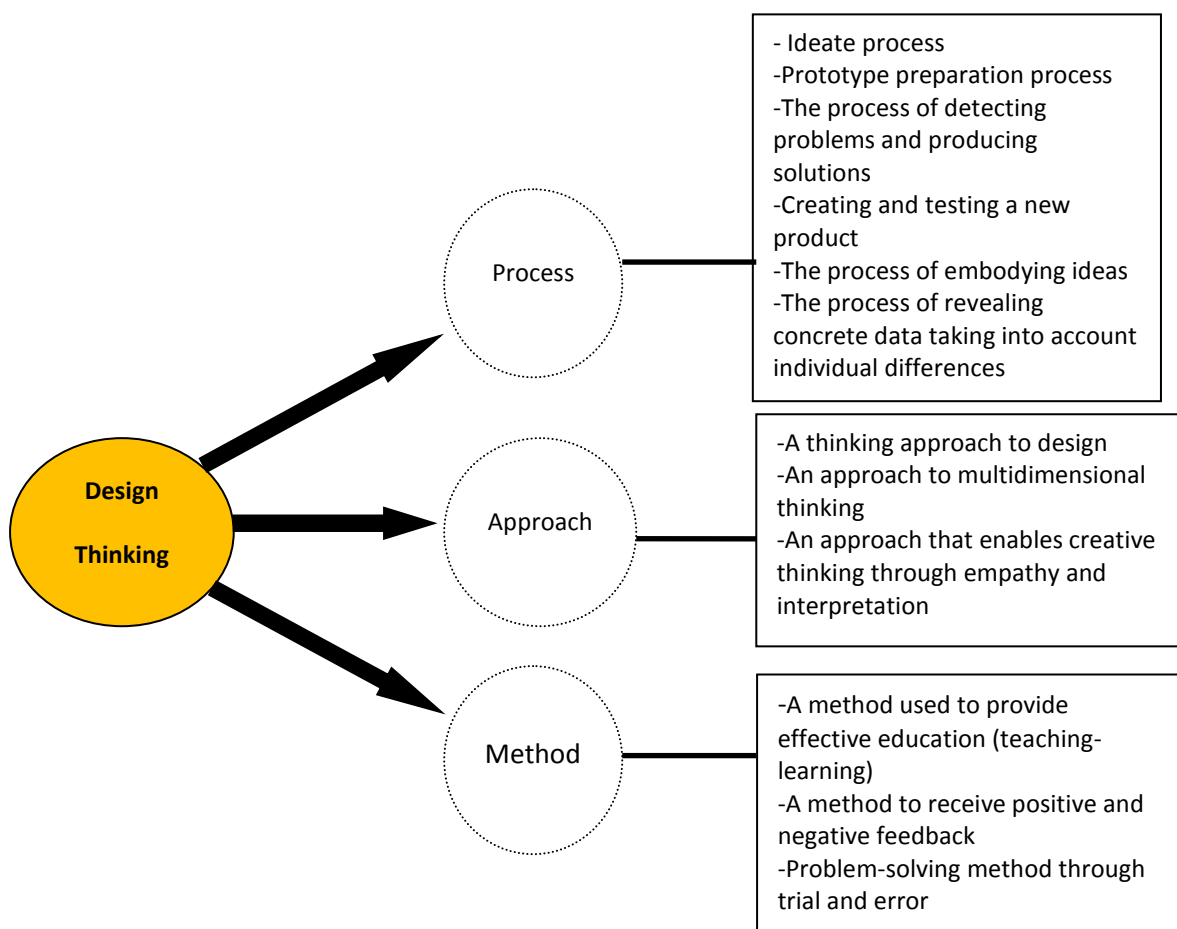
### **Data Collection and Analysis**

Data were collected through focus group interviews, interviews and design thinking perception form. The interview is held with the purpose of eliciting detailed information on the subject being investigated by asking questions to the interviewee about the content. According to the responses given during the interview process, the researcher can add new questions to the process (Aziz, 2011: 86). The focus group interview can be expressed as a planned discussion about a predetermined topic to learn the thoughts of a determined group of participants. (Baş, Çamır & Özmaldar, 2013: 103). The focus group interview was conducted with a total of 7 participants selected from the main study group.

