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FROM THE EDITOR

Dear Distinguished Researchers and Readers,

Last year these times, we fulfilled the criteria for ERIC and applied to be indexed. We are proud that ERIC invited our journal to be indexed starting from the first issue of 2020 (Volume 13). Now, both parties finished the process, and all issues starting from 2020 can be accessed through ERIC.

Now, we feel more pressure on our shoulders to work rigorously. Our next step will be indexing by ESCI, Scopus and SSCI at the end. Therefore, we have made some changes in the aim and scope of our journal. JTES will analyze the quality of articles at the very first step of the submission. Accordingly, the below studies will not probably be accepted for review process:

- Studies that offer a descriptive review of literature,
- Descriptive studies based on opinions of stakeholders,
- Basic metaphor studies,
- Descriptive quantitative studies using a single instrument and reporting differences in terms of some variables,
- Correlational studies on a field that has been researched to a great extent,
- Studies that are not directly related to educational sciences,
- Qualitative studies that depend too much on positivist paradigm, i.e. quantifying the findings without exerting a through qualitative analysis
- Manuscripts that have similarity over 15%, and 3% from one source,
- Studies that are too local, that do not depend on international literature (70% expected to be the literature in WoS or Scopus), and that are not related to international readers.

These criteria are expected to increase quality but decrease reviewing length. For this issue, the average time from submission to publication was 7.7 months. This eight-month process is even shorter due to our OnlineFirst system in which we publish articles earlier than its normal issue. The reviewing time was shorter like 3-4 months but it takes time to publish accepted articles in next issues.

In this issue, we decided to publish 10 research articles of 21 authors. We hope that these articles published in the second issue of 2021 will contribute to the literature. Also, we will continue to show accepted manuscripts in OnlineFirst soon.

Finally, we should also express our sincere thanks to the Editorial Board, reviewers and authors for their invaluable contributions. We will publish the reviewers' names in the last issue of the year.

We look forward to receiving submissions of sufficient rigor and quality. We wish you good health and hope to meet again for the 2021 July issue!

Fatih GÜNGÖR, PhD
Afyon Kocatepe University
Faculty of Education

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Pre-service Teachers' Perceptions about the Efficacy of Various Types of Feedback on Micro-Teaching Activities*

Hizmet Öncesi Öğretmen Adaylarının Farklı Geribildirim Türleri Hakkındaki Algıları

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ABSTRACT: This research study investigates pre-service teachers' perceptions regarding the efficacy of the feedback on their micro-teaching activities. During a 16-week semester, nine pre-service teachers were observed and their micro-teaching activities were video-recorded. After their micro-teaching activities, they were asked to reflect on their own perceptions about the feedback they received on their micro-teachings. In addition, after each micro-teaching, they were asked to participate in an interview and a focus group interview regarding their perceptions about the different types of feedback. Findings suggest that pre-service teachers considered teacher trainer feedback as the most influential one in their development as teachers in the long run. They also stated that they changed their teaching immediately when they themselves realized a mistake. Findings also suggested that while they expected feedback about processing of the task from their peers, they expected feedback about self-regulation from their teacher trainer.

Keywords: Pre-service teachers, feedback, micro-teaching activities, perceptions.

ÖZ: Bu araştırma, hizmet öncesi öğretmenlerin eğitimlerinde kullanılan farklı geribildirim yöntemleri hakkındaki algılarını incelemektedir. 16 haftalık bir dönem boyunca dokuz İngilizce öğretmen adayının mikro-öğretim yöntemleri gözlenlenmiş ve bu mikro-öğretim yöntemleri kaydedilmiştir. Katılımcıların mikro-öğretim aktivitelerinin ardından aldıkları farklı geri bildirimler hakkında bireysel ve grup olarak röportajlar yapılmıştır. Sonuçlar, hizmet öncesi öğretmenlerin uzun vadede öğretmen eğiticisinden gelen geri bildirileri en etkili bulsalar da, kendilerine yaptıkları geribildirimleri sürecinde fark ettikleri hataları hemen düzeltme yoluna gittiklerini göstermiştir. Sonuçlar ayrıca hizmet öncesi öğretmenlerin akranlarından yapılan öğretimin işlenmesi ile ilgili geri bildirim beklerken, öğretmen eğiticisinden kendilerini ne yönde düzeltmeleri gerektiği yönünde geri bildirim beklediklerini göstermiştir.

Anahtar kelimeler: Hizmet öncesi öğretmenler, geri bildirim, mikro-öğretim aktiviteleri, algı.

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> *So active, creative, and important is the role of recipients in the feedback process that it is striking how in educational and managerial settings, there is little to no formal training in the art of seeking and receiving feedback. In contrast, some degree of training in the art of giving feedback is routinely given to teachers, supervisors and managers. This bias toward senders and away from recipients is reflected in scientific literature, too. Compared to that on senders, a good deal or less research attention has been paid to what recipients can do to maximize benefits of feedback* (Sutton, Hornsey, & Douglas, 2012, p. 339).

Introduction

Practice teaching and its assessment have long been recognized as a vital component of pre-service teacher education programs and have been documented by numerous researchers (e.g. Buitink, 2009; Butler & Cuenca, 2012). Although most of the research on teaching component of pre-service teacher education programs has focused on understanding practicum experiences of pre-service teachers (e.g. Eröz-Tuğa, 2012; Johnson, 1996), pre-service teachers' micro-teaching experiences before their practicum experiences seem to be receiving considerably less attention. The influence of school experience on pre-service teachers' beliefs (e.g. Gao & Benson, 2012; Johnson, 1996; Ng, Nicholas, & Williams, 2010; Seymen, 2012; Rozelle & Wilson, 2012) and their reported concerns for practicum (e.g. Çelik, 2008; D'Rozario & Wong, 1996; Paker, 2011; Preece, 1979) have also been investigated. At the same time, a growing number of teacher education research-specialists report that the teaching component in teacher education programs has been described as an important contributor for novice teachers' perceptions of their preparedness and efficacy in the classroom (Faez & Valeo, 2012). In addition, recent work underlined the importance of digital video-based feedback environments on pre-service teachers' feedback competence to further our understanding of pre-service teacher learning in teaching practicums (e.g. Kleinknecht, & Gröschner, 2016; Prilop, Weber, & Kleinknecht, 2020)

While all of these studies have contributed to our understanding of the importance of school-based experience in preparing the pre-service teachers in pre-service teacher education programs, very few, if any, has focused specifically on pre-service teachers' perceptions and understanding of different types of feedback before their school-based practicum experiences during their pre-service teacher education programs. This understanding can provide us with practice-based approach to give feedback from various agents (i.e. self, peer, and teacher trainer) and in different phrases of their pre-service teacher education (e.g. before, during, and if possible, after their school experience). Such an approach can both improve the overall quality of pre-service teacher education programs and influence pre-service teachers' perceptions of their preparedness for the teaching profession and self-efficacy as pre-service teachers. In an attempt to address this gap in research literature and the need in pre-service teacher programs, this research study investigates pre-service teachers' perceptions about the efficacy of different types of feedback they receive from different agents.

Literature Review

Practicum has been a controversial term to define because many researchers studying pre-service teachers' school-based experience differ in the way they define, view and study this concept. Gebhard suggests that the term practicum "involves supervised teaching, experience with systematic observation, and gaining familiarity

with a particular teaching context" (2009, p. 250). As practicum is pre-service teachers' first teaching experience during their pre-service teacher education, it is central to provide them with necessary support and feedback during their practicum experience. It is also equally important to focus on their needs before their practicum experience, equip them with necessary skills, provide them with efficient feedback, and consequently, to better prepare them for their practicum experiences. Johnson (1996) underlines the importance of investigating "how pre-service teachers conceptualize their initial teaching experiences, and what impact these experiences have on their professional development as teachers" (p. 30). As such, pre-service teachers' practices even before their practicum experiences may change their perceptions and understandings about the profession and influence their developing identities as pre-service teachers.

Micro-teaching activities before the practicum is one of the most common practices to provide pre-service teachers with necessary pedagogical tools and resources to help them learn to teach before their actual teaching practices in the profession. Legutke and Ditfurth define micro-teaching as an approach "in which student teachers act as L2 school learners while each student takes his or her turn as teacher" (2009, p. 213). This is particularly important for pre-service teacher candidates because the very act of interchanging roles may raise their awareness of teaching and learning situations alike. Wahba (1999) suggested four stages of micro-teaching activities, namely the briefing stage, the teaching stage, the analysis and discussion stage and the re-teaching stage. The briefing stage refers to the period in which the trainees are informed about the context and the content of their micro-teaching. In the teaching stage, the trainee micro-teaches a lesson and it is, if possible, audio- or video-recorded. In the analysis and discussion stage, the micro-lesson is evaluated and the trainee is given some feedback. In the final re-teaching stage, the trainee is expected to teach the lesson based on the comments received in the analysis and discussion stage. The analysis and discussion stage is very crucial because, if effective feedback is provided, it may lead to changes in practices and thus result in learning gains.

The present study investigates what the relative value is of different types of feedback on micro-teaching activities from the recipient's (i.e. pre-service teachers') perspective. Feedback, according to Hattie and Timperley (2007), is defined as "information provided by an agent (e.g. teacher, peer, book, parent, self, experience) regarding aspects of one's performance or understanding" (p. 81). Hattie and Timperley (2007) offer a model of feedback that identifies the focus of feedback in four levels, namely, feedback about the task, feedback about the processing of the task, feedback about self-regulation, and feedback about the self as a person. Feedback about the task refers to feedback that is related to how well the completion of the task is achieved. This kind of feedback, therefore, is very task-specific. Feedback about the processing of the task concerns the learning processes required for the completion of the task. This kind of feedback may provide learners with alternative options and thus reduce the complexity and cognitive load of the task. Feedback about self-regulation is related to feedback promoting student autonomy and self-control. Feedback at this level helps the students develop skills in self-evaluation. Feedback about the self as a person is particularly significant in classroom environments because it is typically present in the personal positive feedback (i.e. praise) about students. Although this kind of feedback is

delivered quite frequently in the classroom environments, it "has too little value to result in learning gains" (Hattie & Timperley, 2007, p. 96). As such, each feedback works at four different levels: task level, process level, self-regulation level, and self-level. In addition to these levels, Hattie and Timperley (2007) suggest that teachers aim to provide learners with three important feedback questions: (1) Where am I going, (2) How am I going, (3)Where to next? The first question (i.e. feed up part) concerns with the communication of the goals of the lesson. The second question (i.e. feedback part) relates to the notion of progress being made toward the goal. The third question (i.e. feed forward dimension) highlights the activities that need to be undertaken to make better progress.

Education contexts in general and teacher education contexts in particular aim to provide learners with appropriate feedback through different assessment mechanisms; but, in most cases, the process "takes on the forms of new instruction, rather than informing the student solely about the correctness" (Kulhavy, 1977, p. 212). In the context of teacher education, this may stem from a possible lack of understanding of the place of feedback in the continuum of correction and teaching. Most effective feedback, however, is reported as the one that transfers the student from task to processing and then to the regulation phase (Hattie & Timperley, 2007). Teacher educators and student-teachers, in contrast, may be focused more on providing and receiving the best type of feedback than on the advantages of giving and receiving feedback focused at different levels for different teaching and learning circumstances.

Previous literature has informed us about the importance of feedback preparing the pre-service teachers. However, very few, if any, studies focused on an understanding of feedback on micro-teaching activities in which pre-service teachers engage before their practicum experiences. In order to increase efficacy of the feedback provided to pre-service teachers, it seems important to investigate feedback practices on micro-teaching activities and influences of such feedback on their initial teaching practices even before their practicum experiences. As indicated by Hattie and Timperley (2007), feedback "is one of the most powerful influences on learning, too rarely occurs, and needs to be more fully researched by qualitatively and quantitatively investigating how feedback works in the classroom and learning process" (p. 104). In an attempt to address this issue in research literature and provide pedagogical suggestions for the area of teacher education, this study investigates the possible influences of having simultaneous multiple feedback types on pre-service teachers' micro-teaching practices by focusing on pre-service teachers' perceptions about different kinds of feedback on their micro-teaching activities. In view of the literature background provided above, the present study aims to address the following questions:

1. What do pre-service teachers expect from their peers and teacher trainer when they receive feedback on their micro-teaching activities during their pre-service teacher education programs?

2. When pre-service teachers receive feedback from multiple sources, in what areas do they agree and disagree with different agents?

Method

The research adopts a qualitative research methodology to investigate the influence of different types of feedback on micro-teaching activities in pre-service teacher education.

Context of the Study and Participants

Participants in the study included nine pre-service teachers in an English Language Teaching Program at a Northern Cyprus campus of a highly reputable Turkish university. The university is one of Turkey's most competitive universities and the medium of instruction is English. This university, according to The Times Higher Education World Reputation Rankings 2014, which is followed by universities and institutes all over the world, has been ranked in the top 80 as the only Turkish university. At the time the present study was conducted, it was placed among the top 100 universities of the world, ranking in the 71-80 band. In addition, according to UK based Times Higher Education (THE) World University Rankings 2014-2015, the university was ranked 85th in the top 400 universities list.

Teaching English as a Foreign Language program in this university aims to expand and refine pre-service teachers' knowledge of English and equips them with the means and resources to assist their students in learning English. In this program, pre-service teachers learn the practices in the planning, teaching and evaluating of second language instruction and are given the opportunity to observe how these practices are implemented in local schools. Before this practicum component of the curriculum, pre-service teachers are required to take a course called "Teaching Language Skills" which concentrates on building language awareness and teaching skills through a detailed study of techniques used in and stages of teaching reading, writing, speaking, vocabulary and grammar to language learners at various ages and language proficiency levels. Student teachers design individual micro-teaching activities focusing on the integration of the language skills above with adherence to principles of lesson planning and techniques of the specific skills for a variety of proficiency levels.

The participants were nine pre-service teachers taking this "Teaching Language Skills" class on their third year of their pre-service teacher education. The class consisted of nine students, and all of them agreed to participate in the present study. The researcher was the teacher trainer for this class. The data were collected in the naturalistic setting of a pre-service teacher education classroom, and the pre-service teachers were informed about this research after their final grades were entered. The researcher wanted to ensure that their decision regarding giving their consent about their data would not bias their overall grades for the course. The participants are referred here as P1, P2, etc. Six pre-service teachers were female and three of the participants were male. Their ages ranged between 21 and 31.

Data Collection

During one 16-week semester, as a part of their course work, the pre-service teacher participants were asked to prepare and present six micro-teaching lessons on different skills, including teaching receptive skills (e.g. reading and listening), productive skills (e.g. writing and speaking) as well as grammar and vocabulary. Although the students submitted a two-hour long lesson plan, they were asked to

present 15-20 minutes of those lesson plans. Before the micro-teaching activities, the participants were asked to submit their lesson plans and their rationale. During their micro-teaching, the pre-service teacher participants were observed and their micro-teaching activities were video-recorded. In addition, during their micro-teaching, the teacher trainer and their peers filled out the teacher trainer feedback form and peer feedback forms. After the micro-teaching activities, the pre-service teachers were asked to first watch their micro-teaching videos, complete a self-assessment form, and finally write reflections focusing not only on their micro-teaching experiences but also on their perceptions about different types of feedback they received on their micro-teachings (e.g. feedback from self, peer and teacher trainer). These written reflections were complemented with semi-structured individual interviews and group interviews to get a better insight on their perceptions regarding the efficacy of different types of feedback.

Pre-service teachers' perceptions regarding the efficacy of feedback on their micro-teaching practices were elicited through interviews. For the interview component of the research, pre-service teachers were asked to participate in one individual interview and one focus group interview regarding their perceptions about different types of feedback on each of their micro-teachings. These text-based interviews were semi-structured and aimed to tap into their thoughts about different types of feedback from different agents on their micro-teachings and to help them further reflect on their written reflections in an oral form. During the focus group interviews, they were asked to comment on their perceptions regarding the efficacy of feedback by different agents. Each interview lasted for approximately one hour. Both individual and focus group interviews were voice-recorded and transcribed.

During the interviews, which were conducted after each micro-teaching, the participants were asked to comment on the teacher trainer and peer response feedback sheets. In addition, they were also asked to comment on their own feedback on self-assessment forms regarding their view about the possible influences of such feedback on their own developments as future teachers.

Data Analysis

Interview data analysis for the present research began immediately after the first pre-service teacher interviews were conducted. The interview data were analyzed based on Grounded Theory and adopting a qualitative content analysis approach and Data analysis was also aided by a computer program called Atlas.ti. with the help of this qualitative analysis program, both the transcriptions of the interview data and the textual data (i.e. feedback) were organized and coded according to emergent categories.

When listing theoretical and methodological influences on the analysis of interviews, Roulston (2014) provides five options: Hermeneutic influences, phenomenological influences, Grounded Theory influences, ethnographic influences, and narrative influences. The present study adopts Grounded Theory in the data analysis. Grounded Theory was first put forward by Glaser and Strauss (1967), and it has been adopted by many qualitative researchers since then. Grounded Theory "provides rigorous but flexible guidelines that begin with openly exploring and analyzing inductive data and leads to developing a theory grounded in data" (Thornberg & Charmaz, 2014, p. 153). For any study following Grounded Theory, coding is crucial. Coding, according to Charmaz (2006), includes "naming segments of data with a label

that simultaneously categorizes, summarizes and accounts for each piece of data" (p. 43). Roulston (2014) explains that open coding is "a process of associating a conceptual label with a section on transcript that conveys an idea about the topical features of the talk" (p. 303). Following these principles, the data were initially open-coded. After the initial coding, the most frequent and significant codes guided the focused coding stage.

Following the principles of Grounded Theory, the data analysis adopted thematic content analysis. Qualitative content analysis, as Schreier (2014) writes, "is concerned with describing meaning in context" (p. 174). It also requires creating initial categories and themes from the data through constant comparison within each participant and across the participants, which helps to describe the categories within each case and to identify the similarities and differences across the cases. The interview data in the present study were analyzed employing thematic content analysis to get a better insight on the perspectives of the participant pre-service teachers. To employ this approach in content analysis, anticipated and unanticipated emerging categories from the coded data were summarized in a chart to see commonalities and differences between the pre-service teachers' perceptions of feedback though various agents.

In addition to the interview data, instructional materials the pre-service teachers used (e.g. lesson plans and rationales) and their own self-evaluations on their micro-teachings were analyzed. The feedback they received on their teaching in the teacher trainer form and peer form was analyzed and coded. The feedback data were coded based on the framework suggested by Hattie and Timperley (2007).

Atlas.ti coding software was used during the coding stage. In order to ensure investigator triangulation, the data were coded by two experienced researchers who were trained for coding. After the data were coded by each coder, the code sets and codes were compared. Coding disagreements for each code were resolved through joint review of data and discussion.

Ethical Procedures

All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional research committee. Before the research started, the researcher applied the institutional ethics committee for ethical approval. The ethical committee approval date is February 21, 2014 and the number of their approval document is 28620816/103. After obtaining the approval from the ethics committee, the researcher started the data collection. Pre-service teachers who agreed to participate in the study were given consent forms. In order to keep the confidentiality of participants, pseudonyms were assigned to all participants after the data collection.

Findings

Pre-service Teachers' Expectations from the Feedback They Received on Their Micro-Teaching Activities

Results indicated that when receiving feedback on their micro-teaching practices, pre-service teachers expected different types of feedback from each agent. They stated that while they expected to see what they missed and/or negative comments in the feedback they received from their peers, they seemed to pay extra attention to the suggestions and/or positive comments made by the teacher trainer. Commenting and

reflecting on their expectations from different agents, they showed self-regulation over the learning process. In other words, they wanted to see their own strengths and weaknesses in the feedback provided to them by different agents and ways to improve them. More specifically, the results indicated that pre-service teachers expected more feedback about the processing of the task from their peers while they expected more feedback about self-regulation from their teacher trainer. For instance, P5, when reflecting on a micro-teaching activity, underlined that she wanted her peers "to notice and comment on my grammar mistakes" (P5, Interview 3). Later in the semester, in one of the group interviews she voiced the same issue in the following way: "If my peers tell me that I have grammar mistakes, I can be more careful. I made some mistakes and they can notice them" (P5, Group interview 2).

Similarly, P3 commented on the negative comments she received from her peers as follows: "Experience is a good thing. I do not regret it because I had 'bad' comments. Instead, I pay attention to them even more" (P3, Interview 2). Similarly, P5, when reflecting on her perceptions regarding different feedback she received for her final micro-teaching, she commented that peer feedback did not contain any criticism, so she could not find anything to reflect on. She mostly received feedback about task level, and not much feedback about processing of the task and feedback about self-regulation. She explained her perspective in the following way: "I looked at my peers' feedback, like this one on the task level only, generally they wrote good things, so I could not find anything to reflect on to see if I can change my teaching" (P5, Interview 6). P1 also talked about the importance of criticism in the peer feedback he received throughout the semester and noted that he paid attention to the negative criticisms he received in the peer feedback. He explained this issue in the following way: "I tried to pay attention to the negative or the less effective parts mentioned in the peer feedback. I know I did it correctly, but I want to see what I need to do for the next step" (P1, Interview 6).

Some pre-service teachers stated that they perceived peer feedback as a way to improve their deficiencies in their teaching practices. P8, for example, underlined that he did not know what to do next if there was no criticism in the peer feedback. In contrast, if his peers made some criticisms in the feedback, he thought that they cared for him. He clarified his point in the following way: "I like it when my peers made constructive criticisms on my teaching because then it seems that they really tried to help me to improve my downsides" (P8, Interview 5). P1 also underlined the importance of the specifics of the negative comments he received from his peers. In one of the group interviews, he voiced his preference in the following way: "I want detailed comments from my peers. Especially negative ones… Because in those comments, they say specific things to you" (P1, Group interview 2).

While pre-service teachers expected some criticisms in the feedback they received from their peers, they explained that, in the teacher trainer feedback, they hoped for more suggestions and positive comments. This seems to indicate that they look for more feedback on self-regulation from their teacher trainer. P6, for instance, in the teacher trainer feedback on one of the micro-teaching activities, received feedback on modelling the activity. He later reflected on the aspects that he paid attention to in the teacher trainer feedback in the following way: "I pay attention to suggestions part more in teacher trainer feedback. It was about modelling the activity. I should have modelled the activity in addition to my instructions." (P6, Interview 2). Similarly, P2

commented on one instance in which she received feedback on preparing handouts for an activity she presented. She commented on that feedback as follows: "This time teacher trainer evaluation was effective. The teacher trainer provided some tips that we could not provide in peer feedback. In her feedback, I like to see suggestions for future teaching like the preparing handout example, for instance" (P2, Interview 2). P1, also, when reflecting on the teacher trainer feedback she received throughout the semester, noted the importance of receiving positive feedback from her teacher trainer for her development as a pre-service teacher. She explained this point in the following way: "I paid more attention to the positive comments that were provided in the feedback from the teacher trainer. I thought keeping those parts would lead my own development as a teacher" (P1, Interview 6).

In sum, it seems that pre-service teachers may have different expectations from the feedback they received from their peers and teacher trainer. They tend to focus more on the weaker parts of their teaching in the peer feedback whereas they hope for suggestions for future teaching in the teacher trainer feedback.

(Dis)agreement areas found in the feedback

When the pre-service teachers reflected on the feedback they received from their peers and teacher trainer, they commented on some agreement and disagreement areas. Table 1 below presents the agreement areas found in the peer and teacher trainer feedback along with the number of instances and percentages found in each type of feedback.

Table 1

Agreement Areas Found in the Feedback Pre-service Teachers Received on Their Micro-Teaching Activities

Agreement areas found in the feedback	The number of instances/percentages found in peer feedback	The number of instances/percentages found in teacher trainer feedback
Feedback about the task	41 (33%)	94 (58%)
Feedback about the processing of the task	42 (34%)	42 (26%)
Feedback about self-regulation	19 (15%)	26 (16 %)
Feedback about self as a person	27 (18%)	0 (0%)
Total	125 (100%)	162 (100%)

As can be seen from the table, while pre-service teachers agreed with their teacher trainer most of the time when they received feedback about the task, they seemed to agree with their peers when they receive feedback on the processing of the task and feedback about self as a person. While the pre-service teachers seemed to agree with their peers and teacher trainer in different areas, the data also showed some areas of disagreement found in the feedback they received on their micro-teaching activities. Table 2 below illustrates the disagreement areas found in the feedback pre-service teachers received on their micro-teaching activities along with the number and percentages found in peer and teacher trainer feedback.

Table 2

Disagreement Areas Found in the Feedback Pre-service Teachers Received on Their Micro-Teaching Activities

Disagreement areas found in the feedback	The number of instances/percentages found in peer feedback	The number of instances/percentages found in teacher trainer feedback
Feedback about the task	85 (64%)	2 (11%)
Feedback about the completion of the task	13 (10%)	10 (56%)
Feedback about self-regulation	16 (12%)	2 (11%)
Feedback about self as a person	19 (14%)	2 (22%)
Total	133 (100%)	18 (100%)

As can be seen from the table, while the pre-service teachers disagreed with their peers 64% of the time when they received feedback on the task, there were only two instances in which they expressed disagreement with their teacher trainer. For the feedback on the completion of the task, however, they showed disagreement with their teacher trainer 56% of the time whereas they disagreed with their peers 10% of the time they received feedback on the activities they presented. In general, the total number of instances they disagreed with their peers is 133, whereas they disagreed with their teacher trainer only in 18 instances.

These two tables illustrate the agreement and disagreement areas found in the feedback pre-service teachers received on their micro-teaching activities along with the number and percentages found in peer and teacher trainer feedback. It is important to note that pre-service teachers seemed to agree with their teacher trainer (N=162) more than they agreed with their peers (N=125) regarding the feedback they received from these agents. They seemed to disagree, however, with their peers (N=133) more than they disagreed with their teacher trainer (N=18). As far as the areas are concerned, the biggest difference between the agreement and disagreement areas found in the teacher trainer feedback and peer feedback was on feedback about the task. That is, pre-service teachers agreed with their teacher trainer 94 instances of the time they received feedback on the task, but they only disagreed with their teacher trainer only in two instances on this topic. They seemed to disagree with their peers on feedback about the task more than they agreed with their peers on this type of feedback.

In sum, the results indicate that pre-service teachers perceived the importance of multiple sources of feedback from different agents, and expected different feedback types from different agents and, maybe because of these expectations, there were some discrepancies found in the feedback data. These discrepancies may be related to the quantity of the feedback they received instead of the specificity of the feedback they received. It seems that the participant pre-service teachers expected feedback from multiple sources and thus filtered different types of feedback they received. Although most of the pre-service teachers commented on the efficacy of multiple sources of feedback, this seems to be in line with what Hattie and Timperley underlined in their seminal work on feedback (2007). Some pre-service teachers also talked about the filtering process they underwent in these feedback types. This seems to suggest that in

order to enhance the efficacy of feedback and support the learning environment, instead of multiple sources of feedback, it should be that those sources of feedback should provide feedback of a particular type (level) as it is these types of feedback that are the most effective in supporting improvement.

Discussion and Conclusion

The present study investigates what the relative value is of different types of feedback from the recipient's perspective. Using interview data, the study reported that although pre-service teachers considered teacher trainer feedback as the most influential one in their development as teachers in the long run, they stated that they changed their teaching immediately when they themselves realized a mistake and reflected on those in self-evaluations and reflections. Findings also suggested that they expected feedback about processing of the task from their peers and feedback about self-regulation from their teacher trainer.

Giving and receiving feedback on teaching is crucial for the development of pre-service teachers. Although the focus of the present study is on pre-service teachers, the findings could potentially have broader relevance, to any teachers, both pre- and in-service, who get formative feedback on a sample of their teaching. It seems that getting feedback from multiple mechanisms was perceived as a beneficial and enriching experience by the participants in this study. Teacher educators and pre- and in-service teachers, however, may be too focused on providing and receiving the one best type of feedback and not on the advantages of having simultaneous multiple feedback types and mechanisms. In order to increase the efficacy of the feedback, as suggested by Hattie and Timperley (2007), it seems important to train teachers on the advantages of focusing on the different types of levels (e.g. task, process, self-regulation, and self) to enhance learning and improve their teaching by integrating them.

In addition to training teachers on the advantages of feedback types and the ways to integrate such feedback on their teaching, it is also important to underline the implementation of feedback for learning. As Lee (2007) notes, mainly referring to teacher feedback in writing classrooms, teachers should implement the use of feedback for formative purposes. This may be also true for the use of feedback in the area of second language teacher education. Teacher trainers may want to emphasize the value of seeing post-observation feedback as a pedagogical tool to promote teacher learning rather than as a tool to assess teacher learning.

It seems also equally important to research the recipient's perspective on the feedback they receive and also to communicate the needs and expectations between the sender and the recipient before and during the feedback sessions. As Copland (2009) suggested, post-observation feedback may result in tension in initial teacher training, as was the case with some pre-service teacher participants in the present study. Receiving multiple simultaneous feedback on a sample of their teaching, they selected and integrated some points to consider from the feedback they received from different agents. This may also help to promote the sense of being part of an observation rather than an object of observation, as suggested by Freeman (1982).

Moreover, training the recipient in how to digest the feedback seems crucial for teacher educators who use micro-teaching. In this study, for instance, some pre-service teacher participants did not know what to do with the feedback initially and then their

comprehension, understanding and appreciation of the feedback changed over the course of the semester. As they participated in the activities, the agreement areas increased towards the end of the semester. Like the recipients who eventually got better at receiving feedback, the peers also improved their feedback giving skills towards the end of the semester.

Teacher trainers may also want to investigate the value of encouraging pre- and in-service teachers to reflect on different types of feedback they receive on their teaching. Especially in the initial years, novice teachers may be reactive towards the feedback they receive from their teacher trainers. With the help of such a reflective practice on feedback types at different levels, novice teachers may be more proactive towards the feedback and, possibly, they may develop a sense of appreciation for the value of observed lessons.

Finally, caution has to be sounded regarding the limitations of the study. It is important to point out that the findings reported here are constrained in that they focused on nine pre-service teachers in one institution over a single semester. As Yuan and Lee (2014) indicated, pre-service teachers change as they start teaching in the practicum. In addition, future research studies could integrate case studies and narrative studies to tap into pre-service teachers' cognitions. Future ethnographic research should take a more longitudinal approach to focus on pre-service teachers changing beliefs about different types of feedback they receive on their teaching practices.

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The Investigation of the Effect of Montessori Approach-based STEM Activities on the Problem-solving Skills of Pre-service Preschool Teachers*

Montessori Yaklaşım Temelli STEM Etkinliklerinin Okul Öncesi Öğretmen Adaylarının Problem Çözme Becerilerine Etkisi

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ABSTRACT: This research was conducted to determine whether there is any effect of the Montessori approach-based STEM activities on the development of the problem-solving skills of pre-service preschool teachers or not. The mixed-method was employed in the research. The sample of the research consisted of 50 teacher candidates studying at the Faculty of Education Preschool Teaching Department in the 2017-2018 academic year. A single grouped pretest-posttest pattern was created to determine the difference in the problem-solving skills of the pre-service teachers in the research. The quantitative data gathered during the process of the research were analysed with the statistical methods; the qualitative data were analysed with the content analysis. In the study, quantitative data were collected using the "Problem Solving Scale", and qualitative data were collected using the "Semi-Structured Interview Form". The interview form is quantitative and consists of 10 open-ended questions in total. This form was applied only to 15 volunteers at the end of the study. For 14 weeks, candidates were given Montessori approach-based STEM training. In the findings obtained as a result of the research; it was observed that there was a significant difference between the pre-test and post-test scores of problem-solving skills and the qualitative analysis results also supported the quantitative results. With these findings, it was concluded that the activities developed the problem-solving skills of individuals and produced solutions to the problem from different perspectives.

Keywords: Montessori approach, problem-solving, STEM.

ÖZ: Bu araştırma, Montessori yaklaşım temelli STEM etkinliklerinin okul öncesi öğretmen adaylarının; problem çözme becerilerinin gelişimi üzerine etkisinin olup olmadığını tespit etmek amacıyla yapılmıştır. Araştırmada karma yöntem kullanılmıştır. Araştırma örneklemini 2017-2018 eğitim öğretim yılında Eğitim Fakültesi Okul Öncesi Öğretmenliği Bölümünde öğrenim gören 50 öğretmen adayı oluşturmuştur. Araştırmada öğretmen adaylarının problem çözme becerilerindeki değişimi belirlemek amacıyla tek gruplu öntest sontest deseni oluşturulmuştur. Araştırma süresince elde edilen nicel verilerin analizi istatistiksel yöntemler ile nitel verilerin analizi ise içerik analizi ile yapılmıştır. Çalışmada nicel veriler "Problem Çözme Ölçeği" ile nitel veriler ise "Yarı-Yapılandırılmış Görüşme Formu" kullanılarak toplanmıştır. Görüşme formu niceli destekleyici nitelikte ve toplamda 10 açık uçlu sorudan oluşmaktadır. Bu form çalışma sonunda sadece gönüllü 15 katılımcıya uygulanmıştır. 14 hafta boyunca adaylara Montessori yaklaşım temelli STEM eğitimleri verilmiştir. Araştırma sonucunda elde edilen bulgularda; problem çözme becerilerinin öntest ve sontest puanları arasında, anlamlı bir farklılık olduğu ve yapılan nitel analiz sonuçlarının da nicel sonuçları desteklediği gözlenmiştir. Bu bulgular ile etkinliklerin bireylerin problem çözme becerilerini geliştirdiği ve soruna farklı bakış açıları ile çözümler ürettikleri sonucuna ulaşılmıştır.

Anahtar kelimeler: Montessori yaklaşımı, problem çözme, STEM.

* This study was produced from the master's thesis of the first author under the supervision of the second author at Erzincan Binali University.

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Today, economic developments and technological changes have changed the characteristics and competencies expected of people in the 21st-century competitive world (Çevik & Abdioğlu, 2018). These qualifications are the skills of being firm against the problems, studying inter-disciplinary, having improved communication skills, creative and problem-solving skills, which is the most significant factor in education. Problem-solving is the planning of the answer to an existed problem, presenting a situation or response to achieve a difficult task, suggesting a probability or showing interest. The most important environment that will help the individual to think original, productive, different and qualified and to become responsible individuals by taking solid steps in the future is education environments (Yuvacı & Dağlıoğlu, 2018). Therefore, different and new approaches are needed to educate individuals having these skills in education environments (Şahin, 2013; Yaman & Yalçın, 2005). It has been supported in several studies that the Montessori approach (Durakoğlu, 2011) and STEM education are effective in getting individuals to acquire problem-solving skills at early ages in the 21st century (Uyanık-Balat & Günşen, 2017). The easiest way to achieve this is to provide the individual with STEM education with the help of games made in childhood (Uyanık-Balat & Günşen, 2017). It is suggested that STEM education should be given at a basic level in order to maintain the effectiveness of scientific process skills for individuals (Çepni, 2017). Considering these suggestions, in order to increase the effect and permanence of STEM education to be given in the pre-school period, STEM education applied based on the Montessori approach philosophy, which is of great importance in children's education and school success in this period, will provide a stronger and more effective education (Çakır & Altun-Yalçın, 2020). These two educational approaches complement each other with the same goals (to raise creative individuals who have 21st-century skills, research, question, analyze, produce, find solutions to problems (Çakır, 2018). Therefore, training of expert teachers who can integrate these trainings by supporting each other and apply them in the pre-school period will be effective in education (Çakır, 2018). In the literature, the importance of bringing up STEM experience to children in the pre-school period and raising individuals who will produce innovative solutions to complex problems in the future and contribute to economic developments is emphasized (Aronin & Floyd, 2013). However, in our country, sufficient teachers could not be trained at the desired level with this training (Çepni, 2017). The same is true for the Montessori approach in accordance with Montessori principles, preparing new materials and activities suitable for the needs of the developing age and using them properly in the program is an important point that should be adopted in child education (Oğuz & Köksal-Akyol, 2006). For this reason, in order to apply the Montessori approach in preschool education programs, there should be educators who have absorbed this approach in the school. For this, first of all our teachers who are experts in these fields should be trained. The fact that two approaches are used jointly in the literature and there are almost no studies on prospective teachers reveals the deficiency in this field.

Montessori Approach

Montessori approach is developed by Maria Montessori. It is based on the child's ability to learn in the best and easiest way through self-application (Yücesan, 2017). The Montessori approach advocates that education is a natural process and the

child will act according to his inner voice and at his speed so that the child can control himself and achieve permanent learning (Hobbs, 2008). The aim of the Montessori approach is to develop self-confidence, initiative, knowing what you want and applying it, acting independently, problem-solving, making a critical analysis, using creativity skills, concentration, being organized, helping each other, and respecting others (Oğuz & Köksal-Akyol, 2006). In order to achieve these goals, first of all, to enable the child to live (learn) on his own without forcing the joy of learning; the second is to help perfect the learning mechanism (Özdağ, 2014). Montessori schools are designed in a format that allows children to use the necessary teaching materials and engage in activities related to daily life without the help of adults. In these classrooms, not the areas dominated by adults, but the areas where children are independent and to develop their own control are taken as a basis. Considering all these, all items in Montessori schools or classrooms, especially tables, chairs and cabinets, were prepared according to the height of the children (Arslan, 2016). The main goal here is to enable the child to learn freely by doing, touching, and experiencing. Therefore, it aims to raise qualified and happier individuals for the future (Korkmaz, 2005). Among the most important features, what makes the Montessori approach different from other approaches is that it has its own unique materials developed by the founder of the approach. Montessori materials accommodate the child's sensory areas and daily life exercises. Its applications are based on the principle from simple to difficult and the materials are interesting, natural, vibrant, and colorful. In the Montessori approach, the individual freely creates a product by using his / her own creativity (Yücesan, 2017). In Montessori education classes, trainings consisting of mixed age groups (0-3 and 3-6 ages in 2 groups) are applied, and activities are generally handled individually or in small groups (Hobbs, 2008). The materials used in the activities provide corrective feedback and are grouped into language, senses, culture, mathematics-geometry, art, music, and daily life materials. The Montessori approach positively affects the child physically and mentally; attaches importance to all kinds of senses, movements, and language education of the child; it is an approach that contributes significantly to their physical, social and emotional development (Dereli, 2017).

STEM Education

STEM is an educational approach in which Science, Technology, Engineering and Mathematics (Mathematics) are given in an integrated manner (Zhou and Wu, 2010). Bybee (2010) describes STEM education as an approach that teaches from pre-school to 12th grade by integrating mathematics, science-based engineering, and technology. The process of using STEM education in lessons starts with teaching science and mathematics knowledge. Afterwards, they are given a problem situation where they will use this knowledge and now the engineering design processes begin. As a result of the applied engineering design process, a product emerges. All this process and the resulting product are expressed as technology (Yıldırım, 2019). The aim of STEM education is to establish interdisciplinary relationships so that learning can be carried out in a holistic approach. STEM education aims to enable students to look at problems from an interdisciplinary perspective and gain knowledge and skills with a holistic education approach (Şahin, Ayar, & Adıgüzel, 2014). To learn the effectiveness of learning by using the principles of age and learning from simple to difficult, theoretical information in STEM education transformed into applications, products, and

innovative inventions (Milli Eğitim Bakanlığı, 2016). Aslan-Tutak, Akaygün, and Tezsezen (2017) stated in the results of their studies that teacher candidates should be made aware of STEM education before graduating from university, and emphasized that teachers do not have knowledge in areas other than their own fields and that the necessary information should be given in these fields because STEM is an interdisciplinary approach. In Arıkan (2018), students who encounter a problem consisting of many variables in real life may not be able to be solved by learning in schools according to a single discipline. Therefore, it was stated that conveying the climate of approaching disciplines as a whole and teamwork with the help of STEM education will contribute to students' solving their problems (Timur, Timur, Yalçınkaya-Önder, & Küçük, 2020).

