Reflections of Doctoral Students' Creative Thinking Skills on Their Dissertation Preparation Process

Doktora Öğrencilerinin Yaratıcı Düşünme Becerilerinin Tez Hazırlama Süreçlerine Yansımaları

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Abstract: The importance attached to graduate education is increasing to meet the demands of preparing qualified manpower. Training researchers aims to build the skill sets of mastering scientific research and critical thinking, being an expert in a field while generating and grasping knowledge. Additionally, creative thinking skills are highly valued in producing original and authentic studies. In this respect, dissertations (for PhD) are reported to include more of these skill sets compared to the theses (for MSc). This research aims to examine how creative thinking skills of doctoral students are reflected in their dissertation preparation process. This case study investigates these processes experienced by five doctoral students who are in the stage of dissertation proposal submission. With a semi-structured interview, their reflection on their use of creative thinking skills in dissertation processes are comprehensively analyzed. It is concluded that these students utilize various strategies to produce original work by integrating creative thinking skills such as fluency, flexibility, elaboration, combinational and exploratory creativity to their dissertation processes. At the same time, personal, environmental, financial, and implementation related challenges that would adversely affect their creative thinking skills are reported along with the approaches of their advisors towards the originality and limitations of dissertations.

Keywords: PhD studies, Dissertation, Creativity, Creative thinking, Originality

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Öz: Günümüzde ülkelerin nitelikli insan gücü yetiştirme stratejileri doğrultusunda lisansüstü eğitime verilen önem giderek artmaktadır. Bilim insanı yetiştirme süreci, bilimsel araştırma ve eleştirel düşünme yeteneklerini geliştirme, bir alanda uzmanlaşma ve bilgi üretme konularında beceriler kazandırmayı amaçlamaktadır. Aynı zamanda yaratıcı düşünme becerileri, özgün ve gerçek çalışmalar üretmede büyük bir öneme sahiptir. Bu doğrultuda, yüksek lisans tezlerinden çok doktora tezlerinden büyük bir beklentinin olduğu alanyazında belirtilmektedir. Bu araştırma, doktora öğrencilerinin yaratıcı düşünme becerilerinin tez hazırlık süreçlerine nasıl yansıdığının incelenmesini amaçlamaktadır. Nitel araştırma yöntemlerinden durum çalışması yönteminin kullanıldığı araştırmada, bir devlet üniversitesinde doktora eğitimi alan ve tez önerisini henüz vermiş 5 doktora öğrencisi ile çalışılmıştır. Öğrencilerin yaratıcı düşünme becerilerini tez hazırlık süreçlerine yansıtmalarının belirlenmesi amacıyla yarı yapılandırılmış görüşme formu kullanılmış, bu sayede süreç hakkında derinlemesine bilgi alınabilmiştir. Araştırma sonucunda öğrencilerin, akıcılık, esneklik, ayrıntılandırma, birleştirici ve keşfedici yaratıcılık gibi becerileri tez hazırlık süreçlerine entegre ederek özgün çalışmalar üretmek için çeşitli stratejiler kullandıkları sonucuna ulaşılmıştır. Aynı zamanda, kişisel, çevresel, mali ve uygulamaya yönelik zorluklar da rapor edilmiş, bu zorlukların öğrencilerin yaratıcı düşünme becerilerini olumsuz etkileyebileceği belirtilmiştir. Öğrencilerin danışmanlarının, tezlerin orijinalliğine ve sınırlılıklarına yönelik nasıl bir tutum sergilediklerine yönelik sonuçlara da yer verilmiştir.

Anahtar Kelimeler: Doktora çalışmaları, Tez, Yaratıcılık, Yaratıcı düşünme, Orijinallik

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1. INTRODUCTION

Creativity is generally associated with fine arts such as painting, sculpture, music, poetry; however, creativity should not be limited to arts. Creativity stands as an indispensable part of our being despite our awareness and is integral to every area of our lives. For instance, creativity and creative thinking skills can be observed in the field of science. While scientific advances depend on conceptual and technological advances, they also depend on scientists' ability to generate new insights or ideas, that is, their creativity (Neumann, 2007). According to Feist (2011), if science did not have creative ideas and creative solutions, it would not coexist with art.

Truran (2016) points out that we focus on teaching graduate students research methodology, scientific reasoning, and skills such as evaluating evidence. Lecturers even serve as role models for their students in teaching these skills. However, as Truran (2016) points out, teaching the processes of generating new ideas, hypotheses, and theories is not as generous as the technical skills related to research methodology, such as designing experiments, which statistical methods to use, and how to write a paper. Truran (2016) states that graduate students learn how to conduct research professionally by establishing an apprentice/master relationship with a researcher or advisor and gain the competencies and attitudes necessary for successful scientific research; he also draws attention to the fact that in this process, they "unwittingly" experience the skills that are not included in the textbooks by watching and doing. In this process, not every graduate student may be lucky enough to find guidance on conducting "original" research. However, prospective researchers need to develop creative thinking skills to formulate new and interesting hypotheses and even develop new experimental techniques.

Scientific research follows its own rules and systematically functioning processes. While a research process is gradual and chronological, it is also an iterative chain that accumulates learning and knowledge (Aaltio, 2009). Critical thinking attracts a significant amount of attention in scientific studies; on the other hand, creative thinking is not respected in the same manner. This may arise due to the rational and systematic nature of critical thinking and scientific studies. In this direction, Gallo (1994) states that the polarization of critical and creative thinking will be misleading and the contribution of critical processes necessary for creative production and the importance of creative processes essential for critical thinking will be hindered. Brodin and Frick (2011) argue that the development of scientific thinking can be supported by integrating critical thinking and creative thinking without differentiating them. Creative thinking complements the coherent, logical, and analytical powers of critical thinking (DiYanni, 2015).

Creativity shapes the foundation of research in any field (Ulibarri, Cravens, Svetina Nabergoj, Kernbach, & Royalty, 2019). The prerequisites for a creative scientific work can be listed as new, original, and notable (Simonton, 2004). Scientists target to create innovative and socially acceptable work (Ziman, 2000) that places originality/authenticity in a unique position. Originality stays at the core of academic studies and forms the primary component (Şuteu, 2022). Conducting original research challenges the researchers to be aware of originality and know how to make their research distinctive. Since the manuscripts are evaluated in terms of originality, this trait can contribute to plagiarism prevention. Authenticity, illustrating the uniqueness of work, does not meet the criteria of originality if the researchers insert ideas and work of others in their research without attribution (Phillips & Pugh, 2010). In addition, ethical regulations can sometimes cause scholars to carry out less challenging research (Gelling & Rodríguez-Borrego, 2014) that will produce risk-averse researchers to be unsatisfactory in terms of originality.

Runco, Illies, and Eisenman (2005) point out that originality is essential to creativity; however, creative work encompasses more than originality. Hence, seeking originality in all scientific studies, either articles or dissertation research, requires maintaining creative thinking skills such as fluency, flexibility, and

elaboration. Guilford (1973) summarizes that research studies of artists, writers, scientists, and creative adults reveal fifteen different characteristics including flexibility, fluency, elaboration, and originality.

1.1. Creativity and Creative Thinking Skills

Although creativity has been researched comprehensively, Guilford points out the need to conduct more research on creativity and suggests methods and assessments to measure creativity (Weisberg, 2020). Grounded in the research outcomes, the standard definition of creativity covers both originality and effectiveness (relevance) (Runco & Jaeger, 2012). Creativity is signified not only at the individual but also social levels for various task areas (Sternberg, 2003, p.89). Boden (2004) defines creativity as the ability to come up with new, unexpected, and valuable ideas or works, and classified creativity as; combinational creativity, making unusual combinations of familiar ideas; exploratory creativity, exploring a field to create a new and unexpected idea; transformational creativity allowing changes in the rules of the conceptual field.