In the analysis of the data, descriptive and content analysis of qualitative data analysis methods were performed. The words used, the contexts in which the responses are given, the consistency of the responses given, the frequency of the responses and the number of the similar responses given by the different people in the analysis of the data obtained as a result of the focus group interview should be noted (Baş, Çamır & Özmaldar, 2013: 109). When analyzing the data obtained as a result of interviews, it is important for the researcher to follow these steps; dividing the data into sub-headings, labeling the subjects according to their characteristics, identifying and interpreting the important findings (Baş, Usta & Uyar, 2013: 116). In this study, the findings obtained after analysis were split into categories and codes.

## FINDINGS (RESULTS)

Within the scope of the research, prospective teachers to whom design thinking approach was applied were asked to define design thinking. Perception form was used in the design thinking definitions of the participants. Design thinking definitions of the participants were examined and codes were formed. The participants were coded as TD-1, TD-2 TD,...., TD-19. In this context, focal points for the type of design thinking in participant definitions were addressed and the codes generated were divided according to such foci. In Figure 4, the definitions of design thinking approach are visualized according to process, approach and method focus.

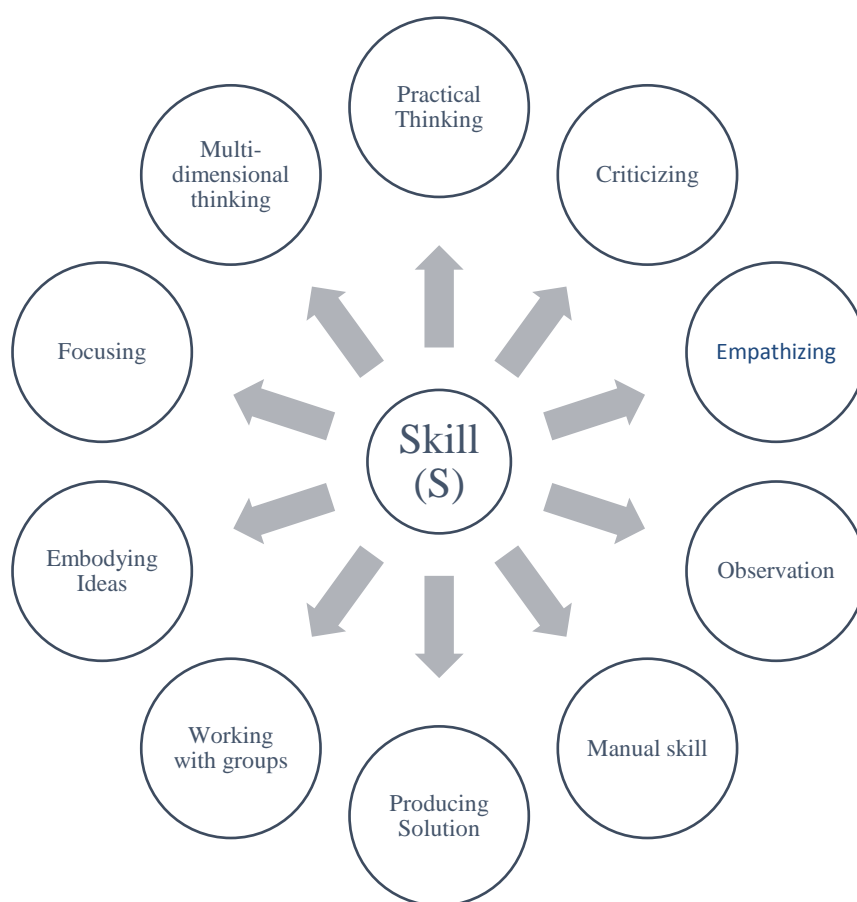


**Figure 4.** Findings related to Design Thinking Definitions

When Figure 4 is examined, it is seen that participants consider design thinking as an approach, method or process. The participants who defined design thinking as process perceived it as the process of ideate, prototype preparation, detecting problems and producing solutions, creating and testing a new product, embodying ideas, revealing concrete data taking into account individual differences; the participants who defined as approach perceived as a thinking approach to design, an approach to multidimensional thinking, an approach that enables creative thinking through empathy and interpretation, the participants who defined as

method perceived the design thinking as a method used to provide effective education (teaching-learning), a method to receive positive and negative feedback and problem-solving method through trial and error.