Montessori Approach and STEM

Preschool children are expressed as individuals with enormous potential such as engineers and problem solvers (Hadzigeorgiou, 2002). By an awareness of the importance of early childhood education in the world, including Turkey has been a significant increase in training programs for this area (Dereli, 2017). Materials prepared in accordance with the principles of Montessori approach included in these programs. It provides behaviors and skills that include the willingness and pleasure to work in collaboration, productivity, focusing attention, questioning, creativity, self-confidence, analyzing, responsibility awareness, how to solve a problem, and respect for themselves and others (Durakoğlu, 2011). For STEM education, which has common goals, Chesloff (2013) uses the concepts at the center of STEM; curiosity, analysis, creativity, cooperation, problem-solving and critical thinking. Therefore, he argues that this education should begin in the preschool period in order to gain these skills in the individual and to ensure their permanence. When the literature is examined, two studies have been found among the joint studies of the Montessori approach and STEM. Açıkgöz (2018), in order to determine the extent to which STEM and Montessori approaches can be applied in the preschool education program and what their similar and different aspects are, the views of a total of 14 preschool teachers were examined. Elkin, Sullivan, and Bers (2014) conducted a study on how the robotics curriculum can be applied in Montessori classes. The study was carried out by 1 preschool teacher, who is an expert in the field of Montessori, receiving 3-day training on robotics and applying it to 19 preschool children in his classroom. One of the studies conducted is a qualitative study that only takes an opinion on two approaches. The other is a study that includes only the robotic step of STEM education. In this study, all the steps of STEM education were applied (STEM with simple materials, STEM with types, and robotic coding). In addition, different examples of activities were applied at each step. For example, 4 different robots and their coding were made in the robotic step.

The aim of the present study is to contribute to the development of the problem-solving skills of pre-service preschool teachers with the Montessori approach-based STEM activities. In addition, it is aimed to train teachers to be qualified on STEM Education and Montessori approach, which is one of the new education programs, and to become competent educators who can apply for these education programs in their courses in accordance with the national education curriculum.

Research questions are as the following:

1. Do STEM activities based on Montessori approach have an effect on pre-school teacher candidates' problem-solving skills?
2. What are the pre-service teachers' feelings and thoughts about activities?

Method

Research Design

Within the scope of the research, the descriptive pattern of the mixed method was employed. The mixed-method is collecting both qualitative and quantitative data resources, combining and associating with the purpose of supporting the study results with more than one proof (Baki & Gökçek, 2012). The descriptive pattern, in which the quantitative analysis is dominant, was employed. In descriptive patterns, the quantitative research is dominant and researchers collect quantitative data and analyse it first. Then, they collect qualitative data to complete, support and refine these data (Büyüköztürk, Kılıç-Çakmak, Akgün, Karadeniz, & Demirel, 2016). In handling quantitative data, the weak experimental pattern, which is among the experimental research designs, was applied. The basic purpose of needing this method is to measure the effectiveness of any "thing" (a new learning method or a curriculum) and to make suggestions (Büyüköztürk et al., 2016). The single group pre-test, post-test design was created to measure the problem-solving skills of the group in the study.

Study Group

The research was carried out with 50 teacher candidates studying in the 3rd grade in the pre-school department in a university of a medium-sized city in Eastern Anatolia. Easily accessible sampling model is used. 15 of the group are boys and 35 are girls. The study was implemented under the name of Preschool Science Education course. In the study, the volunteering of the candidates was taken as a basis in the survey applications. In addition, while determining the group, it was taken as a basis that they had not received any previous training in these areas.

Data Collection Tools

In the study, Problem Solving Scale developed by Heppner and Petersen (1982) and adapted to Turkish for the first time by Taylan (1990) was used to determine the problem-solving skills of prospective teachers in the sample group. The problem-solving scale consists of 35 items that describe how individuals react to their problems in their personal and daily lives and how they react (Kaya, 2010). On the scale, there are 6 sub-dimensions: impetuous style, thinking style, evaluative approach, self-confident, planned approach, and avoidant approach. The reverse items in the scale are items 1, 2, 3, 4, 11, 13, 14, 15, 17, 21, 25, 26, 30 and 34. The Cronbach Alpha coefficient of the scale was found to be .79.

In collecting qualitative data in the study, a semi-structured interview form consisting of 10 open-ended questions prepared in writing by the researcher for problem-solving skills was used. The purpose of the questions is to determine the opinions, feelings and thoughts of pre-school teacher candidates about the activities carried out in parallel with the quantitative questionnaires. In order to ensure validity, all items of the problem-solving scale were taken as the basis and analyzed in accordance with the research purpose. In addition, these questions were prepared in

order to determine how and in what direction the development of the problem-solving skills of the candidates, different perspectives and social communication skills of the activities performed during the process. The comprehensibility and suitability of the questions prepared were examined by 3 different experts, and then finalized and applied to 15 volunteers at the end of the process. The interviews were recorded and transcribed and analyzed by the researcher. Each question is included in the results section under the heading of table analysis. The questions are given below.

1. The questions related to opinions of the pre-service teachers are "Did these activities change your perceptions of problem-solving? If yes, can you explain with an example?"
2. The questions related to opinions of the pre-service teachers are "How did the Montessori approach-based STEM activities influence your thoughts towards the problems you encountered?"
3. The questions related to opinions of the pre-service teachers are "Were you able to reach a common conclusion in solving problems within the group? How did you do this? What way did you follow?"
4. The questions related to opinions of the pre-service teachers are "Did you encounter any problems while doing these activities? If yes, how did you solve the problems you encountered?"
5. The questions related to opinions of the pre-service teachers are "What way do you follow in case of problems (during the event) you encounter?"
6. The questions related to opinions of the pre-service teachers are "What did you feel when you could not get the result in any event? Did you think why you could not reach? Did you try to find a solution? How?"
7. The questions related to opinions of the pre-service teachers are "Did you find solutions to the problems in the activities? What changes occurredd in your thoughts and studies when you realised that you had reached the right answer?"
8. The questions related to opinions of the pre-service teachers are "Could you tell us about the ways to solve the problem situations you encounter in the activities?"
9. "Can you anticipate the problems you may encounter while doing other activities yourself after these activities?"
10. The questions related to opinions of the pre-service teachers are "Do you still try to find new ways, even if you know that you cannot reach the conclusion about a problem you encounter?"

Process

For the Montessori approach-based STEM activities, which will be applied to 50 pre-school teacher candidates for 14 weeks, the relevant literature was first scanned. Activities in line with the results; care has been taken to ensure that STEM education and Montessori approach contain the basic features and common goals. For example, the ability of teacher candidates to integrate them with different fields by using the knowledge of their own fields (the dimension of STEM fields integration) and the excitement that they can create new products in line with the purpose specified in these

areas (the dimension of creating products freely using the individual's own creativity of the Montessori approach), to be used in their professional life and individual development, attention has been paid to having the qualifications to use its experience and knowledge to solve problems. If it is stated how the STEM and Montessori approach is integrated into the activities; the materials in the Montessori approach applications are interesting, vibrant and colorful. STEM materials also contain a level encountered in daily life that can attract the attention of the child (plastic bottle, motor, rope, colored binding cables, cap, plastic cup, etc.). Montessori materials accommodate the individual's sensory areas and daily life exercises. Similarly, while selecting STEM materials, it includes the sensory field and subjects that can be seen in daily life by making, living, touching. Both approaches contain the characteristic of going from simple to difficult. In addition, individuals were enabled to solve the problem with their own ideas without any intervention in case of making mistakes in the activities. There are 14 activities, and the materials used are composed of materials that will include different application areas. These are, respectively, from the recycling of simple materials that can be found in all areas of daily life (for example, discarded plastic bottles and lids, straws, plastic cups, cardboard boxes, insulating electrical cables, tin coke boxes, etc.), type (made of starch and colored with food dyes) they are small sponges in the form of a cylindrical, wetted special cloths are easily glued with each other by touching them and the desired design is shaped) and robotic-coding design legos. In this process, it was tried to contribute to the development of the problem-solving skills of the teacher candidates, to establish a relationship between the information they acquired and the situations they encountered in daily life, and to create their own products by building new things. After setting up groups of no more than 4 people, firstly, the short and required level of theoretical information about how to do about the activity of that week (for example; required mathematics and science information, showing the figure drawings of the determined activity) were introduced and the necessary materials were introduced. In the events, activities consisting of simple materials, robotic coding with legos and type (small, colored, cylindrical sponge-like materials prepared from corn starch for preschoolers, where designs are created by sticking together when wetted) studies were done. In applications made for these purposes, for example, the subject of rain formation and its stages, including science and mathematics, was given to the candidate. The candidates were asked to create a product that is entirely up to their creativity by the group in line with the materials and time given. Later, as an example of those made with simple materials, in the activity named "energetic glass", a circuit institution from the candidates, engineering design, using mathematical measurements to keep balance and a robot using daily materials such as colored pencils and pet glasses has been asked to design. Again with the given legos, the group was asked to design the machines in an amusement park that they encounter in daily life and how these machines work was taught by giving coding training in the computer environment. The coding activities part covers STEM-based robotics activities. For example, they have created activities such as a washing machine, traffic light, carousel with STEM engineered and made STEM-based robotic applications by coding these designs on the computer. In the twelve weeks of 14 weeks, they were asked to create products within the scope of the topics determined by the experts. In the remaining 2 weeks, the candidates were asked to create products within the scope of the topics and materials determined entirely. For example, a group

presented the concepts of number from the types by integrating the stages of the butterfly with the stages of formation, by narrating the design they created.

Table 1

STEM Activities Based on Montessori Approach

Weeks	Event names
1	Balloon car
2	Parachute making
3	Traffic light (from a can of coke)
4	Mousetrap car
5	Non-knockdown CD
6	Remote control snake
7	Energetic glass
8	Carousel robot construction (design and robotic coding)
9	Traffic light (design and robotic coding)
10	Washing machine (design and robotic coding)
11	Sensor door (design and robotic coding)
12	Type studies
13	Activity presentations prepared by the student candidates (STEM activity presentations prepared based on the Montessori approach philosophy by leaving the subject selection to the candidates.)
14	Activity presentations prepared by the student candidates (STEM activity presentations prepared based on the Montessori approach philosophy by leaving the subject selection to the candidates.)

Data Analysis

The quantitative data gathered as a result of the study were analyzed with the statistical methods. In the analysis of these data, In order to determine any statistical method in the analysis of these data, considering the histogram graphs and skew coefficient of all measurements, the compliance of the values with the normality assumption was checked with the Kolmogorov – Smirnov test (the sample was taken into account because the sample number is over 30) in order to determine whether the data shows normal distribution or not (p>.05). The graphs and values emerged to indicate that the data show normal distribution. Paired samples t-test was applied to determine whether there was a significant difference between the problem-solving scores in the sample group pretest and posttest results. In the paired samples t-test, pre and post-test averages are compared on the same sample group (Can, 2016).

Qualitative data were subjected to content analysis. In these analysis methods, codes and relevant categories are created from the interviews made by the researcher. In the content analysis, the data were analyzed in four stages: coding the data, finding the categories, organizing-defining the codes and themes, and interpreting the findings (Yıldırım & Şimşek, 2008). Interviews were made with 15 people. More than one code

was created in some versions of some of the students. The interview data were recorded, transformed into text, and analyzed in accordance with the stages of content analysis. The codes and categories created in the validity and reliability dimension of the data analysis were analyzed by 4 different experts and the results were combined.

The equation P = (Na x 100) / (Na + Nd) (P: percentage of agreement, Na: amount of agreement, Nd: amount of disagreement) stated by Miles and Huberman (1994) was used. The percentage of agreement calculated by the researchers was found to be 75%. It was stated by Yıldırım and Şimşek (2008) that when the agreement percentage in the reliability calculation is 70%, it can be assumed that the reliability percentage has been reached.

Ethics Committee Information

Erzincan University Human Rights Ethics Committee is a study dated 30.11.2017 and numbered 09/09. In the study, volunteer individuals in the sample group selected to collect data were informed about the subject by signing a consent form. None of the actions against the Scientific Research and Publication Ethics have been carried out and all the rules in the Higher Education Institutions Scientific Research and Publication Ethics Directive have been followed.

Findings

The quantitative and qualitative findings gathered in the research are presented in tables with their interpretations below.

The paired samples t-test results for the pre and post-test scores of the problem-solving skills of the pre-service teachers are presented in Table 2. The paired samples t-test was applied to determine the effect of activities on the problem-solving skills of the pre-service teachers and to find out the significant difference between the pretest-posttest scores. In the results of the test, it was observed that there was a significant difference between the scoring average (pre-test=139.20) before the application and the average (post-test=151.10) after the application ($t(49)=-3.383$, $p<.05$). Thanks to this significant difference, it can be claimed that the education given developed the problem-solving skills of the preschool pre-service teachers. In order to analyze the qualitative data, each question is analyzed separately and a table is created and interpreted below.

Table 2

The Paired Samples T-Test Results Related to Problem-Solving Skills.

Measurements	*n*	$\bar{X}$	*ss*	*t*	*sd*	*p*
Pre-test	50	139.20	18.67	-3.383	49	.001
Post-test	50	151.10	19.51			

$p<.05$

Table 3
Paired Samples T-Test Results for Sub-Dimensions of the Problem Solving Skill Scale

Bottom Dimension Measurements	*N*	$\bar{X}$	*Ss*	*t*	*p*
Impetuous style Pre-test	44	34.95	5.96	-4.513	.000
Impetuous style Post-test	44	40.63	6.30		
Thinking style Pre-test	48	23.56	3.75	-.443	.659
Thinking style Post-test	48	23.85	4.0		
Evaluative approach Pre-test	48	27.50	4.64	-1.174	.246
Evaluative approach Post-test	48	28.54	5.31		
Self-confident Pre-test	50	19.48	3.12	.061	.951
Self-confident Post-test	50	19.52	3.48		
Planned approach Pre-test	49	13.42	3.00	-2.643	.011
Planned approach Post-test	49	14.83	2.0		
Avoidant approach Pre-test	48	18.31	3.45	-.891	.417
Avoidant approach Post-test	48	18.89	3.82		

Lower dimensions (1: Impetuous style, 2: Thinking style, 3: Evaluative approach, 4: Self-confident, 5: Planned approach, 6: Avoidant approach)

Paired samples t-test results for detecting the difference between pre-test and post-test scores of 6 sub-dimensions of the pre-service teachers' problem-solving skills scale are shown in Table 3. In the results of the test, there was a statistically significant difference in the 1st and 2nd sub-dimensions ($p<.05$), while no difference was found in the 2, 3, 4, and 6th dimensions ($p>.05$).

Table 4

The Opinions of the Pre-Service Teachers Related to the Question "Did These Activities Change Your Perceptions of Problem-Solving? If Yes, Can You Explain With An Example?"

Category	Code Name	Frequency (*f*)
Method and Technique	Trial and error	3
	Scientific overview	3
	Different solutions	2
	Problem-solving	1
Individual Qualification	Clearance of prejudices	4
	Dealing with the problem	3
	Self-confidence	2
Other		4
Total		22

In Table 4, the answers of the teacher candidates regarding the question are given and 3 separate categories have been created. In the category of method and technique; the statements about the positive thoughts and problem-solving methods provided in the perceptions of the pre-service teachers in solving a problem after the activities were included. The candidates stated that they did not deal with a problem (especially about science) before the training, even if they did not find it, they stopped. However, after this training, they constantly learned to develop different perspectives on the problem, tried by making trial and error, found new ways, learned from their mistakes and succeeded in reaching a solution by offering different solutions to the problem that will arise in the next event, and they learned to look at the problems they encountered from a more scientific perspective have done.

In the individual qualification category; Statements containing the contribution of positive effects on candidates' perceptions in solving a problem after the activities to their competencies were included. In this category, the candidates included opinions stating that their prejudices such as not being able to do or not being able to solve any problem were demolished and their self-confidence increased in problem-solving, each activity they made facilitated the next one and that they could overcome the problems.

In the category of 'other', some pre-service teachers stated that they did not have a very in-depth effect on their perceptions about the problem as they found the training given short.

Some of the preservice teachers' views on the question are given below.

"…We are purified in our prejudices. We learned that there is nothing we cannot do..."

"… Sure. For example, the teacher liked the binding system we use in the traffic light event, which led me to create new roads. It allowed me to gain different perspectives…"

"… Provided. While I used to find a solution to a problem, now I wonder if I can find different solutions…"

In Table 5, the answers of the teacher candidates regarding the question are given and 6 separate categories have been created. In the learning category; pre-service teachers teach that the activities teach how to find different solutions and perspectives for the solution of a problem, to deal with different aspects of the problem, to reach the solution of the problem carefully, patiently, by making mistakes, step by step, to learn by living by doing one-to-one and to use concrete expressions suitable for children they stated.

Table 5

The Opinions of the Pre-Service Teachers Related to the Question "How Did the Montessori Approach-Based STEM Activities Influence Your Thoughts Towards the Problems You Encountered?"

Category	Code Name	Frequency (*f*)
Learning	Different perspective	5
	Be patient	3
	By doing	2
	Use of electronic tools	1
	Embodying abstract issues	1
Thinking Skills	Mental activities	8
	Abstract and versatile	5
	Generating hypotheses	1
In Terms of Social Perspectives	Fixing social relationships	3
	Cooperation	2
	Sharing	1
	Don't listen	1
In Terms of Education Opportunities	Preschool period	2
	Career	1
Product Creation Methods	By trying and wrong	2
	Following the stages	2
	Going from part to whole	1
	Putting the problem on the versatile table	1
Awareness Level	Noticing the situation	4
	Helps in solving problemsThe beauty of education	3
		1
Total		50

In the category of thinking skills; the candidates stated that various thinking skills for any problem were developed after the activities. In other words, they stated that their mental thinking activities developed in the face of a problem situation, they thought more creatively and critically, they could think abstractly and put forward many hypotheses in the face of the problem, and they were able to use their versatile thinking skills to create the product in the light of these hypotheses.

In the category of social aspects; they stated that the activities performed positively affect their social skills, for example, they reached the result more easily by making collaborative practices in the face of the problem. They also stated that thanks to these activities, they listened patiently and respectfully to each other, shared information and overcome the problem in solidarity because they were doing as a group to solve a problem, and their negative thoughts towards their groupmates decreased (their social relations improved).

In the category of educational opportunities; the candidates stated that the Montessori approach-based STEM activities are suitable for preschool children and

teachers can easily apply these activities in their professional lives. They also talked about the importance of providing the child the opportunity to find the problem that arises in any activity.

In the category of product creation methods; the candidates talked about the methods they have used to reveal the product against the problems during the activities. They stated that they gained experience from the mistakes they made for the problems they made, that they progressed carefully while making the product, that they discussed the problem from many aspects and strived for its solution, reached from the piece to the whole and made very good products by trial and error.

In the awareness category, the candidates talked about the beauty of the activities, the benefits they provided to them, and their awareness of a situation.

They stated that it helps them develop their ability to create different solutions in the solution of a problem and design remarkable products.

Some of the preservice teachers' views on the question are given below.

"… I didn't know about STEM. Especially that it can be applied in the pre-school period.. then we found and started to use examples that we learned in our presentations…"

"…It was a very good education. It helps us a lot in problem-solving. Before we started an activity, we produced something about it, then we posed a problem. Then we got it resolved. It helped a lot in these matters…"

"… Montessori is already an education in itself. Once, it offers children learning by doing. Our aim is to find the problem for the child and find the result himself. It activates the thoughts and mental activities of the child as it gives this opportunity…"

Table 6

The Opinions of the Pre-Service Teachers Related to the Question "Were You Able to Reach A Common Conclusion in Solving Problems Within the Group? How Did You Do This? What Way Did You Follow?"

Category	Code Name	Frequency (*f*)
Social Competence	Collaborative work	7
	Joint decision making	6
	Business departments	6
Mental Achievements	Achievement	6
	Joint solution	5
	Respect for ideas	4
	Presenting ideas	4
	Don't try ideas	2
	Logic	2
	Recognizing mistakes	1
Behaviour	Don't put effort	1
	Not give up	1
	Calm	1
	Getting information	1
	Product satisfaction	1
Total		48

Table 6 includes the answers of the teacher candidates regarding the question and 3 separate categories were created. In the social competence category; the teacher candidates are able to make group decisions in solving the problems that arise during the activity, and while doing this, they can work collaboratively, come together as a group to reach common decisions and conclusions, allow the implementation of every opinion put forward, the method they use such as creating a team spirit and the behaviors they pay attention to.

In the category of mental acquisitions; it includes expressions about what the ideas and methods they produce in solving the problem mentally bring. The preservice teachers stated that they offered everyone their ideas to reach the solution of the problem, they cared and tried all the ideas, they found the mistakes as a result of the experiments, and they achieved success in the solution by combining the common decision taken by the group with the ideas found to be correct and logical.

In the behavior category, the behaviors of the teacher candidates during the implementation phase of the common decisions they take to reach the result are included. Statements were included stating that each member of the group made an effort to achieve a result, that they acquired information focused on revealing the product, that they maintained their calmness in case of negative results, and they made trials until they reached the result again and again, and that they wanted the product to be satisfied for every member of the group.

Some of the preservice teachers' views on the question are given below.

"… In the early days, I was saying everyone should listen to my opinion. But after listening to me, I saw that we got the wrong conclusions. Later, I learned to act with the group and make joint decisions. Because sometimes someone else can see something that I do not see..."

"…There was teamwork. We used to divide work. We would try and respect everyone's opinion among ourselves and we took whatever happened…"

"… There were some difficulties with different people at first, but this was a group work and somehow we had to make sacrifices and meet common results and we succeeded..."

"…We always decided as a group. Everyone has come up with their minds. We did it according to who got the most votes..."

Table 7 includes the answers of the teacher candidates regarding the question and 3 separate categories were created. In the problem-solving category; candidates applied for expert help to solve the problems that arise in the activities (for example, lack of material, lack of theoretical knowledge, inability to reach a result), they tried different ways by taking different opinions of the group members, they tried to notice their mistakes by doing the activity again and again, that they joined together as a group, helped them in their own field. They stated that they made use of the knowledge and science-mathematics knowledge, followed the instructions in the guides given in some activities and reached a solution by using trial and error methods considering different possibilities.

Table 7

The Opinions of the Pre-Service Teachers Related to the Question "Did You Encounter Any Problems While Doing These Activities? If Yes, How Did You Solve the Problems You Encountered?"

Category	Code Name	Frequency (*f*)
Problem Solving	Group collaboration	5
	Expert assistance	4
	Try different ways	4
	Information	3
	Guidelines	1
	Correcting mistakes	1
Attitudes Towards Problem	Be patient	2
	Competition ambition	2
	Competition pleasure	1
	Strain	1
Problems	Inability to place materials	2
	Lack of material	1
Total		26

In the category of attitudes towards problem; statements stating the candidates' attitudes towards the problems they encountered were included. They stated that even if they have difficulties in the face of problems, they never give up with the ambition to reach results and compete, they tried hard again and again patiently, and they did it by enjoying the excitement of the competition.

In the category of problems, the problems that the teacher candidates encountered in the activities were included. These problems are the lack of material and the difficulties they experience in material placement.

Some of the preservice teachers' views on the question are given below.

"…We met. We solved them by helping each other. We found it by trying different ways..."

"…Yes. For example, when we were making materials, we did it first in the balloon car event, but the car was not driving fast, we used science knowledge in this problem. In other words, we used smaller and lighter materials due to speed and usage. In this event, we learned that the more we reduce the friction, the faster it goes…"

"...I had difficulties in making materials with some simple materials, but since there are competitions or something that adds pleasure to the lesson, we quickly resolved the problem as a group…"

Table 8 includes the answers of the teacher candidates regarding the question and 2 separate categories were created. In the category of problem-solving methods; the methods applied by the candidates to solve the problems they experienced during the activity were mentioned. In other words, they first determine the problem situation in the face of existing problems and if there is missing material in the activity, they remove the missing part by making different designs with other materials in their possession to provide it, they make a group meeting and distribute work and tasks for the problem, make a literature review or consult expert opinions, statements were included stating that they tried to determine different hypotheses for the solution and tried to determine

them by trial and error and that they tried to detect the error by looking at the guides and proceeding step by step.

Table 8

The Opinions of the Pre-Service Teachers Related to the Question "What Way Do You Follow in Case of Problems (During the Event) You Encounter?"

Category	Code Name	Frequency(*f*)
Problem Solving Methods	Expert opinions	9
	Group meeting	7
	Work sharing	4
	Elimination of missing materials	3
	Generating hypotheses	3
	Guides	2
	Retries	2
	Literature review	1
	Step by step progress	1
	Identifying the problem	1
	Understanding the problem	1
	Do not ask me question	1
Skill-Knowledge	Respect for ideas	7
	Brainstorming	5
	Hand skill	1
	Area information	1
	Designing different parts	1
Total		50

In the knowledge-skill category; they talked about the methods used by pre-service teachers in problem-solving and the knowledge-skills they gained as a result. Individuals stated that they gained the skills of generating different ideas, designing different pieces by brainstorming as a group against the problem, gained the skills to respect each other's views, and again, in order to reach a solution, they consulted the ideas of their friends, whom they trusted in their field knowledge and manual skills.

Some of the preservice teachers' views on the question are given below.

"…With divisions of labor within the group. After the first weeks, our problems decreased as we got to know each other. As a group, we listened to everyone's ideas and distributed tasks…"

"…First I determine the problem. Then I proceed step by step. STEM taught me this already. I grasp the problem, proceed step by step, and reach the result..."

"…In our group friends, we turned to everyone according to their own hand skills and knowledge in the field. For example, one of them collected materials, the other detected the missing materials, and the other produced a solution to the problem by using field information..."

In Table 9, the answers of the teacher candidates regarding the question are given and 2 separate categories have been created. In the attitude category, the attitudes that include the feelings of the candidates when they cannot produce products while performing the activities are included. These; when candidates do not reach the result,

they stated that they were depressed, they were very upset, they were angry, they always continue with the ambition to reach a result, they felt bad and they had a hard time reaching a solution. When they reached the result, they stated that they had good feelings.

Table 9

The Opinions of the Pre-Service Teachers Related to the Question "What Did You Feel When You Could Not Get the Result in Any Event? Did You Think Why You Could Not Reach? Did You Try to Find A Solution? How?"

Category	Code Name	Frequency (*f*)
Attitude	Do not be sad	3
	Getting angry	3
	Strain	2
	Good feelings	2
	Ambition	1
Creating Solutions	Solidarity	5
	Learning by doing	4
	Stage Review	4
	Exchange of ideas	2
Total		26

In the category of generating solutions, they stated the solutions that the teacher candidates applied when they could not reach the result. These; they stated that they received help from experts, senior classmates, groupmates and friends in other groups who were knowledgeable about the subject, they tried to find the existing mistakes by constantly starting the construction of the activity, they tried to find the existing mistakes, they tried different ways by exchanging ideas within the group, and they found solutions by correcting the mistakes.

Some of the preservice teachers' views on the question are given below.

"…I was very sad when you couldn't. Of course, I thought about the solution. I disassembled it and did it all over again. I reviewed the stages again…"

"…We had a hard time when we couldn't reach a result. Then we went back over and over again. We corrected our mistakes and came to a conclusion, which was a very good feeling. Even if we were forced, it was beautiful. Seeing our own mistakes and correcting it ourselves, trying again, exchanging ideas on our mistakes as a group..."

"…I got so angry when I couldn't reach it. I said I should definitely arrive. Then I thought and tried to find different ways and reached..."

The answers of the teacher candidates related to the question are given in Table 10 and 2 separate categories have been created. In the readiness category; the candidates stated that they have feelings that increase success such as happiness and self-confidence that comes from reaching the right results by producing solutions to the problems that occur and that all these feelings positively affect their level of readiness for the next event so that they expect the next event with even more enthusiasm, determination, curiosity, and excitement. They also stated that they enjoyed what they did and that all this motivated them.

Table 10

The Opinions of the Pre-Service Teachers Related to the Question "Did You Find Solutions to the Problems in The Activities? What Changes Occurred in Your Thoughts And Studies When You Realised That You Had Reached the Right Answer?"

Category	Code Name	Frequency (*f*)
Readiness	Don't make you happy	7
	Self-confidence	4
	Excitement	2
	Success	2
	Perseverance	2
Attitude	Finding a solution	9
	Request to move on to the next step	4
	Product design	3
	Active participation	2
Total		35

In the attitude category; similar to the statements in the readiness category, as the candidates overcome the problems, everyone in the group actively participates in the activity against another problem, they want to find new things in constant search, they want to design different ideas and products, develop solutions, desire to do their best and they stated that they constantly strive to move on to the next stage.

Some of the preservice teachers' views on the question are given below.

"…Of course. We set out on a road and finally reached the right path, and this increases people's enthusiasm and makes them happy. Most importantly, you say 'I did it'..."

"…Yes. It excites me to have a lot of effort and to move forward. And it motivates the event to be held next week…"

"…Yes. I tasted the sense of success. For example, I am building a machine; light is on, it sounds and moves. I had the pleasure of designing something. This also increased my self-confidence towards the work..."

"…When one finds the truth, one starts to study other ideas. In other words, I come up with different ideas such as I mean this is happening in this and if I combine this and this, I can reach this conclusion..."

Table 11 includes the answers of the teacher candidates regarding the question and a single category was created. In this category; the methods applied for the solution of the problems arising during the activities were mentioned. The candidates applied to the science field for the solution of the problem that emerged, if there were any missing materials, they closed the gap by designing that material from other materials themselves, they proceeded by trying the group views put forward and correcting the mistakes, they tried to influence the juries who would evaluate the product by keeping the verbal defense of the designs strong, they stated that they consulted experts and checked the stages by looking at the given guides.

Table 11

The Opinions of the Pre-Service Teachers Related to the Question "Could You Tell Us About the Ways to Solve the Problem Situations You Encounter in the Activities?"

Category	Code Name	Frequency (*f*)
Troubleshooting Ways	Science knowledge	4
	Missing part design	2
	Group comments	2
	Trial and error way	1
	Oral defense	1
	Expert opinions	1
	Guides	1
Total		12

Some of the pre-service teachers' views on the question are given below.

"…For example, there was no wheel on the balloon car. Everyone had bought the wheel before, it was not up to us. That's why we couldn't maintain balance, so the air was wasted. That's why we designed wheels that can enter thereby combining two different circle shapes. So we solved the problem..."

"… For example, we made the way for it to go fast in the car event, we first made it for a long time and then looked at it. We broke it and shortened it and solved the situation where it goes faster..."

"…We discussed the problem with our group friends. Then we looked at the guides, checked the stages over and over and we did it...."

Table 12

"Can You Anticipate the Problems You May Encounter While Doing Other Activities Yourself After These Activities?"

Category	Code Name	Frequency (*f*)
Critical Thinking Tendency	Experience	4
	Sensing danger	3
	Measure-prevention	3
	Enough information	3
	Don't be fast	1
Other	Partially	3
	Distribution of work	1
	Inability to guess	1
Total		19

Table 12 includes the answers of the teacher candidates regarding the question and 2 separate categories were created. In the category of critical thinking disposition; they stated that the candidates had the ability to anticipate the dangers of a problem they will encounter as a result of the activities given, in other words, critical thinking disposition behaviors. Having enough information about these trends and how they emerge, to have enough information about the activities they will do, to be able to

anticipate the danger in advance and take the necessary precautions, and to make preparations for the next steps, to learn from their mistakes in their activities, that is, to be able to move faster to the next by experience and now a lot of information is settled in their minds.

In the other category, only one of the candidates stated in his answer to the question that he could not sense the problem beforehand, but he made sense when this problem happened to him. On the other hand, 3 people stated that they could partially sense the problem and take measures, depending on the type of problems that may arise. On the other hand, the job distribution code stated that individuals overcame the problem by making divisions of work according to the status of group members among themselves.

Some of the preservice teachers' views on the question are given below.

"…We know what to do, when the professor gives the draft, we look at it first and, as an estimate, we do what is necessary immediately... We do business segments, for example, to be fast..."

"…Of course. I made this mistake here before, but I am preparing myself for the next one, in order not to make the same mistake again…"

"…Yes. This situation is about experience. So, our prediction increased with this training. We are more cautious against problems so..."

Table 13

The Opinions of the Pre-Service Teachers Related to the Question "Do You Still Try to Find New Ways, Even If You Know That You Cannot Reach the Conclusion About A Problem You Encounter?"

Category	Code Name	Frequency (*f*)
Method	Struggle	9
	Don't try to the end	6
	Verbal defense	3
	Claim	4
	Group supports	2
	The quest	2
	Move forward	2
	Disagreement	1
Feeling – Thought	Don't hope	2
	Don't be frustrated	2
	Not giving up	1
Total		35

In Table 13, the answers of the teacher candidates regarding the question are given and 2 separate categories have been created. In Method - Method category; the candidates talked about the efforts and methods they have made to reach the result for the solution of the problem. All of the candidates stated that they had a feeling of constantly producing new things and trying to achieve a solution in the face of the problem. For this, the group members stated that they constantly support each other, try

to produce different ways, use their time until the last minute and do their best, conduct specific theoretical researches, and always want to move their products forward, that is, to a higher level.

In the Emotion-Thought category, codes indicating the pre-service teachers' feelings and thoughts when they could not reach a solution in the face of a problem were included. In the face of this situation, the candidates; first of all, even if they were disappointed, they always kept their hopes alive and they tried to find different ways again without giving up, one person stated that after trying all the ways, he started to get bored and left the solution of the problem to his other friends.

Some of the preservice teachers' views on the question are given below.

"…Even if we could not reach a good result, we thought of new ways. Our material was not very good, but we said that if we defend it well, we can succeed and we won the second place…"

"…I tried to the end. I tried until the last drop. But I think these are about supporting each other as a group. If only one person did, he would surely give up. We have given each other a lot of support so that we can do it; they did it, we gasped to each other why we couldn't do it and we achieved good results..."

"…We have already done this with this training. Our teacher did not like what we did at first. We were disappointed, but we did not despair, we added something to it and presented it and succeeded in being the first..."

Result and Discussion

It was determined at the end of the quantitative analysis that STEM activities based on the Montessori approach improved the problem-solving skills of pre-school teacher candidates and it was observed that this result was supported by the qualitative analysis. It can be interpreted that the activities carried out in line with the analysis results were effective in developing the problem-solving skills of prospective teachers. It supports the results in the literature that STEM education improves the problem-solving skills of the individual. Sungur-Gül and Marulcu (2014) stated in their study results that teachers, an engineering-design-based course would commonly improve students' psychomotor, problem-solving and social thinking skills. Elkin et al. (2014) conducted research on how to apply the robotics curriculum in early childhood Montessori classes. In the results of the study, they prepared a report that includes robotics education can be effective in preschool and how it should be integrated into lessons. Strong (2013) stated in his study that STEM education improves scientific process skills. Sullivan (2008) stated that robotics and science literacy education contributed to the development of students' thinking and scientific process skills. In Kaya (2010) and Kökdemir (2003) studies, STEM education included ideas and conclusions stating that it will provide an interdisciplinary perspective, improve problem-solving, engineering design and creativity skills, and increase students' interest-motivation towards courses.

The qualitative analysis results collected with the semi-structured interview forms of the study also appeared to support the quantitative result, that is, the activities developed the problem-solving skills. The candidates stated that they achieved positive changes in their perceptions and skills about problem-solving after the activities. They stated that thanks to the activities, they learned not to give up in the face of problems and to develop different scientific perspectives on the problem with their experience. They stated that their prejudices such as not being able to solve the problem were

destroyed, their self-confidence increased, their motivation and knowledge (success) towards science lessons increased. In a study supporting the results, Judson (2014) found a significant difference in terms of academic achievement between the STEM-applied experimental group and the non-applied control group as a result of the experimental and control group research on students' academic achievement of STEM applications. Çevik and Abdioğlu (2018) examined the effect of a science camp on 8th-grade students' STEM achievement, science motivation and metacognitive awareness.

As a result, they found that STEM activities significantly increased STEM achievement and that STEM achievement had a high level of correlation with science motivation and metacognitive awareness. Bakırcı and Kutlu (2018) examined the opinions of science teachers about STEM education. As a result, the teachers stated that STEM education would increase students' interest and motivation towards the course, gain different perspectives and improve their decision-making skills. Yıldırım (2019) stated in his study, which included the opinions of pre-service science teachers about biomimicry applications in STEM education, that the candidates had different perspectives thanks to the activities and that their motivation increased by producing solutions in the face of problems.

Among the qualitative results of the study, they stated that acting as a group in solving a problem in activities positively affected their social skills and communication skills. The studies of Tarkın-Çelikkıran, and Aydın-Günbatar (2017), which supports the positive results of working as a group in the research; they stated that the teacher candidates who will be trained with STEM activities will be more successful in creating interdisciplinary connections. In addition, they stated that doing STEM practice with group interactions with friends while solving problems was more positive. Akgündüz and Akpınar (2018) stated that in STEM education study results, students gained science and mathematics achievements with STEM applications in preschool education; they found that it developed 21st-century skills such as creativity, critical thinking, collaboration, and communication. In addition, in this study, they stated that STEM education practices developed creativity and communication skills in children, especially during the engineering design cycle, by presenting original ideas and evaluating alternative solutions that emerged from different ideas. Keçecioğlu (2015) researched the effect of Montessori approach on social development skills of the individual compared to normal education and recorded positive results. Ceylan (2014) supports the research results by stating that STEM education improves students' creativity, academic achievement, and problem-solving skills. Koçyiğit and Kayılı (2008) conducted a study to compare the social skills of kindergarten children who received an education with the Montessori approach and received an education with the normal curriculum. According to the results of the study, they stated that kindergarten students studying with the Montessori approach observed that there was a significant difference in social cooperation, social interaction, and social independence sub-dimension scores from kindergarten students who received education according to the normal curriculum. In the study, teacher candidates stated that doing collective activities in cooperation in the face of a problem leads to a result more easily. Again, thanks to these activities, the candidates stated that they overcame each other with patience and respect, exchange information and overcome in solidarity as they did as a group to solve a problem and that their negative social relations towards their groupmates improved.

Finally, in the qualitative results of the study, prospective teachers stated their opinions regarding the suitability of STEM activities to preschool children. They stated that these activities can be applied easily due to their remarkable, fun and curious features, and some of them stated that the dimensions of the materials used are suitable for the child's muscle skills, that is, if the safety of the materials such as adhesives is ensured, they will be more suitable for children.

Hartzler's (2000) study, which supports the results, concluded that the mathematics and science activities taught in consideration of engineering design increase the student's interest in the course, desire to learn and succeed, supports the qualitative results of the study. Doppelt, Mehalik, Schunn, Silk, and Krysinski (2008) stated in their study that STEM education has a very important place in increasing students' interest in science, desire to learn, and succeed. Akins and Burghardt (2006) investigated the application of mathematical reasoning in solving a design-related problem in their research with middle and high school students, titled Developing K-12 mathematical understanding through engineering design projects. As a result, they stated that progress was observed in all students' mathematics and science tests, and although there were no significant changes in the scores of some of the students who participated in engineering activities, these students improved their skills in analyzing, explaining, commenting or reasoning about mathematics, science, and technology.

Recommendations

This study was carried out with the pre-service teachers at the third class of preschool teacher training department of the faculty of education in a state university. New researches to be conducted based on this study can be carried out on different faculties and classes (except for 4th-grade students; the pre-service teachers are not able to focus adequately on activities because they concentrate on the KPSS). This study can be carried out for longer periods. Moreover, the fact that the study took place in a university and was completed within a certain period of pre-school science education course also created a limitation in discussing the effects of the study. Instead of considering the Montessori approach-based STEM applications developed by the researchers in a limited way within the pre-school science education course, it can be recommended to be given to pre-service teachers as a lesson.

Statement of Responsibility

Zehra Çakır; planning and implementation of activities, analysis, methodology, resources, literature review, formal arrangement, verification, reporting, writing - reviewing and inspection. Sema Altun-Yalçın; Determination of problem situation, determination of sample group, determination of activities, planning and implementation of activities, selection and application of data collection tools, verification, analysis.

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An Examination of Adolescents' Well-Being and Parents' Psychological Control According to the Some Demographic Variables*

Ergenlerin Öznel İyi Oluşları ve Anne-Baba Psikolojik Kontrolünün Bazı Demografik Değişkenlere Göre incelenmesi

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ABSTRACT: In this study, the relationship between the psychological control perceived by the adolescents from their parents and their subjective well-being was investigated. The study group consisted of 565 adolescents in the 10-14 age group attending secondary school. "Adolescent Subjective Well-Being Scale" and "Psychological Control Scale" were used for data collection. It was investigated the normality of data, and non-parametric tests were applied in data analysis. As a result of the study, it was determined that the adolescents' subjective well-being did not change by gender and that the boys' perceived psychological controls from their father were higher than girls. It was determined that adolescents 14 years older have lower positive feelings than have 10-11 years old and have a higher perception of parental psychological control from their mothers than have 11 years old**.** It has been remarked that adolescents with notable academic success have higher subjective well-being while adolescents with average academic performance have higher perceptions of parental psychological control. A meaningful negative relationship was detected between parental psychological control scores and adolescent well-being scores; meaning that higher parental psychological control causes lower adolescent subjective well-being.