Creativity includes both performance-based and mental activities (Doğan, 2020). For this reason, mentally engaging activities that require creative thinking form an essential part of creativity. For example, a product, an idea, or thought can be creative resulting from creative thinking function. Creative thinking establishes a relationship between ideas or objects that have not been previously related (Üstündağ, 2020). The Australian Council for Educational Research (ACER, 2020) defines creative thinking as "the capacity to generate many different kinds of ideas, manipulate ideas in unusual ways, and make unconventional connections in order to novel possibilities that have the potential to elegantly meet a given purpose" (Ramalingam, Anderson, Duckworth, Scoular, & Heard, 2020). Ingledew's (2016) definition highlights the process of generating pioneering theories, and the possibility of development of innovative things and solutions to seemingly impenetrable problems. Likewise, creative thinking correlates to the development of problem recognition and solution proposals (Ulibarri et al., 2019, p. 2). In this direction, according to Yıldırım (2007), creative thinking is the ability of an individual to grasp a problem by means of imagination, mental visualization, assumption generation, and then to reveal a different view or concept by using applicable traditional or new aspects.

Torrance (1972), developed the Tests of Creative Thinking based on the work of Guilford, applied fluency (number of relevant responses), flexibility (various response categories), originality (authenticity), and elaboration (the number of details used to describe how ideas are executed) in the test measurement. Torrance (2002) declares that creative thinking represents an effective step towards the unknown in a manner where one idea leads to another with typically an element of surprise or unexpectedness; so, it incorporates inventiveness, discovery, curiosity, and experimentation.

1.2. Doctoral Education and Creative Thinking

Doctoral education prepares individuals to be researchers with expertise in their fields (LaPidus, 1997). According to the first article of the Salzburg principles published by the European University Association (2010), the aim of doctoral education is underscored as "to cultivate the research mindset, to nurture flexibility of thought, creativity and intellectual autonomy through an original, concrete research project". At the same time, these principles point out that the credit system for undergraduate and graduate students does not work as a prerequisite for doctoral programs; high-quality doctoral education needs a stimulating research environment in the supervision of curiosity, passion for research and creativity rather than rigid credit systems. According to the Turkish Official Gazette (2016, 20 April, no: 29690), doctoral programs help students "gain the required skills to conduct independent research, interpret, analyze and reach new syntheses by analyzing scientific problems and data with a broad and deep viewpoint".

The prominence of innovation in doctoral education validates the presence of creative thinking skills in this process. Creativity in doctoral education can be observed in the stages such as identifying the research problem, deciding appropriate approaches to investigate the problem, collecting, and analyzing data constitute a part of the creative process (Dewett et al., 2005). It can also be seen in creative products such as

doctoral dissertations, peer-reviewed journal articles, book chapters, and conference proceedings (Frick, 2011). Dissertation remains to be the central element of any doctoral program; they are mainly original research projects that are planned, conducted, and written by graduate students (Seligman, 2012). Altbach (2007) underlines the aim of doctoral dissertations as making a new contribution to science and discipline with original exploration. The importance attached to dissertations as stated in the Turkish Official Gazette (2016, 20 April, no: 29690) specifies that "Dissertations must fulfill at least one of the qualities of bringing innovation to science, developing a new-found scientific method, and applying a known method to a novel field.".

Doctoral education is expected to make an original contribution to knowledge in a broad sense (Brabazon, 2020). Frick (2011) emphasizes the nature of doctoral study to make a creative effort in which the student impacts by expanding the knowledge boundaries of a particular discipline. To Denicolo (2003), the original influence on knowledge needs to be decent enough to be published that would expand the discipline. Finn (2005) considers doctorate students to have the ability to independently carry out original research in their own discipline and to make an original contribution to knowledge. In addition, Gelling and Rodríguez-Borrego (2014) put emphasis on the role of doctoral research in all disciplines, and the requirement from doctoral students to be able to confirm how they integrate innovative expertise.

Considering the requirement of generating original knowledge, doctoral education is inherently risky due to the novelty aspect fundamental to the topic selection (Baptista, Frick, Holley, Remmik, & Tesch, 2015). Students might prefer the safest option to avoid the risks and pursue studies that lack surprise, complexity, innovation, or originality (Petre & Rugg 2010). Another potential issue for students who take the risk lies in evaluating the originality of their work. At the same time, not only the students, but also the advisors and dissertation jury members may struggle in evaluating the originality of doctoral dissertations. Accordingly, Phillips and Pugh (2010, p. 69) determined 18-items criteria to evaluate originality. Some of these criteria are as follows:

- *"Setting down a major piece of information in writing for the first time.*

- *Continuing a previously original piece of work.*

- *Bringing new evidence to bear on an old issue.*

- *Taking a particular technique and applying it in a new area.*

- *Making a synthesis of things that haven't been put together before.*

- *Trying out something in this country that has previously done only elsewhere.*

- *Carrying out empirical work that hasn't been done before.*

- *Being cross-disciplinary and using different methodologies."*

Many countries list creative thinking as a required skill for doctoral students. For instance, some schools offer training to improve the creativity of doctoral students. The University of Nottingham (n.d) declared that a common criterion in graduate research is to produce 'original work that makes a significant contribution to the field', and exploratory thinking in this process can support confidence and willingness to take risks when developing ideas. The University of the Arts (n.d) invites students from programs such as science, medicine, engineering, social sciences to its 'PhD in Creativity' program. It intends to expand the creative thinking skills of graduate students for their further studies. All in all, based on the views of faculty members and doctoral students, Karadağ and Özdemir (2017) declare active practice of creative thinking skills to be required from doctoral education.

The procedures for dissertation preparation, and the unified creativity are largely evaluated based only on originality. Still, not only originality but also fluency, flexibility and elaboration dimensions of creativity can be utilized while working on the literature review, methodology, and conceptual framework. In addition, various types of creativity such as exploratory creativity and scientific creativity can be observed during these processes.

Significance of the Research

This study is important in terms of understanding the creativity of doctoral students and their creative thinking skills in dissertation preparation processes, thus encouraging the creativity of future researchers, and supporting them to contribute to scientific discoveries. In the research, sub-skills including creative thinking skills are also addressed. When the literature is reviewed, it is seen that only the originality dimension of these skills has been examined comprehensively in studies dealing with doctoral students and creative thinking. These are the skills that have not been studied comprehensively except for the originality. This study is unique in terms of addressing other dimensions of creative thinking. At the same time, it is important because it presents the perspectives of doctoral students regarding the expectation of more originality in doctoral studies than master's studies. With this different perspective, this research will contribute to the literature.

Aim of the Research

This study aims to explore the potential creative contributions of doctoral students, and the way they reflect their creative thinking skills in their dissertation preparation processes. These reflections are analyzed in terms of fluency, flexibility, elaboration, combinational creativity, exploratory creativity, and transformational creativity.

2. METHOD

2.1. Research Design

This case study aims to establish the situation of doctoral students reflecting their creative thinking skills in their dissertation preparation processes. As a qualitative approach, the case study collects and reveals in-depth information about real life, a situation, or multiple situations in a certain time using multiple sources of information (e.g., observations, interviews) (Creswell, 2021). According to Yin (2009), the exploratory case study strategy complies with the purpose of the research as to answer the "what" question. Accordingly, this study applied an exploratory case study strategy to discover the aspects of student reflection about their creative thinking skills to the dissertation preparation processes.