A focus group interview was conducted with the pre-service teachers who participated in the design thinking process. After the interview, the voice recorded data was transcribed. Some of the codes were deduced from transcriptions and these codes were analyzed according to some categories and tabulated. In the cross-sections of the transcriptions (student views), the emphasis was focused on the skills (S), the benefits of the approach (B), the difficulties in the process (D), and the difference from other approaches (Di). These focuses are symbolized by the expressions in parentheses.



**Figure 5.** Skills Focused by Design Thinking Approach

Figure 5 shows participants' skills expressed in the context of the approach and obtained after focus group interviews with pre-service teachers in the study group. In this respect, it was found that the design thinking process was related with focusing, multidimensional thinking, criticizing, producing solution, working with groups, embodying (concretizing ideas), practical thinking, empathizing, observation and manual skills. Below are sample quotes from the interview in which the data regarding to the skills are obtained during the interview.



For example, I do not normally have manual skills. I am not very skilled at designing things. But at this stage, we have played a lot on the products. We made different changes. In this case, my manual skill is also improved.(TD-5)

S: Manual skills

For example, when we go to an internship, I think we can observe problems in class more easily. Because we have experienced this in this approach. (TD-2)

S:Observation

Figure 6 presents the views on the benefits of design thinking approach.

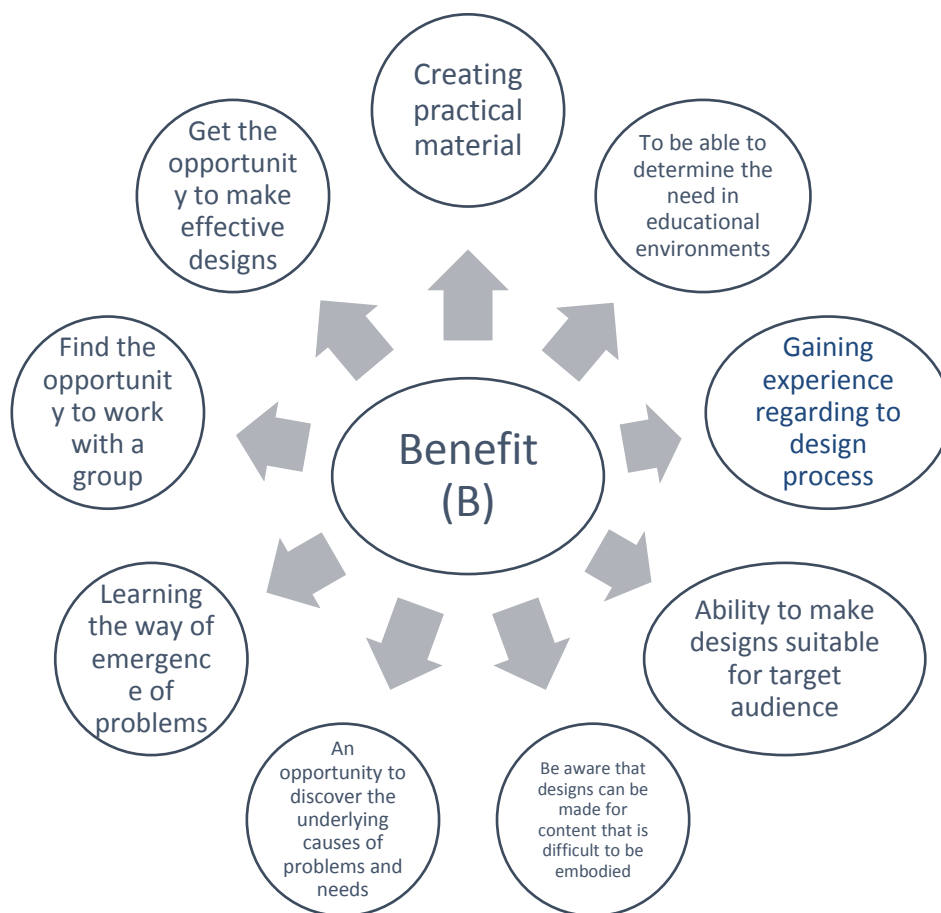


Figure 6. Findings Related to the Benefits of Design Thinking Approach

The examination of Figure 6 shows that the benefits of the design thinking approach expressed by the participants have the opportunity to make effective designs, learning the way of emergence of problems, making designs suitable for target audience, being aware that designs can be made for content that is difficult to be embodied, gaining experience regarding to design process, determining the need in educational environments. Below are some example quotes of students’ views on the benefits of design thinking:

After this process, we took instructional technologies and material design course. One of the most important contributions of this process was to this course. In the process, we learned the concept of design, what to look out for while making designs, who we should think about while designing. This enabled us to make designs in a

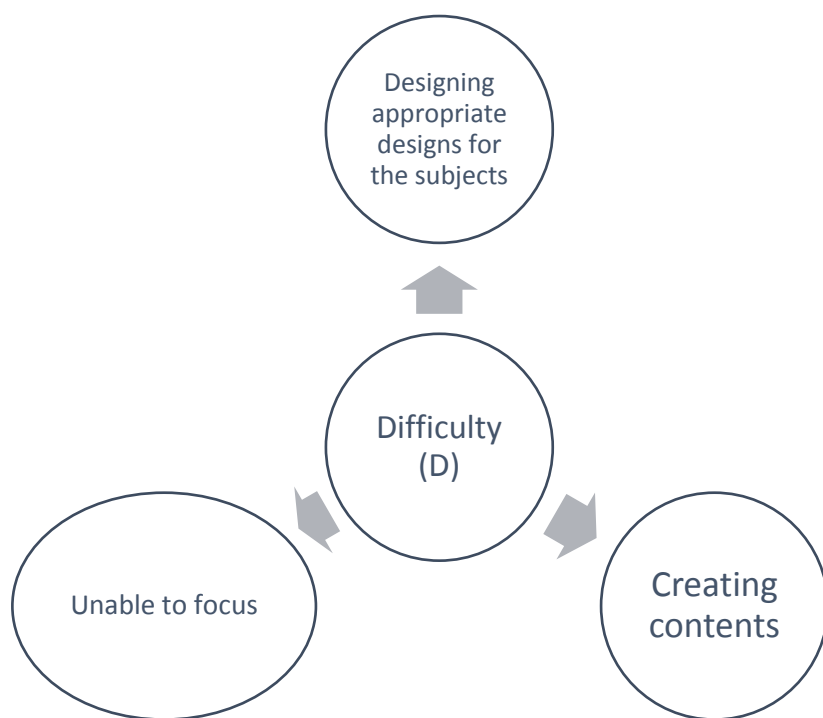
B: Gaining experience regarding to design process

more comfortable way in instructional technologies and material design course than our friends who did not participate in the process. (TD-3)

And we can say that...for example, at the end of the process, we received feedback on our designs. We implemented and observed our designs. We learned about the deficiencies of our designs and what criteria that people are criticizing accordingly. This helped us discover what we need to pay attention to in the products we design in our normal design processes.(TD-4)

**B:** Gaining experience regarding to design process

Figure 7 presents the findings related to the difficulties experienced in the design thinking process.



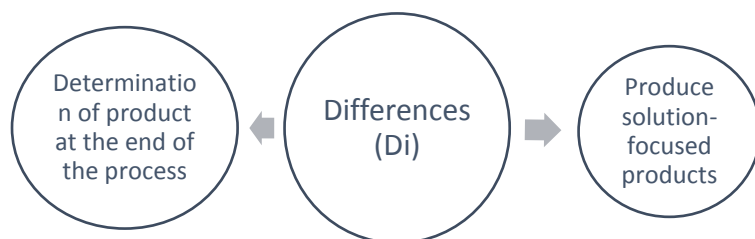
**Figure 7.** Findings related to the Difficulties in the Design Thinking Process

When Figure 7 is examined, it is seen that the participants in the study group had difficulty in focusing on design thinking process, creating content and developing contents that is appropriate for designs. Below is a sample quote of the participant's views on the difficulties in the design thinking process:

*For example, we developed the word forest. We wanted to use the words in the word forest dictionary that evoke unknown words, but we had difficulty in reaching those words. (TD-2)*

**D:** Creating contents

Finally, in Figure 8, there are views about the differences of design-thinking approach from other design processes.