Keywords: Adolescence, psychological control, subjective well-being.

ÖZ: Bu çalışmada, ergenlerin anne-babalarından algıladıkları psikolojik kontrol ile öznel iyi oluşları arasındaki ilişki incelenmiştir. Çalışma grubunu ortaokula devam eden 10-14 yaş grubunda 565 ergen oluşturmuştur. Veri toplamada "Ergen Öznel İyi Oluş Ölçeği" ile "Psikolojik Kontrol Ölçeği" kullanılmıştır. Verilerin normallik dağılımı incelenmiş ve buna göre veri analizinde parametrik olmayan testler uygulanmıştır. Araştırmanın sonucunda ergenlerin öznel iyi oluşlarının cinsiyete göre değişmediği, erkek ergenlerde babadan algılanan psikolojik kontrolün kızlara göre daha yüksek olduğu belirlenmiştir. Çalışmada 14 yaş daha büyük yaştaki ergenlerin olumlu duygular içerisinde olmasının 10 ve 11 yaşındakilere göre daha düşük olduğu, annelerinden algıladıkları psikolojik kontrolün ise 11 yaşındakilere göre daha yüksek olduğu belirlenmiştir. Okul başarısı çok iyi olan ergenlerin öznel iyi oluşlarının, okul başarısı orta olanların ebeveyn psikolojik kontrol algılarının yüksek olduğu belirlenmiştir. Anne-baba psikolojik kontrol puanları ile ergenlerin öznel iyi oluş puanları arasında negatif yönlü anlamlı bir ilişki olduğu; anne ve baba psikolojik kontrolü arttıkça ergenlerin öznel iyi oluşlarının azaldığı belirlenmiştir.

Anahtar kelimeler: Ergenlik dönemi, psikolojik kontrol, öznel iyi oluş.

* This study was produced from Ayşenur Aydın's master's thesis conducted under the supervision of Arzu Özyürek.

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An individual goes through several growing periods that contain lots of physiological and psychological changes, starting from birth. Adolescence is the period of growth that starts from the end of childhood and lasts until the person reaches an adult's physiological features. The age range of adolescence differs depending on cultural or historical conditions one lives in, and today it starts around ages 10-13 and ends at the end of teen ages in many countries (Santrock, 2014).

Physical growth is the most apparent change in adolescence. When talking about adolescents' physical growth, muscular and skeletal growth due to the increase of height and weight, growth occurring in various organs of the body, and changes in endocrine glands come to mind first (Yavuzer, 1994). Also, cognitive skills and mental functions significantly change during this period. Thus, adolescence is not limited to emotional and social aspects that occur physiologically (Piaget, 1972). Individuals (adolescents) strive to cope with many pressures during adolescence, when an individual's responsibility and freedom both increase. In this period, how they cope with the problems they encounter is significantly related to the social environment they live in. Living in an environment that does not support their cognitive and spiritual development or that is oppressive may facilitate adolescent's orientation to risky behavior (Kara, Hatun, Aydoğan, Babaoğlu, & Gökalp, 2003). The most obvious of all the emotional situations in adolescence is adolescent's emotional intensity and mood swings (Koç, 2004). The rapid and sudden physical changes that are observed in adolescence may create anxiety and surprise in adolescents, thus causing mixed emotions. Trouble of adaptation to these changes that occur affect adolescents' attitudes and behavior towards the people around them (Büyükgebiz, 2009). As with every individual, the adolescent's first environment is the family.

The family maintains its impacts on the individual, starting from the prenatal period and lasting until death. It is an institution that warns the adolescent about how and where to react. It shapes adolescents' behavior and spiritual, emotional, economical, social, cultural, and physical development. Since early childhood, parents' attitudes and behaviors towards the child maintain their impact on the child's future life. Furthermore, the awareness that they are a member of the family being ingrained in their mind is an important base that helps them adapt to social norms (Erbil, Divan, & Önder, 2006). Control has an active role in parents' attitudes and behaviors in the family. First descriptions made about parental control have defined control not only as violence but also as enforcing the individual and restricting their behavior; it was defined as an authoritarian and requiring-force kind of attitude. Psychological control refers to control practices that include the child's emotional and psychological orientation, such as the child's self-expression and thinking processes (Barber, 1996).

Psychological control is often the characteristic of parents who are not responsive to their children. This characteristic is defined as the parental approach style of parents who are ignorant to their children's needs, who interfere with and restrict the children's freedom and are oppressive, who impose their feelings and thoughts on the child rather than letting the child's feelings and thoughts shape freely (Soenens & Vansteenkiste, 2010). Parents keep the children's actions under control by ignoring their need for love and making them feel guilty (Pulat, 2011). Accordingly, it can be said that parents who adopt particularly negative attitudes have higher psychological control.

Parental practices are often studied in two ways: support and control. Parental supportive attitude towards their children causes positive results. Adolescents' cognitive development, academic success, moral development, self-respect, adaptation to adulthood, and various more conditions are all related to parental supportive attitude. The definition of parental controlling behavior may change depending on the form of control. While strict control such as intimidation and physical punishment has developmentally negative results, authoritarian control based on logic and explanation can yield positive results (Durak-Batıgün & Say, 2015). For adolescents who perceive extreme psychological control from their parents and who must internalize their parents' thoughts, it would be too difficult to find their true and authentic selves. Perception of parental psychological control can cause negativities in the parent-adolescent relationship (Barber, 1996; Barber & Harmon, 2002); it may significantly affect the adolescent's well-being. Parents who use psychological control exhibit negative behaviors such as depriving their children of love, making them feel guilty, and causing them to be ashamed (Korkın, 2019).

Subjective well-being is the individually subjective form of satisfaction that consists of emotional and cognitive components and positivity of the individual's mental health. Subjective well-being includes subjectively evaluating one's life in terms of cognitive and emotional aspects (Eryılmaz, 2009). One's subjective well-being reaching high levels is a desired situation. A rise in the subjective well-being level depends on pleasant reactions to situations outweighing unpleasant reactions, and also one's cognitive inference about the quality of their life being positive (Derin, 2013). The criteria of expressing the nirvana of human life and the perfection of life are happiness. Happiness is an answer to problems and a solution that people find (Fromm, 1995). Well-being is psychologically defined as happiness, and one's well-being level can be evaluated by the individual himself and a health professional, a researcher, their spouse, or a teacher. The individual evaluating himself is called "subjective well-being" (Ormel, Lindenberg, Steverink, & Verbrugge, 1999). Even though several variables affect subjective well-being, the quality of family relationships during adolescence is a variable that needs to be regarded as a priority.

Adolescents get sad if they feel like they are not loved by those they want to be loved by in the family. This feeling may cause a sorrow that will last long or will never end in the adolescent. If every member of the family can express their emotions easily, noticing the adolescent's sorrow is an advantage for both the adolescent and their family (Orvin, 1995). Life satisfaction is considered the cognitive component of subjective well-being. Beyond being the evaluation of the emotions one's feeling, life satisfaction has the role of complementing cognitive judgments and emotional components. The scope of life satisfaction of subjective well-being expresses one's satisfaction in different areas of their life. Satisfaction areas of one's life can be formed by their family, school, job, health, circle of friends, money, the role they undertake, and the close circle they are in (Cenkseven & Akbaş, 2007; Dost, 2007). Life satisfaction and subjective well-being are related to positive moods.

Positive feelings mean desire, dynamism, spiritual well-being, and stability concepts coming together. On the other hand, negative feelings comprise unwanted feelings such as worry, rage, fear, hate, sorrow, and guilt (Cenkseven & Akbaş, 2007). An individual who has experienced the moment of happiness often is satisfied with his

life, consequently lives in a high leveled well-being (Dost, 2007). Social relationships are essential factors that affect subjective well-being. That being said, individuals establishing a secure bond in their relationships with the environment and adapt to the group or society they belong to will increase their level of well-being (Baş, 2019). Based on all of this information, it can be said that changes that occur during adolescence due to the nature of the period will affect parental psychological control, and psychological control will affect the adolescent's well-being. There are studies in the literature that investigations relationships with parental psychological control and depression, anxiety, anger (Barber, 1996; Costa, Cuzzocrea, Gugliandolo, & Larcan, 2016; Nanda, Kotchick, & Grover, 2012; Pulat, 2011; Tian, 2019) and aggression (Murray, Dwyer, Rubin, Knighton-Wisor, & Booth-LaForce, 2014). In this study, the answer to the question "Is there a relationship between the perception of parental psychological control of individuals in adolescence, and their well-being?" has been sought. Questions of the study are given below:

1. Does the psychological control perceived by adolescents from their parents change according to gender, age, and perception of academic success?
2. Does the subjective well-being of adolescents change according to gender, age, and perception of academic success?
3. Is there a significant relationship between psychological control perceived by adolescents from their parents and their subjective well-being?

Method

Study Group

The study group of the research consisted of 565 adolescents aged 10-14, attending public or private secondary school in the center and districts of Karabuk Province in the 2019-2020 academic year. Three schools out of five private schools in the city center approved the study's conduction and five public schools from the countryside were randomly selected. One class from each of 5th, 6th, 7th and 8th grades in schools was selected: 310 adolescents from private secondary schools, 255 adolescents from public secondary schools; 293 girls and 272 boys in total. %9.7 of the study group is 10 years old, %22.5 is 11 years old, %26.4 is 12 years old, %23.2 is 13 years old, %18.2 is 14 years old or older; according to their self-assessment %39.3 of them have remarkable school success, %60.7 have an average level.

Data Collection Tools

Personal Information Form, Psychological Control Scale and Adolescent Subjective Well-Being Scale has been used in this research.

Personal Information Form developed by the researcher, gender, age, and perception of the study group's school success are included.

Psychological Control Scale was formed by Barber (1996) to get information about both paternal and maternal psychological control perceived by adolescents. The scale was later improved by Sayıl and Kındap (2010) by adding intercultural articles, was adapted to Turkish culture, and its psychometric properties were checked. The scale consists of 16 articles, and they are used on a four-degree scale: "1-is unlike my mother's/father's features" and "4-is very similar to my mother's/my father's features".

For much broader applicability of the Psychological Control Scale, it was applied for both parents to 885 adolescents aged 11-18. When factor analysis of the study was made, it showed that the scale's factor structure has two dimensions for both parents, just like the original study: Psychological Control (PC) and Parental Abandonment (PA). Internal consistency coefficients of the scale have been found as .77 and .79 for mother and father in the Psychological Control dimension, and .85 and .89 in PA dimension.

Adolescent Subjective Well-Being Scale was developed by Eryılmaz (2009), and it has 15 articles and 4 sub-dimensions. The scale aims to measure adolescents' subjective well-being, and consists of Satisfaction in Family Relationships, Satisfaction in Relationships with Important Others, Life Satisfaction, Positive Feelings sub-dimensions. Evaluation can be done by sub-dimensions or by the total score, and the higher the score is, the higher adolescent's subjective well-being is. The study of validity and reliability of the scale was made with 250 adolescents aged 14-18. The internal consistency coefficient of the scale was found as .86, and the reliability value based on the test-retest method was .83 (Eryılmaz, 2009). In this study, Cronbach Alpha reliability coefficient for the total scale was found as .84, and it has been concluded that the scale could be reliably used to determine the subjective well-being of adolescents aged 10-14.

Data Collection and Analysis

Karabuk University Social and Humanities Sciences Researches Ethics Committee (27/02/2019, decision numbered 2019/04(16) and official permissions from Karabuk Governorship were obtained before the study. Data collection tools were applied in the cooperation of school counselors (in a period that will not disrupt the adolescent's classes) and in the classroom environment. The aim of the study was explained, and participation was provided voluntarily. All of the scales were applied in 30 minutes in a single session. Data of the adolescents who fully completed all of the scales have been taken into consideration.

The normality distribution of data has been examined and accordingly, it was observed that non-parametric analyzes were suitable. Based on this, Mann Whitney U (MWU) and Kruskal Wallis H (KWH) tests and Spearman-Brown Correlation coefficient was used. Significance value has been taken as .05, and Post hoc Scheffe Test has been used when determining the source of the difference.

Results

In this section, findings on the questions of the study are included. In Table 1, the analysis results of adolescents' Subjective Well-Being Scale and Psychological Control Scale scores by gender are given.

Table 1

MWU Test Results of Adolescent Subjective Well-being Scale and Psychological Control Scale Scores by Gender

		Gender	*N*	$\bar{X}$	*S*	*Z*	*p*
Adolescent Subjective Well-Being Scale	Satisfaction in Family Relationships	Girl	293	14.33	2.52	-.263	.793
		Boy	272	14.21	2.90		
	Positive Emotions	Girl	293	12.72	2.70	-.494	.621
		Boy	272	12.60	2.78		
	Satisfaction in Life	Girl	293	9.01	2.58	-1.866	.062
		Boy	272	9,43	2,40		
	Satisfaction in Relationships with Important Others	Girl	293	13.51	3.09	-.321	.749
		Boy	272	13.77	3.73		
Psychological Control Scale	Mother Psychological Control	Girl	291	24.38	7.37	-1.620	.105
		Boy	268	25.58	8.39		
	Father Psychological Control	Girl	282	22.32	6.21	-2.311	.021*
		Boy	263	23.84	7.83		

*p<.05

According to Table 1, there is no significant difference between adolescent gender and Adolescent Subjective Well-being Scale and Mother-Psychological Control Scale mean scores (p>.05). The difference between the gender of the adolescents and the Father-Psychological Control Scale mean scores is significant (p<.05). Father-Psychological Control mean scores of boys ($\bar{X}$=23.84) were higher than girls ($\bar{X}$=22.32).

Table 2 shows the results of adolescents' Subjective Well-Being Scale and Psychological Control Scale scores by age. Table 2 shows a significant difference between adolescents' age and the Subjective Dimensions of Adolescent Subjective Well-being Scale Positive Emotions (p<.05). According to the results of the Scheffe Test, the Positive Emotions subscale mean scores ($\bar{X}$=11.72) of adolescents aged 14 and older are significantly lower than the scores of adolescents aged 10 ($\bar{X}$=13.40) and 11 ($\bar{X}$=13.18).

Table 2

KWH Test Results of Adolescent Subjective Well-Being Scale and Psychological Control Scale Scores by Age

		Age	*N*	$\bar{X}$	*S*	*H*	*p*
Adolescent Subjective Well-Being Scale	Satisfaction in Family Relationships	10 age	55	14.58	2.49	8.869	.064
		11 age	127	14.51	2.50		
		12 age	149	14.19	2.73		
		13 age	131	14.51	2.39		
		14 age and older	103	3.63	3.30		
	Positive Emotions	10 age	55	13.40	2.62	20.057	.000*
		11 age	127	13.18	2.60		
		12 age	149	12.58	2.73		
		13 age	131	12.67	2.38	Significant Difference: 10,11-14 age and older	
		14 age and older	103	11.72	3.14		
	Satisfaction in Life	10 age	55	9.29	2.42	9.008	.061
		11 age	127	9.70	2.35		
		12 age	149	9.26	2.30		
		13 age	131	8.97	2.75		
		14 age and older	103	8.77	2.62		
	Satisfaction in Relationships with Important Others	10 age	55	13.89	3.11	6.331	.176
		11 age	127	14.23	4.37		
		12 age	149	13.37	2.97		
		13 age	131	13.63	2.79		
		14 age and older	103	13.15	3.48		
Psychological Control Scale	Mother Psychological Control	10 age	54	23.70	7.44	22.141	.000*
		11 age	126	23.37	7.56		
		12 age	149	25.08	7.57		
		13 age	129	25.27	7.92	Significant Difference: 11-14 age and older	
		14 age and older	101	27.27	8.50		
	Father Psychological Control	10 age	55	22.67	7.09	9.241	.055
		11 age	122	23.01	8.21		
		12 age	145	22.80	6.78		
		13 age	124	22.67	6.27		
		14 age and older	99	24.18	6.93		

*p<.05

The difference between the adolescents' age and the Mother-Psychological Control Scale mean scores is significant (p<.05). According to the results of the Scheffe Test, the mean scores of the adolescents aged 14 and older are significantly higher than the scores of the adolescents aged 11 ($\bar{X}$=23.37).

In Table 3, the results of the analysis of the adolescents' Subjective Well-Being Scale and Psychological Control Scale scores according to school success perception are given.

Table 3

MWU Test Results of Adolescent Subjective Well-Being Scale and Psychological Control Scale Scores According to Adolescents' Perception of School Success

			N	$\bar{X}$	S	Z	p
Adolescent Subjective Well-Being Scale	Satisfaction in Family Relationships	Very Good	222	14.84	2.30	-5.189	.000*
		Medium	343	13.90	2.89		
	Positive Emotions	Very Good	222	13.37	2.54	-5.497	.000*
		Medium	343	12.20	2.76		
	Satisfaction in Life	Very Good	222	9.81	2.29	-4.768	.000*
		Medium	343	8.82	2.56		
	Satisfaction in Relationships with Important Others	Very Good	222	14.19	2.77	-4.728	.000*
		Medium	343	13.27	3.73		
Psychological Control Scale	Mother Psychological Control	Very Good	222	23.55	6.80	-3.505	.000*
		Medium	337	25.89	8.42		
	Father Psychological Control	Very Good	212	22.11	6.30	-2.575	.010*
		Medium	333	23.66	7.47		

*p<.05

According to Table 3, the difference between adolescents' school success perceptions with their Subjective Well-Being Scale's sub-scales mean scores (Satisfaction in Family Relationships, Positive Emotions, Satisfaction in Life, Satisfaction in Relationships with Important Others) (p<.05). Satisfaction in Family Relationships ($\bar{X}$=14.84), Positive Emotions ($\bar{X}$=13.37), Satisfaction in Life ($\bar{X}$=9.81), Satisfaction in Relationships with Important Others ($\bar{X}$=14.19) scores of adolescents who have good school success higher on a meaningful level than the adolescents who have school success as a medium.

The difference between adolescents' school achievement perception and the Mother and Father Psychological Control Scale mean scores is significant (p<.05). The mean scores of adolescents who stated their school success as medium Mother-Psychological Control ($\bar{X}$=25.89) and Father-Psychological Control ($\bar{X}$=23.66) were among the mean scores of the adolescents who stated school success as very good (Mother-Psychological Control $\bar{X}$=23.55, Father-Psychological Control $\bar{X}$=22.11) is significantly higher.

Correlation analysis results of adolescents' Subjective Well-being Scale and Psychological Control Scale scores are given in Table 4.

Table 4

Correlation Analysis Results of Adolescent' Adolescent Subjective Well-being Scale and Psychological Control Scale Scores

		Psychological Control Scale	
Adolescent Subjective Well-Being Scale		Mother	Father
Satisfaction in Family Relationships	*r*	-.212	-.127
	p	.000*	.003*
Positive Emotions	*r*	-0.212	-.131
	p	.000*	.002*
Satisfaction in Life	*r*	-.232	-.138
	p	.000*	.001*
Satisfaction in Relationships with Important Others	*r*	-.175	-.098
	p	.000*	.022*
Total	*r*	-.249	-.148
	p	.000*	.001*

According to Table 4, adolescents' Subjective Well-Being Scale and all its sub-dimensions and the mother and father Psychological Control Scale scores had a negative and low-level significant relationship ($p<.05$). As the mother and father Psychological Control Scale score increases, adolescents' Subjective Well-Being Scale of Satisfaction in Family Relationships, Positive Emotions, Satisfaction in Life, Satisfaction in Relationships with Important Others, and total scores decrease. In other words, as the psychological control of adolescents increases, subjective well-being levels decrease, or as the psychological control of parents decreases, subjective well-being levels of adolescents increase.

Discussion and Conclusion

In the study, it was determined that the subjective well-being of adolescents did not differ significantly according to the gender variable. Eryılmaz and Aypay (2011), Bayram (2018), Şahin (2011), Akgündüz and Bardakoğlu (2012), Keng and Hooi (1995) subjective well-being of teenagers; Dost (2010), Bozkurt and Sönmez (2016), Saraç, İpek, and Çavuş (2018) determined that the current, desired and general meaning of life levels did not show any significant differentiation of existing on gender. It can be said that these studies are similar to the study findings. Tiliouine, Cummins, and Davern (2006) found that women are considerably more satisfied with their own lives than men. Gündoğdu and Yavuzer (2012) expressed that girls have more subjective well-being than boys. It can be said that the studies conducted have different results, and no findings have been found in the literature indicating that gender and subjective well-being are related.

In the study, it was determined that the psychological control that boys perceived from their fathers was greater than that of girls. In the study that Kındap-Tepe and Sayıl (2012) compared parental control and adolescent adjustment variables according to adolescent gender, they found that teenage boys had higher psychological control over their fathers than girls. In Türk's (2019) study, it was perceived that the psychological control perceived from the father was significantly higher for boys. In the study of Kındap-Tepe and Sayıl (2012) carried out the effectualness and reliability of the psychological control scale, it was observed that boys perceived psychological control higher from parents than girls. Pulat (2011), in his study conducting with teenagers aged 15-17, found that the level perceived by boy teenagers in psychological control from their parents is higher than that of girls. When the findings of the study conducted by Kurt, Sayıl, and Kındap-Tepe (2013) it was seen that boys perceive more psychological control from their parents than girls. These studies support the findings of the research. Fathers may have a more controlled attitude toward boys due to gender-specific differences in adolescent characteristics. On the other hand, depending on the characteristics of the period, teenage boys may perceive their parents as overly controlled, who restrict their desire to exhibit more free behavior. In addition, the father is a role model for the boys. The father's attitude towards his child has a particular effect on the child's personality development. The father's activeness in the family has positively effects on the cognitive skills and basic skills of boys (Telli & Özkan, 2016; Tezel-Şahin, 2007). Fathers are also a significant figure for girls in the family.

Apart from the conclusions of this study, there are researches revealing that psychological control does not change depending on the gender (Kındap-Tepe, Deliser, Kuzan, & İslamoğlu, 2018; Shek, 2007). Büyükşahin (2009) determined that the perception of paternal psychological control is higher in girls than boys in his study, which is also apart from the findings of this study. Based on the findings of these studies, it could be said that gender has a relative effect on psychological control, in which gender predicts psychological control in some situations and does not in some, and it is not effective in every situation.

When examined by age, adolescents that are 14 years old and older being in positive emotions are significantly lower than 10- and 11-years old adolescents. This may be due to the age of 10-11 years in the pre-adolescence period. As age increases, adolescents' view of the situation changes. In their studies, Şahin (2011) and Özen (2005) stated that there is not a significant difference between subjective well-being scores based on the age of the participants. As Ural et al. (2015) determined in their study, in mother-child relationships situations of warmth and love, aggression and grudge, apathy and neglect, and unparsed rejection differentiate depending on the child's age, and the mother gives more warmth and love as the child's age gets lower. Even though there are not many pieces of research that support or contradict these results, based on the research results, it could be said that changes seen in adolescence cause different outcomes in adolescents as the age increases. Physically observed changes may cause negative thoughts in the adolescent. Also, when the fact that adolescents aged 14 are seniors in secondary school is taken into consideration, subjective well-being may have been affected depending on the stress of transition to the next level of education and family or school pressure.

In the study, it was determined that adolescents aged 14 and older perceive significantly higher maternal psychological control than 11 years old adolescents. Tığrak (2017) found that adolescents perceive more maternal psychological control as their age increases. Based on the results of these researches and the study's findings, it could be said that adolescents' age and level of psychological control perception are directly related. Additionally, 14-year-old adolescents preparing for exams of transition to the next level of education might have increased their mothers' control over them and caused adolescents to perceive high-levels of mothers' psychological control.

It was identified that adolescents who reported their school success as remarkable have higher leveled subjective well-being than those who reported their school success as average. In the study findings of Telef and Ergün (2013), it was stated that high school students who felt academically competent were happier. In his study, Özen (2005) determined that adolescents who reported their school success as remarkable have higher subjective well-being than adolescents who reported their school success as low. Karakoç, Bingöl, and Karaca (2013) determined in their study that the better the success level is, the better adolescent's positive future expectations and adolescent life satisfaction, adolescent's positive emotions, adolescent's satisfaction in relationships with important others and family is. In Çakır's (2015) study results, it was determined that students who stated they perceive their school success as high have higher subjective well-being than those who stated they perceive their school success as low. In Yarar's (2019) study it was observed that, as school success perceived increases, student subjective well-being increases as well. The result of this study is similar to the results in the literature. As school success is formed with the effects of various positive variables, it can be said that successful students feeling happy and pleased by their situations is an expected result.

In the study, it was determined that adolescents who stated their school success is average perceive higher parental psychological control than adolescents who stated their school success is remarkably high. In the study aimed to investigate the effect of family attitudes on school success of hyperactive kids aged 7-12, Öztürk (2008) identified that psychological autonomy degrees parents present to their children contribute to the school success of students from both genders. Arcan (2006) identified that psychological autonomy degrees parents present to their children contribute to the school success of girl and boy students. This situation brings to mind that psychological control will harm school success.

It was identified that there is a negative low-leveled significant difference between adolescent's parental psychological control scores and adolescent's subjective well-being scores. It was detected that as parental psychological control increases, adolescent's subjective well-being decreases, or as parental psychological control decreases adolescent's subjective well-being increases. In Çelik's (2015) study, it was observed that as adolescent's psychological control perception from mother and father increases, adolescent's emotional autonomy level decreases, and adolescent's well-being is negatively affected by this. In Smetana and Daddis's (2002) study, they pointed out that as the level of perceived psychological control increases, the adolescent's thoughts about life get negative, and subjective well-being level decreases. Cui, Morris, Criss, Houltberg, and Silk (2014) stated that parental psychological control is related to aggressive behavior and negatively affects adolescent's compatibility. When looked at

Bostan and Duru's (2018) study findings about the relationship between psychological abuse and subjective well-being, it was seen that there is a negatively significant relationship between these two variables, and as psychological abuse level increases, subjective well-being level decreases. Kins, Beyers, Soenens, and Vansteenkiste (2009) detected that as parental psychological control increases, the individual's well-being decreases. Conger, Conger, and Scaramelle (1997) detected in their study in which they aimed to examine psychological control of parents and siblings, and adolescent adaptation, that psychological control from both parents and siblings cause adolescent's adaptation problems to increase and their self-confidence to decrease. The studies also show that parental psychological control can cause negative effects on adolescents' well-being.

It is seen that the studies in the literature revealed that negative emotions increase in children as perceived psychological control from parents increases. For example, Pulat (2011) expressed in his study that as psychological control perceived from parents increase, depression, chronic anxiety, and anger formation increase. In the study, Shek (2007) made longitudinally on the perception of parental psychological control and psychological well-being on Chinese adolescents in Hong Kong, he detected that adolescents with low psychological well-being perceive high-leveled psychological control from both parents. Costa et al. (2016) detected that parental psychological control has a positive relationship with the adolescent's disappointment and feelings of depression. Nanda et al. (2012) detected in their study in which they studied with kids aged 8-11, there is a significant relationship between parental psychological control and children's anxiety symptoms. In their study which they made daily evaluations for five days based on 2 kids from 154 families, Kaap-Deeder, Vansteenkiste, Soenens, and Mabbe (2017) detected that autonomy support perception and each one of the psychological control sources have a relationship with changes in daily well-being and sickness. In his study, Barber (1996) detected that psychological control perceived by adolescents rapidly foresee adolescent's internalized problems (depression) and, in some situations, externalized problems (guilt). In the study Tian and his colleagues (2019) made, they detected a significant and positive relationship between parental psychological control and aggressive behavior. Murray et al. (2014 detected, in their study in which they studied with 8th and 9th graders, that when a parent applies psychological control, the adolescents' low-quality relationship with the other-gender parent increases the risk of adolescent aggression. This means that if the adolescent perceives maternal psychological control and their relationship with their father is low-quality, or if adolescent perceives paternal psychological control and their relationship with their mother is low-quality; this situation increases the risk of adolescent aggression. It is seen that the studies in the literature and summarized above support the study findings.

As a result of interpretation of the obtained data, it was considered that gender, age, and perception of school success variables most of the time are not affective alone on adolescent subjective well-being and psychological control perceived from parents, and different variables can be an effect, too. Even if it is low, it can be said that adolescent subjective well-being is associated with parents' psychological control situation. High psychological control can sometimes directly or indirectly reduce the level of adolescent subjective well-being.

Implications

Following suggestions were developed in line with the findings obtained in the study and the information in the literature:

- Considering that the study data are subjects that take into account the family-child relationship, the children and their families; Family education seminars and training to activate positive and supportive parenting behaviors can be organized. Family support programs are vital in terms of guiding the family in child development, determining the needs of families and ensuring that the family fulfills its function fully, ensuring that children are in complete well-being in every development area. Parents may need a guide to help their children and to find educational behavior during this process. In this regard, child development specialists, guidance counselors in schools, and psychological counselors can work together.
- It can be suggested that teachers, school administrators and families cooperate in order to increase the positive feelings of students in schools and provide opportunities that can satisfy their psychological needs.
- Experimental studies can be conducted to monitor the effects of family training and projects carried out on parents' psychological control and on the subjective well-being of the adolescent over time. Adolescents' well-being can be investigated regarding the different variables. Effects of parental psychological control can be examined.

Statement of Responsibility

Ayşenur Aydın; methodology, resources, data collection, validation, analysis, writing-original draft, writing-review & editing, and visualization. Arzu Özyürek; methodology, resources, validation, analysis, writing-original draft, writing-review & editing, visualization, supervision.

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An Evaluation of the Cultural Domain in Turkey in the Context of Lifelong Learning*

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ABSTRACT: The cultural domain may be defined as a sphere of influence that involves all cultural activities, whether economic or social in nature. In the context of lifelong learning, cultural and artistic environments represent tools and media of significance for formal and informal adult learning. The availability of learning opportunities in the cultural domain, the achievement of cultural competence by all individuals, and their cultural participation are strongly associated with lifelong learning. The research study employed a descriptive review model intending to establish the data available in Turkey with respect to cultural productivity and participation. These data span the period between 2000 and 2018. The study was structured on the basis of the data in Turkey as pertains to the budget allocated to culture and cultural expenditure, as well as performing arts, printed media, libraries, and museums. In summary, a general evaluation of the present state of productivity and participation in the cultural domain and its course over the years gives way to the argument that the cultural domain in Turkey is far from offering a source of possibilities and tools that would allow for the broader dissemination of the culture of learning. The data indicate that cultural participation in Turkey is limited to a relatively low population rate in many respects.

Keywords: Cultural domain, cultural participation, lifelong learning, learning culture.

ÖZ: Kültürel alan, ekonomik ve sosyal tüm kültürel faaliyetleri kapsayan bir etki alanı olarak tanımlanabilir. Yaşam boyu öğrenme bağlamında kültür-sanat ortamları yetişkinlerin formel ve enformel öğrenmesinde önemli araçlar ve mecralardır. Kültürel alandaki öğrenme fırsatları, toplumdaki tüm bireylerin kültürel yetkinlik kazanması ve kültürel katılım yaşam boyu öğrenmeyle yakından ilişkilidir. Araştırmada, Türkiye'deki kültürel üretim ve katılım verilerini belirlemek üzere betimsel tarama modeli kullanılmıştır. Veriler, 2000-2018 yıllarını kapsamaktadır. Çalışma; kültürel alan kapsamında Türkiye'de kültüre ayrılan bütçe, kültür harcamaları, gösteri sanatları, yazılı medya, kütüphane ve müzelere ilişkin veriler üzerinden ele alınmıştır. Özetle, kültürel alandaki üretimin ve katılımın yıllara göre seyri ve mevcut durumu genel olarak değerlendirildiğinde Türkiye'de kültürel alanın öğrenme kültürünün yaygınlaşmasını sağlayabilecek olanak ve araçlar sunmaktan uzak olduğu söylenebilir. Veriler, Türkiye'de pek çok boyutuyla kültürel katılımın oldukça düşük bir nüfus oranıyla sınırlı olduğunu göstermektedir.

Anahtar kelimeler: Kültürel alan, kültürel katılım, yaşam boyu öğrenme, öğrenme kültürü.

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Lifelong learning is defined as a concept that encompasses both purposeful and incidental learning experiences of individuals in the Terminology of Adult Education (Titmus, Buttedahl, Ironside, & Lengrand, 1985). The European Council described lifelong learning as learning from the pre-school age to that of post-retirement, including the entire spectrum of formal, non-formal, and informal learning. Smith (2002, p. 49) defines lifelong learning as all learning activities undertaken with the aim of improving knowledge, skills, and competence.

The humanist perspective in lifelong learning stems from an equalitarian understanding that encompasses all forms of life-wide and -process learning and supports the development of individuals and the society in all of their aspects. When defined as all purposeful learning activities undertaken continuously for the purpose of improving knowledge, skills, and competences, lifelong learning embodies formal and non-formal education, informal learning, and individual learning and learning in a group environment and in the context of social movements, i.e., all forms of education and learning. This context, in turn, brings forth a holistic perspective to education and recognises learning in a variety of environments. In addition, lifelong learning, as an approach, also dissipates the borders between conventional policy areas. Policies concerning such areas as education, culture, labour, etc. are affected by lifelong learning, and all these domains assume a common responsibility for lifelong learning and life-wide learning (IFLA, 2004). The cultural domain constitutes the context for lifelong learning as a domain that encompasses all cultural activities, whether economic or social in nature.

The cultural domain offers lifelong and life-wide learning for all ages in all forms of learning, namely formal, non-formal, and informal (EUCIS-LLL, ACP, & CAE, 2013, p. 2-3). When considered in this context, all learning opportunities in the domain of culture and arts and the achievement of cultural competence by all individuals in a society may be addressed in the scope of lifelong learning. The culture of learning may be considered to be the process of raising sensitivity among individuals towards attaining new knowledge and skills to respond to the rapidly changing social and economic requirements of the current times. Public Education Centers are at the centre of the efforts for creating a culture of learning in Turkey (Komşu, 2017).

Cultural participation represents one of the most effective forms of informal learning (Ahponen, 2009, p. 78). In this context, learning is an essential indicator for culture, as well. Cultural participation is defined as an umbrella term to denote activities of individuals and groups in the making and using of cultural products and processes (Murray, 2005). UNESCO (2012, p. 51) defines cultural participation as participation in any activity that, for individuals, represents a way of increasing their own cultural and informational capacity and capital, which helps define their identity and/or allows for personal expression. Such activities may be formal or informal or active or passive in nature and therefore, may take a number of forms. An artistic pursuit, volunteering for a cultural event, going to the cinema, reading books, visiting a museum, a heritage site, or a library, going to a concert, a theatre, or a dance performance and even watching a cultural show on TV are among the examples of means employed by individuals for cultural participation. As an intrinsic part of lifelong learning and education, cultural participation improves individuals' self-esteem and self-worth. It creates an overall positive impact on their entire lives (Access to Culture Platform, 2011, p. 6-7). Any

mention of cultural participation necessitates a reference to the relevant infrastructure (number of museums and halls, etc.), the cultural supply (plays or movies available in theatres), the use of such supply (number of viewers or number of museum visits, etc.), and the preferences and leisure habits of consumers (Kutlu & Aksoy, 2011, p. 106). The responsibility for the provision of conditions favourable for the cultural participation of individuals rests with the state (Erder, 2003). Availability of information, creation, participation, and utilisation in every field of culture and arts depends on the proper arrangement and provision of relevant possibilities in the cultural domain (Şenlik, 1981, p. 117).

In the context of lifelong learning, the cultural domain represents tools and media of significance for formal and informal adult learning. From this perspective, statistical analysis depicting the cultural domain point out to its capacity and dimensions in its general framework. The present study, building upon this starting point, addressed the present state of productivity and participation in the cultural domain, which constitutes a field of lifelong learning, through the following questions:

- What is the extent of budgetary resources allocated by the public to the cultural domain? What is the breakdown of household cultural expenditure?
- What is the current level of performing arts such as theatre plays, cinema, opera, and ballet, and what is the current level of participation in such arts?
- What is the number and of printed books, magazines, and newspapers? What is their level of circulation per year, and how have they changed in years?
- What are the number of public libraries, the number of public libraries users, and how have they changed in years?
- What are the number of museums, the number of museum visitors, and how have they changed in years?

Method

The research study employed a descriptive review model to establish the data available in Turkey concerning cultural productivity and participation. A descriptive study attempts to offer a systematic description of or information about a situation, a problem, a case, a result, a service, a programme, or a group of people or a community or to identify the current attitudes towards such a question (Kumar, 1999, p. 9-11). The present study is based on data in Turkey as pertains to the budget allocated to culture and cultural expenditure, as well as performing arts, printed media, libraries, and museums. These data span the period between 2000 and 2018 and allow for drawing a quantitative picture of the cultural domain and establishing a trend of changes in various areas in years. The data were provided with the Turkish Statistical Institute (TurkSTAT) and the Ministry of Culture and Tourism (MoCT). The data were collected using the full enumeration method for each area throughout Turkey. Full enumeration refers to the aggregate of all units that comprise the population (Ural & Kılıç, 2005, p. 28). The most explicit example to full enumeration is a population census in which a whole population is scanned (Ergin, 1991). The data collected for the study were examined by way of the descriptive analysis technique. A descriptive analysis represents the summarisation and interpretation of data obtained through a variety of data collection techniques in line with predefined themes. A descriptive analysis aims to provide readers with a

summarised and interpreted version of findings (Yıldırım & Şimşek, 2003). The statistics concerning culture were therefore interpreted by way of their depiction in tables and graphs. These data draw the big picture in Turkey for the cultural domain.

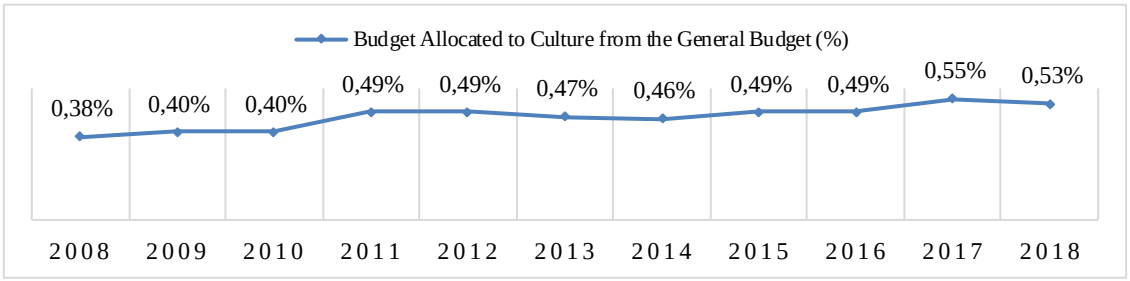
Results

Budget Allocated to Culture in Turkey

The budget allocated to MoCT, the highest public authority in charge of cultural affairs in Turkey, is amongst the most influential factors in terms of the identification of possibilities in this domain. As can be seen in Graph 1, the share allocated to MoCT in Turkey has remained under 1% and thus rather limited in every term. What is more, an argument may be put forth outlining the quite limited nature of possibilities in the cultural domain because of the limited financial resources, considering that this share allocated from the budget is ultimately divided into two between culture and tourism.