2.2. Study Group

The research was carried out with five graduate students pursuing their doctoral education at the Program of Computer Education and Instructional Technology in Gazi University. The sample of the research conform criterion sampling method that seeks to meet a set of predetermined criteria (Yıldırım & Şimşek, 2018). The principle applied in selecting the doctoral students was choosing those who have recently submitted or are about to submit their dissertation proposal. At the same time, with the convenient sampling method, fast and easy access to sampling (Patton, 2018) was achieved.

2.3. Data Collection Instruments

Data were collected using a semi-structured interview form as the data collection instrument. The form consists of four open-ended questions and was prepared by the researchers to enable doctoral students' self-evaluation of creative thinking skills during their dissertation preparation processes. In addition to the four questions, the form includes some additional questions. During the preparation of the form, opinions were gathered from two field experts with doctorate degrees in the Program of Computer Education and Instructional Technology who worked on creative thinking in their master's theses. The semi-structured interview form was revised in line with the feedback received from the experts. The interview form was

piloted with one student from the target group, and the form was finalized by considering their answers. The semi-structured interview form provided data for in-depth-analysis. Throughout the study, the researchers avoided personal judgments by excluding subjective evaluations and maintaining objectivity.

2.4. Data Collection

While collecting data, interviews were conducted with the five doctoral students who were in the dissertation preparation stage and who volunteered to participate in the research. The data were collected using the semi-structured interview form during the virtual interviews. Each doctoral student was interviewed using Google Meet platform and these interviews were recorded. Care was taken to avoid data loss in the interviews recorded with a voice recorder. Before the interview, permission was obtained from the participants to record the interviews with a voice recorder.

2.5. Data Analysis

NVIVO qualitative data analysis software was used in the analysis of the data. The research data applied the theoretical thematic analysis approach that allows researchers to analyze in line with their theoretical or analytical preferences in the field (Braun & Clarke, 2013). Henceforward, in addition to Torrance's (1972) creative thinking skills of originality, fluency, flexibility, and elaboration, Torrance's (2002) additional skills such as resourcefulness, exploration, curiosity along with Boden's (2004) combinational, exploratory, and transformational creativity types shaped the framework of the research, and themes were formed in this direction.

The codes produced by the researchers were organized under seven themes that are grounded in theoretical thematic analysis. In the practice of classifying the coding to form the themes, the researchers resolved the inconsistencies by discussion and negotiation. The codes were revised until consensus was reached. The procedure is followed by seeking advice from a field expert to finalize the coding and themes.

2.6. Ethical Approval

In this study, all the rules stated in the "Higher Education Institutions Scientific Research and Publication Ethics Guidelines" were strictly followed. None of the actions specified under the section titled "Actions Contrary to Scientific Research and Publication Ethics" in the guidelines were carried out.

Ethics Committee Approval Information

Ethical committee: Gazi University Research Ethics Committee

Data of ethical approval: 25.03.2022

The number of ethical approval: E-77082166-604.01.02-321412

3. RESULTS

The findings obtained through the semi-structured interview were presented in sub-headings by the dimensions of originality/authenticity, fluency, flexibility, elaboration, combinational creativity, exploratory creativity, and transformational creativity. In addition, sub-themes of advisor and challenges emerged in line with the data obtained from the analysis, and these sub-themes were gathered under the general creativity theme. In the presentation of the findings, quotations were made from the views of doctoral students. In the excerpts from the interviews, numbers were given to the doctoral students according to the order of the interviews (DS1, DS2, DS3... etc.), and this numbering was used.

3.1 Originality/Authenticity

The theme of Originality/Authenticity includes doctoral students' reflections on originality in their dissertation preparation process and their perception of originality. Each student stated that they are concerned about the originality of their doctoral dissertations. The third doctoral student (DS3) expressed the reason for the integration of originality as 'the dissertation is a serious piece of work'; "The focus of study, what it tries to examine, and if there is a real deficiency related to the field, it is necessary to close this deficiency with proper and correct information or to give direction to it. Actually, it is helpful to provide some guidance and sources for future research. Authenticity is very important in this respect." They further emphasized the importance of doctoral education in terms of being solid, filling the gap and shedding light on future studies. DS4, on the other hand, pointed out the meaning of the originality for dissertation as to make a difference.

The doctoral students stated that the originality/authenticity of the dissertations can be evaluated in distinct dimensions. The first of these is listed as innovation. DS4 expressed their opinion as "An original dissertation, to be able to reveal an original topic that has not been researched or studied before, or to be able to bring a solution to a problem or reveal a problem... But for example, only one aspect has been looked at, so it is different, so it does not seem original to me, how can I say, success has been studied, so I'll look at motivation, frankly, it doesn't add a lot of originality to me. I don't know how correct it is to say that it has never been studied, but it has never been used... There may be originality in studying a different aspect of a common issue, but...". The originality of a dissertation is believed to be determined in terms of the fact that it has not been studied before, that the problem has not been addressed. S/he expressed that considering a different dimension of a topic may similarly be appropriate in this context; however, if the topic is the same with separate variables, it cannot be considered original. Similarly, DS1 mentioned that "... some studies with a title called satisfaction in distance education, have been done; you know, a random example...here, they carried out a study with a hundred people at an A university. They state that if I do the same work with two thousand people, the work is not original, but it becomes more valid." They pointed out that exploring the identical topic with various samples does not yield to original work but recognized as more valid. DS2, on the other hand, argued that "Now, when we say originality, originality is not to produce something from scratch, it is to bring together things that exist in different places...". Unlike DS4's views, producing work from scratch is not taken as original, and merging existing work matters more. From a different point of view, DS3 specified that eliminating the limitations can add originality "At least, as I understand it, there is a defect in the field rather than the subject, and I think that the topics that have not been studied before but that have been studied but have limitations in any way, actually fall into the category of originality". DS1 underlined the applicability of a dissertation to be original "If it will work in practice, putting it into practice, that is, being applicable, actually ensures its originality and applicability". The participants further identified originality in terms of problem and solution, problem identification, solution proposal, contribution to the literature, integration of conflicts, added value from yourself, recognition of unattainability that is subject to change according to the field.

DS1 expressed their contentment for the fact that their dissertation was original "But right now, since it is one of the issues that creates a big problem in the Covid period, it makes me happy that my dissertation is original." The issue of originality is risky and can be discussed in a multidimensional way that they as "I mean, the issue of originality is a bit risky, it is also important how original it is, it can be discussed in many dimensions; is it original in its topic or its ability to meet the need." On the other hand, DS5 indicated that "...freedom now increases your research area, it leads to searching more sources in your research area; more literature review may lead to complete a more original thesis or project as a result,". Freedom and originality are seen directly related. DS4 mentioned that originality can be understood as long as you know the specifics "You know, originality is something that can be understood as you get into the work and know the details". DS2 said, "...that is, the doctorate shows that you are competent and expert in a sense, and you need to present a synthesis-level study in that field as well. In order for this to reach the level of synthesis, it should be as original as possible." They emphasized that originality demands synthesis.

The students stated that they mostly benefited from literature review, training, and the opinions of their qualified teachers and friends in order for their doctoral theses to be original. In this direction, DS3 explained "For example, our instructors had directives in the master's degree; say, in the seminar course, we were told about the areas that need more studies. The instructors were pointing out the international work that our country lacks. In fact, I benefited a lot from the seminar course both in the master's degree and in the doctorate, as well as the lectures of my other professors.". DS2 stated his views as "We try to read as much work as possible on the topic, and to catch up on the unspecified points". While delving into the literature for an original study, they were pursuing unexplored topics, examining trend studies, researching latest topics, surveying national and international literature, and seeking directly related or distinct subject matter in a chain manner.