**Figure 8.** Findings Concerning the Differences of Design Thinking Approach from Other Design Processes

When Figure 8 is examined, it is seen that the participants had the opinion that from the perspective of determining the product at the end of the process and producing solution focused products in the design thinking approach make it different from other approaches. Some of the quotes from pre-service teachers' views are given below:

*In a normal design process, the product is determined in advance. The production of this product is very long. But in the design thinking process, the situation is moving in the opposite direction. The process of finding the product is longer in this approach. Many stages passed until the product is found. Design of the product is shorter after the design is decided.*

**Di:** Determination of product at the end of the process

## CONCLUSION and DISCUSSION

The results of the research were grouped according to the definitions, benefits, difficulties in the process and skills focus of the design thinking approach.

As a result of the study, we have concluded that the participants defined design thinking approach as ideation process, prototype preparation process, the process of identifying problems and generating solutions, creating a new product, testing process, the process of embodying ideas, revealing concrete data taking into account individual differences, a thinking approach to design, an approach that enables multidimensional thinking, an approach that enables creative thinking through empathy and interpretation, as a method used to provide effective education (teaching-learning), a method to receive positive and negative feedback and problem-solving method through trial and error. McKilligan, Dhadphale, and Ringholz (2017), as a result of their study that aimed at revealing how the design thinking approach is perceived, found that the managers who were included in the sample and implemented with the design thinking approach considered the approach as a new process of thinking, a systematic way to understand the problem, an activity formed by a series of steps.

Within the scope of the research, it was concluded that the participants who engaged in the implementation in the study group focused on particular skills of criticizing, practical thinking, multidimensional thinking, observation, empathizing and manual skills in their expression on the design thinking approach.

In his study, Ryan (2012) listed the benefits of design-thinking on children as “By providing infinite benefits, it allows you to develop a different perspective and understand the problem.” And “It brings together the subjects taught in various courses and connects the multiple skills.” Kwek (2011) stated that design thinking approach could be used to increase student motivation especially in class. Freimane (2015) concluded that design thinking approach can be successfully applied in schools to solve creative problem solving and students. Sega (2017) argues that as a new problem-solving approach, design thinking approach is a useful approach for small companies and social entrepreneurs to find and identify important problems and produce various solutions. As a result of his study, Cabello Llamas (2015) stated that design thinking process can be a useful tool in creating innovation. In this study, it has been concluded that the design thinking approach has some benefits such as learning the way of emergence of problems, making designs suitable for the target audience, being aware that designs can be made for content that is difficult to be embodied, gaining experience regarding to design process, determining the need in educational environments.

As a result of his study on the application of design-oriented thinking in education, Retna (2016) found that teachers who applied the approach considered design thinking as “unique” and “different” compared to other traditional methods. In addition to this, it was found that some difficulties were experienced during team work and adaptation to the process. Within the scope of the research, the difficulties experienced in the design thinking process were found as not being able to focus on the process, creating designs that is appropriate for the determined content and developing design contents.

The difference between the other design processes and the design thinking is determined as in design thinking, the product is determined at the end of the process and it places more emphasis on producing solution focused.

## SUGGESTIONS

Design thinking approach, which is a need and problem-focused approach, can be used more frequently in teaching-learning environments; and it can be effective in determining and eliminating the needs and problems in educational environments. In this context, design thinking approach can be applied within the scope of courses in teacher training programs in higher education institutions as well as courses in secondary schools. By creating design workshops in schools, a design thinking approach can be prepared for the implementation of the process. It can also be used under the leadership of the school principal to provide solutions to school problems.

Also, both project implementers and project executives can effectively use design thinking approach in addressing human needs and problems.

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