Graph 1

Share Allocated to Culture from the General Budget (%)

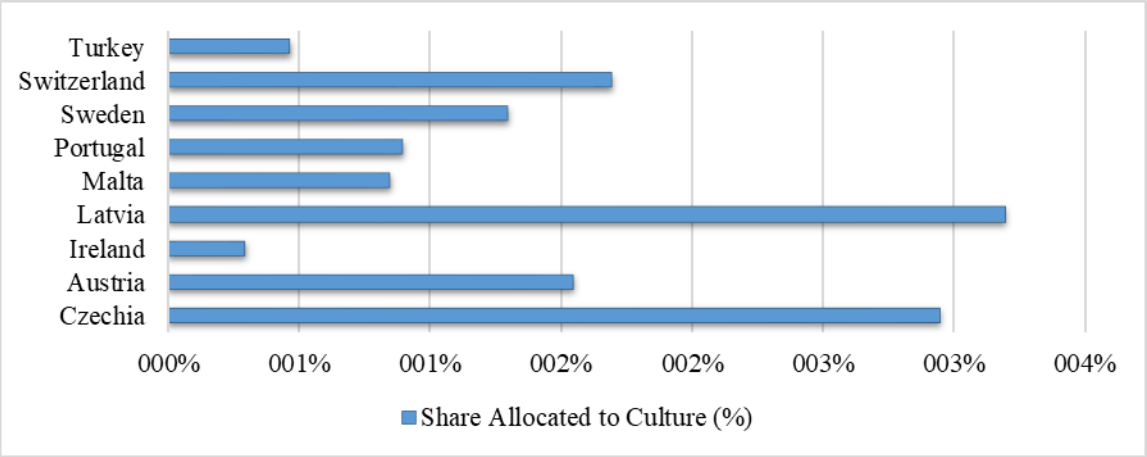


Source: www.hmb.gov.tr

The necessity for expanding the budget allocated to culture was among the most frequently pronounced recommendations during the 3rd National Cultural Council (MoCT, 2017). Developed countries are characterised by an approach to cultural budgeting that not only embraces culture as a human right but also takes the prospective economic and social contributions of culture in the development of societies into consideration, and they are built on the awareness that any investment in this field would offer value for money in all aspects. The relevant data compiled by the European Council offers a comparative view of the shares allocated by countries to culture from their general budgets, as can be seen in Graph 2.

Graph 2

Shares Allocated to Culture from General Budgets in Various Countries



Source: Council of Europe, Compendium of Cultural Policies and Trends in Europe (2013).

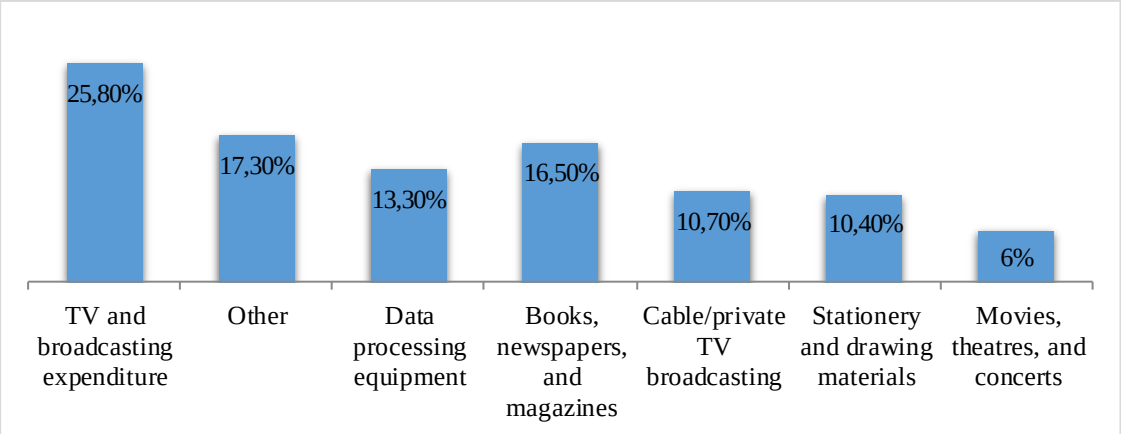
Among these countries, Turkey is the second country that allocates the lowest share to culture after Ireland. As a country with a rooted cultural past, Turkey suffers from insufficient budgetary resources to invest in the infrastructure to promote cultural productivity and development, to preserve cultural heritage, to improve the cultural competences of its citizens, to promote the country in general, and the other steps necessary in this context.

Household Cultural Expenditure

When addressed in the context of household consumption expenditure, cultural expenditure may be construed as one of the indicators of the development level of a country (İnci, 2011, p. 52). TurkSTAT covers household cultural expenditure under the heading of recreational-cultural expenditure. The absence of separate categories for recreational and cultural expenditure adds difficulties to the interpretation of cultural expenditure. The share of household recreational-cultural expenditure in total expenditure was 2.9% in 2018. The share of recreational-cultural expenditure in the general expenditure was 2.1% in households designated as the 20% lowest income group, while the same share was 3.8% for the %20 highest income group (TurkSTAT, 2019). The total ratio of the share of these two categories in all consumption expenditure being 2.9% points out to the fairly low level of the share allocated to culture. The breakdown of household cultural expenditure in various cultural categories is a key indicator of the achievement of cultural capital. The breakdown of household cultural expenditure in 2018 is as specified in Graph 3.

Graph 3

Breakdown of Household Cultural Expenditure (2018)



Source: TurkSTAT

The breakdown of household cultural expenditure indicates that approximately 37% of all cultural expenditure is allocated to TV broadcasting expenditure and cable and private TV broadcasting services. This, in turn, means that television is the dominant "cultural instrument" in Turkey. On the other hand, books, newspapers, and magazines represent 16.50% and movies, theatres, and concerts represent approximately 6% of household cultural expenditure. Turkey is observed to suffer from a reasonably low demand for cultural products and not achieving a sufficient level of development in this regard (Enlil et al., 2011). According to the analysis undertaken by Şengül, Şengül, and Lopçu (2018) on purchase and consumption decisions of households in the recreational and cultural domain along the axis of sociodemographic and economic variables, income represents the most critical determinant for household recreational and cultural expenditure in Turkey. This finding confirms the argument of Bourdieu (2015) that cultural capital gains volume in association with economic capital.

Performing Arts

Theatre

Theatre is the most shared domain of performing arts in Turkey. The development of theatre in years in terms of the number of theatre halls, the number of Turkish and foreign works performed, and the number of viewers may be construed as a source of important indicators concerning this branch of arts (Table 1).

Table 1

Theatre Data

Year	No. of Halls	No. of Works	No. of Plays	No. of Viewers
2000	108	735	11.215	2.376.066
2001	99	630	9.254	1.554.886
2002	102	713	10.271	1.666.463

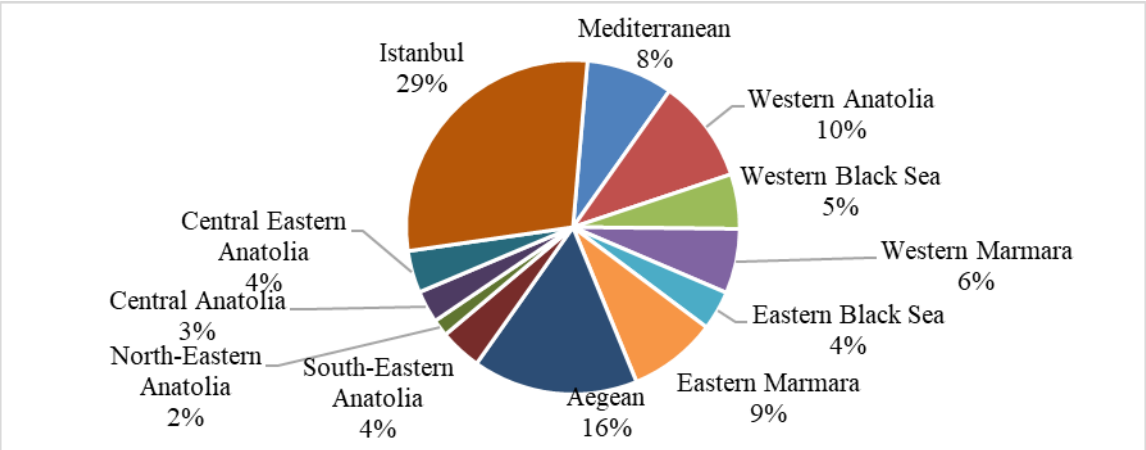
2003	97	898	13.305	1.809.068
2004	115	977	12.587	1.787.714
2005	123	1.177	11.453	2.110.523
2006	112	608	9.510	1.519.852
2007	130	848	10.289	1.701.291
2008	204	2.122	17.410	2.466.373
2009	201	2.217	18.803	3.067.727
2010	430	3.694	25.378	3.854.341
2011	511	4.252	23.361	4.059.860
2012	606	5.539	25.043	4.023.018
2013	678	6.219	28.359	4.739.078
2014	611	6.642	28.877	4.909.012
2015	719	6.825	28.257	4.579.412
2016	721	7.766	26.816	4.575.551
2017	783	8.948	31.690	7.006.410
2018	736	9.376	33.772	7.841.353

Source: TurkSTAT

With respect to the number of theatre halls in Turkey, there were only 108 halls around the country in 2000 despite the country's over 60 million population at the time. Even though the figure reached 736 theatre halls by 2018, the country may still be argued to rate rather poor in this context. In fact, the regional disparities identified in this breakdown bring the insufficient number of theatre halls even further visibility. As shown in Graph 4, there is an unequal distribution of theatre halls between regions.

Graph 4

Breakdown of Theatre Halls by Region (2018)



Source: TurkSTAT

29% or 211 of currently available theatre halls are observed to be located in Istanbul. On the other hand, the region featuring the lowest number of theatre halls is

North-Eastern Anatolia, with 12 halls. The insufficient number of theatre halls, coupled with the unequal distribution of existing halls among regions, adds difficulties to theatre performances and access to theatres among all groups of society, thereby narrowing down the room available to theatre in the domain of culture and arts.

In the field of theatre, an important indicator besides the need for infrastructure as measured by the number of halls is the number of works performed. A linear increase is observed in the number of theatre plays in years. Accordingly, it is possible to state that productivity has been reinvigorated in the field of theatre, and a larger volume has become available to respond to the demand in this field. Nevertheless, the breakdown of the number of works performed at theatre halls by cities indicates that such richness does not necessarily reflect every city. As an example, in 2018, the number of works performed was 4.472 for Istanbul, 716 for Izmir, and 367 for Ankara, while this figure was recorded at 1 each for Batman and Bilecik, 2 each for Erzincan and Hakkari, 4 for Ardahan, and 5 for Ağrı. Such concentration of plays in metropolitan cities may be attributed to the collective positioning of private theatre companies in these cities. However, private theatres are faced with financial challenges in staging theatre plays and organising performance tours. Furthermore, mark-ups in ticket prices aimed at covering the costs have an impact on the number of viewers visiting private theatre companies (Öner, 2018). This finding adds visibility to the importance of state-funded theatre companies in the wider dissemination of theatre.

The supply of plays offers another source of data pointing out the popularity of theatre. The number of plays nearly tripled and exceeded 33.000 in a period of eight years after 2000. As a finding similar to that of the number of works performed at theatre halls, the breakdown of plays by cities also represents significant discrepancies. As an example, out of the total number of 33.772 theatre plays put forth in 2018, 14.176 were staged in Istanbul, 4.365 in Ankara, and 1.794 in Izmir. This situation indicates that approximately 60% of all plays performed were staged in these three cities, which collectively represent 30% of the total population in Turkey. On the other hand, the low number of plays in cities located in the East of Turkey offers a clearer indication of the inequality that prevails in the right of individuals to access culture. Both the existing body of infrastructure and the numbers representing the current supply of plays point out the insufficiency of opportunities available for access to theatres and their unequal distribution around the country. In the light of such a lack of impossibilities, it does not seem realistically possible for theatre to enjoy a wider dissemination around the country. In fact, this observation is confirmed by the number of theatregoers.

The number of theatregoers exceeded 7 million in 2018, but still represented 9% of the population. Furthermore, emphasis must be placed on the regional inequality observed in the number of theatregoers as is the case in the number of theatre plays. In fact, out of the total number of theatregoers, approximately 3 million reside in Istanbul and 1 million in Ankara. In other words, the majority of all theatregoers are located in these two cities. On the other hand, approximately half of all theatregoers are represented by children. These data bring the relationship of adults with theatre in Turkey more into the open. Considering the fact that the population of Turkey exceeded 80 million by 2018, the number of both adult and junior theatregoers remaining limited to three to four million shows that theatre has not been widely disseminated around the country.

In summary, an overview of theatre in Turkey makes it almost impossible to talk about either sufficient infrastructure based on such factors as the number of theatre halls or a widely disseminated theatre culture. The relationship between individuals and theatres offer an important indicator of the social capital of individuals and of the society. Theatre is a source of significant opportunities to improve the general knowledge and vocabulary of the public, as well as their historical knowledge and socialisation (Öner, 2018). Within the context of the right to culture, one of the most important responsibilities of a social state requires it to allow all citizens access to theatre and to support productivity in this domain. Nevertheless, the shortcomings mentioned above reproduces the deficiency prevailing in this domain in Turkey.

Opera and Ballet

The institutional introduction of opera and ballet to Turkey dates back to 1948, and therefore, these arts do not enjoy a rooted past. In Turkey, opera and ballet could not be disseminated as widely as theatre due to their perception as elitist branches of arts and the lack of mass access to such performances. As can be seen in Table 2, limited figures are observed in the number of opera and ballet halls in Turkey, as well as the number of works performed and the number of viewers.

Table 2

Opera and Ballet Data

Year	No. of Halls	No. of Works	No. of Viewers
2000-2001	6	95	207 360
2001-2002	5	98	165 154
2002-2003	5	135	273 271
2003-2004	5	144	457 717
2004-2005	5	199	252 076
2005-2006	5	189	245 448
2006-2007	7	84	451 271
2007-2008	10	203	325 364
2008-2009	7	143	181 605
2009-2010	12	251	324 007
2010-2011	9	208	310 623
2011-2012	14	228	333 707
2012-2013	12	234	375 223
2013-2014	15	188	400 420
2014-2015	11	190	337 007
2015-2016	11	170	272 578
2016-2017	11	198	281 069
2017-2018	11	202	293 002

Source: TurkSTAT

Opera and ballet halls are located in 6 provinces: Ankara, Istanbul, Izmir, Mersin, Antalya, and Samsun. Therefore, access to opera and ballet are observed to be concentrated in these provinces. Such infrastructural deficiency represents the obstacle to the wide dissemination of opera and ballet. In fact, the number of opera and ballet viewers also confirms this argument. The number of viewers recorded in 2018 shows that approximately 3 per mill of the population in Turkey viewed opera and ballet performances. The data given in Table 2 may be construed to point out to the extreme deficiency in the culture of opera and ballet in Turkey, as well as that in the current efforts put forth in this area. In fact, the data covering the last 18 years represent a course of stagnation rather than significant development in the area of opera and ballet. Another piece of data supporting such stagnation is the number of performances. The lack of equal opportunities for access to cultural and artistic activities between regions and cities in Turkey appears to constitute a major obstacle to the internalisation and wide dissemination of the culture of opera and ballet.

Cinema

Cinema may be specified as one of the most popular venues of cultural productivity and consumption in Turkey. The popularity enjoyed by cinema may be attributed to the significant factors of the culture of cinema created in society before the widespread dissemination of television and the possibility of individuals from all cultural levels to access such products. The Development Plan is also observed to attach importance to the development of cinema in Turkey. Even though available data partly allows for the analysis of the quantitative extent to which this objective has been reached, the quality of cinema products available in Turkey is a question for another research study. A review of the fundamental infrastructure required for access to cinema gives way to a picture of deficiency in this area (Table 3).

Table 3

Data on Cinema

Year	No. of Halls	No. of Featured Movies	No. of Viewers
2001	606	25 608	16 905 737
2002	580	22 529	15 406 597
2003	532	21 254	14 503 052
2004	826	26 398	18 670 834
2005	822	25 076	18 001 466
2006	987	25 297	23 512 599
2007	1.045	28 733	20 659 569
2008	1.140	32 003	31 132 231
2009	1.514	34 947	31 334 447
2010	1.647	35 999	35 787 380
2011	1.834	37 892	37 439 786
2012	1.917	37 546	39 002 190

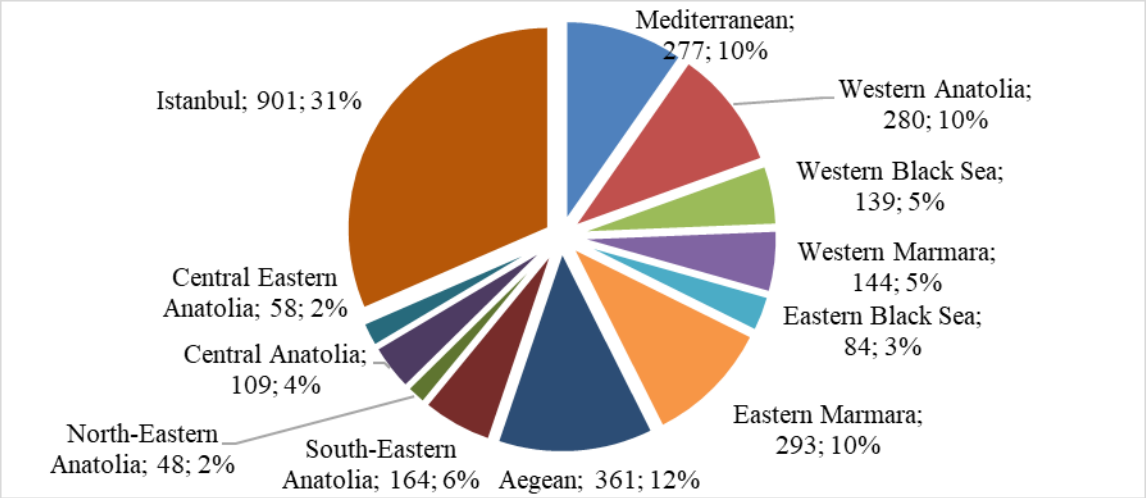
2013	1.998	40 406	45 077 509
2014	2.102	41 517	55 378 716
2015	2.170	49 151	57 148 011
2016	2.356	53 443	55 260 600
2017	2.483	58 214	68 482 526
2018	2.692	65 501	64 772 380

Source: TurkSTAT

As can be seen in Table 3, the number of movie theatres enjoyed an increase every year following 2002, and it remains rather insufficient when considered in conjunction with the population of Turkey. The total number of seats available in movie theatres increased from 200 thousand to 342 thousand in the same period. However, the latest situation shows that there is one available seat for approximately every 235 persons in Turkey. When coupled with the unequal distribution of movie theatres between regions and cities, such low number adds further visibility to the deficiency in this area (Graph 5).

Graph 5

Number of Movie Theatres by Region (2018)

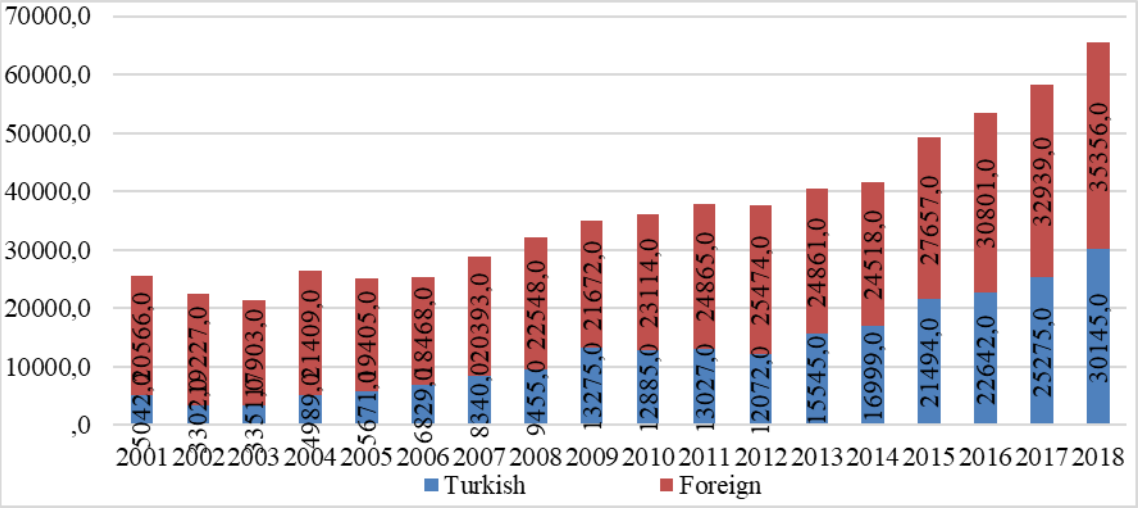


Source: TurkSTAT

As can be seen in Graph 5, 31% of all movie theatres in Turkey are located in Istanbul. Istanbul has become the heart of cinema from every angle. On the other hand, the regions characterised by deprivation in this sense include North-Eastern and Central Eastern Anatolia with 2% and Eastern Black Sea with 3%. The provinces of Ardahan, Bayburt, Şırnak, and Tunceli did not feature a movie theatre until 2017. Bayburt and Tunceli claimed their respective movie theatres in 2018, while there are still no movie theatres in the other two cities. Another source of data indicating dynamism in the area of cinema is the number of featured movies. Significant increases have been observed in the number of featured movies in Turkey after 2014. The breakdown of such featured films by their Turkish or foreign nature reveals the prominence of foreign movies (Graph 6).

Graph 6

Number of Turkish and Foreign Featured Movies (2001-2018)



Source: TurkSTAT

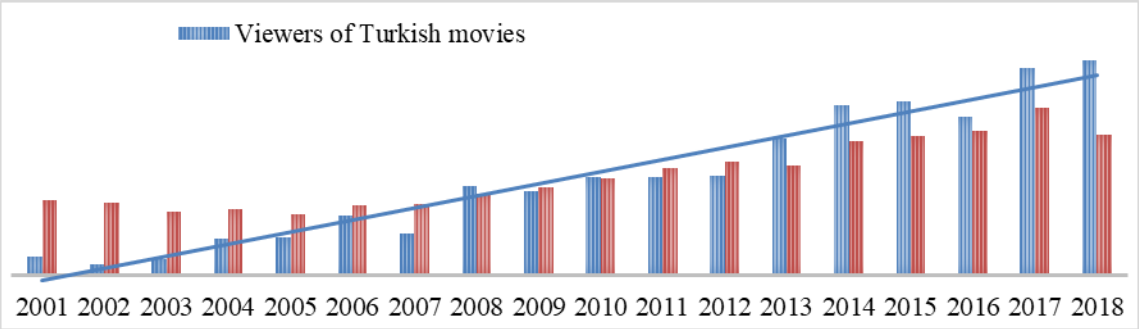
Graph 6 shows the prominence of foreign movies in all years under analysis, while also signifying a faster growth for Turkish movies in the same period. The increase of approximately 500% in the number of Turkish movies featured between 2001 and 2008 in Turkey points out the significant progress attained by the production of Turkish movies. This increase may be, in part, attributed to the state support afforded to the cinema industry[1]. The increase in the number of featured movies was also accompanied by an increase in the number of moviegoers. The number of moviegoers in Turkey achieved an increase of over 100% in the last decade, exceeding 64 million in 2018. Considering that the number of moviegoers in Turkey was over 80 million in the 1970s, the current number of moviegoers may fall short of the expected level. With an average of 0.8 tickets per person, Turkey ranks 29th in Europe. One of the most important factors that influence the number of moviegoers is ticket pricing. High fees of participation turn access to cultural practices into a luxury (Vitrinel, 2018). Since the culture of cinema thrives in an atmosphere where it cannot be substituted by television or digitally streamed movies, the number of moviegoers may be construed as a significant indicator of the continued maintenance of this culture.

An increasing trend has been observed in the production of Turkish movies in recent years in Turkey. How this increase has affected the number of moviegoers may be considered an important parameter in interpreting the area of cinema in Turkey. Graph 7 represents the changes in the number of viewers of Turkish and foreign movies in years.

[1]The Directorate-General for Cinema supported 446 feature films with TRY157.569.646 TL since 2005. 29 out of 148 Turkish movies that were released in 2017 were supported by the Ministry of Culture and Tourism. For details, see.

Graph 7

Number of Viewers of Turkish and Foreign Movies (2001-2018)



Source: TurkSTAT

As can be seen in Graph 7, the number of viewers of foreign movies is higher than that of viewers of Turkish movies every year between 2001 and 2007. The insufficient number of Turkish movies may be stated to lead to a low number of moviegoers during this period. The increase in the number of Turkish movies starting from 2008 was translated into a significant increase in the number of viewers of Turkish movies and, ultimately, in the total number of moviegoers. Such increase continued in forthcoming years, and the number of viewers of Turkish movies exceeded the number of viewers of foreign movies starting with 2013. This observation may be construed to indicate a preference among moviegoers in Turkey for Turkish movies. In fact, as can be seen in Table 4, Turkish productions have been the most popular movies since 2006.

Table 4

Most Popular Movies and Their Number of Viewers in the Last 12 Years

Year	Movies	No. of Viewers
2006	Kurtlar Vadisi: Irak	4.256.567
2007	Beyaz Melek	2.032.885
2008	Recep İvedik	4.301.693
2009	Recep İvedik 2	4.333.144
2010	New York'ta Beş Minare	3.474.495
2011	Eyvah Eyvah 2	3.947.988
2012	Fetih 1453	6.572.618
2013	Düğün Dernek	6.980.000
2014	Recep İvedik 4	7.369.098
2015	Düğün Dernek 2: Sünnet	6.072.000
2016	Dağ 2	2.800.000
2017	Recep İvedik 5	7.437.050
2018	Müslüm	6.311.619

Source: Box Office Türkiye (https://boxofficeturkiye.com)

Even though the movie preferences of the viewers of Turkish movies and the quality of such Turkish movies in Turkey may be addressed in an entirely separate research study, the heavy demand for such farcical movies as the Recep Ivedik series is rather thought-provoking for the culture of cinema. Stating that the share of viewers of locally produced movies does not exceed 20% in Europe, Vitrinel (2018) associates such a high number of viewers of Turkish movies in Turkey with the absence of healthy and sustainable cinema industry in the country. In addition, the present analysis should factor in the fact that cinema is among the areas targeted by the profit-oriented approach dominating the cultural industry that commodifies artistic content. With the perspective put forth by Adorno (2007), the aforementioned farcical movies may be described as hollow commodities of the recreational and mass culture. This situation signals the potential of cinema in Turkey to distance itself from artistic content and become a commodity of the recreational ideology and popular culture.

In general, the data available in Turkey with respect to cinema makes it rather difficult to state that this area offers individuals opportunities for cultural development. A review of the available infrastructure brings to light the insufficient number of movie theatres. On the other hand, the genres of the most popular movies add difficulty to the analysis of cinema in terms of its association with cultural capital. Cinema is gradually becoming one of the most popular leisure activities in the modern age. The most popular movies around the world are in the genres of science-fiction, fantasy, and animation, and these have also become one of the tools of cultural imperialism (Kozan, 2016). In Turkey, the demand is shaped through a supply created by a cinema industry that is far from healthy and sustainable (Vitrinel, 2018). Considering the use of such supply based on the number of viewers, it does not appear possible to talk about a widely disseminated culture of cinema.

Printed Media Statistics

Newspapers and Magazines

The annual figures and circulation of books, newspapers, and magazines in a country are important indicators of its culture. A review of the number and circulation of newspapers and magazines in Turkey indicates a remarkable decline rather than an improvement in recent years (Table 5).

Table 5

Number and Circulation of Newspapers and Magazines (2005-2018)

Year	No. of Newspapers	Circulation of Newspapers (Million)	No. of Magazines	Circulation of Magazines (Million)
2005	1.848	1.530	2.360	87
2006	1.993	2.241	2.650	109
2007	2.336	2.342	3.338	129
2008	2.479	2.550	3.186	115
2009	2.604	2.140	3.469	127
2010	2.780	2.432	3.679	140

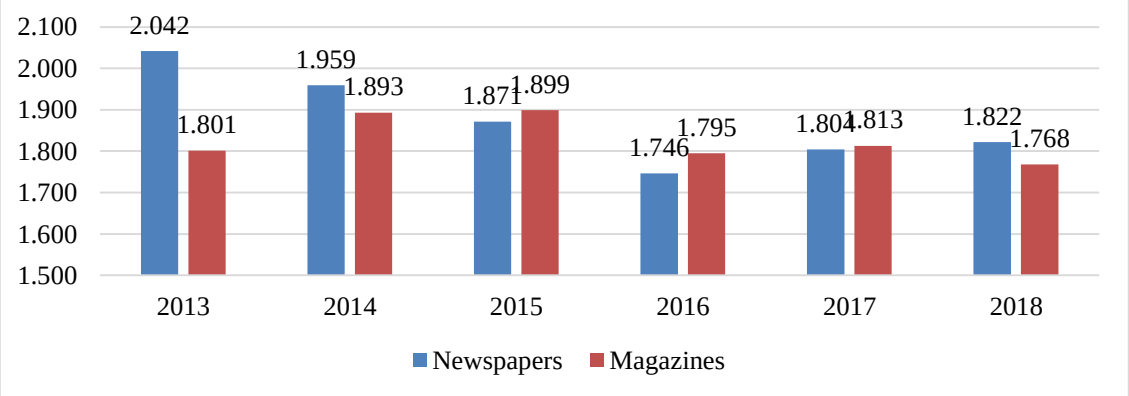
2011	2.905	2.130	3.873	135
2012	3.004	2.143	4.105	165
2013	3.100	2.296	4.058	165
2014	2.944	2.141	4.176	134
2015	2.731	1.994	4.071	139
2016	2.527	1.604	3.738	101
2017	2.474	1.559	3.650	102
2018	2.463	1.289	3.499	79

Source: TurkSTAT

The circulation of newspapers and magazines is among important indicators for cultural productivity in the area of printed media and is, in a way, indicative of the number of literate individuals in a country. The period between 2005 and 2018 is not characterised by any remarkable increase in the circulation of magazines and newspapers. What is more, the circulation of magazines was 87 million in 2005, while it dropped to 79 million in 2018. The decline in the circulation of newspapers and magazines may be interpreted more thoroughly when considered in conjunction with the increase observed in the population of Turkey, the number of educated individuals, and the rate of urbanisation in the same period. In terms of the number of newspapers per person in countries in comparison with their respective populations, there are four newspapers per 100 persons in Turkey and this figure is 55 in Japan, 37 in Sweden, 26 in Germany, 20 in Singapore, 13 in France, and 12 in the UK (B2PRESS, 2019). The declining trend in the circulation of printed newspapers and magazines is most commonly attributed to the increase in the number of readers of digital content in parallel to the technological advances in recent years. On the other hand, the productive trend in this area may be identified in the number of magazines and newspapers published online (Graph 8).

Graph 8

Number of Online Newspapers and Magazines

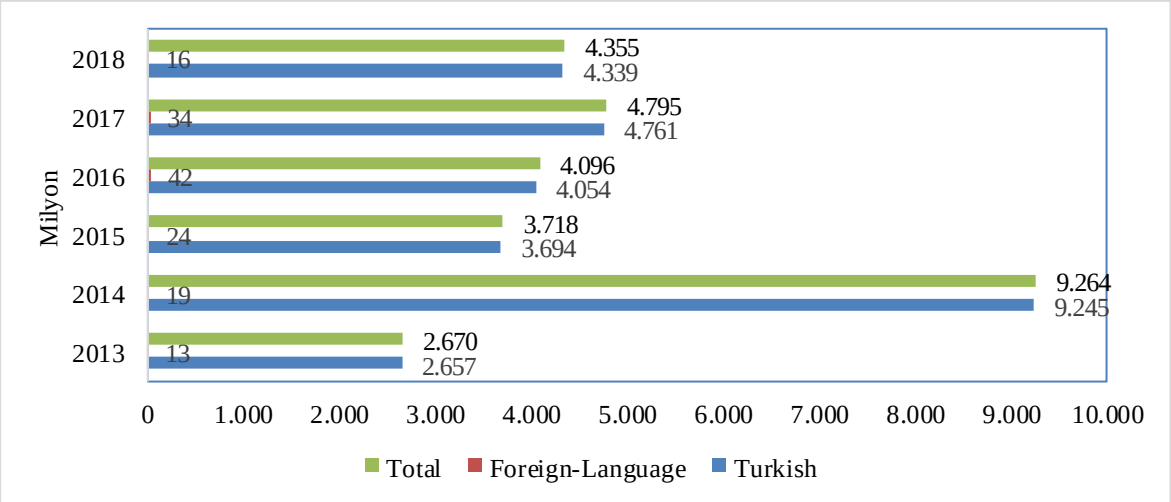


Source: TurkSTAT

The number of online magazines did not exhibit any remarkable increase between 2013 and 2018 in Turkey; however, the number of newspapers suffered a striking decline in the same period. This finding indicates the slow pace of adaptation to the digital space in Turkey. Specifically, the decline in the number of online newspapers is thought-provoking, especially in terms of the sufficiency of available sources of information in today's so-called information age in Turkey. On the other hand, the data required to establish digital literacy are sourced from the number of visitors to online newspapers (Graph 9).

Graph 9

Number of Visitors of Online Newspapers (2013-2018)

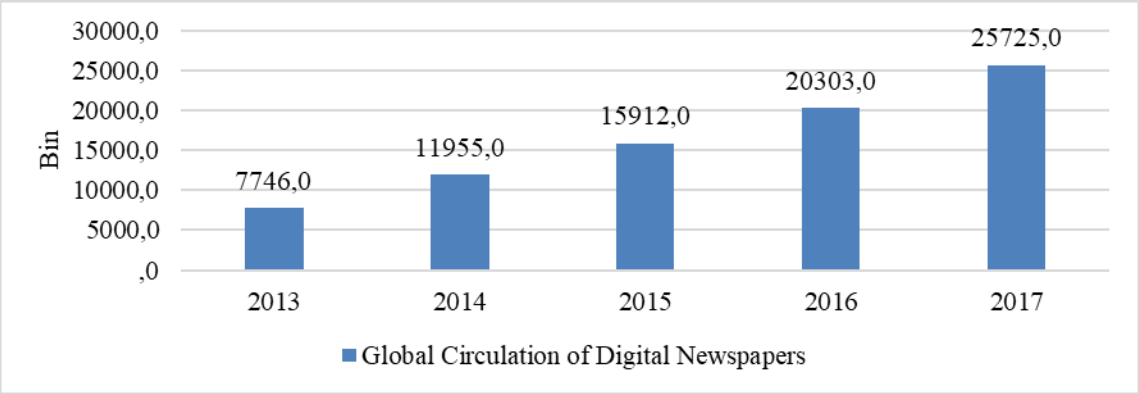


Source: TurkSTAT

The number of visitors to both Turkish and foreign-language online newspapers in Turkey enjoyed a significant increase between 2013 and 2018. During this period, the number of visitors to online newspapers nearly doubled and was close to 5 billion in 2018. This piece of data is both promising for the development of digital literacy and concerning for the pace of such development. On the other hand, it gives way to the suggestion that printed media will fade away in the face of online resources in parallel with the development and wider dissemination of relevant technologies. In fact, the number of visitors to online newspapers in Turkey was approximately four times the circulation of printed newspapers in 2018. Both Turkey and the entire world have witnessed a rise in parallel with the development of digital journalism. Graph 10 represents the circulation of digital newspapers around the globe.

Graph 10

Global Circulation of Digital Newspapers (2013-2017)



Source: TurkSTAT

According to the data released by WAN-IFRA, the global circulation of digital newspapers has enjoyed an increase of over 225% and reached 25.775 in the last five years. This piece of data is also indicative of the pace of digitalisation in recent years.

The circulation of newspapers and magazines represents an important source of data concerning literacy. When considered in proportion to the population of Turkey, it identifies the literate population to be a minority in Turkey. As is the case at the global scale, printed newspapers and magazines have suffered from declines in their circulation in recent years also in Turkey. The declining trend in the circulation of printed newspapers and magazines is attributed to the recent increase in the number of readers of digital content in parallel with technological developments. However, the decline in the number of online newspapers and magazines in Turkey points out the absence of any increase in production in this area. Furthermore, the number of visitors to online magazines and newspapers offers a significant piece of data indicating that the culture of digital readership has not enjoyed widespread dissemination in Turkey, either. In summary, a review of the production and readership of newspapers and magazines in Turkey makes it impossible to point out a widely disseminated culture of learning.

Books

Books represent one of the most important instruments of the cultural domain because of their currency and accessibility. Their production and consumption are both a determinant and an indicator of countries' social and cultural development levels. The number of books published in Turkey are observed to have enjoyed an increase of approximately 90% in the past decade. This, in turn, indicates a growth in the publishing industry. Graph 11 shows the changes in the number of published books in years.

Graph 11

Total Number of Published Books (2008 – 2018)

Source: TurkSTAT

According to the data released by the Turkish Publishers' Association, 580.956.504 books were published, and the number of books per person was 7.08 in Turkey (Turkish Publishers' Association, 2018). However, 168.192.941 of these books are unlabelled books distributed by the Ministry of National Education free of charge, while 2.122.558 are unlabelled books published for distance learning at Anadolu University. In this case, the number of books sold is reduced to 410.641.000. Therefore, the number of books per person, i.e., 7.08, does not reflect the reality in proportion.

The number of books published is as significant as the breakdown of books by genre to analyze their target audience. The last five year data point out to an increase in the number of books of every genre as can be seen in Table 6.

Table 6

Number of Published Books by Genre (2013-2018)

Year	Adult Fiction Literature	Adult Culture	Children and Teenagers	Education	Academic	Faith	Total
2013	6 637	9 611	8 130	12 565	7 003	3 406	47 352
2014	9 542	11 652	6 889	12 380	7 171	3 118	50 752
2015	11 356	11 092	8 215	15 548	6 808	3 395	56 414
2016	9 166	11 150	8 618	14 711	7 481	3 320	54 446
2017	9 830	11 509	10 042	17 153	8 143	3 658	60 335
2018	10 639	11 687	9 299	21 628	10 751	3 131	67 135

Source: TurkSTAT

The genre that enjoyed the highest rate of increase between 2013 and 2018 was adult fiction literature with 50%. A review of the books by genre reveals the prominence of educational books in terms of their number in every period. Educational books are followed by adult cultural books and adult fiction literature books. The next

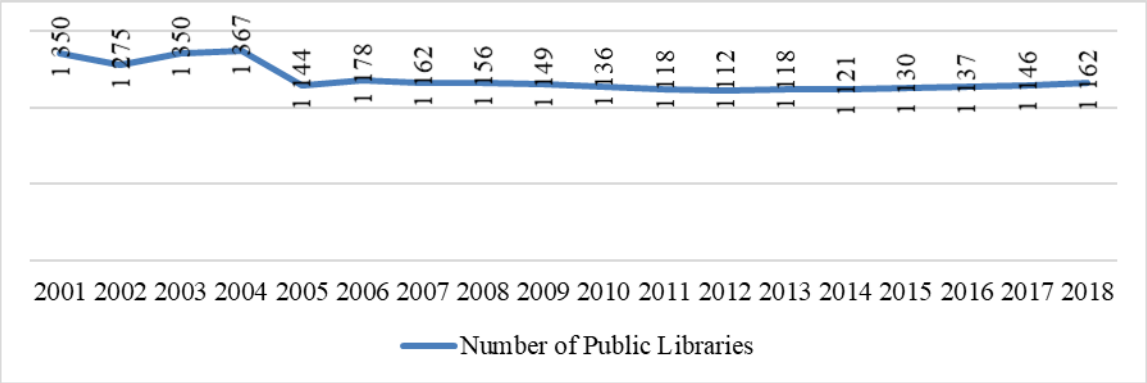
two genres belong to children's and teenagers' books and academic books. Finally, books on faith constitute the least produced genre in every period. Considering the reading habits in Turkey, UNESCO data indicate Turkey to rank 86th in the world in terms of book reading rate. In addition, TurkSTAT data indicates that books rank 235th among the items of need in Turkey. On the other hand, the money spent on books per person is 13 dollars in the world, while this figure is a quarter of a dollar in Turkey (CNNTurk Newspaper, 2018). All of these indicators identify Turkey to be at a less-than-perfect position in terms of reading.

Libraries

Libraries are institutions of great importance in society's cultural development due to their systematic recording and regulation in access to information. As *reading* is right at the heart of the philosophy of lifelong learning, libraries' qualitative and quantitative competences as institutions offering organised service in this area may be construed as a parameter of cultural services in a country. The 2018 data of TurkSTAT reveal that there are 31.451 libraries in total in Turkey, namely 1 national library, 1.162 public libraries, 598 university libraries, and 26.690 libraries within formal and non-formal educational institutions. A review of the changes in the number of public libraries in years points out to a decline rather than an improvement in the last 17 years (Graph 12).