Students agreed that a dissertation is projected to be more original than a master's thesis. Hence, DS3 clarified his opinion "Master's degree is actually a bit more academically warm-up phase, how you determine the research, how to do the research, what criteria to follow for this; what you learn is actually a kind of walking, similar to a baby crawling before walking."

3.2 Fluency

Fluency occurs at various stages of dissertation preparation processes; for instance, the stage of determining the variables. In general, students explained that they used 2-3, 3, 3-4 variables in their dissertation. DS4 contrasted stating that "...when we look at the research, I did not see at least two or three or four in the thesis. I guess it is scarce, but the average three variables were looked at...the three variables seemed much more comprehensive, I did not know whether to consider it less; it depends on the topic, maybe it depends on the weight." They stated that in establishing the number of variables, he imitated the previous theses and believed that three variables were standard, and in the case of fewer variables, it may vary according to the topic of the thesis and the weight of the variable. DS5 argued that "We took as many variables for our purpose as we put forward in our problem; that is, our limitation is directly proportional to the problem, the problem statement, and our aim", and stated that they limited the number of variables depending on the problem and purpose of his dissertation. Some of the students justified not applying any restrictions on the number of variables while defining the variables.

Another fluency integrated procedure is the formation of the conceptual framework. DS1 said "Now, there are keywords related to the subject in the conceptual framework, distance education; there are terms such as e-learning under it... Therefore, it is a conceptual framework from general to specific. Here is distance education, what is distance education, then e-learning. What does the subject bring to me? The flow goes from general to specific till it reaches my research dimension." They stated that organized and defined the concepts from general to specific, while preparing the conceptual framework of his dissertation. DS5 explained "Of course, I keep the conceptual framework quite wide, and I have to keep it wide... Therefore, yes, I have a very broad conceptualization, I have a broad concept. For example, gamification is a concept itself. The history of gamification, its philosophy, models, accepted models, work done. I mean, at least four or five topics can be explored." They mentioned that at least four or five headings can be studied by keeping the conceptual framework broad.

3.3 Flexibility

For this dimension, the integration of interdisciplinary/multidisciplinary/transdisciplinary studies in dissertation preparation processes and the extent of flexibility applied need consideration. Most of the students indicated applying an interdisciplinary approach in their studies. Only one student singled out by having worked on a single discipline, while two students stated that they merged interdisciplinary and multidisciplinary approaches. In this direction, DS3 described their work as "I think it is an

interdisciplinary study. But right now, I can't say for sure. I need to make some progress to say this...", "...I think it will both contribute to the field and give people an idea about how to work with different disciplines when it is interdisciplinary." While the student is not sure about the state of interdisciplinary for his work, they find it beneficial to conduct an interdisciplinary study. DS5 explained that the outcome of the current procedure will yield either to an interdisciplinary or transdisciplinary work.

The dissertation preparation process illustrates that, unlike interdisciplinary or transdisciplinary work, flexibility as well as fluency can be reflected in the process while defining the conceptual framework and variables. For example, DS1 explained "I think my concept map is really broad, because my position covers both the process and the cognitive load. It actually touches on design principles and also refers to multimedia, and also deals with their applicability in the same way. You know, what can be done not only in theory but also in practice, and how is the situation in Turkey, how is it in the world." Based on their views, they reflect flexible thinking skills by covering several topics providing the breadth of the conceptual framework of their work both theoretically and practically. At the same time, according to DS1 accommodating the variable plays a significant role in establishing the topic "You know, I just wanted to study a different variable, but I didn't let this variable included in my dissertation... I actually adjusted in the way I needed to research whatever the topic brings. You know, for example there are terms like digital fluency, I would love to study them. But frankly, it doesn't seem right for me to say that I will study digital fluency and determine the topic according to it." DS4, on the other hand, clarified that they did not experience any limitations during the topic identification stage. Though they have not yet finalized the topic, they can benefit from flexibility in this process: "Hmmm, I haven't actually determined the topics of research in that sense... I can benefit from the flexibility provided by BİLSEM, that is, the education of the gifted. You know, I can combine different subjects, not just the subject of a unit in a regular school, I honestly think I can be more flexible".

About flexibility during the dissertation preparation DS5 underlines the role of freedom "...freedom now increases your research area, it leads to searching more sources in your research area; more literature review may lead to complete a more original thesis or project as a result," They state that it provides flexibility and thus can be effective in organizing original theses and projects.

3.4 Elaboration

Elaboration incorporates the strategies doctoral students apply to detail dissertation topics, conceptual frameworks, and variables at different stages during the dissertation preparation. One of the conventional ways for enriching the conceptual framework of dissertation is found to be the literature review. Accordingly, DS4 asserted to have used theses and international scholarly work, particularly in the design of the conceptual framework: "In fact, I formed the conceptual framework using international sources, mostly from the dissertation archives". In addition, DS5 stated seeking similar studies "After identifying the problem, of course I reviewed the similar studies in the literature.". DS2 pointed out the use of bibliography "While reviewing the literature, I checked the references of similar works and accessed them". At the same time, the students listed books as a primary resource, and they reported to have followed a flow from general to specific.

The doctoral students applied branching whilst forming the conceptual framework. DS1 described the method as "It turns out that when brainstorming the topics, I keep adding more topics to cover. In the end, my advisor and I discussed to limit the scope". Another commonly used method is coding-content analysis as explained by DS5 as "...I read the literature as if I was doing a qualitative study. There is a method that is carried out by coding in a qualitative study: content analysis. I'm coding and grouping the content I read, this goes under this and this, etc...." and DS3 added "... for content analysis, I created a table that includes data about the rationale of the study, its methodology, variables, limitations, and the research questions". Additionally, doctoral students elaborated their conceptual framework by consulting expert opinions. DS5 stated that "Your research topic may not be entirely found in the literature. You may not find that topic. Then, expert opinions are very crucial...". In addition to the expert opinion, students ask for help from their

friends. At the same time, students described various strategies such as courses-homework-projects, trainings, proficiency exam, and applicability of work.

In the course of deciding the variables, the students stated that they described their variables based on the problem, mostly centered on the literature, and they chose the variables that were interconnected to one another.

3.5 Combinational Creativity

Regarding the theme of combinational creativity, DS2 described "I'm coding the content I read, I try to see them all together, like this one, that one, and so on. Then, I try to identify other codes that can match the similarities, differences, and variations in them, and then I try to merge them." DS2 added "Now, when we say originality, originality is not to produce something from scratch, but to bring together existing things in different places, work done at different points, work done in different places. That means, it has a lot of resources. I think it is like bringing out all the ingredients and creating a new dish". This shows how the student employed combinational creativity by integrating various studies. DS4 justified the integration as "Then, as I read the theory of connectivism, I thought about doing something else. I can integrate it into flipped learning; how I can include special education, that is, I included gifted students." It is seen that combinational creativity reveals itself in the form of connecting topics to each other during the dissertation preparation processes.

In general, students apply combinational creativity while making associations between variables. To illustrate, DS2 labeled the variables as correlated to each other, and DS1 benefited from literature reviews while making these associations: "The correlations between the variables are based on literature reviews, which dimensions were related to each other, and which study could be similar to mine were considered".