Graph 12

Number of Public Libraries (2001-2018)



Source: TurkSTAT

As can be seen in Graph 10, the number of public libraries was 350 in 2001 and decreased to 162 in 2018. Considering the fact that the population of Turkey was around 65 million in 2001, but exceeded 80 million in 2018, the increase in the number of persons per library reveals the insufficient number of libraries.

According to the "World Library Map" released by the International Federation of Library Associations and Institutions (IFLA), there is one library for every 6.300 persons in European Union (EU) countries as of the year 2016, while this figure rises to 70.000 in Turkey. IFLA data shows that there were 1.143 public libraries in Turkey as of the end of 2017, while this figure was 16.100 for France, 6.042 in Italy, and 5.021 in Germany. As can be gathered from Table 7, Turkey is especially far behind EU countries in terms of the delivery of library services.

Table 7

Population and Number of Public Libraries by Country

Country	Population (Million)	No. of Public Libraries (Thousand)	No. of Persons per Library
Czechia	10.58	6.220	1.701
Russia	144.5	37.412	3.862
France	66.86	16.100	4.153
Poland	37.97	8.050	4.717
Australia	8.773	1.372	6.384
Finlandia	5.503	854	6.444
Norway	5.258	740	7.105
Romania	16.64	2.046	8.133
Sweden	9.995	1.120	8.924
Italy	60.59	6.042	10.028
Belgium	11.35	1.105	10.271
Canada	36.71	3.415	10.750
Netherlands	17.08	1.135	15.048
Germany	82.52	5.021	16.435
United Kingdom	66.02	3.889	16.976
Mexican	129.2	7.427	17.409
USA	325.7	17.218	18.916
Iranian	73.14	3.278	22.312
Cuba	11.48	399	28.772
Colombia	49.7	1.702	29.201
Brazil	209.3	6.102	34.300
Chile	18.05	519	34.778
South Afrika	56.72	1.504	37.713
Japan	126.8	3.331	38.067
Swiss	8.42	220	38.273
Uruguay	3.457	63	54.873
Turkey	79.81	1.143	70.000
Uganda	42.86	45	952.444
Sudan	40.53	20	2.026.500

Source: IFLA, https://librarymap.ifla.org

The number of books borrowed from public libraries was 9 million in Turkey, 315 million in Germany, 66 million in France, and 33 million in Italy in 2016. When considered in comparison with countries that are close to Turkey in population, these figures reveal the demand for library services to rate rather low in Turkey. Libraries are

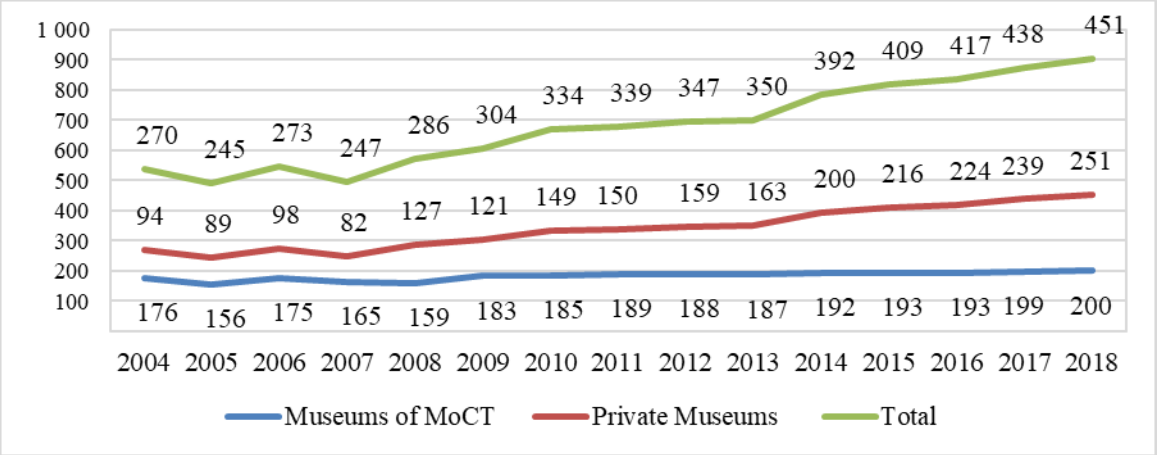
building blocks of the culture of reading as institutionalised physical spaces, but the quantitative picture of libraries and their materials in Turkey fails to offer a positive outlook for Turkey. In general, both the deficiencies in the delivery of library services and the low level of interest in library services become more visible when considered on the basis of data of comparison with other countries. In this sense, it is possible to state that libraries as institutions positioned at quite an important place in the relationship between culture and books suffer from deficiencies in Turkey.

Museums

The modern day is characterised by a transition from the conventional understanding of museums as institutions to collect, preserve and maintain works to the modern approach to museums that involve exhibition and presentation techniques that are compatible with the contemporary understanding. The methods employed by the modern approach to museums have been instrumental in improving cultural richness and the public interest in museums (Altunbaş and Özdemir, 2012). In this respect, the outlook of museums in Turkey may be construed as an important source of data for the cultural domain. Graph 13 represents the changes in the number of museums in years.

Graph 13

Number of Museums in Years (2001-2018)



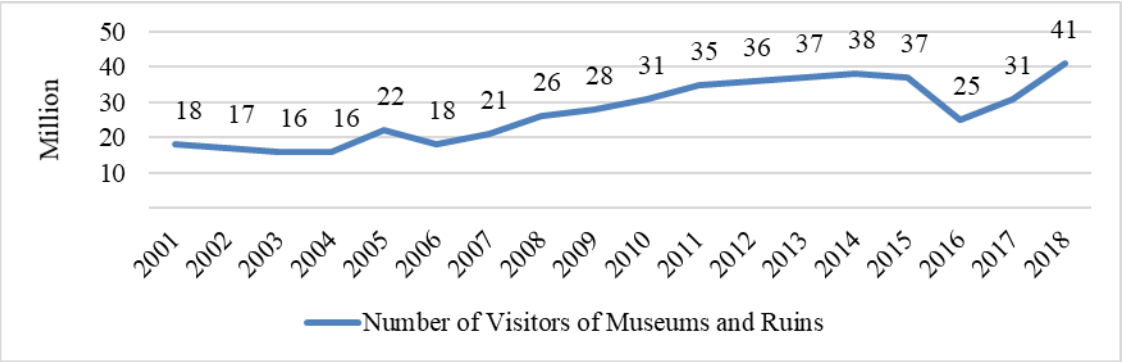
Source: TurkSTAT, Cultural Heritage Statistics

The number of museums in Turkey was 270 in 2004 and increased to 451 by 2018. During this period, the number of museums operated under MoCT reached 200 with an increase of 13%, and the number of private museums reached 251 with an increase of 167%. Compared to museums around the world, the indicators of museums in Istanbul, a city described as the capital of culture in Turkey, offer a significant source of data. According to the World Cities Culture Report (2013), Istanbul is home to 38.292 historical ruins as the capital of culture in Turkey. This figure is 8.689 for Berlin, 18.901 for London, 1.482 for New York, and 3.792 for Paris. In terms of the number of museums, there are 78 museums in Istanbul, 158 museums in Berlin, 182 museums in London, and 131 museums in New York. These data indicate that the culture of capital in Turkey possesses a greater richness in terms of historical heritage when compared to the other countries, but has fallen far behind them when it comes to translating such richness into museums and the exhibition of the historical heritage. As

an indicator of the interest in museums, the number of museum visitors is given in Graph 14.

Graph 14

Number of Visitors of Museums and Ruins (2001-2018)

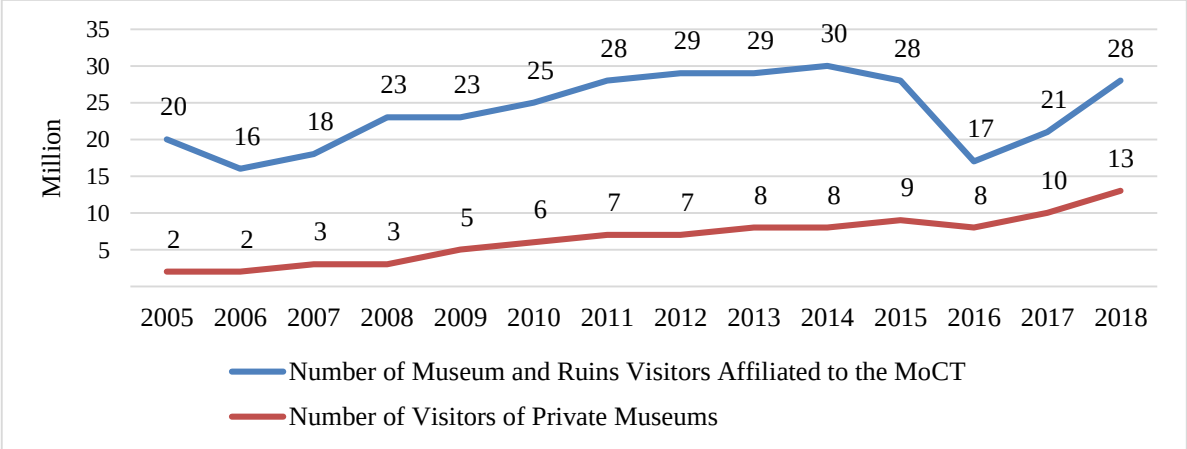


Source: TurkSTAT, Cultural Heritage Statistics

A review of the number of visitors to museums and ruins indicates the number of visitors to be registered at approximately 18 million in 2001 and to reach 40 million in 2018. Despite the slow pace of the increase in the number of museum visitors, there has been a remarkable variation in the rate of increase in the number of visitors of museums operated under MoCT and of private museums (Graph 15).

Graph 15

Breakdown of Number of Visitors of Museums and Ruins (2005-2018)



Source: TurkSTAT, Cultural Heritage Statistics

Even though museum visits have been made mostly to museums operated under MoCT in every period, the recent years have been characterised by a decline in the number of visitors of museums operated under MoCT and a continuous increase in the number of visitors of private museums. The majority of the museums established by MoCT have been founded with the aim of preserving the cultural heritage unearthed in their respective localities. The conservation-oriented approach to museums placed the works themselves at the heart of museums and precluded sufficient studies on the expression of such works with a variety of languages and methods appropriate to

various groups in the society (Dinçer, Enlil, & Ünsal, 2011, p. 80). This observation may be considered a determinant with an influence on the number of visitors to museums operated under MoCT. On the other hand, a promising picture arises from the increase in the number of visitors to private museums from 2 million to 13 million in the last twelve years along with the increase in the number of such private museums. Despite the prominence of museums exhibiting archaeological and ethnographic works in Turkey, any increase in the number of museum visitors is affected significantly by the presence of specialised museums including scientific and technical museums, industrial museums, and toy museums. In this context, the rapid increase in the number of visitors to private museums gives way to the suggestion that the public interest in museums in Turkey may be improved by supporting and encouraging private museums in promoting the modern approach to museums.

A general overview of the museums that are home to Turkey's historical and cultural heritage indicates that the number of museums in Turkey is not at an adequate number to respond to the needs of such heritage compared to those in European countries. Learning cultural heritage is an important part of lifelong learning as a cultural right. In the achievement of this cultural right, there is an important role to be assumed by efforts to address museums in Turkey in conjunction with their contemporary versions that witness the history and guide the future and to improve the same in quantitative and qualitative terms as significant spaces in the cultural domain.

Discussion

Following the military coup of the 1980s, cultural development was handicapped further by such factors as the restrictions of the freedom of thought and the seizure and banning of books. When coupled with consumer capitalism, the oppressive political climate of this period resulted in the prominence of an anti-intellectual atmosphere characterised by the disfavouring of literacy and arts (Işık, 2014, p. 33). Furthermore, the dominant ideology was based on a Turkish-Islamic synthesis, and cultural policies started to pursue the internalisation of national and moral values as their overriding goal. Such policy of conservatisation may be perceived as a trivet of the cultural transformation enforced by new ideas of the right that supported neoliberalism in parallel with marketisation. In this context, the cultural policies in Turkey focused on preserving history, heritage, and conventional forms (İnci, 2011, p. 51).

The domain of culture and arts was not handled with a contemporary approach; the country failed to follow a consistent and continuous cultural policy; and this domain was not provided with sufficient resources (Tutar, 2019). In fact, the share of the budget allocated to the Ministry of Culture and Tourism from the general budget in Turkey remaining under 1% in every period is also a reflection of the importance and value attached here to culture (Ministry of Treasury and Finance, 2018). What is more, the deficiency in the economic share of culture and arts becomes even more apparent, considering the division of this share further into two. The ratio of cultural expenditures to the gross domestic product was 1.5 in 2018 (TurkSTAT, 2018a) while according to the Turkish- European Foundation for Education and Scientific Studies (2016), cultural and creative industries accounted for 3.3% to 4.5% of EU GDP.

In performing arts such as theatre, cinema, opera, and ballet, there are deep gaps among regions in Turkey with respect to available possibilities that suffer from

deficiencies in both the number of plays, movies and performances staged and the number of halls and theatres. The deficiency in this domain becomes more visible through a comparison of the data on cinema in Turkey and European countries that are close to Turkey in population. The number of movie theatres as of 2018 is 5.193 in France, 5.298 in Italy, 4.803 in Germany, and 2.483 in Turkey. In the same order, the number of viewers is 200 in France, 93 in Italy, 105 in Germany and 70 million in Turkey (Compendium, 2017). As to theatre, the fact that the Directorate General of State Theatres has theatre halls in a total of 43 provinces and none in 58 provinces while half of its halls are located in Ankara, İstanbul, and İzmir depicts a quite clear picture (TurkSTAT, 2018b).

The development of possibilities for individuals to access and participate in culture and arts is among the priorities of cultural policies. The quantitative data pertaining to the cultural infrastructure in Turkey reveal the narrowness of the room allocated to arts. Deficiencies in infrastructure are prevalent in several areas such as libraries, movie theatres, theatre halls, recreational courses, and cultural centres. Accordingly, cultural productivity remains rather limited (Karakaş, 2003). Furthermore, there are rampant inequalities between regions in terms of the cultural infrastructure, the cultural supply, and the use of such supply. Istanbul possesses a dynamic infrastructure and a great potential for both cultural productivity and cultural consumption. Nevertheless, the other cities are endowed with limited possibilities in the face of such diversity and consumption (Kutlu & Aksoy, 2011).

The root of the deficiencies in this domain may be attributed to the discontinuation of the importance attached during the foundation years of the Republic to Western arts as an approach specified in relevant policy papers (Tutar, 2019). As the architect of the Republic of Turkey, Atatürk specifically emphasised culture and arts while founding Turkey (And, 1981, p.15). Nevertheless, cultural policies and cultural development have never been underlined on the national agenda especially following the transition to the multi-party system in Turkey (Kongar, 2003). The lack of a written cultural policy steering the cultural life in Turkey (Ada, 2011) has left the domain of culture and arts without a compass. Even though the supportive policy launched by the Republican era was partially maintained, the country could not achieve its desired goals in terms of finding the necessary human and financial resources, developing creativity and participation, and protecting and improving freedoms (Kongar, 2003).

An individual's ability to be involved in a cultural activity as a human right depends on the elimination of various cultural inequalities and social and regional inequalities (And, 1981). As cultural and artistic institutions are not distributed evenly around the country, citizens find it impossible to access such institutions. Consequently, an organic bond cannot be established between citizens and cultural and artistic institutions (Şenlik, 1981). The establishment of such a bond may be possible upon the provision of equal training, creation, and utilisation opportunities to the public in the field of arts (Canak, 1981, p. 131).

Bourdieu (2015, 136-150) associates the achievement, utilisation, and evaluation of some dimensions of cultural consumption termed by him as original competences such as classical music, jazz, theatre, and cinema with the availability of possibilities in different areas. The achievement of such competences depends on the levels of encouragement and motivation afforded to individuals. Studies conducted in the areas of

culture and arts establish that the great majority of viewers of performing arts represent an elite group in terms of professions, income, and most notably, education and do not include the general public in the society (Büyükyazıcı, 2016). A country where culture is accessible mostly to prominent individuals favoured by a strength in terms of social, cultural, and economic capital may be criticised in terms of the democratic nature of its cultural policies.

Cultural competences are achieved in social areas where they are valued (Bourdieu, 2015). In this context, the interest in performing arts can be stated to rate rather low when considered in proportion with the total population in Turkey. As an example, the number of theatregoers and viewers of opera and ballet represent 9% and 3% of the population, respectively. This picture undoubtedly stems from the insufficient nature of environmental possibilities and the absence of an extensive culture concerning these areas; these two factors, in turn, reproduce each other. Istanbul Foundation for Culture and Arts (İKSV) classified the factors that hinder mass participation in the life of culture and arts as prejudices, shortcomings in social environment and education, financial factors, requirements of school and business life, lack of motivation, and infrastructural and similar tangible shortcomings (İKSV, 2017, p. 7-33).

However, within context of performing arts, cinema stands out as the most popular area offering the widest public access and enjoying the highest number of viewers. Nevertheless, the position of cinema as the most favoured area for the cultural industry makes it difficult to interpret such wide dissemination. In fact, the share of viewers that prefer Turkish movies is higher and the most popular movies in the past decade are represented by farcical movies such as the Recep Ivedik series in Turkey. The market-oriented approach causes cultural production to move away from the domain of fine art and results in the commodification of culture. Such causation is exemplified by the feature of locally produced farcical movies among the most popular productions in the film industry. Therefore, the commodification of these and similar cultural products removes them from a quality that can touch the development of individuals and societies. Cinema represents the most obvious example of the argument by Adorno (2007) that the cultural industry commodifies arts, eliminates their artistic value, and brings them into the guidance of the market.

Turkey is observed to suffer from a rather low demand for cultural products and not to have achieved a sufficient level of development in this regard (Enlil et al., 2011). According to the research study undertaken by İPSOS (2018), 35% of the population never read a book, and %44 never go to the cinema. On the other hand, the percentage of individuals who have never viewed any concert, theatre play, or opera in their entire lives is 64%. The research study also shows that %72 of the population spends their free time at shopping malls. Watching television is at the top of the list of most frequent activities. The percentage of individuals who watch television every day is established at 83%: According to the 2016 data released by TurkSTAT, the average time spent watching television is 6 hours. Data concerning household cultural expenditure confirm such data. The largest share in the breakdown of household cultural expenditure belongs to television that accounts for approximately 43% of cultural expenditure. This, in turn, means that television is the dominant cultural instrument in Turkey.

Relevant discussions must cover the financial, environmental, and political conditions that give way to the prominence of television among leisure activities. The

reason for such necessity is that it leaves deep scars on society's cultural and political life (Erder, 2003). The wider dissemination of such technologies as television and Internet has also altered the habits of learning and accessing information. The rapid, superficial, and visually oriented changes affected by the latest technologies in communication habits create a direct impact on the reading habit, which requires attention and concentration (Işık, 2014, p. 45). Television may be regarded as an obstacle to a reading, writing, thinking, and productive individual as a screen that imposes on them a rapid change instead of permanent values. Television produces a mass culture based on consumption (Karakaş, 2003).

Cultural products created in the capitalist system are created in such a manner as to serve the interests of the sovereign system rather than to generate meaning for humanity (Adorno, 2007; Kara, 2014; Kurt, 2009). The cultural industry and media are among the most powerful tools employed by cultural imperialism in its global siege (Çalışlar, 1992). The close affinity of Turkey to television is, then, a meaningful indicator of the extent to which the country is influenced by such hegemony in terms of its culture.

The decline observed in the number and circulation of newspapers and magazines and the decrease in the number of museums, public libraries, and books per person in the last twelve years in Turkey reveal the sterility prevailing in the cultural domain. The deficiency in Turkey becomes more evident when compared to Europe. As an example, in terms of the number of newspapers per person in countries in comparison with their respective populations, there are four newspapers per 100 persons in Turkey, and this figure is 55 in Japan, 37 in Sweden, 26 in Germany, 13 in France, and 12 in the UK (B2PRESS, 2019). According to the IFLA, there is one library for every 6.300 persons in European Union (EU) countries as of 2016, while this figure rises to 70.000 in Turkey. The number of books borrowed from public libraries was 9 million in Turkey, 315 million in Germany, 66 million in France, and 33 million in Italy in 2016 (IFLA, 2019).

In summary, a general evaluation of the present state of productivity and engagement in the cultural space and its course over the years gives way to the argument that the cultural space in Turkey is far from offering a source of possibilities and tools that would allow for the wider dissemination of the culture of learning.

Conclusion and Suggestions

The cultural domain occupies an important place as a broad source of informal learning in the context of lifelong learning (EUCIS-LLL, ACP, & CAE, 2013, p. 2-3). When considered from this perspective, it is possible to state that Turkey's cultural and artistic possibilities are rather limited and are not distributed evenly among regions and, therefore, do not offer an equal opportunity to every group in the society to access such possibilities. A review of cultural participation in Turkey based on the relevant infrastructure, the cultural supply, the use of such supply, and the preferences and leisure habits of consumers gives way to the observation that cultural development has not been widely disseminated around the country. The data indicate that cultural participation in Turkey is limited to a rather low population rate in many respects. The following recommendations are considered to be essential to enrich the cultural domain as a source of lifelong learning:

- Cultural domain should be prioritized by policy and strategy makers taking into consideration its contributions to the holistic development of individuals.
- Cultural policies that evenly include the pluralistic, participatory, universal and domestic should be developed in the cultural domain.
- Measures should be taken in order to create equal opportunities in access to cultural activities between regions.
- Access to culture should be regulated within the context of cultural rights as state responsibility enabling low socio-economic income groups to participate, as well.

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A CEFR-based Comparison of English and Turkish Language Teaching Course Books in Terms of Speaking and Writing Skills

İngilizce ve Türkçe Öğretimi Ders Kitaplarının Konuşma ve Yazma Becerileri Açısından CEFR'ye Dayalı Karşılaştırması

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ABSTRACT: This study aims to investigate to what extent the competences in the Common European Framework of Reference for Languages (CEFR) are fulfilled in language teaching course books in terms of productive skills (speaking-writing) in foreign/second language teaching. With this purpose in mind, speaking and writing activities in Headway for teaching English as a foreign/second language and in Yeni İstanbul for teaching Turkish as a foreign/second language were examined and compared in terms of the compatibility with the competences specified in the CEFR. At this point, the distinction of 'writing/speaking as a production skill' and 'writing/speaking as an interaction skill' defined in the CEFR was used in the detailed analysis of the activities. As a result of the content analysis, it was found that there were differences and similarities in both course books in terms of the implementation of CEFR and the representation of A2 level descriptors. Although both course books claim to have been developed with reference to the CEFR, findings showed that they do not reach the learning outcomes in terms of speaking and writing skills related to 'interaction' and 'production' specified in the CEFR at the same rate. Basically, the study concluded that 'interaction' skills in Headway and 'production' skills in Yeni Istanbul are prioritized. The results also emphasize that these two course books need to be revised and reorganized to reflect the CEFR at A2 level.

Keywords: Foreign/second language teaching course books, CEFR, speaking skill, writing skill.

ÖZ: Bu çalışma, yabancı/ikinci dil öğretiminde anlatma becerileri (konuşma-yazma) açısından, Avrupa Dilleri Ortak Çerçeve Programında (CEFR) yer alan yeterliliklerin dil öğretimi ders kitaplarında ne ölçüde yerine getirildiğini araştırmayı amaçlamaktadır. Bu amaçla, çalışmada yabancı/ikinci dil olarak İngilizce öğretim kitabı Headway ve yabancı/ikinci dil olarak Türkçe öğretim kitabı Yeni İstanbul; konuşma ve yazma etkinliklerinin CEFR yeterlilikleri ile uygunluğu açısından incelenmiş ve karşılaştırılmıştır. Bu noktada CEFR'de yer alan 'üretim becerisi olarak yazma/konuşma' ve 'etkileşim becerisi olarak yazma/konuşma' ayrımı etkinliklerin detaylı analizinde kullanılmıştır. İçerik analizinin sonucunda CEFR'nin uygulanması ve A2 düzeyi tanımlayıcıların temsili açısından her iki ders kitabında farklılıklar ve benzerlikler olduğu görülmüştür. Bu iki ders kitabının da CEFR referans alınarak geliştirildiği belirtilmesine rağmen, CEFR'de yer alan konuşma ve yazma becerileriyle ilgili öğrenme çıktılarına 'etkileşim' ve 'üretim' becerileri açısından aynı oranda ulaşamadıkları tespit edilmiştir. Temel olarak Headway'de 'etkileşim' becerilerinin; Yeni İstanbul'da ise 'üretim' becerilerin öncelendiği görülmüştür. Bulgular, iki ders kitabının da CEFR'yi A2 düzeyinde yansıtmak için revize edilmesi ve yeniden düzenlenmesi gerektiğini vurgulamaktadır.

Anahtar kelimeler: Yabancı/ikinci dil öğretimi ders kitapları, CEFR, konuşma becerisi, yazma becerisi.

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In a new, changing, globalized world, communicative language abilities have gained more importance. Being a linguistically competent, open-minded and responsible world citizen will add more values to the individual in culturally diverse societies. Since language is surely the most useful means of communication, language learning has become even more and more important in today's interconnected world. A learner is considered successful as long as they can master four basic language skills; namely reading, listening, speaking, writing. These skills are mainly divided into two main groups in the literature. The first one is reading and listening, which are described as receptive skills, and the second one is writing and speaking, which are described as productive skills.

In his second language acquisition theory, Krashen (2009) also expresses speaking and writing skills as the outputs of language and argues that the development of these two skills takes a long time. With these two skills in the target language, the learner engages in production activities and interaction. The area specified as production and interaction activities in CEFR (2020) includes speaking and writing skills. With their oral and written production skills, the language learner can make short statements, create anecdotes, prepare formal or informal presentations, engage in academic production activities, and express oneself professionally. The learner is expected to be fluent and clear while doing all these. All these production skills are not acquired easily in the natural operating process of language. In order for a language learner to be able to do these production and interaction activities in the target language, a period of time and mastery in that language are required.

Regarding teaching and learning a foreign/second language, it would be suitable to examine the CEFR in detail as a reference because the CEFR (2020, p. 11), which "is one of the best-known and most used Council of Europe policy instruments", draws a specific framework and offers suggestions for language learners, language teachers and those who prepare foreign/second language teaching course books. More specifically, CEFR (2020, p. 28) aims to:

- "promote and facilitate co-operation among educational institutions in different countries;
- provide a sound basis for the mutual recognition of language qualifications;
- assist learners, teachers, course designers, examining bodies and educational administrators to situate and co-ordinate their efforts".

Thus, the CEFR is the basis of the foreign/second language teaching process while developing education programs that include these four main skills in the language teaching process; developing the instructions of these programs, preparing textbooks and exams. The CEFR comprehensively determines what learners have to learn and do to meet their communicative needs in the target language. The CEFR also clarifies which knowledge and skills the learner needs to develop in order to be successful in the communicative and declarative dimensions of the language and the skills that are expected to be acquired at the end of the learning process. The CEFR aims to realize all these by also including the cultural dimension of the language in the process. Additionally, the CEFR also defines the language proficiency levels required to measure the learner's achievements at every stage of the learning process.

Communicative language activities and strategies in CEFR, which was updated in 2020, are detailed as 'Reception', 'Production', 'Interaction' and 'Mediation'. With respect to speaking and writing skills, CEFR has two basic categories; these are 'production' and 'interaction' skills in CEFR. They are also divided into "oral production/written production" and "oral interaction/written interaction" separately. Production activities are defined under two categories, namely oral production and written production. Oral production includes six subcategories as learning outcomes; these are 'overall oral production', 'sustained monologue: describing experience', 'sustained monologue: giving information', 'sustained monologue: putting a case', 'public announcements', 'addressing audiences'. On the other hand, written production involves three subcategories as learning outcomes; these are 'overall written production', 'creative writing', 'reports and essays' (CEFR, 2020, p. 61). (see 2020 CEFR Companion Volume for details on the competences under the categories)

As for interaction activities, they are defined under three categories, namely oral interaction, written interaction, and online interaction. Under the category of oral interaction, there are ten subcategories; namely, 'overall interaction', 'understanding an interlocutor', 'conversation', 'informal discussion (with friends)', 'formal discussion (meetings)', 'goal-oriented co-operation', 'obtaining goods and services', 'information exchange', 'interviewing and being interviewed', 'using telecommunications'. There are 'overall written interaction', 'correspondence', and 'notes, messages and forms' under the category of written interaction. The third category, which is online interaction, has 'online conversation and discussion', 'goal-oriented online transactions and collaboration' as subcategories. (CEFR, 2020, p. 71). (see 2020 CEFR Companion Volume for details on the competences under the categories)

There are various reasons why an individual needs to learn a foreign/second language. In the study conducted by Tok and Yıgın (2013) in the field of teaching Turkish as a foreign language, the reasons for international students to learn Turkish were investigated. A total of 57 foreign students learning Turkish from 34 different countries participated in the study and the reasons of learners to learn Turkish were academic reasons (26), economic reasons (22), touristic reasons (16), kinship ties-Turkic Republics (8), historical ties (6), political reasons (5), marriage (2), religious ties (2) (Tok & Yıgın, 2013, p. 139). As can be seen, the main reasons for students to learn Turkish as a foreign language were academic reasons. In this regard, it is of importance to mention the data released by UNESCO in 2018. This data showed that Turkey is the 10th country in the world, which has the largest number of international students with 125.138 international students in higher education. This number was 48.183, according to the data in 2014. Thus, it is expected that the increase in the number of international students in only four years may affect the policies in teaching Turkish as a foreign language. Karakaya-Özyer and Yıldız (2020) conducted a study with 281 participants who learned/were learning Turkish as a foreign language in order to continue their higher education. As a result of the study, it was found that the reasons for international students' preferences in Turkey differed according to the regions the students come from. This suggests that university administrations should take internationalization into account, and the education system should be enriched with necessary strategies and changes accordingly.

By taking internalization into consideration, one of the critical things that can be done is revising and reorganizing the language course books and materials. While doing so, the most important basis should be the CEFR. If the books and materials are compatible with the CEFR criteria, it is believed to make the teaching-learning process more efficient for both teachers and learners.

In Turkey, some regulations and reforms in teaching English as a foreign language have been made for a long time (Dincer & Koç, 2020). However, systematic and planned academic studies in the field of teaching Turkish as a foreign language have gained momentum since the 1990s. As stated by Tüm (2017, p. 494), the studies conducted during these years were mostly based on general problems and the studies were insufficient because the course materials were limited in number and form. Although the lack of an undergraduate education program in the field is still considered to be a deficiency, important studies have been put forward at the postgraduate level. For example, it can be mentioned that there is a significant improvement in terms of Teaching Sets of Turkish as a Foreign Language compared to the 1990s. There are currently Turkish teaching sets for use in the field under the leadership of institutions such as Ankara University, Gazi University, Dokuz Eylül University, Hacettepe University, and Yunus Emre Institute. These teaching sets seem to contribute to the field of teaching Turkish as a foreign language both qualitatively and quantitatively.

It can also be said that textbooks and extracurricular materials used in foreign/second language teaching are accepted as usable and effective to the extent that they comply with the CEFR. In his study, Tomlinson (2012) states that textbooks in foreign/second language teaching are often preferred because of their ease of transportation, saving time, being affordable, and gathering many needs of the teacher in a single source. This situation is based on a survey conducted by British Council in 2008. According to the survey that investigates textbooks use of instructors, 65% of the foreign/second language teachers answered the question about the use of textbooks ‘always’ and ‘often’. Only 6% of the participants said ‘never’ (Tomlinson, 2012, p. 158). Thus, textbooks turned out to be one of the most basic resources that language teachers and students need. In this respect, teaching English, which is spoken in 101 countries (Uzun, 2012) and accepted as ‘lingua franca’, and which is the official language of more than 50 countries, is a significant resource for teaching Turkish and other languages as a foreign/second language in terms of its methods, techniques, strategies, materials and also language teacher education.

In the literature, there are some studies conducted to investigate the course books with reference to the CEFR. One of these studies was carried out by Tüm and Parmaksız-Emre (2017). In their study, they evaluated Yeni Hitit 1 Turkish teaching course book prepared by Ankara TÖMER and Success English language teaching course book. Specifically, speaking parts of both course books were examined according to the CEFR self-assessment criteria. The study found that while both books prioritized interactional skills, they did not give sufficient emphasis on productive skills. Given this outcome, Tüm and Parmaksız-Emre (2017) stated that teachers are required to take more responsibility in the teaching process. For example, teachers can select and create additional resources for their students. Tüm and Parmaksız-Emre also (2017) argued that these books include formal use of the language rather than different language use for different contexts in terms of linguistic patterns. They further

emphasized that this does not help learners use real communicative language structures. In this respect, this study recommends more CEFR-based revisions and strengthening of course books. Another comparative study by Tuzcu-Eken and Dilidüzgün (2014) investigated Yeni Hitit 1 and New Headway in terms of listening comprehension exercises by taking the CEFR as a basis. The analysis showed that both course books need to be revised and developed in order to teach listening skills more effectively. Ünlü (2015) also carried out a comparative study and examined Hitit (older version of Yeni Hitit) and Yeni Hitit1 Turkish teaching course book in terms of their grammar and grammar exercises. The study concluded that there are some elements which need reviewing in terms of grammar. Fişne, Güngör, Guerra, and Gonçalves (2018, p. 129) in their comprehensive study examined "the 3rd and 4th grade course books and the Turkish and Portuguese English language curricula through content analysis and cross-cultural comparison". The course books were analyzed in terms of language skills with reference to the CEFR, A1 level descriptors and intercultural characteristics of the books. Results indicated that there are similarities and differences in Turkey and Portugal in terms of compatibility with the CEFR.

As it is seen, there are several studies which investigates course books in terms of various aspects based on the CEFR. However, there is still a need to carry out more related studies, which might significantly contribute to the research area. The findings of new studies might also help educators and material and course book designers. Moreover, further studies could help to find out whether other different course books reflect the criteria suggested in the CEFR.

Taking all these into consideration, the current study aims at evaluating two different course books. Headway used for teaching English as a foreign/second language and Yeni İstanbul used for teaching Turkish as a foreign/second language were examined in terms of production and interaction skills as suggested in the descriptor scale of CEFR. Speaking and writing language skills are represented under the category production and interaction in the CEFR. However, it is important to note that this study only focused on speaking and writing activities of the course books, the category of 'online interaction' was not included in the study. Therefore, in the current study, all speaking and writing activities were evaluated based on the criteria defined in the related categories of CEFR Illustrative Descriptor Scales. Another important issue is that the study is based on the final edition of the "CEFR Companion Volume", which was updated in 2020.

Aim of the Study

The main objective of the study is to compare Headway and Yeni İstanbul in terms of writing and speaking activities based on The Common European Framework of Reference for Languages (CEFR). With this purpose in mind, the following research questions were addressed in the study:

1. What is the percentage of writing and speaking activities in Headway (A2 level) and Yeni İstanbul (A2 level)?
2. Are the writing and speaking activities in Headway (A2 level) designed according to the criteria determined in CEFR?
3. Are the writing and speaking activities in Yeni İstanbul (A2 level) designed according to the criteria determined in CEFR?

4. To what extent are writing and speaking activities included in Headway (A2 level) and Yeni İstanbul (A2 level) suited to CEFR when they are compared?

Method

Design of the Study

The current study was designed as qualitative research. Qualitative research is a type of investigation in which such data collection tools as document analysis, interviews, observations are employed, individuals' experiences, interpretations and perceptions are explored in detail, and findings are presented in a holistic approach (Creswell, 2018; Merriam, 2013; Yıldırım & Şimşek, 2013). Qualitative research aims to examine, understand, interpret, explain a social phenomenon in its own context.

Data Collection Instrument

In order to seek answers to the research questions, document analysis was used as a data collection tool. Document analysis is "a method of collecting data from existing records and documents" (Karasar, 2020, p. 229). According to Ekiz (2009), document analysis is to collect official and private records, analyze and evaluate these records systematically. Through this method, related documents are analyzed progressively and elaborately (Yıldırım & Şimşek, 2013).

In accordance with the objectives of the study, two different course books were investigated. One of them is Headway (A2 level), the other is Yeni İstanbul (A2 level). More specifically, the writing and speaking activities of these two books were examined in detail, and it was aimed to identify whether these activities are compatible with the CEFR descriptor for A2 level. The reason why these books were chosen for the purpose of the study is that they are widely used for teaching the target languages, English and Turkish, in Turkey.

Headway course books have been published by Oxford University Press in order to be used for teaching English across the world. Headway series are currently composed of six different language proficiency levels from Beginner to Advanced level. This book has also been widely preferred as the main course book in English Preparatory Schools of the universities in Turkey. Headway examined in the current study is the fifth edition, which is the last edition of this series.

The number of the units may change from one language level course book to another. Headway (A2 level) includes 12 units, and every unit consists of grammar, vocabulary, reading, listening, writing sections besides everyday English section for speaking. More specifically, Headway fifth edition provides comprehensive and functional vocabulary and grammar presentation and practice. Moreover, each unit aims at improving integrated skills; namely reading, writing, listening, speaking, which is of great importance in learning a new language. Thus, it is understood that the book has been prepared based on skills syllabus. Headway also claims to aid millions of students to realize their potential throughout the journey of learning a language. Another significant issue is that Headway puts forward that it has been produced considering the objectives of CEFR.

Yeni İstanbul, which is a series of course books, has been planned in a communicative and student-oriented way and designed based on the language

proficiency levels determined by CEFR. It includes six levels in congruent with the learning outcomes of CEFR. Yeni İstanbul has been produced by İstanbul University – DİLMER, and it aims to teach Turkish, which is the official language of Turkey, in modern and up-to-date methods.

Yeni İstanbul has been prepared for each language level as claimed in the foreword of the book, and each book is composed of six units arranged according to the subject matters following the objectives of CEFR. Each unit is separated into three parts. At the beginning of every unit, skills to be taught, grammar and vocabulary groups are provided. Moreover, the format of each unit is systematically designed the same. The units start with warm-up activities and continue with the sections of "reading, what about you?, grammar, listening, speaking, writing". At the end of the units, the sections "from culture to culture, classroom language, let's enjoy and learn, what have we learned?, self-evaluation and vocabulary list" are available.

It is of great significance to specify that almost all of the course books including Headway and Yeni İstanbul claim to have been developed based on The Common European Framework of Reference for Languages (CEFR). "The Common European Framework provides a common basis for the elaboration of language syllabuses, curriculum guidelines, examinations, textbooks, etc. across Europe" (Council of Europe, 2001: 1).

Data Analysis

Writing and speaking activities developed for A2 language proficiency level in Headway and Yeni İstanbul were investigated based on production and interaction stated in the CEFR descriptor for A2 level. For coding and categorizing the qualitative data, content analysis was conducted. This is implemented based on "the process of summarizing and reporting written data – the main contents of data and their messages" (Cohen, Manion, & Morrison, 2007, p. 475).

As for the in-depth data analysis procedure, firstly, how many units each course book includes and how many writing and speaking activities each unit has were determined. In this way, the percentage of the activities for each unit in both course books was identified. Following this, writing and speaking activities were evaluated according to the production and interaction outcomes for A2 language proficiency level suggested in CEFR. At this point, it is noteworthy to say that writing and speaking tasks correspond to production and interaction activities in CEFR. That is why, by comparing and contrasting, the activities for both skills were categorized as production and interaction activities as suggested in the CEFR descriptor. More specifically, after categorizing the tasks as production or interaction, each activity was also positioned under the related sub-heading in CEFR. Eventually, completing the analysis of the speaking and writing activities of each course book in terms of oral/written production and oral/written interaction in CEFR, the collected data were presented as frequencies and percentages in order to indicate to what extent the course books reflect the learning outcomes in the CEFR descriptor for A2 level.

It is of importance to state that the collected data were analyzed by four different raters. The two researchers of this study and two other independent raters, who had experience in document analysis and who were course book users as language teachers, analyzed the data in order to abstain from researchers' subjectivity and to ensure

interrater- reliability. Inter-rater reliability was identified by using "[agreement / (agreement + disagreement)] X 100" formula (Miles & Huberman, 1994) and found .84, which shows a high level of reliability.

Limitations

The study has the following limitations:

1. Only Headway and Yeni İstanbul course books for teaching languages are employed in the current study.
2. Among all six different language proficiency levels defined as Common Reference Levels in CEFR, only A2 level course books are included in the study.
3. Only speaking and writing activities were examined in the study.

Results

In this section, based on the analysis of two different course books, the findings were presented.

Table 1

The Number of Speaking and Writing Activities in Yeni İstanbul

Unit	Writing	Speaking Activity	The number of activities in each unit
Unit 1	5	7	12
Unit 2	3	14	17
Unit 3	3	8	11
Unit 4	3	9	12
Unit 5	3	10	13
Unit 6	3	8	11
Total	20	56	76
Average	3 (3.33)	9 (9.33)	13 (12.66)

In the beginning, while determining the number of activities, end-of-unit evaluation sections of Yeni İstanbul course books were not included in the study. Table 1 indicates that the activities did not show a homogeneous distribution in terms of productive language skills in A2 level Istanbul course book. The average speaking activity per unit is around three times higher than the average writing activity. Given the total number of activities based on writing and speaking skills used in the book, it was seen that the number of speaking activities is around three times higher than the writing activities. This outcome suggests that speaking skill takes precedence over writing, which is another productive language skill.

Table 2

Evaluation of the Activities in terms of Oral Production/Interaction and Written Production/Interaction in CEFR for Yeni İstanbul

Skills	Total Use
Oral Production Skills	42
Written Production Skills	16
Oral Interaction Skills	19
Written Interaction Skills	5
Total	82

On the basis of the examination, the total number of production-oriented (oral and written production) activities was determined as 58, and the number of interaction-oriented (oral and written interaction) activities was determined as 24. Especially written interaction skills were activated five times only in the first and third units. In parallel with the results in Table 1, an inhomogeneous distribution in terms of activating production and interaction skills in activities was observed in Table 2. Results also indicate that oral/written production and oral/written interaction skills were activated 82 times in the 76 writing/speaking activities in the book. This finding indicates that more than one skill was activated in some of the activities.

Table 3

The Frequency of Oral and Written Production Skills According to CEFR for Yeni İstanbul

1-) Oral Production	Frequency of use	Units	2-) Written Production	Frequency of use	Units
1-a) Overall Oral Production	14	1-2-3-5-6	2-a) Overall Written Production	5	1-3-5
1-b) Sustained monologue:Describing experience	32	1-2-3-4-5-6	2-b) Creative writing	6	2-3-4-5
1-c) Sustained monologue:Giving information	1	1	2-c) Reports and Essays	11	1-2-3-4-5-6
1-d) Sustained monologue:Putting a case	3	2			
1-e) Public Announcements	-	-			
1-f) Addressing audiences	3	3-5			
Total	53			22	

Since the study focused on 'speaking' and 'writing', which are productive language skills, 'Production' and 'Interaction' sections were examined in CEFR. In Table 3, production skills were examined in terms of writing and speaking activities in Yeni Istanbul course book. Table 3 demonstrates that oral production skills come to the fore significantly in parallel with overall activities identified in Table 1. 53 oral production skills were aimed to activate in 56 speaking activities in the book. However, these 53 oral production skills did not show a homogeneous distribution within themselves. Among six oral production skills specified in the CEFR, only 'Overall Oral Production Skills' and 'Sustainable Monologue: Explanation' were targeted to improve 46 times in total. The 'Public Announcements' skill was never included in the book as a skill. This result means that the activities used in the book do not contribute to the development of all skills included in the CEFR.

Written production skills showed a more homogeneous distribution than oral production skills. In 20 writing skill activities in the book, three skills determined in the CEFR were aimed to improve 22 times in total. All three skills were determined to be close to or above average usage.

Table 4

The Frequency of Oral and Written Interaction Skills according to CEFR for Yeni İstanbul

3-) Oral Interaction	Frequency of use	Units	4-)Written Interaction	Frequency of use	Units
3-a) Overall Oral Production	13	1-2-3-4-5-6	4-a) Overall written interaction	1	3
3-b) Understanding an interlocutor	12	2-3-4-5-6	4-b) Correspondence	-	-
3-c) Conversation	12	2-3-4-5-6	4-c) Notes, Messages and Forms	4	1-3
3-d) Informal Discussion (Friends)	2	2-3			
3-e) Formal Discussion (Meetings)	-	-			
3-f) Goal-Oriented Cooperation	5	1-3-6			
3-g) Obtaining goods and services	3	1-6			
3-h) Information Exchange	11	1-2-3-4-5-6			
3-i) Interviewing and being interviewed	-	-			
3-j) Using telecommunications	-	-			
Total	58			5	

In Table 4, the speaking and writing activities in Yeni Istanbul course book were also evaluated in terms of interaction. CEFR includes ten subcategories for 'Oral Interaction' and three sub-categories for 'Written Interaction'. It is seen that 'Oral Interaction' skills were aimed to foster 58 times through 56 speaking activities in the book. However, it is observed that the distribution is not homogeneous again. Three oral interaction skills (3-e, 3-i, 3j) did not find a place among the speaking activities in the book, and three oral interaction skills (3-d, 3-f, 3-g) were used very limitedly. Therefore, it can be said that all of the 'Oral Interaction Skills' in the CEFR could not be completely achieved through the speaking activities in the book.

In parallel with the distribution of activities throughout the book, 'Written Interaction' skills are found to be inadequate in quantity, especially compared to 'Oral Interaction' skills. While seven skills were intended to develop 58 times regarding oral interaction, two skills were focused five times in total in terms of written interaction.

While speaking skill in the book shows consistency within itself in both oral production and oral interaction dimensions (oral production 53, oral interaction 58), this cannot be said for writing skill. In terms of enhancing writing skills, "Written Production Skills" in the CEFR are included 22 times in the book while "Written Interaction Skills" are included only five times.

Table 5

The Number of Speaking and Writing Activities in Headway

Unit	Writing activity	Speaking activity	The number of activities in each unit
Unit 1	2	6	8
Unit 2	1	8	9
Unit 3	1	9	10
Unit 4	4	6	10
Unit 5	1	6	7
Unit 6	1	9	10
Unit 7	3	7	10
Unit 8	1	7	8
Unit 9	1	8	9
Unit 10	1	7	8
Unit 11	2	8	10
Unit 12	1	6	7
Total	19	87	106
Average	1.58	7.25	8.83

When all the units in Headway A2 level were analyzed, it was seen in Table 5 that the total number of activities in each unit is close to the other units. However, as Table 5 shows, there is no homogeneous distribution between writing and speaking activities. The number of speaking activities is around four times greater than writing activities. It is obviously understood that Headway prioritized speaking activities over

writing activities. Thus, the book primarily appears to aim at improving speaking skills and accordingly included more activities for this purpose and preferred to keep the number of writing activities at a minimum.

Table 6

Evaluation of the Activities in terms of Oral Production/Interaction and Written Production/ Interaction in CEFR for Headway

Skills	Total use
Oral Production Skills	26
Written Production Skills	15
Oral Interaction Skills	66
Written Interaction Skills	4
Total	111

In Table 6, the productive skills-based activities in Headway were evaluated in terms of the production and interaction outcomes that are defined under the title of Communicative language activities and strategies in The CEFR Illustrative Descriptor Scales. On the basis of the analysis, whereas the total number of production-oriented (oral and written production) activities was 41, the number of interaction-oriented activities (oral and written interaction) was 70. This suggests that Headway focuses more on providing and enhancing interaction among students during classroom activities than only making them productive without interaction. When comparing the total number of the activities in Table 5 to the number of the activities prompting oral and written production and oral interaction and written interaction, it was found that the numbers are not the same. The book aims to foster 111 skills through a total of 106 writing and speaking activities. This is because some activities aim to stimulate more than one skill. Hence, it is significant to note that one activity might serve different production and oral skills simultaneously. Moreover, as shown in Table 6, there is no homogeneous distribution among oral production/written production and oral interaction/written interaction skills.

Since the study focused on speaking and writing skills, which are productive language skills, Headway course book also was examined in terms of ‘Production’ and ‘Interaction’ sections in CEFR as in Yeni İstanbul. Table 7 demonstrates the frequency of oral and written production skills that Headway aims to develop through speaking and writing activities. The results revealed that the frequency of oral production skills addressed in all the activities of Headway was three times higher than the frequency of written production skills.

Table 7

The Frequency of Oral and Written Production Skills According to CEFR for Headway

1-) Oral Production	Frequency of use	Units	2-) Written Production	Frequency of use	Units
1-a) Overall Oral Production	19	1-2-4-6-9-10-11-12	2-a) Overall Written Production	4	1-2-4-12
1-b) Sustained monologue: Describing experience	22	1-2-3-4-6-7-9-10-11-12	2-b) Creative writing	8	1-4-6-7-11
1-c) Sustained monologue: Giving information	1	9	2-c) Reports and Essays	3	7-9-10
1-d) Sustained monologue: Putting a case	2	5-11			
1-e) Public Announcements	-	-			
1-f) Addressing audiences	1	11			
Total	45			15	

When the Table 7 was examined in detail in parallel with Table 5, a total of 87 speaking activities were prepared to develop 45 oral production skills. However, there is no homogeneous distribution among all different six subcategories of oral production skills defined in CEFR. The competence of 'Sustained monologue: Describing Experience' ranked the first in terms of the frequency (*n*=22), followed by 'Overall Oral Production' (*n*=19). The competence of 'Public Announcements' is never intended to promote in the course book. On the other hand, considering the findings in Table 5 again, 19 writing activities were added to the course book in order to improve 15 written production skills. In terms of the frequencies of three subcategories of written production, it is observed that 'Creative Writing' was aimed to build the most (*n*=8), succeeded by 'Overall Written Production' (*n*=4) and 'Reports and Essays' (*n*=3).

Table 8 indicates the frequency of oral and written interaction skills that Headway aims to develop through speaking and writing activities. When the Table 8 was gone through in detail together with Table 5, 87 speaking activities were intended to develop a total of 161 oral interaction skills. Among all ten different oral interaction learning outcomes defined in CEFR, 'Informal Discussion with Friends' was aimed to teach the most (*n*=32), followed by 'Overall Oral Production' (*n*=30) and 'Conversation' (*n*=30). Another striking finding is that Headway does not aim to promote 'Formal Discussion Meetings' and 'Using Communications' (3-e, 3j).

Table 8

The Frequency of Oral and Written Interaction Skills according to CEFR for Headway

3-) Oral Interaction	Frequency of use	Units	4-)Written Interaction	Frequency of use	Units
3-a) Overall Oral Production	30	1-2-3-4-5-6-7-8-11-12	4-a) Overall written interaction	-	-
3-b) Understanding an interlocutor	25	1-2-3-4-7-8-11-12	4-b) Correspondence	3	5-8
3-c) Conversation	30	1-2-3-4-5-6-10-11-12	4-c) Notes, Messages and Forms	1	3
3-d) Informal Discussion (Friends)	32	2-3-4-5-6-7-8-9-10-11-12			
3-e) Formal Discussion (Meetings)	-	-			
3-f) Goal-Oriented Cooperation	14	3-4-5-7-8-9-10-11			
3-g) Obtaining goods and services	5	4-6-8-9			
3-h) Information Exchange	24	1-2-3-4-5-6-7-8-9-11-12			
3-i) Interviewing and being interviewed	1	11			
3-j) Using telecommunications	-	-			
Total	161			4	

On the other hand, in parallel with the findings in Table 5 again, 19 writing activities only served to improve written production skills four times. In terms of the frequencies of three subcategories of written production, it is obvious that the frequency of 'Correspondence' in the course book was the highest (n=3) whereas 'Overall Written Interaction' was never included as a skill (4-a). Therefore, it can be suggested that all of the 'Oral Interaction' and 'Written Interaction' outcomes defined in the CEFR could not be achieved through the speaking and writing activities in Headway.

Based on all these analyses, it can be put forward that Headway put much emphasis on oral production and interaction skills compared to written production and written interaction skills. There already exists a significant difference in quantity between speaking and writing activities. Moreover, in accordance with a high number of speaking activities, speaking skills represented under oral production and oral interaction in CEFR are aimed to improve the most. However, when considering the frequencies of oral production and interaction separately, it was found that oral interaction skills were given significant priority over oral production. Thus, it can be argued that Headway serves to promote interaction by primarily activating oral interaction skills instead of written interaction.

Discussion

The current study aimed at investigating to what extent the competences defined in CEFR are reflected in language teaching course books in terms of speaking and writing skills. To this end, Headway and Yeni İstanbul were evaluated in detail based on CEFR. After presenting the findings for each book were provided separately in the previous section; here, in this section, two course books were evaluated together, and findings obtained were discussed thoroughly.

Table 9

Overall Comparison of Headway and Yeni Istanbul in terms of Reflection of the CEFR

	Yeni İstanbul	Headway
Activity per unit	12.66	8.83
Writing activity per unit	3.33	1.58
Speaking activity per unit	9.33	7.25
Frequency of Oral Production Skill	42	26
Frequency of Writing Production Skill	16	14
Frequency of Oral Interaction Skill	19	66
Frequency of Writing Interaction Skill	5	5
Production Skill Per Total Activity	.71	.37
Interaction Skill Per Total Activity	.31	.66
Production Skill Per Total Writing Activity	.8	.73
Interaction Skill Per Total Writing Activity	.25	.26
Production Skill Per Total Speaking Activity	.75	.29
Interaction Skill Per Total Speaking Event	.33	.75

For the analysis, frequencies and percentages were taken into account in the interpretation of the data because the total number of units was different. Whereas Headway has 12 units, Yeni İstanbul has 6 units. When the Table 9 is examined, Yeni Istanbul course book contains a bigger number of activities than Headway both in terms of total number and in terms of writing and speaking activities per unit separately. When these activities are considered quantitatively, it can be interpreted as a significant difference. However, when the activities were evaluated in terms of skills, the activities in Headway aim to improve more skills than Yeni İstanbul, which can be clearly understood when the number and the frequencies of activities are compared.

When the activities in the books were evaluated in terms of interaction and production skills, the main skill area planned to be activated and developed through the activities in Headway is interactive speaking and writing with 63.96%. In Yeni Istanbul, this percentage is 29.26%. This situation provides similar results in terms of skill per total activity. That is to say, whereas interaction skill-based activity per total speaking and writing activity in Yeni Istanbul is .31, this percentage is .66 in Headway, which is more than twice the number in Yeni Istanbul. This result highlights that Headway pays more attention to interaction during a language learning process.

Similar results were found when the activities prepared for improving speaking skills were evaluated within themselves under two categories: interaction and production. The interactional skill per activity was .75 in Headway, while this rate was found to be .33 in Yeni Istanbul. Again, in this regard, it can be suggested that compared to Yeni İstanbul, Headway gives much more importance to enhancing interactional speaking skills rather than productive speaking skills. On the other hand, Yeni İstanbul turned out to disregard interaction by mainly focusing on production. Even though interaction is given more priority in Headway, "formal discussion with friends" and "using communications" in the CEFR A2 level descriptor are never included as learning outcomes. As for Yeni İstanbul, the frequency of interactional speaking skills is quite low, and also, the learning outcomes of "formal discussion with friends", "using communications" and "interviewing and being interviewed" are not realized.

In the light of the findings, it can also be put forward that the activities prepared for the development of writing skills are insufficient in quantity for both course books. In these two different materials, the number of activities prepared for writing skills is quite limited. Whereas the overall percentage of writing activities in Yeni İstanbul is 15.2%, it is 17.92% in Headway. This outcome demonstrates that in both course books, the writing skill is primarily overshadowed by the speaking skill and is highly underestimated both in terms of interaction and production. This finding signifies that both do not appear to fully represent the CEFR descriptor A2 level in terms of writing skills.

To sum up, the current study arrived at the conclusion that the course books do not reach the learning outcomes at the same rate in terms of speaking and writing skills regarding 'interaction' and 'production' specified in the CEFR. Basically, the study concluded that 'interaction' skills in Headway and 'production' skills in Yeni Istanbul are prioritized.

With reference to the CEFR, writing skill is underrated in two course books both in terms of production and interaction. Instead, speaking skill is given more priority. However, in terms of two subcategories of speaking skills in CEFR, which are production and interaction, it was concluded that Headway mainly aims at improving interactional speaking skills. In contrast, Yeni İstanbul focuses on improving productive speaking skills, which is one of the main differences between the course books.

Conclusion

The study concluded that these course books are not proficient in achieving all the learning outcomes specified under oral/written production and oral/written interaction in CEFR. Even though they claim that they have been prepared with reference to the CEFR, it was found that they do not fully reflect all the learning outcomes suggested in the CEFR. Thus, the implementation of the CEFR and the representation of A2 level descriptor has not been completely realized in the course books.

Based on the findings, there seems a need for the course book writers to develop and redesign their books. In other words, these two course books need to be revised and reorganized to reflect the CEFR because there is still much room for improvement to be able to compatible with the CEFR A2 level descriptor. Especially, it would be better to

design and add more writing activities to Headway and Yeni İstanbul in order to stimulate students' productive and interactive writing skills, which appear as insufficient in both of them. Another important thing is that Yeni İstanbul should put more emphasis on improving interactional skills in speaking activities, which turned out to be limited in the analysis. Additionally, both course books should also find a balance between oral/written production and oral/written interaction in terms of speaking and writing.

Considering some limitations of the course books, as Enever, Moon, and Raman (2009) suggest, teachers should be observed if they know about materials development and adaptation and curriculum evaluation. If teachers are educated in such areas at pre-service teaching education and gain awareness of what the CEFR is and how it is important, they can overcome the drawbacks of the course books. They can adapt the course books, enrich the activities, create suitable content, new extra activities and materials in order to implement the CEFR. Thus, "pre-service teacher education programs also need to be redesigned by including the courses that enhance pre-service teachers implement the CEFR" (Fişne et al., 2018, p. 145). Similarly, Balcı (2017) and Bekteshi (2017) puts forward that in-service trainings can be provided to teachers about this issue. As Kennedy and Tomlinson (2013) highlight, evaluation of teaching materials and curriculum is fundamental, so teachers also need to develop their pedagogical skills in this area.

Given the findings and limitations of the study mentioned above, the current study puts forward some suggestions for further research. First of all, Headway and Yeni İstanbul could also be evaluated based on the CEFR in terms of reading and listening skills, which are described as receptive language skills. Additionally, another study could examine different language levels of these course books so that comparisons across different levels can be made. Further studies could also be carried out with other English and Turkish course book sets designed for teaching languages in order to find out whether they are compatible with the learning outcomes of CEFR.

Statement of Responsibility

İbrahim Fatih Demirel; resources, data collection, validation, analysis, writing-original draft, writing-review&editing, visualization. Özlem Fakazlı; methodology, resources, data collection, validation, analysis, writing-original draft, writing-review&editing, visualization, supervision.

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Emotional Socialization Behaviors of Mothers Having Preschooler*

Okul Öncesi Dönem Çocuğa Sahip Annelerin Duygu Sosyalleştirme Davranışları

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ABSTRACT: The aim of the study is to investigate emotional socialization behaviors of mothers having preschooler in relation to the child's gender, education and socioeconomic level of the mother. In the research, a correlational survey model was used. The participants of the study consisted of 303 mothers having children aged 4-6 with low, middle and high socioeconomic living conditions. The data of the study were collected with the Coping with Negative Emotions of Children Scale and Personal Information Form. T-test and variance analysis were used to analyze the data. Research results revealed that emotional socialization behaviors of mothers did not differ significantly according to the child's gender. As a result of the analysis, it was found that emotional socialization behaviors differ significantly in terms of the socioeconomic level of the mothers. According to this, low socioeconomic level mothers showed more punitive reactions and minimization reactions than middle and high socioeconomic level mothers. Results also showed that punitive reactions and problem-focused responses differed according to the educational level of the participating mothers. In this direction, as the education level of the mothers increases, it is seen that there is a decrease in punitive reactions while there is an increase in problem-focused responses.

Keywords: Early childhood, emotional socialization, gender, socioeconomic level, maternal education level.

ÖZ: Araştırmanın amacı, okul öncesi dönem çocuğa sahip annelerin duygu sosyalleştirme davranışlarının çocuğun cinsiyeti, annenin eğitim ve sosyoekonomik düzeyi ile ilişkilendirilerek incelenmesidir. Araştırmada nicel araştırma yöntemlerinden ilişkisel tarama modeli kullanılmıştır. Araştırmanın katılımcılarını 4-6 yaş grubu çocuğu olan düşük, orta ve yüksek sosyoekonomik yaşam şartlarına sahip 303 anne oluşturmaktadır. Araştırma verileri Çocukların Olumsuz Duyguları ile Baş Etme Ölçeği ve Kişisel Bilgi Formu aracılığı ile toplanmıştır. Araştırma verilerinin çözümlenmesinde t-testi ve varyans analizi kullanılmıştır. Araştırma sonuçları incelendiğinde; annelerin duygu sosyalleştirme davranışlarının çocuğun cinsiyetine göre anlamlı düzeyde farklılaşmadığı belirlenmiştir. Annelerin içinde bulunduğu sosyoekonomik düzeye göre duygu sosyalleştirme davranışlarının farklılaştığı tespit edilmiştir. Buna göre, düşük sosyoekonomik düzeydeki annelerin orta ve üst sosyoekonomik düzeydeki annelere göre cezalandırıcı ve küçümseyici duygu sosyalleştirme davranışlarını daha fazla gösterdikleri saptanmıştır. Bununla birlikte katılımcı annelerin eğitim düzeyine göre cezalandırıcı ve problem odaklı duygu sosyalleştirme davranışlarının farklılaştığı belirlenmiştir. Bu doğrultuda, annelerin eğitim düzeyi arttıkça cezalandırıcı duygu sosyalleştirme davranışında azalma görülürken, problem odaklı duygu sosyalleştirme davranışlarında artış olduğu görülmektedir.

Anahtar kelimeler: Okul öncesi, duygu sosyalleştirme, cinsiyet, sosyoekonomik düzey, anne eğitim düzeyi.

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The most common way of direct and indirect emotional socialization in children occurs in observing their parents' reactions to the emotions they express (Root & Rubin, 2010). In daily life, children frequently express their positive and negative emotions through facial expressions, behaviors, or oral expressions (Eisenberg, Cumberland, & Spinrad, 1998). Parents' reactions to children's negative emotions whether it is anger, sadness, or fear are defined as emotional socialization behaviors (Altan-Aytun, Yağmurlu, & Yavuz, 2013). Parents' emotional socialization behavior is regarded as the perfect example to directly socialize reactions related to children's emotions (Eisenberg, Cumberland, & Spinrad, 1998).

Parents can have supportive or non-supportive reactions to children's negative emotions. For example, parents might avoid communicating with the child, exhibit negative and selfish behaviors, or they may punish or ignore a child's emotional experience. However, parents can comfort the child and show reactions that teach the child how to manage emotions or stressful events (Eisenberg, Cumberland, & Spinrad, 1998). These emotions are evaluated in the context of six different types of reactions: positive (Emotion-Focused Reactions, Expressive Encouragement, Problem-Focused Reactions) and negative (Distress Reactions, Minimization Reactions, Punitive Reactions).

Problem-focused reactions among positive emotional socialization behaviors mean parents help the child to solve the problem that causes sadness. Parents' initiative to use strategies that will help their child to feel better (for example, comforting or distracting the child) reflects their emotion-focused reactions. Accepting negative emotions of the child, helping the child to express these emotions and effectively encouraging this expression are considered reactions that Expressive Encouragement. On the contrary, minimization reactions among negative/non-supportive emotional socialization behaviors mean decreasing the child's emotional reactions by the parent and therefore, limiting or trying to limit the child's negative emotion expression. This is defined as oral or physical punishment usage attempts of parents towards children to cope with negative emotions. When children express negative emotions, parents' anxious reaction towards these emotions indicates distressed emotional socialization in the parent (Fabes, Eisenberg, & Bernzweig, 1990; Fabes, Poulin, Eisenberg, & Madden-Derdich, 2002).

Parents' emotional socialization behavior affects children's emotional experience, emotional expression, understanding and organization skills (Denham, Mitchell-Copeland, Strandberg, Auerbach, & Blair, 1997; Eisenberg, Fabes, & Murphy, 1996; Eisenberg, Spinrad, & Cumberland, 1998). Parents that comfort their children and talk about negative emotions might help these children to express their emotions in a socially acceptable manner and to decrease emotional stimulation. Parents' behaviors that support or encourage coping with a child's negative emotions in an instrumental way might support a child's sense of sufficiency and offer tangible methods to regulate negative emotions (Eisenberg et al., 1996). It is known that children of parents that follow an interactive way to express emotions better regulate their emotions and tend not to show aggressive behaviors (Macklem, 2008). Additionally, it is stated that children of mothers that show emotional expression and problem-solving supportive reactions had a higher rate of attention (Eisenberg & Fabes, 1994).

Parents' negative reaction towards children's emotional expression is related to children's negative affectivity and low social competence (Eisenberg, Cumberland, & Spinrad, 1998). Mothers' minimization reactions towards children's emotions negatively affect children's social competence and leads to a tendency of using shy coping strategies. Additionally, non-supportive reactions of parents towards children's negative emotions especially towards fear, sadness and anxiety might decrease the sense of trust in these children, indicate insecure parent-child connection and lead these children with trust issues to struggle in social situations that have emotional regulation and emotions (Eisenberg et al., 1996). It can be seen that mothers' minimization/punitive reactions towards children's emotions are related to children's low attention span and negative affectivity (Eisenberg & Fabes, 1994). For example, punishing parent reactions to a child who shows emotional expression might cause this child to feel anxious about punishment, fear, or anger (Eisenberg, Cumberland, & Spinrad, 1998). Additionally, these children show the tendency to escape rather than express their emotions when they are angry (Eisenberg & Fabes, 1994).

Emotional socialization behaviors are affected by the child's properties (age, gender, and temperament), parents' properties (for example, values, child-raising philosophy, parental organization and sensuality) and culture-specific properties (for example, culture-specific values when expressing emotions, the role of parents in child-raising practices). Additionally, the dimension of a specific context (for example, whether a child's behavior is suitable or the attraction and importance level of a given situation for the child or parent) doubtlessly contributes to emotional socialization of parents (Eisenberg, Cumberland, & Spinrad, 1998).

When the fact that mothers' emotional socialization behavior is important for children's success in various fields is considered, it is an important topic to determine variables that impact mothers' emotional socialization behavior and take steps to increase positive emotional socialization behaviors. Although the role emotional socialization behavior plays in children's emotional development was analyzed in the international literature with various aspects (Eisenberg et al., 1996; Mirabile, Oertwig, & Halberstadt, 2018; Pintar Breen, Tamis-LeMonda, & Kahana-Kalman, 2018; Yang, Song, Doan, & Wang, 2020) there are limited studies in our country (Altan-Aytun et al., 2013; Kılıç & Kumandaş-Öztürk, 2019; Özen-Uyar, Yılmaz-Genç, & Aktaş-Arnas, 2018; Seçer & Karabulut, 2016). In this sense, the purpose of this study is to analyze whether the emotional socialization behavior of mothers having preschool children is differentiated according to child's gender, mother's education level, and socioeconomic level. Based on this purpose, answers to the following research questions will be investigated.

1. Do mothers' emotional socialization behavior (emotion-focused responses, expressive encouragement, problem-focused responses, distress reactions, minimization reactions, punitive reactions) differentiate by the child's gender?
2. Do mothers' emotional socialization behavior (emotion-focused responses, expressive encouragement, problem-focused responses, distress reactions, minimization reactions, punitive reactions) differentiate by the mothers' education level?

3. Do mothers' emotional socialization behavior (emotion-focused responses, expressive encouragement, problem-focused responses, distress reactions, minimization reactions, punitive reactions) differentiate by socioeconomic level?

Method

Research Design

This study adopted a relational survey method among quantitative research methods. Correlational survey model analyses the change or quantity of the relationship between two or more variables (Karasar, 2012). Within the scope of this study, a correlational survey model was adopted as its main purpose was to analyze the relationship between mothers with preschool child emotional socialization behaviors and children's gender, mothers' education level and socioeconomic level.

Participants

Based on the aim of this study, a purposeful sampling method was selected to determine mothers to be included in the study sample. The study sample consisted of 303 mothers with children in preschools in four districts of Adana Provincial Directorate of National Education. The socioeconomic level of participant mothers was determined to be based on education level and household income. In this direction, it was determined that all families in the low socioeconomic level had an income less than the poverty line, and that 42% of mothers were elementary school graduates and 48.7% were high school graduates. It was determined that the families in the middle socioeconomic level had monthly income more than the poverty line and 26.6% of the mothers graduated from elementary school, 38.3% graduated from high school, and %20.2 graduated from university. Monthly incomes of all the high socioeconomic families were more than middle socioeconomic families' income, and 23.3% of the mothers received education at the high school level and 53.3% were educated at the university level. Accordingly, while 39.35% of mothers in the sample had low socioeconomic living standards, 31% were at middle and 29.7% were at high socioeconomic level. Among participant mothers, 27.1% graduated from elementary school, 38% from high school, 8% from college, 24.1% from university and 2.8% from postgraduate programs. Mothers' mean age was 33 years (ranging from 22 to 57 years). Among participant mothers, 149 had girls and 154 had boys. 10.2% of children were four-years-old, 35.3% were five-years-old, and 54.5% were six-years-old.

Data Collection Tools

Study data were collected with Personal Information Form and Coping with Children's Negative Emotions Scale.

Personal Information Form: Demographic information of mothers and their children were obtained by Personal Information Form prepared by the researchers. This form contained information such as mother's age, education level, occupation, monthly income, child's age, and gender.

Coping with Children's Negative Emotions Scale: Scale developed by Fabes, Eisenberg and Bernzweig (1990) to measure parent's emotional socialization behavior that was adapted to Turkish culture by Altan-Aytun et al. (2013). This scale consists of

12 scenarios that show a child experiencing negative emotions such as anger, fear, sadness etc. and a possible reaction by the parent to the child expressing this emotion. This scale consists of reactions that expressive encouragement, emotion-focused, problem-focused, distress reaction, punitive reaction and minimization reaction sub-dimensions. The internal consistency coefficient for Turkish form of this scale was found to be .87, .79, .72, .83, .86 and .65 for sub-scales respectively. In the present study, Cronbach's alpha scores were calculated, and internal consistency values were found as .85 for expressive encouragement subscale, .81 for emotion-focused responses subscale, .77 for problem-focused responses subscale, .46 for distress reactions subscale, .84 for punitive reactions subscale, and .83 for minimization reactions subscale.

Data Collection Process

In the data collection process of the study, firstly, preschools in four different districts of Adana were visited by researchers to ensure that the participants varied in three socioeconomic levels. In these schools, the administrators and teachers were informed about the purpose and importance of the study. Accordingly, mothers who volunteered to participate in the research were determined. The Personal Information Form and Coping with Children's Negative Emotions Scales were given to the teachers in the schools for sending them to volunteer mothers. During the current study, ethical principles were followed. Mothers were informed that this study would only be used for scientific research, and that the research focused only on the process, not the individual. All data of the study were kept confidential.

Data Analysis

The data obtained within the scope of this study were analyzed with SPSS 18.0 package program. Normal distribution of research data was analyzed with skewness and kurtosis coefficients. The analysis showed that all coefficients calculated for all variables were between +2 and -2 and it was accepted that obtained data fits with normal distribution. According to Şencan (2005), the skewness value should not be bigger than 2 and the kurtosis value should not be bigger than 7 in order to provide multivariate normality (as cited in Çokluk, Şekercioğlu, & Büyüköztürk, 2012). Parametric tests were applied for research data analysis. Accordingly, the relationship between the mother's emotional socialization behavior (Distress Reactions, Punitive Reactions, Minimization Reactions, Expressive Encouragement, Emotion-Focused Reactions, Problem-Focused Reactions) and the child's gender was analyzed with an independent samples t-test. The relationship between a mother's emotional socialization behaviors (Distress Reactions, Punitive Reactions, Minimization Reactions, Expressive Encouragement, Emotion-Focused Reactions, Problem-Focused Reactions) and education and socioeconomic level were analyzed with variance analysis. The Tukey Test among Post-Hoc tests were applied to identify which groups caused differences between groups. It was benefited from Eta squared (η^2) value to determine the effect size of the mothers' education level and socioeconomic level variable on the dependent sample. Cohen (1988) states that the small eta squared as (η^2=.01), medium eta squared as (η^2=.09) and large eta squared (η^2=.25) effects (as cited in Tabachnick & Fidell, 2013).

Results

This section presents findings obtained from this study based on sub-problems. Table 1 shows the t-test results for the mother's emotional socialization behavior (distress reactions, punitive reactions, minimization reactions, expressive encouragement, emotion-focused responses, problem-focused responses) for the child's gender.

Table 1

T-test Results of Emotional Socialization Behaviors of Mothers According to Child's Gender

	Gender	*N*	$\bar{X}$	*SD*	*df*	*t*	*p*
Distress Reactions	Girl	149	20.70	6.43	301	.30	.76
	Boy	154	20.50	5.16			
Punitive Reactions	Girl	149	20.05	7.09	301	1.48	.13
	Boy	154	21.38	8.45			
Minimization Reactions	Girl	149	31.08	8.54	301	.24	.80
	Boy	154	31.33	9.07			
Expressive Encouragement	Girl	149	42.72	8.73	301	.06	.95
	Boy	154	42.66	9.03			
Emotion-focused Responses	Girl	149	51.74	6.46	301	.01	.99
	Boy	154	51.74	6.71			
Problem-focused Responses	Girl	149	48.61	5.90	301	.91	.36
	Boy	154	49.25	6.45			

When Table 1 was analyzed, mothers' distressed emotional socialization behavior [$t(301)=.30$, $p>.05$], punitive reactions [$t(301)=1.48$, $p>.05$], minimization reactions [$t(301)=.24$, $p>.05$], expressive encouragement [$t(301)=.06$, $p>.05$], emotion-focused responses [$t(301)=.01$, $p>.05$] and problem-focused responses [$t(301)=.91$, $p>.05$] did not show significant difference for a child's gender.

Table 2 shows descriptive results of mother's emotional socialization behavior (distress reactions, punitive reactions, minimization reactions, emotion-focused responses, expressive encouragement, problem-focused responses) for education level.

Table 2

Emotional Socialization Behavior Results of Mothers According to Their Educational Level

Variable	Education level	*N*	$\bar{X}$	*SD*
Distress Reactions	Elementary school	82	20.39	5.74
	High school	115	20.40	4.68
	College	25	23.68	11.51

Table 2 *Continued*

Variable	Education level	*N*	$\bar{X}$	*SD*
Distress Reactions	University	73	20.16	4.44
	Postgraduate	8	19.87	4.88
	Total	303	20.60	5.81
Punitive Reactions	Elementary school	82	22.86	8.37
	High school	115	21.40	8.66
	College	25	19.16	5.94
	University	73	18.24	5.63
	Postgraduate	8	16.87	3.18
	Total	303	20.73	7.83
Minimization Reactions	Elementary school	82	32.52	8.47
	High school	115	31.80	8.83
	College	25	30.80	9.30
	University	73	28.89	8.78
	Postgraduate	8	31.87	8.28
	Total	303	31.21	8.80
Expressive Encouragement	Elementary school	82	42.29	9.28
	High school	115	41.97	8.60
	College	25	45.88	7.98
	University	73	42.83	9.21
	Postgraduate	8	45.88	6.62
	Total	303	42.69	8.87
Emotion-focused Responses	Elementary school	82	51.29	7.08
	High school	115	51.73	7.15
	College	25	53.04	5.67
	University	73	51.47	5.51
	Postgraduate	8	54.87	3.22
	Total	303	51.74	6.58
Problem-focused Responses	Elementary school	82	46.67	7.07
	High school	115	48.71	5.97
	College	25	50.92	4.94
	University	73	49.61	5.54
	Postgraduate	8	52.87	2.64
	Total	303	48.67	6.20

When Table 2 was analyzed, postgraduate mothers received the highest score in expressive encouragement responses ($\bar{X}$=45.88), emotion-focused responses ($\bar{X}$=54.87), and problem-focused reactions ($\bar{X}$=52.87) which are positive emotional socialization behaviors. However, postgraduate mothers received the lowest score in distress reactions ($\bar{X}$=19.87), punitive reactions ($\bar{X}$=16.87) which are negative emotional socialization behaviors. Elementary school graduate mothers received the highest score in punitive reactions ($\bar{X}$=22.86) and minimization reactions ($\bar{X}$=32.52). In addition to this, elementary school graduate mothers received the lowest score in emotion-focused responses ($\bar{X}$=51.29) and problem-focused responses ($\bar{X}$=46.67).

Table 3 shows ANOVA results of the mother's emotional socialization behavior (distress reactions, punitive reactions, minimization reactions, expressive encouragement, emotion-focused responses, problem-focused responses) according to education level.

Table 3

Emotional Socialization Behavior ANOVA Results of Mothers According to Their Educational Level

Variable	Source of variance	Sum of squares	*df*	Means of squares	*F*	*p*	η^2	Significant difference
Distress Reactions	Between Groups	263.034	4	65.758	1.970	.09	.026	
	Within groups	9947.646	298	33.381				
	Total	10210.680	302					
Punitive Reactions	Between Groups	1056.426	4	264.106	4.508	.00	.057	Elementary school-university, high school-university
	Within groups	17458.921	298	58.587				
	Total	18515.347	302					
Minimization Reactions	Between Groups	582.207	4	145.552	1.900	.11	.025	
	Within groups	22826.850	298	76.600				
	Total	23409.056	302					
Expressive Encouragement	Between Groups	409.016	4	102.254	1.304	.26	.017	
	Within groups	23371.440	298	78.428				
	Total	23780.455	302					
Emotion-focused Responses	Between Groups	142.248	4	35.562	.819	.51	.011	
	Within groups	12939.673	298	43.422				
	Total	13081.921	302					
Problem-focused Responses	Between Groups	661.381	4	165.345	4.488	.00	.057	Elementary school-high school, college, university, postgraduate
	Within groups	10979.615	298	36.844				
	Total	11640.997	302					

When Table 3 was analyzed, it can be seen that there was a significant difference between mothers' emotional socialization behavior punitive reactions [$F(4, 298)=4.508$, $p<.01$] and problem-focused responses [$F(4, 298)=4.488$, $p<.01$] sub-dimensions and education level. According to the Tukey test results conducted to determine which groups caused differentiation in mothers' punitive reactions, it was determined that university graduate mothers ($\bar{X}=18.24$) showed less punitive reactions than elementary school ($\bar{X}=22.86$) and high school graduate mothers ($\bar{X}=21.40$). It was seen that the mothers' education level has a small effect on the mothers' punitive reactions when eta squared value ($\eta^2=.057$) which was obtained in terms of the education level variable was considered. According to the Tukey test results conducted to determine which groups caused differentiation in mothers' problem-focused responses, it was determined that elementary school graduate mothers ($\bar{X}=46.67$) showed less problem-focused responses than high school ($\bar{X}=48.71$), college ($\bar{X}=50.92$), university ($\bar{X}=49.61$) and postgraduate mothers ($\bar{X}=52.87$). It was revealed that the mothers' education level has a small effect on the mothers' problem-focused responses when eta squared value ($\eta^2=.057$) which was obtained in terms of the education level variable was considered.

Table 4 shows the descriptive results of the mother's emotional socialization behavior (distress reactions, punitive reactions, minimization reactions, expressive encouragement, emotion-focused responses, problem-focused responses) according to socioeconomic level.

Table 4

Emotional Socialization Behavior Results of Mothers According to Their Socioeconomic Level

Variable	Socioeconomic level	*N*	$\bar{X}$	*SD*
Distress Reactions	Low	119	21.28	7.20
	Middle	94	19.80	4.39
	High	90	20.52	4.94
	Total	303	20.60	5.81
Punitive Reactions	Low	119	22.89	8.73
	Middle	94	19.78	6.16
	High	90	18.86	7.51
	Total	303	20.73	7.83
Minimization Reactions	Low	119	32.85	9.38
	Middle	94	29.93	7.51
	High	90	30.37	9.00
	Total	303	31.21	8.80
Expressive Encouragement	Low	119	42.04	8.65
	Middle	94	42.61	8.65
	High	90	43.63	9.38
	Total	303	42.69	8.87

Emotion-focused Responses	Low	119	52.09	6.73
	Middle	94	51.35	5.87
Emotion-focused Responses	High	90	51.68	7.11
	Total	303	51.74	6.58
Problem-focused Responses	Low	119	48.12	6.57
	Middle	94	48.56	6.00
	High	90	49.50	5.88
	Total	303	48.67	6.20

When Table 4 was analyzed, mothers with low socioeconomic levels received the highest score in distress reactions ($\bar{X}$=21.28), punitive reactions ($\bar{X}$=22.89), and minimization reactions ($\bar{X}$=32.85) which are negative emotional socialization behaviors. However, mothers with low socioeconomic levels received the lowest score in expressive encouragement ($\bar{X}$=42.04), emotion-focused responses ($\bar{X}$=52.09), and problem-focused responses ($\bar{X}$=48.12) which are positive emotional socialization behaviors. Mothers with high socioeconomic levels received the highest score in expressive encouragement ($\bar{X}$=43.63), and problem-focused responses ($\bar{X}$=49.50). In addition to this, mothers with high socioeconomic levels received the lowest score in punitive reactions ($\bar{X}$=18.86).