3.6 Exploratory Creativity

In line with the views of doctoral students on the entire dissertation preparation process, they were noticed to have employed exploratory creativity. For instance, DS1 verified "Literature really helps for enriching the content, I discover something that helps a lot and I keep searching about it. I integrate it to my work and cite it." The student revealed new content while investigating during the preparation of the conceptual framework; hence, they enriched their dissertation; DS4 said, "Then I looked to be different or original; then, I found a different theory- the theory of connectionism. I did not know about it during the courses; that was a shame." The fact that the student discovered new theories for the originality of the dissertation shows how this creative thinking skill is reflected in the dissertation preparation process.

3.7 Transformational Creativity

According to the analysis of data gathered from the doctoral students, the students are found not to have employed transformational creativity during the process of dissertation preparation.

3.8 General Creativity

3.8.1 The Advisor

Based on the opinions received from doctoral students, another distinctive theme was addressed to advisors, and evaluated from two distinct angles. These focus on the attitude of the advisors towards the originality and the limitations of dissertation during the dissertation preparation processes.

Students acknowledged that their advisors typically guide them about the originality of their dissertation. DS2 explained "Our advisors have expertise in the field; they follow the up-to-date literature and are likely to catch the overlooked points, unexplored topics. They help us in these points. Say, we sometimes look at

the subject from a small window with what needs to be evaluated within the framework of originality, authenticity, and context. For us, it is perceived as new, but it may have already been studied. At this point, our advisors help us.". DS1 said, "We have always avoided clichés… you know, my advisor can approve a work that has been done or research that has been discussed, but it can be done on another subject without repeating it." He also stated that his advisor guided for the originality of his dissertation as an innovative researcher. The doctoral students described their advisors as supportive, motivating and stimulating throughout this procedure. DS2 disagreed in his views saying that "Yes, unfortunately, the advisors are pushing us on this topic... Of course, the advisors insist. They insist too much" and added that the advisors insist on originality.

The students specified that their advisors acted as a guide-director, problem solver, precautionary and informative in the case of the limitations they confronted during the dissertation preparation process. DS2 described "My advisor is trying to solve these issues on his own by taking his own initiative. We need to get expert opinion on some point. When we do not receive feedback, we can get an answer when our advisor reaches and asks for feedback. Or when we need to collect data from a specific place, he can reach and get the permission." He acknowledges that some of the limitations such as accessing various permits and experts in the field were solved by his advisor.

3.8.2 Challenges

The challenges experienced by the doctoral students during the dissertation preparation process are grouped under personal, environmental, financial and implementation related. The students attributed the obstacles to the lack of personal interest in some topics, lack of knowledge and intrinsic motivation. DS2 mentioned "Your private life can affect it; the amount of time you can spend on it matters" and DS5 illustrated as "...I am a teacher; I work for the Ministry of National Education... I could not spend a lot of time on my dissertation. If we look at it from this perspective, the biggest limitation was my profession. We are in very different worlds. I cannot apply the academic work in my school." They confirmed that their personal and professional life, as well as the failure to devote necessary time to their work, constitute an obstacle for them. DS1 said, "...There are certain restrictions brought by your system... so we always focus on satisfaction and success when it comes to distance education. This is the situation that the system imposes…" The imitating of the system seems to impede them.

One of the environmental obstacles appears to be the struggle to reach experts to consult about their prospective dissertation topics. Hence, they had to change their topic, and this situation is reported to influence the originality of their work. DS2 expressed his views "... I wanted to work in a different field, experts in that field did not want to cooperate due to unavailability. In other words, we needed to collaborate with a scholar from that field. Since they did not want to contribute, we had to head to a different position." He said, "Now, if it is done for the first time, it's harder to convince people to oblige. It's the first thing that comes to your mind... you have to convince people while writing the problem situation, and it's the first time you will be doing something original. You need to provide more parameters to convince them…" and emphasized that their disappointment to persuade the experts about the significance of their work, and this may possibly hinder the originality of their work. DS1 complained about the problems related to ethics during the dissertation preparation process. "The issue of ethics really limits me. Everything goes into ethics when it comes to work, but for some reason no one pays attention to ethics in daily life.". The students listed other environmental challenges such as finding networks and space, heavy workload, and discipline issues.

Regarding the dissertation preparation process, DS2 listed the issues "...finding technical materials was a problem. There may be budget constraints. There is some good work you want to do, but there is a lot of equipment you need to buy for it, and you can't find a budget for it, unfortunately. The problems produce some changes along the course, "You either have to change your subject or you have to narrow and shift its scope". It is seen that lack of sufficient budget and lack of technical materials form the two leading financial issues.

DS1 referred to the official correspondence as an implementation obstacle "You know, the long procedures in research, I could spend the time doing my research. It's not a complete waste of time of course, but because it is a process with correspondence, I think I am a little restricted in this regard.". He also indicated that narrowing the topics from general to specific limits him "Actually, thinking more generally and narrowing it to a more specific topic really limits me". Further, DS5 said, "The biggest problem of doctoral students is not being able to decide on the dissertation proposal. Doctoral students are expected to submit their dissertation proposal within six months. In other words, I think six months is not enough, you know, it should be at least one year, and one year should definitely spend all their time on it…" This statement shows the perceived shortcomings in terms of time. In addition to these barriers, during the dissertation preparation processes, students suffered from a pandemic, had problems in collecting data, could not access samples, and pilot their studies. Moreover, the shortage of resources to ground their research, being a frequently studied subject, and the absence of similar studies were recorded as challenges in addition to the breadth of scope, narrowing it down and applying their dissertation.

A few students reported no challenges that would potentially affect the originality of their dissertation. In this direction, while DS2 and DS3 expressed no trouble in finding an original topic, DS5 identified this manner as: "I did not experience any limitations while determining the problem and the topic, frankly, my topics were clear during the PhD course period...".

4. DISCUSSION and CONCLUSION

Creative thinking manifests itself differently in each individual (Cryer, 2006). Doctoral dissertations are organized individually under the guidance of dissertation advisors. For this reason, each student's dissertation process may vary, especially in terms of creative thinking skills, apart from the systematic processes. In this study, the researchers aimed to verify how doctoral students reflect their creative thinking skills to their dissertation preparation processes.

Petre and Rugg (2010) state that a dissertation is a printed work that demonstrates knowledge and skills needed to be worthy of a doctorate, such as being able to design, conduct, and publish original research. Therefore, it does not need to be extremely comprehensive or exceptionally original; it should be comprehensive and original as much as necessary. In the study, in line with the opinions collected from the doctoral students on originality, a dissertation can be original in terms of several dimensions. The doctoral students are observed to care about the originality of their work. It is established that students typically evaluate originality as conducting research that has not been done before, dealing with real problems and solutions, and revisiting the existing studies from different perspectives. In his research, Edwards (2014) discussed originality in nine sub-dimensions from the perspective of doctoral students. The dimensions obtained in the results of this research overlap with three of these nine dimensions. Phillips and Pugh (2010) detected nine identifiers to have a dissertation original and these show connections with some of the definitions that emerged as a result of this research. It is significant that some of the doctoral students described the research that has not been previously studied as original, and specifically the same topics with different samples were not considered authentic, rather more reliable. In this direction, Baptista et al. (2015) emphasize that small-sized studies can be replicated on a larger scale or with another sample, thus increasing the reliability of the findings and the confidence in the results; however, these cannot be referred to as new. In doctoral studies, this situation occurs in some disciplines. It can be concluded that the original perception of the studies or the values attached to originality may vary across the disciplines.