Table 5 shows the ANOVA results of mother's emotional socialization behavior (distress reactions, punitive reactions, minimization reactions, expressive encouragement, emotion-focused responses, problem-focused responses) according to socioeconomic level.

Table 5

Emotional Socialization Behavior ANOVA Results of Mothers According to Their Socioeconomic Level

Variable	Source of variance	Sum of squares	*df*	Means of squares	*F*	*p*	η^2	Significant difference
Distress Reactions	Between Groups	115.385	2	57.693	1.714	.18	.011	
	Within groups	10095.294	300	33.651				
	Total	10210.680	302					
Punitive Reactions	Between Groups	951.622	2	475.811	8.127	.00	.051	low-middle, low-high
	Within groups	17563.725	300	58.546				
	Total	18515.347	302					
Minimization Reactions	Between Groups	537.712	2	268.856	3.527	.03	.023	low-middle
	Within groups	22871.344	300	76.238				
	Total	23409.056	302					
Expressive Encourage	Between Groups	130.553	2	65.276	.828	.43	.005	
	Within groups	23649.903	300	78.833				

ment	Total	23780.455	302				
Emotion-focused Responses	Between Groups	29.234	2	14.617	.336	.71	.002
	Within groups	13052.687	300	43.509			
	Total	13081.921	302				
Problem-focused Responses	Between Groups	98.270	2	49.135	1.277	.28	.008
	Within groups	11542.726	300	38.476			
	Total	11640.997	302				

When Table 5 was analyzed, it can be seen that there was a significant difference between mothers' emotional socialization behavior punitive reactions [$F(2, 300)=8.127$, $p<.01$] and minimization reactions [$F(2, 300)=3.527$, $p<.01$] sub-dimensions and socioeconomic level. According to Tukey test results conducted to determine which groups caused differentiation in mothers' punitive reactions, it was determined that mothers with low socioeconomic level ($\bar{X}=22.89$) showed more punitive reactions than middle ($\bar{X}=19.78$) and high level ($\bar{X}=18.86$) mothers. It was revealed that the mothers' socioeconomic level has a small effect on the mothers' punitive reactions when eta squared value ($\eta^2=.051$) which was obtained in terms of the socioeconomic level variable was considered. According to Tukey test results conducted to determine which groups caused differentiation in mothers' minimization reactions, it was determined that mothers with low socioeconomic level ($\bar{X}=32.85$) showed more minimization reactions than middle ($\bar{X}=19.78$) and high level ($\bar{X}=29.93$). It was seen that the mothers' socioeconomic level has a small effect on the mothers' minimization reactions when eta squared value ($\eta^2=.023$) which was obtained in terms of the socioeconomic level variable was considered.

Discussion and Conclusion

Within the scope of this study, it was found that mothers' emotional socialization behavior showed no difference for a child's gender. When related literature was reviewed, there were contradictory results with this study. While there are studies that showed emotional socialization behavior changed for a child's gender (Garner, Robertson, & Smith, 1997; Fivush, 1991; Fivush, Berlin, McDermott Sales, Mennuti-Washburn, & Cassidy, 2003), there are also studies that show there is no change for gender (Denham, Bassett, & Wyatt, 2010; Eisenberg & Fabes, 1994; Kliewer, Fearnow, & Miller, 1996; Klimes-Dougan et al., 2007; Roberts, 1999). According to Garner et al. (1997), mothers' emotional socialization behavior changes based on the child's gender. Accordingly, mothers stated that girls expressed more positive emotions than boys. Additionally, mothers especially talked about sad emotions with girls and tried to comfort them. On the other hand, while anger emotions are acceptable for boys, it is unacceptable for girls (Fivush, 1991). However, this study found no differentiation in mothers' emotional socialization behaviors between girls and boys. In line with study findings, Denham et al. (2010) found that girls and boys did not show a difference in parents' emotional socialization style. Similarly, Klimes-Dougan et al. (2007) studied with adolescents and their parents and found that both girls' and boy's emotions socialized at the same level. Seçer and Karabulut (2016) studied with mothers in

Turkish culture and stated that mothers' minimization reactions are interacting with education level and child's gender. In this sense, it is believed that a child's gender is insufficient to impact mothers' emotional socialization behaviors alone but there are more significant results when combined with variables such as education level and socioeconomic level.

In this study, it was determined that mothers' education level differentiated emotional socialization behaviors. Accordingly, as mothers' education level increased, while punitive reactions among negative emotional socialization decreased, problem-focused reactions among positive emotional socialization increased. When the related literature was reviewed, some similar research findings were found (Altan-Aytun et al., 2013; Fabes et al., 2002; Seçer & Karabulut, 2016). Altan-Aytun et al. (2013) determined in their study that there was a slight decline in mothers' punitive reactions and an increase in problem-focused responses with education. Seçer and Karabulut (2016) had similar findings with this study and it was determined that as mother's education level increased, their positive emotional socialization behaviors increased and negative emotional socialization behaviors decreased. Bornstein, Hahn, Suwalsky and Haynes (2003) stated that mothers' education level is the variable that best exemplifies mothers' behaviors towards children. Research findings on Turkish mothers showed that a mother's education level is related to the child's socialization goals. Accordingly, while high educated Turkish mothers emphasized targets related to autonomy and self-enhancement more often, low education level mothers emphasized relatedness and obedience (Yağmurlu, Çitlak, Dost, & Leyendecker, 2009). It is known that mothers with low education level expect the child to behave according to authority and tend to give punishments. According to Coolahan, McWayne, Fantuzzo, and Grim (2002) parents with low level education engaged in significantly more restrictive parenting behaviors. In this sense, it is possible to state that mothers' low education level is related to negative emotional socialization behaviors and mothers' high education level is related with positive emotional socialization behavior finding of this study is in line with the literature.

The findings obtained from this study showed that emotional socialization behaviors of mothers changed based on their socioeconomic level. Accordingly, it was determined that mother's with low socioeconomic levels showed more punitive and minimization reactions compared to mothers with middle and high socioeconomic levels. According to Yağmurlu et al. (2009) the socioeconomic variable is a contextual variable that shapes parent behaviors. In this direction, middle income mothers were more likely than low-income mothers to control hostile/anger emotions in response to child sadness and fear (Martini, Root, & Jenkins, 2004). However, economic hardship affects a parent's interaction with their child (Hashima & Amato, 1994). It is known that risk factors such as low-income level within family context and mother's low education level are related with less supportive and mainly non-supportive parenting behaviors towards children's negative emotions (Shaffer, Suveg, Thomassin, & Bradbury, 2012). Conger et al. (1992) stated that economic hardship had an impact on parents' demoralization and emotional distress. When parents feel emotionally distressed, they tend to see negative emotions of their child (Fabes, Leonard, Kupanoff, & Martin, 2001) and show negative emotional socialization behaviors. Similarly, Hashima and Amato (1994) expressed that low-income level parents especially tend to show punishing and

non-supportive behaviors towards their children. Low income combined with a lack of social support is problematic for parents. Low-income parents, who reported that there were few sources of assistance available to them in a crisis, reported that they especially shouted or slapped their children very often.

Implications

When study findings were analyzed, it was determined that emotional socialization behaviors of mothers did not differ significantly according to the child's gender. When contradicting findings in the related literature were considered, it is recommended to future research with a larger sample group.

It was determined that punitive reactions and problem-focused reactions of participant mothers differentiated by the mother's education level. Accordingly, as mothers' education level increased, while punitive reactions decreased, problem-focused reactions increased. Within this scope, it is important to realize the possible effects of a mother's with low education level emotional socialization behaviors on their children and prepare and implement an intervention program that ensures these mothers show positive emotional socialization reactions.

According to results, emotional socialization behaviors of mothers differentiated for socioeconomic levels. Whereas, it was determined that mother's with low socioeconomic levels showed more punitive reactions and minimization reactions compared to mothers with middle and high socioeconomic levels. Hashima and Amato (1994) stated that parents with low social support perception showed non-supportive and problematic behaviors towards children. In this sense, it is believed that financial support acquisition is important for parents living in low economic conditions.

Within the scope of this study, emotional socialization behaviors of mothers were detected with a self-assessment measurement tool that is commonly used in the related literature. Future studies might apply an observation and interview method to obtain more detailed data related to mothers' behaviors. In line with this, direct observation of mother-child interaction in a natural setting or with in-depth interviews with mothers can be recommended.

Statement of Responsibility

Rabia Özen Uyar; conceptualization, design of research process, methodology, data collection, validation, investigation, data analysis, writing-draft and original, writing- review & editing. Melek Merve Yılmaz; conceptualization, design of research process, methodology, data collection, validation, investigation, writing-original, writing- review & editing. Yaşare Aktaş Arnas; conceptualization, design of research process, validation, writing-review, and supervision.

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Dos and Don'ts of an Effective Telecollaboration Project*

Etkili Bir Uzaktan İşbirliği Projesi İçin Tavsiyeler

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ABSTRACT: This paper is based on the reflections from a telecollaboration project between English as a foreign language (EFL) learners in Turkey and native or non-native speakers of English in the USA. The main purpose of the project was to help the participants to develop their intercultural communicative competence (ICC) via online (a)synchronous communication tools. Therefore, the participants were engaged in tasks, by which they could share their thoughts about cultural issues and expand their (inter)cultural knowledge. The findings showed that telecollaboration projects are potentially key to developing language users' ICC, helping them acquire and improve essential skills and attitudes. However, the study also showed that all the positive effects of the telecollaboration projects cannot be given to the project itself. The efficiency of such projects relies on certain dos and don'ts with which whoever will perform such projects in the future requires to be careful. This paper intends to provide precise guidance about designing telecollaboration projects together with an understanding of its constraints.

Keywords: Telecollaboration, language teaching, communication, efficiency.

ÖZ: Bu çalışma, Türkiye'de İngilizceyi yabancı dil olarak öğrenen öğrenciler ve Amerika'da İngilizceyi anadili veya ikinci dil olarak konuşanlar arasındaki uzaktan işbirliği projesinden elde edilen deneyimlere dayalıdır. Söz konusu çalışmanın temel amacı, katılımcıların kültürlerarası iletişim becerisini eşzamanlı olan ve olmayan iletişim araçlarını kullanarak geliştirmekti. Bu amaçla, katılımcılar kültürel ve kültürlerarası bilgilerini paylaşabilecekleri ve geliştirebileceklerine yardımcı ödevler yapmıştır. Araştırma bulguları, uzaktan işbirliği projelerinin dil kullanıcılarının gerekli beceri ve tutumları edinmelerine yardımcı olarak kültürlerarası iletişim becerilerini geliştirmeleri için önemli olduğunu göstermiştir. Bununla birlikte, çalışma gösterdi ki uzaktan işbirliği projelerinin olumlu etkileri yalnızca projenin kendisine bağlı değildir. Bu projelerin etkinliği ileride bu tarz projeler yürütecek olanların dikkatli olması gereken belirli tavsiyelere bağlıdır. Bu çalışma, uzaktan işbirliği projelerinin kısıtlı yönlerine dair bir anlayış sağlamakla birlikte bu tarz projeler oluşturmak için rehberlik sağlamayı hedefler.

Anahtar kelimeler: Uzaktan iş birliği, dil öğrenimi, iletişim, etkinlik.

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Computer-mediated communication is a broad term which also refers to telecollaboration, online communication, or virtual exchange. Corbett (2003) states that computer-mediated ethnography has two modes: virtual and joint. In virtual ethnography, an individual learns a culture by means of videos, e-mails or computer software, whereas joint ethnography involves individuals' communication with each other through the various tools of the Internet (Corbett, 2003). Telecollaboration projects are given as an example of joint ethnography.

Telecollaboration has two prominent models. The first model is e-tandem models, in which the main interest is to develop learners' linguistic competence. In these models, a language user is paired with another one and she/he is asked to give feedback to each other's writings (Anikina, Sobinova, & Petrova, 2015). The second model of telecollaboration is CULTURA model, which dates back to Furstenberg and his colleagues' project in 1977, involves two groups of language users' collaboration on the same materials so that they can develop a better understanding of each other's cultures (Furstenberg, Levet, English, & Maillet, 2001). As defined by Wainfan and Davis (2004), virtual collaborations involve the teamwork and responsibility share of people who are from different regions and cultures for outcomes such as "a shared understanding, evaluation, strategy, recommendation, decision, action plan or other product" (p. XI). Taking the findings and experiences in the present research into consideration, this paper aims to cast light on how to make the most of the telecollaboration projects for prospective practitioners.

Literature Review

Computer-mediated communication (CMC) entails synchronous and asynchronous forms of communications between people and "among groups" using "networked computers" (Santra & Giri, 2009, p. 103). In asynchronous communication, people who engage in CMC can communicate at different times and this may be done without any need for face-to-face communication; on the other hand, in the synchronous form, individuals communicate at the same time and react to each other. Synchronous online communication provides users with the opportunities of "instant interaction" together with "text-based communication", which makes it effective pedagogically (Kim, 2014, p. 26). Kim (2014) proposes that synchronous online communication creates a new social environment for communication and this differs from face-to-face communication or even from asynchronous communication involving the use of messages or e-mails. According to Wainfan and Davis (2004), individuals may benefit from virtual collaboration because when a virtual meeting, for example, is held; it is easier for an individual to join it than attend a physical meeting. Also, when the participation of a person is required, s/he is likely to be engaged in the meeting through communication in a short time. When such differences are considered, Wainfan and Davis (2004) also continue that virtual meetings would cost less compared to physical meetings.

CMC has a valuable place in educational settings for educators and learners. The use of CMC in education enables learners to contact the speakers of other languages; as a result, it contributes to learners' intercultural competence, improves their motivation to learn foreign languages, other cultures and to explore their own cultures more, and it affects learners' autonomy positively since the learners take initiatives to start a

conversation or ask questions to their partners (McComb, 1994; O'Dowd, 2011; Simpson, 2002).

CMC enhances the limited nature of the classrooms to expose learners to the target language, especially in foreign language classes (Simpson, 2002). As a result, it increases the probability of learners' engagement in interaction in educational settings (Thurnbury, 2006). In fact, it is highly possible in a classroom setting that language learners may be helped to adopt positive attitudes towards other cultures and to realize the differences in separate cultures integrating certain cultural materials designed to increase cultural awareness (Kusumaningputri & Widodo, 2018; Qin, 2015; Shayakhmetova, Shayakhmetova, Ashrapova, & Zhuravleva, 2017). Nevertheless, those materials lack the sense the advances in technology could bring into the classroom and the opportunity of authentic communication for the EFL learners with the other speakers of English (Kusumaningputri & Widodo, 2018; Qin, 2015).

In their review of the contributions of CMC to language learners, Alonso-Belmonte and Vinagre (2017) suggest that CMC has a positive impact on learners' linguistic competence, autonomy, thinking skills, digital skills, socio-pragmatic competences, motivation, intercultural awareness; and overall, their learning making it more active, reflective, and collaborative. When all these benefits are taken into consideration, educators become willing to integrate technology into their classes with the means of telecollaboration projects, as Alonso-Belmonte and Vinagre (2017) explain.

The Benefits of Telecollaboration for Learners

The recognized value of telecollaboration projects has been revealed in numerous research studies. Accordingly, telecollaboration has been found to have a positive influence on learners' motivation, cultural awareness, vocabulary knowledge and language skills (Anikina et al., 2015; Taskıran, 2019); academic achievement (Jaime, Domínguez, Sánchez, & Blanco, 2013); reflection upon cultures (Ramírez-Lizcano, & Cabrera-Tovar, 2020), intercultural competence (Bueno-Alastuey & Kleban, 2016); pragmatic awareness (Marti & Fernandez, 2016). Also, Taskıran (2019) elucidates the positive effects of telecollaboration activity for learners saying that it increases the learners' awareness of language abilities, encourages them to be involved in language exchanges, and helps them gain confidence in their language skills.

Telecollaboration projects are particularly essential as a requirement of the globalised world, in which there are necessities for developing cultural awareness and being able to act appropriately in cultural environments (Alonso-Belmonte & Vinagre, 2017). This is mostly because learners are able to gain a genuine experience of intercultural communication thanks to telecollaboration projects (Marczak, 2013). For example, Jin (2015) puts forward that telecollaboration projects have the potential to develop learners' ICC (intercultural competence) depending on the findings from a 15-week computer-mediated communication between Korean and American learners using a well-known social networking site. In a similar manner, Lee and Markey (2014) revealed that engaging learners in communication with other learners from different cultures is effective in increasing their cultural knowledge and awareness using social networking sites, podcasts, or blogs. Another example showed that learners' exchanges

of their cultural thoughts using blogging positively affect their knowledge and skills (Lee, 2011).

The research in the literature shows that when language learners have an opportunity to read and discuss the cultural texts; for example, in their culture or other cultures with other language users from different cultures employing telecollaboration projects, they are able to develop their intercultural skills because such activities allow the learners to improve their cultural knowledge, and also positively affect their attitudes towards people from different cultures (Liaw, 2006). Jin and Erben (2007) support this finding with their research on a telecollaboration project which was based on instant messaging between speakers of Chinese as a foreign language and as a native language on the participants' intercultural awareness as they stated the project made the participants more respectful for the cultural differences. In a more recent study, Chen and Yang (2014) have come up with the finding that engaging language learners in communication with people from other cultures using e-mails, messages or video conferences contributes to their intercultural awareness. A similar finding showing the positive effect of telecollaboration on language learners' cross-cultural awareness was reported by Angelova and Zhao (2016), who performed a telecollaboration project using different forms of communication such as sending e-mails and having video calls.

The literature shows that doing telecollaboration projects is particularly effective for developing the learners' linguistic abilities and intercultural competences. Thanks to telecollaboration projects, the language users are able to gather for a shared purpose. Thus, they get a chance to communicate with people from different cultures and backgrounds, which would be unlikely in a classroom setting where the target language is taught as a foreign language. Considering the advantages of telecollaboration here, it is possible to suggest that telecollaboration is a requirement to be integrated into language learning programs.

Upon the Constraints of Telecollaboration Projects

Using online technologies and integrating them into the learning and teaching settings are recognized as basic twenty-first-century skills which are necessary for educators and learners to develop and own (Müller-Hartmann & O'Dowd, 2017). Knowing how to use those technologies is not sufficient; educators are required to know how to exploit them in pedagogical respect in their classrooms (Müller-Hartmann & O'Dowd, 2017). As explained by Giralt and Murray (2019), despite the success of telecollaboration projects, some drawbacks such as the mismatch in the partners' (telecollaborators) knowledge, motivation or needs; problems with time management might occur.

Caluianu (2019) states: "a collaboration may fall short of its main goals even when it is carefully planned and enthusiastically carried out and the complexity of the design may harm a project" (p. 12). A cross-cultural encounter with people from different cultures might seem to be fostering intercultural awareness as part of the normal process, yet cultural activities in which the users are engaged do not result in a better understanding of cross-cultural similarities or differences.

Orsini-Jones and Cerveró Carrascosa (2019) have revealed that telecollaboration was found to be effective to enhance ICC and reflective practice. The researchers add that not all the users are the same, so not all the students can be expected to be involved

in the telecollaboration projects equally. For instance, some learners might lack the necessary language skills and confidence to speak to other people. In alignment with this, Bueno-Alastuey and Kleban (2016) stress that when learners, for example, lack good computer skills; they are prone to experience some technical problems. Therefore, it is hugely important to teach the individuals who are involved in telecollaboration projects how to use the particular means of technology which is going to be used in the project (Chun, 2015). Otherwise, certain difficulties related to the digital platform or the use of technology may lead the users to have negative attitudes towards telecollaboration projects.

Telecollaboration projects are great for bringing learners together whose native languages and cultures are different from one another and helping to develop their ICC; however, putting individuals with different cultural backgrounds and communication expectations together might pose some challenges (Kern, Ware, & Warchauer, 2004). Watson (2019) notes the importance of the time allocated for the project and the clarity of what the collaborators are supposed to do. The effectiveness of a telecollaboration project depends on the fact that all the possible constraints are widely anticipated before the project is given a start (Chun, 2015). Regarding this issue, Chun (2015) asserts that it is essential to set realistic goals which are appropriate for the learners' proficiency level. Additionally, all the requirements of the tasks which will be assigned to the participants, the methods to be used to assess the participants' performance, the time to be allocated for the research are to be considered beforehand carefully (Basharina, Guardado, & Morgan, 2008).

When the constraints here are considered, it might be suggested that carrying out a telecollaboration project is not a seamless process. Besides being advantageous for language learners to a certain extent, it is evident that telecollaboration is to be designed carefully. Like all the other means of technology, the particular means of communication used in any telecollaboration project is likely to cause problems that would be difficult to prevent after the projects have started unless meticulous care is given. Below are the details of the current telecollaboration project on which this paper is based presented.

The Current Project

The project, the details of which are presented below, involved the telecollaboration of Turkish EFL learners and native or non-native English speakers of English basically by means of synchronous online communication. The project aimed to find out whether the telecollaboration between speakers of English affects language users' intercultural communicative competence or not.

Settings and Participants

Two groups of participants joined the project on a volunteer basis. In one of the groups, there were 15 Turkish learners who were learning English as a foreign language at a private university in Turkey. Their English proficiency level was pre-intermediate, and ages ranged from 18 to 22. All the participants in this group had been learning English at the preparatory school for about five months when the project started. The university which the participants affiliated to had English medium instruction, and in order that the participants could be ready to start their education in their departments,

the participants needed to pass the proficiency exam which they would take at the end of the preparatory school with a score of 60 out of 100. The Turkish EFL learners had not known any of the participants in the second group with whom they would engage in communication via computer-mediated communication means. Although most of the Turkish participants stated that they had not communicated with the speakers of English who were not from the same culture or did not speak the same mother tongue as them by means of CMC before, only a few stated to have had contact with foreign speakers of English from different cultures using the Internet. Their previous contact was not on a regular basis and long-term compared to the communication they were involved with the foreign participants in the current study, though.

In the second group, there were nine native or non-native speakers of English (who are also referred to as foreign participants in this paper) from Florida International University, Miami, USA. They were studying at different departments of social and numerical sciences at university, and their year of study ranged from freshman to senior. One of the foreign participants was Indian; the others were American, Guyanese, and Hispanic American. Like the Turkish participants, their ages were between 22 and 24. The participants were mostly not familiar with the Turkish culture, but two of the participants mentioned they knew Turkish culture since one had a friend from Turkey at school, and the other had a short visit to Turkey a long time ago.

The Arrangements of the Sessions

The project lasted eight weeks in total (excluding the time allocated to the recruitment of the participants). Each week throughout the project, the participants joined a live video session on *Google Hangouts,* each *of* which continued for at least 45 minutes. Since the optimum number of the participants who could join a video session on *Hangouts* was up to ten participants at a time, each session was arranged in a way that both Turkish EFL learners and (non)native speakers of English would join the session at the same time. Hence, it was aimed to take the advantage of bringing people from different cultures together to exchange their ideas on the weekly themes and topics on cultural terms.

The present project basically depended on synchronous online communication which was carried out via *Google Hangouts*, a free and user-friendly platform all the participants could use with no difficulty. Additionally, an online educational platform, *Eliademy*, was employed to enable the participants to be in contact in asynchronous ways. On the platform, an online course was created, and all the participants were enrolled there. Using this platform, the participants were acknowledged about the theme of the week, answered some awareness raising questions related to the topics they would discuss in the video session. On the *Eliademy*, the participants were asked to comment on the pre-video session questions and respond to other participants' comments writing on the platform using its *discussion forum* function. Thus, the use of the *Eliademy* aimed to support the participants' asynchronous communication with one another. Besides, once the weekly video session was over, the participants were requested to write a reflection paper (regarding what they had taken from their telecollaboration experience) and submit it using the *Tasks* function of the platform. Following the same sequence each week, the participants were engaged in activities and tasks in which they could exchange their ideas about the culturally-themed topics.

Tasks and Activities

The tasks and activities that the participants performed were adapted from *Mirrors and Windows Textbook* by Huber-Kriegler, Lazar, and Strange (2003). Each week, the tasks and activities were assigned under a predetermined theme to the participants. In the selection of the themes, the cultural sensitivity towards the topic, the participants' interest areas, and age groups were taken into consideration. Some of the themes chosen are exemplified as how timing is perceived across cultures, what sorts of food and eating habits people have in different cultures, what gestures and speaking aloud mean in different cultures, how children are raised across cultures etc. Based on the theme, the tasks involved getting into a discussion about one cultural concept across cultures, relating it to a person's own culture and others' cultures; talking about the similarities and differences in the cultural concept across countries etc.

Regarding the Effect of the Project

To understand the effectiveness of the project, a 20-minute-semi-structured interview with each participant was carried out shortly after the project ended. In the interviews, the participants were addressed questions related to their experiences throughout the project. Later, the recordings of the interviews were transcribed verbatim. The data from the interviews and weekly written reflection papers were uploaded onto Maxqda, a qualitative data analysis software, whereby the data were coded efficiently. In order to eliminate the subjectivity risk which may be involved in the qualitative data analysis, two coders analyzed the same set of data using the same codes. Then, two sets of data were compared on the Maxqda, and the results showed that the inter-coder agreement was 87.5.

In the coding process of the data, a deductive (top-down) approach, which involves the use of already existing codes/ themes in the literature (Riazi, 2016), was adopted. While coding the qualitative data, the codes and sub-codes were grouped under four main themes, specifically learners' attitudes, knowledge, skills and critical cultural awareness (Byram, 1997). The (sub)code(s) 1) for *attitudes* are *appreciating cultural differences, being willing to learn other cultures and interested in them* and *being open to adjust behaviours, to contact with people from different cultures, to believe something about a person's own culture and other cultures might be true even though it seems impossible*; 2) for *knowledge* is *expanding the information about one's home culture and the cultures of people from different countries/ nationalities*; 3) for *skills* are *being able to relate and explain what a particular action, performance etc. means* and *being able to interact and explore*; 4) for *awareness* is *fostering what a person is aware of his/ her own culture and other cultures* (Byram, 1997, 2002).

The findings based on the participants' reflections revealed that the project affected learners' attitudes, knowledge, skills, and critical cultural awareness in a positive way. To illustrate, the participants mentioned a positive effect on their attitudes as a result of the project. All the telecollaborators (EFL learners of English from Turkey and native or non-native speakers of English in the USA) said to be able to develop a view aspect to the cultural events in the sessions in which they carried out the tasks assigned to them. They stated to become more willing to learn other cultures and to embrace cultural differences in a more understanding and tolerant manner.

Also, as the participants had an opportunity to discuss the cultural differences in their cultures and other cultures throughout the project, they said to have explored more about other cultures and their own cultures. It is worth stressing here that the project did foster the participants' awareness of cultural differences and/or similarities not only with the participants from dissimilar cultures but also with the participants from the same culture as them. As a result of the participants' extending knowledge, it was found that their awareness of the similarities and differences across cultures increased.

Additionally, it was revealed by the research that discussing cultural topics, exchanging ideas about cultural issues, and exploring the similarities and differences across cultures helped learners to increase their skills of relating and interpreting. Additionally, the findings showed that both groups of participants seized the opportunity to communicate with people from different cultures, thereby bolstering their confidence to speak to the other speakers of English.

Generally speaking, the findings have indicated that getting learners from different cultures to perform tasks by means of online communication presents advantages for the learners. Telecollaboration seems to be one of the best alternatives in order to bring authentic communication opportunities into the classroom for language learners in EFL settings in countries such as Turkey, where English is taught and learnt as a foreign language. Learners generally have low possibility of being exposed to English on authentic terms.

Despite the fact that such telecollaboration projects seem ideal for raising cultural awareness, developing learners' intercultural competence and also improving learners' skills of communication and interaction, they are not easy to set up. Therefore, the following section aims to help the individuals willing to run similar projects to have a better understanding of how to plan, launch and carry out a telecollaboration project.

Dos and Dont's for Taking the Full Advantage of Telecollaboration Projects

Telecollaboration projects produce a number of positive outcomes for the users notwithstanding the fact that it is highly likely for the practitioners to suffer from certain hindrances which have not been anticipated in the process of designing such projects. Still, the problems are possible to mitigate when such projects are run with real care and schedule.

This section provides a precise understanding of the points to be careful in such projects, to guide educators and researchers and design effective telecollaboration projects. Below are the recommendations based on the experiences from the current project specified.

Setting a Clear Goal

While initiating a telecollaboration project, setting clear and realistic goals is essentially important to reap the potential benefits of bringing learners together for telecollaboration (Chun, 2015). In particular, the focus and the direction of the project ought to be defined obviously. It is necessary to inform the learners about what is aimed at with the online collaboration project and the learning objectives require to be possible to do for the students (Dooly, 2008). Dooly (2008) also underscores that the objectives of the project need to be compatible with the students' objectives. Although the online collaboration will seem to be novel and interesting for the students at first, if the

students cannot expand their knowledge with their online collaboration, their motivation to continue their participation in the project will decrease (Dooly, 2008).

Considering that the purpose of a telecollaboration project is just to make certain groups of learners put together so as to expose them to the target language would be undervaluing the importance of such projects. They might result in even failure for the practitioners. For instance, an unplanned project might cause loss of motivation, cultural misunderstanding, or sense of academic inadequacy from the learners' side. The learners might not want to participate in a project without clearly defined goals while they are struggling with loaded school work. Thus, they are likely to have difficulty in maintaining their motivation and completely lose their interest in being a part of such a project. From the educators' side, setting goals is crucial because it would be possible to have measurable improvements in the study, and the project could be duly completed with the lowest probability of problems.

It is evident that goals help draw an accurate map for the project as long as they are reasonable to accomplish and precisely defined. It is necessary and important to plan a collaborative activity together with the subjects, tasks, the organization of the learners carefully (Dooly, 2008). The present study was particularly planned to reveal the effect of telecollaboration on language users' ICC. In alignment with this, whom to be recruited in the project, how and when the project would be carried out, how long it would continue, what particular measurement instruments were used, how the tasks and topics would be selected and designed were all planned carefully.

Recognizing the Participants

The participant groups were preferred from the same age groups in the present project. This was considered to be more effective for the participants as they would communicate more easily and comfortably with their peers. In the literature, there is telecollaboration research in which university learners, for example, are paired with other telecollaboration partners who are older than them (Keranen & Bayyurt, 2006). On the other hand, having randomly chosen participants without any care for their ages and proficiency levels may cause the inefficiency of such projects. The communication between the participants who are not from the same age group might not bring about a shared outcome of the project as their interest areas would differ from each other.

In a similar way, the proficiency levels of the participants are required to be taken into consideration for the ease of communication and prevent the participants from feeling inadequate academically while talking to other speakers of English. Dooly (2008) explains that the activities to be carried out in an online collaboration should be suitable for the students' skills. In this particular way, first of all, the participant groups were aimed to be known well in the present study. The main researcher in the project had known the Turkish participants in the study for more than four months before the project started, so she had a full understanding of the participants' English proficiency levels and abilities which were necessary for them to carry out the tasks in their telecollaboration with the foreign participants, along with the participants' expectations as a language learner and their interest areas.

The process of finding partners for a telecollaborative project might pose some challenges for the researchers, as also mentioned in Ramírez-Lizcano and Cabrera-Tovar (2020). Therefore, particular attention was also paid to know the foreign

participants in the present project. The participants were specifically preferred to be in the same age group as the Turkish participants in the project so that they could share interest areas and an incentive to communicate with each other. A contact person from the same university as the foreign participants and who knew the profile and culture of the foreign participants well assisted in this process. She talked to the foreign participants individually, acknowledged them about the project and helped the main researcher to get in contact with them easily.

Designing the Tasks

It is essentially important for the educators and project designers to show care for selecting the task topics, the number of the tasks to be assigned, and the time to be allocated for each task. Barbier and Benjamin (2019), for example, experienced some challenges regarding the tasks as they found out the tasks limited the learners' communication in their study, so they were required to alter the tasks with more creative ones.

The participants' interest areas and the suitability of the topics to discuss served as a basis for designing the tasks in the project mentioned in this paper. In alignment with the purpose of the project, all the tasks were themed under the topics such as raising children, feelings, timing, communicating or eating which may show changes across cultures. Thus, eight sessions with a different theme were held with different kinds of tasks for the participants. The tasks involved discussion, idea exchanging, interpreting given cases from different cultures, or relating one cultural issue to their own culture or other cultures. Despite the fact that in the beginning, a long list of cultural themes and tasks related to them were compiled, later some topics, for example, regarding political, gender related or religious issues were eliminated from the list because they were thought to be insulting for some of the participants during the conversations, or some of the topics were not included because they involved too much technical vocabulary to mention, which would have been hard for the participants in the project to talk about.

In addition to the topic selection, the number of the tasks assigned in each session is to be determined meticulously. While deciding how many tasks to include in each session, especially the time length of each session is to be taken into consideration (Basharina et al., 2008). The participants ought not to be assigned tasks which they will not be able to complete in the time announced to be allocated weekly for a session. This would negatively affect the participants' motivation to be a part of the project creating distrust in the project. So as to avoid such inconveniences, the first three weeks of the project were piloted with a small group of participants sharing similar proficiency profiles with the participants in the actual study. Depending on the feedback obtained from the participants in the piloting group, the number of the tasks and the topics were determined more accurately and the numbers were kept at a minimum. Yet, it should be added that not all the participant groups can be the same. Some tasks might be completed more rapidly before the allocated time. Therefore, putting some extra tasks aside to use in case would be very useful for the researchers in similar projects.

In the present study, the time allocated for each task was done carefully, and all the participants were informed about the expected time to spend for each session from the very beginning of the study. This was particularly important because engaging the

participants in a task which would last more than expected could have caused learners to be unwilling to continue their participation in the project. Although the time allocation for each session was 45 minutes in total, some sessions lasted one hour, but the participants knew this is a choice more than an obligation.

Giving the participants a sense that engagement in that project is effective to foster their cultural knowledge, to help them start friendship with individuals from different cultures and have an opportunity to improve their language skills was especially useful. In this way, the participants may strengthen their motivation to be involved in that project for their own benefit. Participation in this project did not entail giving any scores or rewards to the participants, which was highly recommended in telecollaboration projects for the continuity of the participation. The present research findings showed that prizing the participants or giving them extra credits is not the only way out for success in providing the continuity of the participation. Instead, it would be sufficient to arrange sessions carefully considering the appropriacy of the students, to guarantee their participation would not cause any negative effects on their school performance as long as the participants have the motivation to pursue their communication with one another.

Choosing the Communication Means

It is certain that depending on the purpose and the skills to be developed, choosing the right means of communication bears crucial importance in telecollaboration projects. The previous literature suggests the means of technology might affect the users' anxiety level in a negative way. Fondo and Jacobetty (2020) depict in their research that while a particular means of communication tool was being used in their project, the participants felt anxious because the means was new for them. As a result, the researchers had to alter the means with the ones which the participants were familiar with.

Although some literature reports show that technical problems could occur during telecollaboration as a result of lack of internet access, technical skills or equipment (Bueno-Alastuey & Kleban, 2016), almost no technical problems were encountered in the present study. The only obstacle which several participants came across in the study was the slow Internet connections, yet they were not long-lasting. The participants were able to connect to the Internet and engaged in communication again in a few minutes. Also, the participants did not need any special equipment for communication. They were able to join the sessions even using their smartphones without any restrictions of place. Regarding this, it might be thought that advances in technology today are a lot more developed when compared to the past. Therefore, educators or individuals who are planning to set up a telecollaboration project do not need to hesitate to start it because of concerns such as technical glitches as long as the means of communication is chosen carefully to reach their research goals.

Considering that too much complexity while using the means of online communication might confuse the users, the basic idea behind the selection of the means in the current study was to employ a user-friendly tool which the participants would not worry about whether they need any special training to use that communication means or not. All the functions which the selected communication means would serve to fulfill the objectives of the research (such as the possibility of

storing the data and protecting the participants' privacy, having easy access and being affordable) are to be taken into consideration while deciding on whatever tools are going to be employed.

Taskıran (2019) found out that the least developed skills in the telecollaboration activity she conducted were listening and speaking, which the researcher underscores that such a result could be the outcome of the selected means for online communication. Since the preferred means of communication was basically relied on online written chat application, the students preferred texting to their telecollaborative partners and as a result, an improvement in reading and writing skills was observed. Hence, Taskıran (2019) makes it clear that the selected means for a telecollaborative activity is highly likely to influence the outcome to be yielded from the activity.

In a telecollaboration project, the participants in distantly located places gather for a shared outcome. Relying on only a single tool for communication may not be sufficient to reach all the participants at a time. Therefore, it might be good to use more than one means of communication to stay in contact with all the participants. Considering this, all the participants in the present project were requested to provide their personal phone numbers so that a group could be formed on a messaging application already set up on the participants' smart or mobile phones, *WhatsApp*. This enabled the researcher to reach and communicate with the participants quickly. Besides this application, an educational platform, *Eliademy*, was used for acknowledging the participants about the following sessions, getting their reflection papers, and enabling them to write their comments on the pre-discussion topics.

Meeting the Institutional Requirements

After deciding the institutions where the telecollaboration project will be carried out, it is particularly important to learn their requirements in detail because this will help to initiate the projects at the planned time. For instance, two different institutions were involved in the current project, which first required approval from the institutional review boards and ethics committees of the both institutions. In this process, the corresponding institute (FIU) in the present project did request to present a certificate to show the eligibility of the researchers to do research on human subjects, which was not a necessity in the university in Turkey to be certified.

The researchers who intend to do similar projects should be aware of this kind of requirements and search in detail while deciding on the institutions to be working with. The approval is unlikely to be received from the Review Boards of both institutions concurrently. Therefore, before the projects commence, such factors should be searched in detail, and the requirements are to be fulfilled. What documents are to be prepared while applying to the board and how long it takes to get the approval are to be considered beforehand. This is especially important to give a start to the projects at the time as planned. Otherwise, the project has to be started with a time delay, and this will make the researchers start over all the preparations of the project.

The procedures followed in the current research were in compliance with the ethical standards of the institutional review boards of both universities. The Social and Behavioral Institutional Review Board of FIU approved the research on 04/05/17 with 105533 reference number. The Ethics Committee approval from the Turkish University

numbered as 55853172/433-173 was obtained on 12.01.2017. After the approval procures were completed, the recruitment process was given a start.

Piloting the Procedures

The lack of technical knowledge or practice might result in some unexpected delays, even a detrimental effect on the participants' enthusiasm to carry out the projects. Fondo and Jacobetty (2020) underscore that interaction in online settings is likely to be a source of anxiety. Hence, the individuals who are involved in online interaction are to know how the technologies they would use work so that they can have an understanding of how much they are required to wait for the response in communication, how to react when their speeches overlap. Piloting is vital in research since it enables the researchers to see if the idea will work, eliminate the problems, and save time while carrying out research (Bonyton, 2005). Therefore, piloting the procedures with the online means of communication in the telecollaboration project might give first-hand experience and a comprehensive understanding of the possible problems which could happen after the project starts.

In the current study, all the means of communication were piloted using the same tasks to be involved in the actual project. Four language learners who did not take part in the real project, but had similar language proficiency levels and profiles with the participants in the real project volunteered to take part in the piloting sessions. In total, three rehearsal sessions were held in three weeks, and they provided with valuable knowledge and understanding of the possible handicaps the participants could encounter during the project. Also, the piloting procedures helped to figure out the time necessary to be allocated for each session, the number of the tasks to be given in each session, and the possible technical problems which the participants could have while performing the tasks or using the means of communication. Therefore, piloting all the procedures is vitally important for success in telecollaboration projects.