Doctoral research requires students to bring all the components together and synthesize in a profound way, and this is already a creative effort (Bargar & Duncan, 1982). The students at the synthesis level in their dissertation abide by their values of originality and produce an original work. Phillips and Pugh's (2010)

position about originality supports this situation; that is, synthesizing points and topics that have not been analyzed collectively verifies the originality.

Doctoral education diverges from undergraduate and master's education. While a master's degree provides fundamentals of research, doctoral education enables a higher-level and in-depth analysis of investigation leading to production of information. Likewise, authenticity is important in both graduate education levels and in theses. However, opinions about the originality of work at the master's level are contradictory when compared to the doctoral-level work. Therefore, University of Melbourne (n.d) makes a distinction between 'basic' originality that involves evaluating information in distinct aspects and may be required in the master's degree, and 'creative' originality that may be critical at the level of doctoral degree. In this study, the students seem to agree that originality is sought to a greater extent in doctoral dissertations than master's theses.

The doctoral students who have not restricted the identification and number of variables are observed to reflect their fluency skill- one of the creative thinking skills. In general, institutes do not impose any restrictions in deciding the number of variables in dissertation preparation processes. However, according to the data, some students reduced the number of variables in line with their problem situations, objectives, and dissertation topics. This is a situation that prevents them from thinking fluently. At the same time, working with a small number of variables by replicating the variable quantity used in previous studies constrains their creative thinking skills. Consequently, Dunleavy (2003) points out that imitating the work of previous generation doctoral students might entice creative thinking in some cases, along with the fact that the research represents an institution with a robust tradition in the field. This situation coincides with the term scientific traditions that emerged in Brodin's (2016) study on critical and creative thinking skills of doctoral students. In the study, despite the understanding to contribute creatively to novel information-distinctive from existing information- the students felt obliged to comply with scientific traditions, considering the possibility of harming their critical thinking.

Student work on issues related to their own disciplines during the preparation of the doctoral dissertation makes a significant contribution. However, according to Cryer (2006), pushing the limits of knowledge through only one discipline poses a challenge to the originality and impact of the study. For this reason, carrying out studies by integrating diverse disciplines is promoted. The doctoral students' preference to follow an interdisciplinary or multidisciplinary approach shows how they can reflect flexibility in relation to their creative thinking skills. According to Ziman (2000), more interdisciplinarity research advances scientific originality. Hence, performing interdisciplinary studies provide not only originality but also flexibility. At the same time, while students are exploring their ideas through various fields and shape their work by combining these ideas with/in their own discipline, they demonstrate their reflection of exploratory and combinational creativity in the dissertation preparation process.

The students use elaboration at every stage of the dissertation preparation process and benefit from diverse strategies. During the process, the students are found to skim and scan the literature in many ways that is expected to result in reviewing the previous studies and utilizing the research strategies to produce an original work. Since literature review is an indispensable part of scientific studies, students' research, and discovery of separate studies by listing, analyzing and searching to create an original work provides evidence for their reflection of their creative thinking skills. Bargar and Duncan (1987) state that these scholarly and procedural skills and techniques students have developed over the years play a significant role in sound research studies and are essential for creative scholarly work. It is also an important result that the students have enriched their conceptual frameworks in this direction by seeing the applicability in resolving their problems. Phillips and Pugh (2010) underline the real-world pertinence of research performed by doctoral students as a critical consideration for employers.

Exploratory creativity and combinational creativity serve as fundamentals for doctoral dissertations. Since successful dissertations should meet criteria such as originality, fluency, flexibility, creative thinking skills should be presented from the earlier stages of dissertation preparation, even at the beginning of doctoral

courses. Students with creative thinking skills can explore the topics and theories by deeper analysis and synthesis that will generate original dissertations. Lovitts (2007) explains that students who write extraordinary dissertations have an adventurous, flexible mind, and are willing to discover with "the ability to think outside the current framework". Hence, exploratory creativity and flexible thinking skills positively impact writing original dissertations. This study concludes that students were able to reflect exploratory creativity and combinational creativity to their dissertation preparation processes. To prepare an original dissertation, reviewing the existing studies indicates exploratory creativity, and then synthesizing these studies exposes combinational creativity reflected in the process. Another outcome illustrates the absence of reflection about the transformational creativity skill during the dissertation preparation processes. Although transformational creativity is anticipated to be used in doctoral dissertations, the challenge of transforming a current situation limits its convenience for doctoral students.

The scholarly relationship founded between doctoral students and their advisors is maintained throughout the process from the beginning to the end of doctoral education. This study explored the roles of advisors in the originality of the doctoral students' work and the limitations experienced in the dissertation preparation and analyzed the consequences of these roles on the creative thoughts of the students in the process. According to the students, their advisors were guiding, innovative, supportive, motivating, stimulating, and demanding on the originality of their work. In relation to the challenges, they took on the roles of guide-director, problem solver, precautionary and informative with foresight. Hockey (1996) emphasized the advisor's primary responsibility as guiding students in the right direction to creative thinking. Brown and Atkins' (1988, p. 120) list of eleven roles for advisors "director, facilitator, adviser, teacher, guide, critic, freedom giver, supporter, friend, manager, and examiner" has corresponding roles for the advisors in this study.

Meng and Zhao (2018) highlight professional knowledge, creative thinking, and intrinsic motivation of advisors in developing researcher identities and creative thinking skills of graduate students. Correspondingly, Wisker and Robinson (2016) state that advisors should be satisfactorily 'creative minded' to nurture creative approaches and investigations, particularly when working with creative doctoral students. In a doctoral dissertation, the advisor's fixed-single-mindedness can limit the flexibility and independence of the novice researcher (Mauch & Park, 2003). At the same time, it can create obstacles for the researcher in delivering original ideas. However, the findings of this study remain inconclusive about students' ideas about their advisors; overall, the advisors care about and support new ideas. In this case, the students' advisors are seen to play a constructive, effective, and valuable role on creative thinking during the dissertation preparation processes.

Doctoral education goes through numerous forms of challenges that differ according to disciplines. This might be attributed to the specific rules of each discipline. As a result, doctoral students are likely to encounter certain obstacles from the beginning till the end of their dissertation preparation processes. The challenges can cause students to struggle, to lose their motivation and in some cases to drop out of their doctorate programs, notably when they are trying to prepare an original work. According to this study, some students do not experience any problems in finding an original dissertation topic. Still, students confront barriers such as personal, environmental, financial, and practical. Most of these bring adverse effects on students' creative thinking, particularly when these impact their intrinsic motivation. In this vein, Csikszentmihalyi and Sawyer (2014b) argue that a person who is not intrinsically motivated to formulate problem statements has no incentive to go beyond the generally accepted limits of knowledge. The most important individual characteristics that drive individuals to exceed the generally recognized limits of knowledge are interest, curiosity, or intrinsic motivation (Csikszentmihalyi & Sawyer, 2014a). For this reason, students lacking interest in the dissertation are not projected to reflect their creative thinking skills

to this process. On the other hand, this situation can activate creative thinking skills, especially exploratory creativity, by enabling students to investigate topics of their interest.

The students also encountered challenges such as workload, private life, time management, and financial matters during their dissertation preparation process. These obstacles adversely affect students' creative thinking. Nevertheless, students may face these issues not only during the dissertation preparation process, but also throughout the doctoral education. The study by Özmen and Aydın-Güç (2013) report similar problems that students confront such as time, workload, private life, and financial complications during their doctorate education period.

From another perspective, the challenges might sometimes have encouraging effects on students' creative thinking. Despite the reported challenges, the fact that they were still concerned about the originality of their work and kept trying supports this position. Dunleavy (2003) states that creative people tend to be more persistent and dedicated in their efforts, are less affected by setbacks, and find ways to underrate their struggles.

The challenges students experience during the dissertation process present an important area for research. The effects of postgraduate students' challenges on their creative thinking skills deserve closer attention. The way doctoral students cope with these challenges, or the details of these setbacks could be further explored. The impact of students' intrinsic and extrinsic motivation on their creative thinking skills, especially during thesis preparation processes, could be a new topic of research. Therefore, a comprehensive analysis with these variables is believed to contribute to the field.

Since students are required to produce an original work, they can be provided with training about the processes of dissertation preparation and ways of improving their creative thinking skills. In addition to the students, advisors might benefit from training on how to develop their creative thinking skills and how to encourage their students in this direction.

RESTRICTIONS

The study was restricted to five doctoral students who were studying in the Department of Computer Education and Instructional Technology.
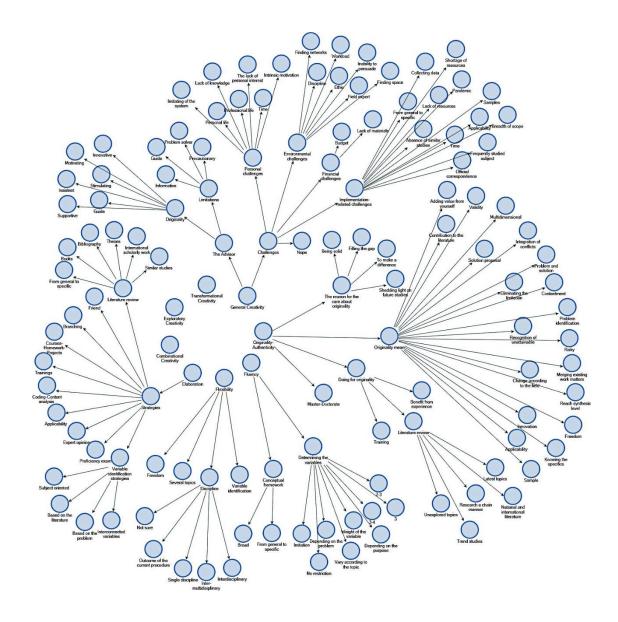
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APPENDIX

Appendix-A. Themes, Categories and Codings of the Interview Data

GENİŞLETİLMİŞ ÖZET

1. GİRİŞ

Yaratıcılık denildiğinde ilk olarak akıllara resim, heykel, müzik, şiir vb. pek çok sanatsal alan gelmektedir. Ancak yaratıcılığı yalnızca sanat ile sınırlandırmak doğru değildir. Yaratıcılık, hayatın her zaman, her yerinde varlığını göstermektedir. Bireyin doğumundan itibaren yaratıcılık, varlığına onunla birlikte devam etmektedir. Bu süreç boyunca birey yaratıcılığının farkında olmayabileceği gibi ilerleyen zamanlarda yaratıcılık bilincine sahip olabilmektedir. Bu süreçte de hayatının her alanında yaratıcılığını kullanabilmektedir. Örneğin yaratıcılık ve yaratıcı düşünme becerisi, bilim alanında da kendisini göstermektedir. Bilimsel ilerlemeler kavramsal ve teknolojik ilerlemelere bağlı iken, bu ilerlemeler de bilim insanlarının yeni anlayışlar veya fikir üretme yeteneklerine bir başka deyişle yaratıcılıklarına bağlıdır (Neumann, 2007). Feist'e (2011) göre, eğer bilimde yaratıcı fikirler ve yaratıcı çözümler olmasaydı sanat ile birlikte var olamayacak bir meslek olurdu.

Doktora eğitimi, bireyleri, alanlarında uzman olan iyi birer bilim insanı olmaya hazırlamaktadır (LaPidus, 1997). European University Association (2010) tarafından yayınlanan Salzburg ilkelerinin ilk maddesine göre doktora eğitiminin amacı, "özgün, somut bir araştırma projesi aracılığıyla araştırma zihniyetini geliştirmek, düşünce esnekliğini, yaratıcılığı ve entelektüel özerkliği beslemektir" şeklinde vurgulanmıştır. Doktora eğitiminde yeniliğin ön plana çıkması, yaratıcı düşünme becerilerinin de bu süreçte var olduğunu göstermektedir. Doktoranın bilgiye özgün bir katkıda bulunması gerektiği genel bir görüştür (Brabazon, 2020). Frick (2011) doktora çalışmasının doğası gereği öğrencinin belirli bir disiplinin bilgi sınırlarını genişleterek bilimsel bir katkı yarattığı yaratıcı bir çaba olduğunu belirtmektedir. Denicolo (2003), doktorada kriter olarak bilgiye özgün bir katkıda bulunulması gerektiğini ve yeterlilik çerçevesinde doktora öğrencilerinin çalıştığı disiplini genişletmenin yanı sıra, yayınlanmayı hak eden yeni bilginin yaratıldığını ve yorumlandığını göstermesi gerektiğini belirtmektedir. Finn (2005), öğrencilere doktora derecesinin verilebilmesi için gerekli özelliklerden bazılarının kendi disiplinlerinde orijinal araştırmalarını bağımsız olarak yürütebilme yeteneğine sahip olmaları ve bilgiye özgün bir katkı sağlamaları olduğunu belirtmektedir. Gelling ve Rodríguez-Borrego (2014) ise, bütün disiplinlerde doktora araştırmasının önemli bir bileşen olarak görüldüğünü ve doktora öğrencilerinin de kendi disiplinlerine nasıl yeni bilgiler kattıklarını göstermeleri gerektiği vurgulanmaktadır.

Bu çalışmada araştırmacıların amacı, doktora öğrencilerinin yaratıcı düşünme becerilerini kullanarak tezlerine yaratıcı katkılarda bulunup bulunmadıkları, bu doğrultuda yaratıcı düşünme becerilerini tez hazırlık süreçlerine nasıl yansıttıklarını araştırmaktır. Bu yansıtmaların orijinallik, akıcılık, esneklik, ayrıntılandırma, birleştirici yaratıcılık, keşfedici yaratıcılık ve dönüşümsel yaratıcılık açısından incelenmesi amaçlanmaktadır.

2. YÖNTEM

Bu araştırmada, nitel araştırma yöntemlerinden birisi olan durum çalışmasından yararlanılmıştır. Yin'e (2009) göre araştırmanın amacının temel olarak "ne" sorusunu cevaplamaya yöneldiği durumlarda keşfedici durum çalışması stratejisi uygulanmaktadır. Bu doğrultuda, bu araştırmada doktora öğrencilerinin yaratıcı düşünme becerilerini tez hazırlık süreçlerine yansıtmalarının keşfedilebilmesi amacıyla keşfedici durum çalışması stratejisi uygulanmıştır. Araştırma, Gazi Üniversitesi Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü 5 doktora öğrencisi ile gerçekleştirilmiştir. Araştırmanın örneklemi ölçüt örnekleme yöntemidir. Araştırmada ölçüt olarak tez hazırlık sürecinde olan doktora öğrencileri içerisinden tez önerisini henüz vermiş veya verecek olan öğrencilerin seçilmesi amaçlanmıştır. Aynı zamanda örnekleme hızlı ve kolay erişim nedeniyle uygun örnekleme yöntemi de kullanılmıştır (Patton, 2018). Araştırmada kullanılan veri toplama aracı, araştırmacılar tarafından hazırlanmış olan ve bireylerin

yaratıcı düşünme becerilerini tez hazırlık süreçlerine yansıtmalarını değerlendirmeyi sağlayan, toplamda dört adet açık uçlu sorudan oluşan yarı yapılandırılmış görüşme formudur. Görüşmelerden elde edilen verilerin analizinde NVIVO nitel veri analiz yazılımı kullanılmıştır. Araştırma verileri teorik tematik analiz yaklaşımı kullanılarak analiz edilmiştir. Torrance'ın (2002) yaratıcı düşünmenin aynı zamanda buluşçuluk, keşif, merak vb. şeyleri de içerdiğini belirtmesi ve yapılan araştırmalar doğrultusunda doktora çalışmalarında keşfedici düşünmenin öneminin vurgulanması, araştırmanın çerçevesini oluşturmada önemli olmuştur. Bu doğrultuda Torrance'ın (1972) yaratıcı düşünme becerilerinden orijinallik, akıcılık, esneklik ve ayrıntılandırmanın yanı sıra, Boden'ın (2004) birleştirici, keşfedici ve dönüşümsel yaratıcılık türleri tema olarak belirlenmiştir.

3. BULGULAR, TARTIŞMA VE SONUÇ

Çalışmanın bulguları Torrance'in (1972) yaratıcı düşünme becerilerinden orijinallik, akıcılık, esneklik ve ayrıntılandırma ile Boden'ın (2004) birleştirici, keşfedici ve dönüşümsel yaratıcılık türleri doğrultusunda temalandırılmıştır. Öğrencilerden elde edilen bulgular doğrultusunda genel yaratıcılık teması da ortaya çıkmıştır. Öğrencilerin her biri doktora tezlerinin orijinal olmasını önemsediklerini belirtmiştir. Doktora eğitiminin ciddi olması, eksikliği kapatması, gelecek çalışmalara ışık tutması ve doktora tezinin farklılık yaratması açısından özgün olmasının önemsendiği belirtilmektedir. Öğrenciler doktora tezlerinin orijinal olması için ise genellikle literatür taramalarından, eğitimlerden ve deneyimli hocalarının ve arkadaşlarının görüşlerinden yararlandıklarını belirtmişlerdir. Özgün bir çalışma için alanyazın taraması yaparken ise hiç yapılmamışı bulmaya çalıştıklarını, eğilim araştırmalarını incelediklerini, yeni konuları araştırdıklarını, yerli ve yabancı alanyazını incelediklerini ve birbiri ile ilişkili olan veya olmayan konuları zincirleme bir şekilde araştırdıklarını belirtmişlerdir. Akıcılığın öğrencilerin tez hazırlık süreçleri bütünüyle göz önünde bulundurulduğunda bu sürecin farklı aşamalarında ortaya çıktığı görülmektedir. Öğrencilerin tez hazırlık süreçlerinde özellikle disiplinler arası/çok disiplinli/disiplinler üstü çalışmalar yapıp yapmadıkları, esnekliği yansıtıp yansıtmadıkları üzerinde belirleyici olmaktadır. Disiplinlerarası veya disiplinler üstü çalışmaktan farklı olarak tez hazırlık sürecinin bütünü ele alındığında kavramsal çerçevenin ve değişkenlerin belirlenmesinde de akıcılığın yanı sıra esnekliğin sürece yansıtılabildiği görülmektedir. Ayrıntılandırma temasında öğrencilerin tez hazırlık süreçleri boyunca tez konularını, kavramsal çerçevelerini, değişkenlerini belirleme gibi farklı aşamalarda ayrıntılandırmak için neler yaptıklarına dair kullandıkları stratejiler ön plana çıkmaktadır. Öğrencilerin birleştirici yaratıcılığı farklı yöntem ve teknikler aracılığıyla tez hazırlık sürecine yansıttığı, aynı zamanda değişken sayıları arasındaki ilişkilendirmeleri yaparken kullandıkları görülmektedir. Keşfedici yaratıcılık temasında doktora öğrencilerinin tez hazırlık süreçlerinin bütününe yönelik görüşleri doğrultusunda bu süreçte keşfedici yaratıcılığı da kullandıklarına dair bulgular elde edilmiştir. Öğrencilerin tez hazırlık süreçlerinde dönüştürücü yaratıcılık kullandıklarına dair herhangi bir bulguya rastlanılmamıştır. Genel yaratıcılık teması ise, danışmanların tezlerin orijinalliğine ve sınırlılıklarına yönelik nasıl bir tutum sergilediğinin yanı sıra, öğrencilerin süreç boyunca yaşadıkları kişisel, çevresel, mali ve uygulama engellerine dair bulguları içermektedir.

Edwards (2014), yaptığı araştırmada doktora öğrencilerinin perspektifinden orijinalliği dokuz alt boyutta ele almıştır. Bu araştırmanın sonuçlarında elde edilen boyutlar da, dokuz boyutun üç tanesi ile örtüşmektedir. Phillips ve Pugh (2010) ise, bir doktoranın nasıl orijinal olabileceğine dair dokuz tanım belirlemiştir. Bu araştırmanın sonucunda ortaya çıkan bazı tanımlamalar ile bu tanımlar benzerlik göstermektedir. Öğrencilerin özgünlük anlayışlarının veya özgünlüğe verdikleri değerlerin disiplinlere göre değişebileceği sonucuna ulaşılmaktadır. Öğrencilerin özgünlüğe verdiği değerler doğrultusunda tezlerinde sentez düzeyine ulaşmanın çalışmalarının özgünlüğü ile alakalı olduğunun farkında oldukları sonucuna ulaşılmıştır. Öğrencilerin, doktora tezlerinde yüksek lisans tezlerinden daha fazla özgünlüğün arandığı konusunda hemfikir oldukları sonucuna ulaşılmıştır. Çalışmada öğrenciler mevcut bilgilerden farklı olarak yeni bilgilere yaratıcı bir şekilde katkıda bulunmaları gerektiğinin farkında olsa dahi, eleştirel düşünmelerinin zarar görme ihtimalini düşünerek bilimsel geleneklere uymak zorunda hissetmişlerdir. Bunun yanı sıra, disiplinler arası ya da çok disiplinli çalışıyor olmaları yaratıcı düşünme becerilerinden esnekliği bu süreçte yansıtabildiklerini göstermektedir. Ziman'a (2000) göre araştırmalarda daha fazla

disiplinler arasılık çalışılması için çağrı yapmak, daha fazla bilimsel özgünlük için de bir çağrıdır. Bu nedenle disiplinlerarası bir çalışma yapıyor olmak esnekliğin yanı sıra özgünlük için de önemlidir. Aynı zamanda öğrencilerin farklı disiplinler aracılığıyla fikirlerini keşfetmeleri ve bu fikirleri gerek kendi disiplini ile gerekse aynı disiplin içerisinde birleştirerek çalışmasını şekillendirmesi keşfedici ve birleştirici yaratıcılığı da tez hazırlık süreçlerine yansıttıklarını göstermektedir.

ETHICAL APPROVAL

In this study, all the rules stated in the "Higher Education Institutions Scientific Research and Publication Ethics Guidelines" were strictly followed. None of the actions specified under the section titled "Actions Contrary to Scientific Research and Publication Ethics" in the guidelines were carried out.

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CONTRIBUTION OF RESEARCHERS

The contribution percentage of the 1st author to the research is 50%, and the contribution percentage of the 2nd author to the research is 50%.

Author 1: Conceptualization, methodology, validation, formal analysis, ınvestigation, resources, writing–original draft, writing – review & editing, visualization.

Author 2: Methodology, validation, formal analysis, resources, writing–original draft, writing – review & editing, visualization.

CONFLICT OF INTEREST

The authors report there are no competing interests to declare.