Recruiting the Participants

While recruiting the participants, knowing their profiles and explaining the contribution along with the requirements of the projects beforehand are crucial. In this way, the participants could comprehend the possible contribution of the project to their language learning process.

In the recruitment of the participants, the presence of a contact person who knows the school and general culture of the participants in the corresponding institute builds the credibility for the projects and also, eases the process as the contact with the foreign participants becomes easier and much more effective.

In the current study, the participants with whom the Turkish participants were partnered were native speakers or non-native speakers of English. These participants did not have the same motivation as the Turkish participants who were learning English as a foreign language and willing to improve their language skills together with their intercultural awareness. In addition, the participants were not given any credits or extra rewards for their participation in the study. Therefore, recruiting highly motivated participants was very important since; otherwise, the participants could end their participation in the project, which would mount the challenge to come to an end in this project.

Also, the researchers who would like to perform similar projects are to pay attention particularly to the number of participants to be recruited. In the project mentioned in this paper, it was experienced before the project started that a few recruited participants from the Turkish and foreign groups stated that they wanted to withdraw from the study for personal reasons. Therefore, in such projects, it might be good to recruit more participants than planned in case that some problems could occur, and some participants might have to withdraw from the project before it starts or while it is being performed.

Establishing Rules and Adhering to Them

It is recommended that certain rules ought to be established in order to proceed effectively in a telecollaboration project. Three rules adhered in the current project were based on the time bound to which the participants had to pay attention while submitting their reflection papers, the participants' attendance at the sessions, and the respect they had to show each other.

The present study required the participants to write their reflections on the sessions before the new session began. It was necessary to collect the participants' feedback accurately and reliably on time because if not, the participants might be unable to remember the difficulties or strengths of the sessions. For this purpose, the participants were informed that they had a time limit for submitting their reflection papers. No sanctions were announced to impose, but the participants agreed to join the research knowing that this was a requirement from the beginning of the project.

Another problem during a telecollaboration project might arise due to the irregular attendance of the participants. However, it is for sure that this may be prevented when clear rules are set out. The participants are precisely acknowledged about the importance of their participation at the beginning of the project. For instance, in the present study, all the participants were informed about the rules before the project started. They knew that it was required to participate in all the sessions. When they were not able to attend a session for any reasons, they were requested to acknowledge their partners and also the researcher beforehand.

In telecollaboration projects, people from different cultures come across, and a misunderstanding is likely to arise because of the deep sensitivity which a participant may show to a cultural issue discussed in a session, and the participants may be involved in an argument with each other, which would affect the project negatively leading to a detrimental effect on the other participants in the project. Therefore, the educators' close control of participants' exchanges and dialogues to resolve any misunderstanding is necessary (Chun, 2015). In the present project, the participants did not have such a negative experience. However, it should be underscored that in order not to get into such troubles, the researcher of the project attended all the sessions personally. Also, at the beginning of the project, all the participants were informed about the necessity of being respectful for others and their ideas in the project and not being involved in an argument with one another. They were requested to notify the researcher personally in case that they were disturbed by an event, action, during their involvement in the project.

Running the Sessions

While the participants were being recruited into the project, their personal telephone numbers were requested to communicate with the participants effectively and instantly. Thus, an instant messaging group on *WhatsApp* was formed, and the Turkish and Foreign participants were invited to the group. Throughout the research, the messaging group was actively used to acknowledge the participants about the situations regarding the research on short notice. For example, the call for the session was made using this message board rapidly. Sometimes it became the case that one participant was late for the session; at such times, s/he expressed her/ his excuse using the instant messaging group. In this way, the contact with the participants was established by the researcher easily.

When the participants convened in the sessions, expecting to establish effective communication between the participants would be unrealistic especially at the first sessions of the project in which the participants did not know each other. O'Dowd (2011) underscores that the educators who organize telecollaboration projects play a prominent role in helping learners to make the most of such projects. Therefore, the researcher or the person who carries out the project undertakes a big responsibility as an initiator of the sessions. In the current project, the researcher joined each session personally, and when the number of the groups is taken into consideration, it is evident that the researcher was to attend three sessions each week. The effect of this situation is two-sided. On one side, it positively affected the research process since the participants could have been given avid interest and the continuity of the contact with the participants, and the attendance in the sessions could have been ensured. On the other side, having more than one session with only one researcher posed a challenge in the project for the educator or researcher because participating in all the sessions and taking all the burden of a project was admittedly tiring. Therefore, involving more than one researcher in the project would have helped the process to be handled more effectively and with less difficulty.

The arrangement of the sessions is also another challenge. In the current study, the participants from different groups were brought together in sessions on *Google Hangouts* for synchronous online communication, which is eligible for small group communication (up to 10 participants). Each week sessions were required to be arranged so that both Turkish and Foreign participants could meet online. Because the participants were readily university students who had a busy schedule in their schools, it was aimed that the participation in the project should not lead the participants to struggle under extra burden with the project. For this purpose, the participants were given a chance to choose the day of the week and the time slot when they would like to take part in the session. As a result, three days with three different time slots could have been arranged. Its advantage is that in the projects, the time length of which is relatively long as in the research discussed here, the participants are likely to quit participating with or without showing any reasons, yet when they are presented a choice to attend a session at a time which will not make their schedules busier, they could comfortably attend the sessions.

A researcher intending to carry out a telecollaboration project would possibly grapple with a difficulty related to time zone differences of the locations where the participants engage in the project. Çiftçi (2016) explains that most of the studies on

telecollaboration projects are mostly based on asynchronous online communication between the participants and involve very few synchronous communication sessions. As different from those studies, the present research basically relied on the participants' synchronous communication with each other, which meant the participants attended the sessions simultaneously. Considering that the participants were joining the online sessions from Turkey and the USA, and the time difference between these two locations was seven-hours, careful planning was required to arrange a schedule for the sessions. For this, the participants were asked about their preferences in the time slots they could join the sessions, and depending on their choices the alternative time slots were created.

Conclusion

In places where English is taught as a foreign language, and the language learners rarely have an opportunity to speak the target language on authentic terms outside the classroom, the language learning process and the learners' communication skills are negatively affected. However, it is evident in the literature and shown in the current study that telecollaboration projects close that gap. Thanks to advances in technology, language learners can meet other English speakers and communicate with them using written and verbal communication.

There is no doubt that developing technological competences is highlighted as a basic requirement in the modern world, which is under the effect of globalization and high technological advances. Besides, how technology has become an integral part of education has been witnessed recently. The sudden and unexpected outbreak of the pandemic, the Covid 19, has urged a shift from face-to-face instruction to online instruction, which caused educators to change their ideas regarding teaching and develop their competence and literacy of technology for an effective online teaching (Gao & Zhang, 2020). Even though the sudden change with the pandemic outbreak has brought a bunch of challenges for education system, it has offered a chance for a bigger number of students to meet online education, which has the potential to change how learners think about the online education and will lead to an increase in adoption of online education even after the pandemic (Xie, Siau, & Nah 2020). CMC has provided with support to continue the interaction in online learning especially by means of digital platforms assisting the learners and educators for delivery of the instruction and the material and the communication in learning (Marani, Subarkah, & Wijaya, 2020). The online teaching via digital platforms has enabled learners and educators to interact synchronously without any boundaries of time and place (Xie et al, 2020). They have even had a chance of asynchronous education, which gave flexibility for the schedules or the opportunity for the students to progress at their own pace (Xie et al., 2020). As a result, it is possible to speculate that the pandemic might change our traditional education understanding and make online education and CMC an indispensable part of education.

Being creative, thinking in a critical way, communicating and being able to work in an effective and respectful way with other people are the skills which are essential to develop in the 21st century, and teachers take on the responsibility to help learners to equip with these required skills (Cretu, 2016). Therefore, it is fundamental to integrate technology into learning and teaching environments since this will help educators to attract and hold learners' attention to the subject, also to develop their

critical thinking skills and creativity (Barreto, 2018). Additionally, the use of technology will foster students' collaboration and autonomy in the classroom. Also, the use of technology brings novelty to the learning, in which the learners take a central role in his/her learning experience; as a result, motivation increases and learning is boosted in the classroom (Tavakoli, Lofti, & Biria, 2019). Tavakoli et al. (2019) stress that technology-enhanced learning makes learners more comfortable or less nervous in their communication with other people; they are not beset by the worry of making mistakes or errors.

Considering all the great potential of technology in learning programs, it remains imperative to encourage its integration into learning and teaching processes. Thus, the learners will catch up with the needs of the globalized world, and the educators contribute to the development of competences which learners are supposed to possess. Engeness (2021) stresses that in the 21st century, teachers require to be equipped the ability to employ educational technologies and design the digital settings in order to fulfill the students' requirements, which is because the students in this century are exposed to the technology in their daily life, and they expect to get the same level of technology in their education as well. Hence, the teachers undertake the responsibility for cultivating digitally informed and agentic lifelong learners (Engeness, 2021). Telecollaboration or with its broader name, computer-mediated communication, provides learners with new perspectives helping them to engage in communication with people from different nations and cultures.

This paper has presented the reflections from a telecollaboration project which took eight weeks in total and provided the practitioners with its significant advantages. The primary concern of the present project was to investigate the impact of the telecollaboration on the participants' ICC. The findings unveiled that the project strengthened the participants' motivation to use the target language with people whose mother tongues were different from theirs, increasing their intercultural awareness, knowledge, and intercultural and language skills and positively affecting their attitudes towards people from other cultures. In this way, the project provided the participants with invaluable benefits and can be considered as a real blessing; on the other hand, it should not be regarded as an easy process. The process could have entailed different kinds of problems such as non-attending participants, wrong choice of communication means, poorly designed tasks, ineffectively planned activities, technological problems etc. However, they were managed to be prevented with special care with the whole process from beginning to the end. Drawing conclusions from the experiences in the research mentioned here, this paper has aimed to give information regarding the actions or activities which the practitioners should or should not perform so that they can make the most of such telecollaboration projects.

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Impact of Creative Drama Method on Students' Speaking Skills*

Yaratıcı Drama Yönteminin Öğrencilerin Konuşma Becerileri Üzerindeki Etkisi

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ABSTRACT: Aim of the research was to investigate the impact of creative method on improving students' speaking skills in primary school 3rd grade Turkish language course. The study was carried out with primary school 3rd graders studying at a private primary school in Çaycuma, Zonguldak. The research was carried out on forty-six 3rd grade students. Quasi-experimental design with pretest-posttest control group was used in the study. Speaking education was given using creative drama method in the experimental group and using current instructional program (traditional teaching method) in the control group. In the study, "Speaking Skill Assessment Rubric" developed by the researcher was employed as data collection instrument. Intervention lasted for six weeks. Shapiro-Wilk normality test was employed to determine whether the data showed normal distribution or not. The data were analyzed via SPSS package program version 20.0. Arithmetic mean, standard deviation and t test was calculated in data analysis. As a result of the study, a significant difference was observed between speaking skills of the students in the experimental group and the ones in the control group; the difference was in favor of the experimental group.

Keywords: Speaking skill, creative drama method, Turkish language course.

ÖZ: Araştırmanın amacı ilkokul 3. Sınıf Türkçe dersinde yaratıcı drama yönteminin öğrencilerin konuşma becerilerini geliştirmeye etkisini incelemektir. Araştırma Zonguldak ili Çaycuma ilçesindeki özel bir ilkokulda 3. sınıf öğrencileri üzerinde yapılmıştır. Araştırma 3. sınıfta öğrenim gören 46 öğrenci ile yürütülmüştür. Araştırmada ön test- son test kontrol gruplu yarı deneysel desen model kullanılmıştır. Deney grubundaki öğrencilere yaratıcı drama yöntemi ile kontrol grubundaki öğrencilere ise mevcut öğretim programı ile (geleneksel öğretim yöntemiyle) konuşma eğitimi verilmiştir. Veri toplama aracı olarak araştırmacı tarafından geliştirilen "Konuşma Becerilerini Değerlendirme Formu" kullanılmıştır. Uygulama 6 haftada gerçekleştirilmiştir. Verilerin normal dağılım gösterip göstermediği Shapiro-Wilk normallik testi ile belirlenmiştir. Veriler SPSS 20.0 paket programına göre analiz edilmiştir. Verilerin analizinde istatistiksel işlemlerden aritmetik ortalama, standart sapma ve t testi kullanılmıştır. Araştırma sonucunda deney grubundaki öğrencilerin konuşma becerileri ile kontrol grubundaki öğrencilerin konuşma becerileri arasında anlamlı bir farklılık olduğu, bu farklılığın deney grubu lehine olduğu tespit edilmiştir. Buna göre yaratıcı drama yöntemi ile yapılan konuşma eğitiminin öğrencilerin konuşma becerilerine olumlu yönde etki ettiği sonucuna ulaşılmıştır.

Anahtar kelimeler: Konuşma becerisi, yaratıcı drama yöntemi, Türkçe dersi.

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One of the instructional areas in Turkish is speaking. When compared to the other skills, speaking skill comes after listening skill. Hunsaker (1990) individuals acquire approximately 80% of what they learn through listening. From the most used to the least used, the learning areas are listening, speaking, reading, and writing (Akyol, 2006). It is a learning skill which is frequently used in our lifetime. Speaking is the basic instrument for humans to communicate with each other.

Speaking means conveying feelings, thoughts and wishes to the person you face both visually and aurally (Taşer, 2015). Speaking, according to another definition, is a process carried out by designing feelings, thoughts, designs and requests mentally and expressing them (Akkaya, 2012). There are various reasons for speaking.

Doğan (2009, p. 186-187) explained some of these reasons as follows:

- to gain a place in society by regulating social relationship,
- to express himself/herself to the people around him/her clearly and properly,
- to give information on any topics,
- to explain his/her feelings, thoughts, and ideas.

According to the studies conducted, speaking skill is the most preferred language skill following listening. Therefore, speaking education should be implemented meticulously and have a permanent impact (Demir, 2010). Speaking is the most natural and the most frequently used linguistic skill. Individuals who lack speaking skills cannot communicate well with society. Being successful in life is quite difficult for these people. Thus, necessary attention should be paid to improving speaking skills in mother tongue education, and students should be given adequate opportunity to practice it (Özbay, 2005).

Moreover, speaking skill has a very important place in every field of life. Thus, individuals need to learn to speak accurately for a developed society, and students need to be raised as good speakers. Students who are successful, social, and can communicate easily with other people have improved speaking skills (Arslan, 2010). The purpose of speaking skill was defined in 2015 Turkish language course curriculum as follows:

1. to develop students' verbal communication, reading and writing skills,
2. to help them use Turkish correctly and carefully by obeying speaking and spelling rules,
3. to help them explain their feelings, ideas and views or thesis on a topic influentially and clearly both orally and in writing (Temizyürek, Erdem, & Temizkan, 2016, p. 215).

The explanations above show that speaking, one of the basic linguistic skills, is linked to the other linguistic skills, and it is highly important to use Turkish effectively. However, it has become one of the neglected areas in Turkish language education. Effects of this show themselves at every stage. Speaking is the most significant indicator of knowing a language entirely, and it is one of the main requirements for children to be successful. As schools prepare children for life, linguistic skills should improve their communication skills (Sağlam, 2010). Individuals are required to raise their speaking skills to the top level for healthy relationships (Bayraktar, 2012). Thus, teachers should allow the students to practice for improving their speaking skills and eliminating some problems. Students should complete their speeches before their mistakes are corrected during these practices. If teachers do not wait for students to

finish their speeches, their warnings about corrections cannot be effective, and the students, who are speaking, can get bored. Then, they may not want to speak in the following classes by hesitating that they would make the same problems (Uçgun, 2007). As Turkish course is the core of other courses, it has great importance. If the learning outcomes of this lesson are actualized, it will contribute to the other courses (Aytaş, 2008). In this regard, practices to improve speaking skills should be focused especially in Turkish courses. According to Kılıç (2008), young children speak without any certain rules before they start school. When they start school, they have already acquired specific speaking habits. A type of speaking with a local dialect acquired from families by checking customs and traditions can be created. That this situation should be fixed and that speaking should be under certain rules need to be taught to the students in the school setting.

As speaking is learnt spontaneously, incorrect and improper styles of speaking can also be learnt. Therefore, speaking is to be taught at schools under the guidance of a teacher and within the frame of a syllabus (Demirel, 2012, p. 46). Creative drama method can be employed to improve speaking skills of the students. Specifically, primary school children are eager to do drama because of their characteristics. In this method, special attention is paid to the characteristics of students. According to Akyol (2015, p. 37), primary school children, especially 6-year-old ones, are eager to do drama. Hence, this characteristic of primary school children ought to be considered to improve their speaking skills.

Creative drama method is people's acting out or interpreting an experience or an event by embedding their own experiences into the process in a group work (Adıgüzel, 2006). Game lies at the core of creative drama method. It changes students from passive into active, and an active learner is a faster learner (Aytaş, 2008). Drama is one of the most effective methods to be used in language education since it provides learning by doing experiencing with a practical instructional method (Maden, 2011).

Creative drama is a way of acting out events by naturally reacting to a new situation encountered by interpreting the current situation using prior knowledge under the guidance of a leader. Creative drama occurs when the group members reflect on the events they think through improvisation with the leader's guidance. The leader shows the members how to express their ideas in dramatic ways. Creative drama has many social, cultural, and educational benefits for students (Kadan, 2013).

Several studies have revealed that creative drama is effective on improving speaking skill (Balaban, 2019; Galante & Thomson, 2017; Gökçearslan-Çiftçi & Altınova, 2017; Göktürk, Çalışkan, & Öztürk, 2020; Kuimoval, Uzunboylu, Startseval, & Devyatoval, 2016; Pishkar, Moeinzadeh, & Dabaghi, 2017). Creative drama is not just effective in improving speaking skills. It is also effective in fostering entrepreneurial skill, problem-solving skill, fluent-thinking skill, social skill, foreign language teaching, mathematics teaching, teaching basic ecological concepts, science teaching, gaining basic linguistic skills and comprehension skill (Akbayrak, 2019; Aktepe & Bulut, 2014; Aykaç & Adıgüzel, 2011; Bailey & Watson, 1998; Bergil, 2010; Çelik & Buluç, 2018; Değirmenci, 2020; Dupont, 1992; Kaf, 2000; Kahyaoğlu, Yavuzer, & Aydede, 2010; Karakelle, 2009; Kaya-Güler, 2008; Öztürk & Sarı, 2018; Saraç, 2007; Yeşilyurt, 2011).

Self-expression in creative drama promotes self-confidence (Rowland, 2002). Thus, creative drama is a method used in various fields of instruction. Creative drama method consists of three steps which are as follows:

1. Warm-up / Preparation Step: This step explains the following features:

- This step is often determined by the leader. Introvert studies are implemented in this step.
- Gestures are used, and it is aimed to create a background of the group.
- It is a preparation for the next step.
- Familiar or reproduced kid games can efficiently be used for group interaction or communication within the group in this step. Playing games is preferred.
- Role-playing or improvisation is applied as introductory (Tutuman, 2011, p. 29).

The purpose of this step is to relieve participants and providing them an environment for recognizing themselves and communicating with each other. Thus, the feeling of confidence and harmony is triggered (Adıgüzel, 1994). Games in the preparation step are essential for students' active participation in the acting step (Üstündağ, 1998).

2. Acting Step: Features of this step are as follows:

- Improvisation, role-playing, and other techniques can be used in this step, known as the starting point of acting.
- All the things experienced and shared and evaluations are actualized based on acting in this step, on the results of it and on its personal impact.
- Acting can be both individual and in small or large groups (Tutuman, 2011, p. 29).

This is the step during which role-play is highly applied. This step can be implemented as individual work, pair work, or group work (Adıgüzel, 2019).

3. Evaluation Step: The followings are the features of the evaluation step:

- This is the step in which results obtained from drama studies are evaluated.
- In general, it is the step in which learning outcomes are expected to be given to students or the results revealed are discussed (Tutuman, 2011).

During this step, educational outcomes and results are discussed and assessed (Adıgüzel, 2019). It was found in the course of "Improvement and Learning" that drama method affected students' skills of doing and conducting work in a group, of starting and maintaining a connection, and of self-control (Kara & Çam, 2007). According to Keyik (2011), creative drama requires students not to be passive but a participant. This is because of the fact that with the help of drama, individuals develop self-confidence (Gönen, 1999; Ulubey, 2015) and self-respect, explore their knowledge, and prepare themselves for different situations they may encounter in their lives by gaining the skill of independent decision-making. According to Sağırlı and Gürdal (2002), teachers ought to know well the methods and techniques which can help students learn by doing and experiencing to make Turkish lessons more manageable and more understandable. Drama is a method to be used for ensuring learning by doing and experiencing as well. Moreover, students who are introverted or passive can get social through drama. Language learning settings need to be appropriate for a natural living environment. Language teaching and knowledge, skills and rules inherent in a language should

naturally be appropriate (Hamilton & Mcleod, 1993, p. 7; as cited in Maden, 2011).

Today, the education and training process adopts active students and leading teachers. Teachers should not be the ones to make speeches during activities in classrooms; students should be active. Teachers should encourage the ones that are shy to overcome their speaking anxiety, and they should motivate students to speak. Primary school Turkish lessons should be organized in a way to ensure that students can actively take part in classes, and students should be given an opportunity to speak, discuss and comment on the activities (Sallabaş, 2011, p. 124).

Our age prompts individuals to keep in touch more than ever. In such an environment, using language effectively can enable individuals to communicate better and be entrepreneurs. In this regard, children need to have good speaking skills from an early age. It should be given special importance to improve students' speaking skills starting from primary school. Shy children, who cannot express themselves well, can behave the same when they become adults. The most suitable subject to promote children's speaking skills is Turkish. In this respect, teachers should give more importance to improve students' speaking skills in Turkish course.

Creative drama method is highly effective in improving students' speaking skills. There have been several studies revealing that creative drama method helps improve speaking skill (Balaban, 2019; Galante & Thomson, 2017; Gökçearslan-Çiftçi & Altınova, 2017; Göktürk et al., 2020; Kuimoval et al., 2016; Pishkar et al., 2017).

On the other hand, people need to have the skill of speaking well to speak effectively and smoothly. Various methods and teaching techniques can be applied for gaining this skill. In this regard, the impact of creative drama method on improving students' speaking skills in primary school 3rd grade Turkish course was investigated in the current study.

Aim of the Study

The aim of the research was to investigate the possible impact of creative drama method on the improvement of students' speaking skills in primary school 3rd grade Turkish course. The following questions were tried to be answered to reach this general aim:

1. Are there any significant differences between pretest scores of the experimental group students on whom creative drama method was applied and the ones in the control group on whom current instructional program was employed?
2. Are there any significant differences between pretest scores of the experimental group students on whom creative drama method was applied and the ones in the control group on whom current instructional program was employed?
   2. a. Are there any significant differences between average scores received from "Beginning of Speech" sub-component of the Speaking Skill Assessment Rubric by the experimental and the control groups?
   2. b. Are there any significant differences between average scores received from "Linguistic Skills" sub-component of the Speaking Skill Assessment Rubric by the experimental and control groups?

2. c. Are there any significant differences between average scores received from "Sound and Body Language" sub-component of the Speaking Skill Assessment Rubric by the experimental and control groups?

3. Are there any significant differences between pretest and post-test scores of the experimental group students on whom creative drama method was applied and the ones in the control group on whom current instructional program was employed?

Method

Model of the Research

Quasi-experimental model with a pretest-posttest control group was employed in the research. This model provides great statistical potential to the researcher about testing the effect of intervention on dependent variable, and helps interpretation of findings obtained within the context of cause and effect (Büyüköztürk, 2011). Hence, quasi-experimental model was preferred in the study. Depending on the pretest result, the two classes having similar results were randomly assigned - one as the experimental group and the other as the control group. Speaking education was given using creative drama method in the experimental group and current instructional program in the control group.

Study Group of the Research

The study group of the research consisted of 46 students selected among the 3rd graders studying in a private primary school located in Çaycuma, Zonguldak. The study group was created through an easily accessible sampling method in accordance with the aim of the research.

Easily accessible sampling is a method that fastens and eases research when some problems related to time and expense exist, and it is a sampling method in which people close and convenient to the researcher are selected (Yıldırım & Şimşek, 2013). Distribution of the students in the experimental and control groups by gender was shown in Table 1.

Table 1

Distribution of the Students in the Experimental and Control Groups by Gender

Gender	Experimental Group		Control group		Total	
	n	%	*n*	%	*n*	%
Female	17	73.9	11	47.9	28	60.8
Male	6	26.1	12	52.1	18	39.1
Total	23	100	23	100	46	100

Data Collection Tools

The study group was randomly created with two groups 3-A and 3-B classrooms. Twenty-three students were included in the experimental and control groups. Training related to speaking skills was given through creative drama method in the experimental group and current instructional program (traditional teaching method) in the control group. "Speaking Skill Assessment Rubric" was used in order to gauge speaking skills of the students. This rubric consists of 24 items. The researcher developed the mentioned rubric following a search about learning outcomes of oral communication in the 3rd grade Turkish course and related literature. The experts in the department of elementary and early childhood education at Bartın University were asked to express their opinions about the rubric.

The questions to be used in improvement of speaking skills were prepared on the theme of "Health and Environment" existing in learning outcomes and texts in the 3rd grade Turkish course book. The student to make a speech started to speak by drawing lots among questions. The students' speeches were recorded through a camera, and these recordings were used during data analysis. Finally, speaking skills of the students were assessed based on "Speaking Skill Assessment Rubric". Pretest – post-test assessment process lasted for two weeks. The students in the experimental group were taught through creative drama method on the theme of "Health and Environment" for four weeks (32 hours in total). However, the students in the control group were taught based on the current instructional program. The research period was six weeks. "Speaking Skill Assessment Rubric" developed by the researcher was used as the data collection tool.

Speaking Skill Assessment Rubric (SSAR)

To develop the rubric, questions related to extempore speech among learning outcomes about speaking skill in Primary Schools Turkish Language Curriculum and Guide, a rubric was developed with reference to the scoring rubric included in the curriculum. The final version of the rubric contained three components upon assessment of three subject area experts. Speaking items were classified into three components which are "Beginning of Speech", "Linguistic Skills" and "Sound and Body Language". There were seven items in the component of "Beginning of Speech", ten items in the component of "Linguistic Skills" and seven items in the component of "Sound and Body Language" (24 items in total). As the highest point to be received from each item was 5, the highest score to be received from the rubric was 130. Sum scores were calculated after assessment, and they were converted into a hundred system.

Firstly, speaking skill observation and assessment forms in the literature (Aykaç, 2011; Bulut, 2015; Erdem, 2012; Gürhan, 2013; Kartallıoğlu, 2015; Maden, 2010; Orhan, 2010; Öztürk, 1997; Sallabaş, 2011; Sargın, 2006; Temizkan & Atasoy, 2016; Yüceer, 2014) developed to gauge speaking skill were studied before developing the current rubric. Measuring instruments on speaking skill vary in terms of both naming and sub-components of the skill. While names such as verbal communication observation form, speaking skill observation form and speaking skill rubric are preferred in naming, names such as speaking order, language awareness and psychological condition of the speaker (Sargın, 2006); organization, content, the general situation of presentation, language use, speaking aesthetic, body language and material

support (Akyol, 2015) are used as sub-components. Sub-components of the rubric which are "Beginning of Speech", "Linguistic Skills" and "Sound and Body Language" used in this study were developed by regarding "Speaking Skill Assessment Form" in Turkish Language course curriculum of Turkish Ministry of Education (2006) and "Peer Evaluation Form for Speaking Skill" developed by Temizkan (2009).

Four academics working at Bartın University Faculty of Education on Turkish language education were asked to express their opinions on the draft rubric for ensuring validity. The items in the draft were evaluated in terms of features such as content, clearness of expression, comprehensibility, and attribute to be measured. Based on the experts' views, 3 of the items were removed, and five items were revised in accordance with the aim of the rubric. Thus, the rubric was finalized with 24 items in total in the sub-components of "Beginning of Speech", "Linguistic Skills" and "Sound and Body Language". As the highest score is 5, the highest score to be obtained from the scale is 130. After evaluation, the total scores were calculated and converted into the hundred system. SSAR was scored according to the rubric scoring system as follows:

Completely unobserved = 1 point, Unobserved = 2 points, Partially observed = 3 points, Observed = 4 points, Completely observed = 5 points.

Pretest-Posttest Questions

In order to assess speaking skills of the students, they were asked to speak off-the-cuff. Impromptu speech topics were determined based on the subjects that the students discussed previously. Accordingly, 53 questions – 25 as pretest and 28 as post-test – were prepared by benefitting from primary school 3rd grade Turkish language course guidebook for teachers. Experts were asked to express their opinions on the questions. The prepared questions were put in a box, and the students were asked to pick one randomly. While each student was speaking about the question he/she selected, the others were asked to listen to him/her. Speaking of the students both in the experimental and control groups was assessed using SSAR.

Empirical Process

In the study, an experimental group and a control group were generated. A pretest including 25 questions was used to gauge speaking skills of the experimental and control groups. According to the pretest results, both of the groups were equal. The students' speaking skills were assessed using "Speaking Skill Assessment Rubric".

Speaking education was given using creative drama method in the experimental group and using current instructional program for four weeks. The intervention lasted for 32 hours – 8 hours per week. The theme of "Health and Environment" from primary school Turkish language course book was determined for speaking education with creative drama. Eleven drama topics about this theme were prepared by the researcher. These topics were battery, tree, paper, fruit tree, noise, plastic waste, glass waste, smoke, waste oil, perfume and deodorant, and moldy bread. Pictures and scenes were prepared to be used in creative drama about this topic. Roles determined for each topic were distributed to the students by the researcher. The students performed their own roles by considering three steps of the creative drama (warm-up – presentation, acting, and evaluation). These activities went on during the empirical process. At the end of four-weeks of speaking education, a post-test consisting of 28 questions was

implemented to assess the experimental and control groups' speaking skills. Speaking skills of the both groups were compared. The intervention lasted for 6 weeks – 2 weeks for pre and post assessment and 4 weeks for intervention.

Data Analysis

Firstly, the speaking process was discussed with the students in order to determine pretest results of the students in the experimental and control groups. Next, the questions created by benefitting from the 3rd grade Turkish language teacher's guide were asked to each student. The students answered the questions by drawing lots from a box randomly. Each student was given a chance to speak on different topics in an attempt to prevent them from being affected by the other students. Speeches of the students were recorded by a video camera. The recorded speeches were assessed according to the speaking skill assessment form. Arithmetic mean, percentage, standard deviation, normality test, dependent and independent groups t-test were employed for data analysis. The data obtained were given in tables. Normality test results related to the pretest and post-test scores of the students in the experimental and control groups were shown in Table 2.

Table 2

Normality Test Results of the Experimental and Control Groups Before and After Intervention

Groups	Dependent Variable	Shapiro-Wilk Test		
		Statistics	*sd*	*p*
Control Group	Pretest Scores	.958	23	.329*
	Posttest Scores	.937	23	.157*
Experimental Group	Pretest Scores	.952	23	.423*
	Posttest Scores	.951	23	.301*

Normality test results in Table 2 indicated that pretest and post-test scores of the students in the experimental and control groups showed normal distribution (p>.05).

Ethical Procedures

Ethics Committee approval numbered 73005770-300-E.1897702 was obtained for the research. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee.

Results

The results related to the first sub-problem, "Are there any significant differences between pretest scores of the experimental group students on whom creative drama method was applied and of the ones in the control group on whom current instructional program was employed in improving students' speaking skills in primary school 3rd grade Turkish course?", were presented in Table 3.

Table 3

Independent Groups T-Test Results of the Students in the Experimental and Control Groups Based on the Pre-Intervention Scores They Received from SSAR

Groups	*n*	$\bar{X}$	*ss*	*sd*	*t*	*p*
Experimental	23	3.45	9.299	46	.561	.578
Control	23	3.38	9.617			

According to Table 3, there were not any significant differences between pretest scores of the experimental group and of the control group (p>.05). Accordingly, it can be claimed that the experimental and control groups were equal.

The results related to the second sub-problem, "Are there any significant differences between post-test scores of the experimental group students on whom creative drama method was applied and of the ones in the control group on whom current instructional program was employed in improving students' speaking skills in primary school 3rd grade Turkish course?", were given in Table 4.

Table 4

Independent Groups T-Test Results of the Students in the Experimental and Control Groups Based on the Post-Intervention Scores They Received from SSAR

Groups	*n*	$\bar{X}$	*ss*	*sd*	*t*	*p*
Experimental	23	3.56	9.351	46	6.914	.000*
Control	23	2.92	5.024			

It can be deduced from Table 4 that there was a significant difference between SSAR post-test mean scores of the students in the experimental group and the ones in the control group (p<.05). The difference was in favor of the experimental group ($\bar{X}$ experimental=3.56, $\bar{X}$ control=2.92). Thus, it can be suggested that speaking skills of the students in the experimental group on whom lessons were taught through creative drama were better than those of the students in the control group.

The results related to the first sub-component – "Beginning of Speech" – of the second sub-problem were shown in Table 5.

Table 5

Independent Groups Post-Intervention T-Test Results of the Experimental and Control Groups Related to the Sub-Component of "Beginning of Speech"

Groups	*n*	$\bar{X}$	*ss*	*sd*	*t*	*p*
Experimental	23	3.87	2.668	46	7.825	.000*
Control	23	3.00	2.645			

Table 5 indicated that there was a significant difference between post-test mean scores that experimental group students received from "Beginning of Speech" sub-component and that the control group students received from the same sub-component (p<.05). Furthermore, the difference was in favor of the experimental group ($\bar{X}$ experimental=3.87, $\bar{X}$ control=3.00).

The results related to the second sub-component – "Linguistic Skills" – of the second sub-problem were given in Table 6.

Table 6

Independent Groups Post-Intervention T-Test Results of the Experimental and Control Groups Related to the Sub-Component of "Linguistic Skills"

Groups	*n*	$\bar{X}$	*ss*	*sd*	*t*	*p*
Experimental	23	3.43	4.271	46	5.023	.000*
Control	23	2.89	2.946			

It was revealed in Table 6 that there was a significant difference between post-test mean scores that experimental group students received from "Linguistic Skills" sub-component and that the control group students received from the same sub-component (p<.05). The mean scores showed that the difference was in favor of the former group ($\bar{X}$ experimental=3.43, $\bar{X}$ control=2.89).

The results related to the third sub-component – "Sound and Body Language" – of the second sub-problem were demonstrated in Table 7.

Table 7

Independent Groups Post-Intervention T-Test Results of the Experimental and Control Groups Related to the Sub-Component of "Sound and Body Language"

Groups	*n*	$\bar{X}$	*ss*	*sd*	*t*	*p*
Experimental	23	3.42	4.395	46	3.478	.010*
Control	23	2.88	2.696			

As it can be understood from Table 7, there was a significant difference between post-test mean scores that experimental group students received from "Sound and Body Language" sub-component and that the control group students received from the same sub-component (p<.05). Moreover, this difference was in favor of the experimental group ($\bar{X}$ experimental=3.42, $\bar{X}$ control=2.88).

The results related to the third sub-problem, "Are there any significant differences between pretest and post-test scores of the experimental group students on whom creative drama method was applied and of the ones in the control group on whom current instructional program was employed in improving students' speaking skills in primary school 3rd grade Turkish course?", were presented in Table 8.

Table 8

Dependent Groups T-Test Results Related to the Pretest-Posttest Scores Received from SSAR by the Students in the Experimental Group

Experimental Group	*n*	$\bar{X}$	*ss*	*sd*	*t*	*p*
Pretest Score	23	3.45	9.299	46	5.558	.000*
Posttest Score	23	3.56	9.351			

It was concluded from Table 8 that there was a significant difference between pretest and post-test scores of the students in the experimental group (t=5.558; p<.05; p<.01). This difference was in favor of their post-test scores ($\bar{X}$=3.56). Thus, it can be suggested that creative drama method was efficient in improving the speaking skills of the students.

Table 9

Dependent Groups T-Test Results Related to the Pretest-Posttest Scores Received from SSAR by the Students in the Control Group

Control Group	*n*	$\bar{X}$	*ss*	*sd*	*t*	*p*
Pretest Score	23	3.38	9.617	46	-7.190	.000*
Posttest Score	23	2.92	5.024			

Finally, it was deduced from Table 9 that there was a significant difference between pretest and post-test scores of the students in the control group as well (t=-7.190; p<.05; p<.01).

Discussion and Conclusion

As a result of the study, instruction through creative drama method was found to be effective in improving speaking skills of primary school third graders. When speaking skills of the students in the experimental group on whom creative drama method was applied and the ones in the control group on whom current instructional program (traditional teaching method) was employed were compared, a significant difference was observed in favor of the ones in the experimental group.

The findings obtained in the current study are similar to the findings of the previous studies on this topic. Results of not only the current study but also several other studies in this area (Balaban, 2019; Corbett et al., 2011; Çakır, 2008; Çifçi, 2001; De La Cruz, 1995; Dibek, 2003; Eldeniz-Çetin & Avcıoğlu, 2010; Flennoy, 1992; Galante & Thomson, 2017; Gökçearslan-Çiftçi & Altınova, 2017; Göktürk et al., 2020; Kardash & Wright, 1987; Kassab, 1984; Kılıç & Tuncel, 2009; Kuimoval et al., 2016; Pishkar et al., 2017; Saraç, 2007; Shulz, Carpenter, & Turnball, 1991; Warger, 1983) suggested that creative drama method contributed to improve students' speaking skills. Gestures and facial expressions are crucial for conveying messages to be given while speaking because they help messages to be perceived by the receiver. Body language is employed in creative drama method as well, contributing to the development of speaking skills. On the other hand, especially primary school students are disposed to do drama. It is necessary to make use of this willingness in improving their speaking skill.

In addition, a large number of studies have revealed that creative drama can improve writing skill, entrepreneurial ability, problem-solving skill, teaching of artistic movements, fluent thinking skill, social skills, mathematics teaching, teaching of basic ecological concepts, science teaching, main linguistic skills, comprehension skill and foreign language teaching (Akbayrak, 2019; Aktepe & Bulut, 2014; Aykaç & Adıgüzel, 2011; Bailey & Watson, 1998; Bergil, 2010; Çelik & Buluç, 2018; Değirmenci, 2020; Duman-Yegen, 2019; Dupont, 1992; Kadan, 2013; Kaf, 2000; Kahyaoğlu et al., 2010; Karakelle, 2009; Kaya-Güler, 2008; Önalan, 2020; Saraç, 2007; Şentürk, 2020; Şentürk-Tosun, 2020; Yeşilyurt, 2011). These results have revealed that creative drama method is effective in gaining skills apart from speaking skills.

While Rosenberg (1989) revealed that creative drama method enhanced students' vocabulary, Ünsal (2005) claimed that creative drama method was effective in mastering the language and expression skills. In another study, it was emphasized by Robbie (1997) that using creative drama method in foreign language teaching had improved written expression skills of the students. Additionally, creative drama method was found to be efficient in the area of language education (Aldağ, 2010; Aynal, 1989; Çebi, 1996; Farris & Parke, 1993; Kara, 2000; Maden, 2010; O'Hara, 1997; Öztürk, 1997; Solmaz, 1997; Yılmaz, 2000). These results are similar to the results of the current study.

Furthermore, it was revealed in several studies that creative drama method had a positive impact on improvement of students' written expression skills in the course of Turkish language (Aslan, 2006; Ataman, 2006; Aykaç, 2011; Karakuş, 2000; Karateke, 2006; Kaya-Güler, 2008; Laurin, 2010). In two other studies carried out by Çelik (2015) and Ceran (2010), it was indicated that creative thinking techniques affected students' achievement positively.

Speaking skill is among the social skills, and a significant number of studies exist having suggested that creative drama method is influential in development of students' social skills (Akfırat, 2004; AnnGuli, 2004; Barnes, 1998; De La Cruz, 1995; Freeman, Sullivan, & Fulton, 2003; Gresham & Elliott, 1990; Hedahl, 1980; İpek, 1998; Kocayörük-Yaya, 2000; Miller, Rynders, & Schleien, 1993). In this sense, the findings of the current study are similar to that of previous studies.

Recommendations

In line with the research results, the following suggestions can be made:
1. Teachers should include creative drama activities to improve students' speaking skills in Turkish lessons.

2. The use of creative drama in the lessons may help the shy children participate in the lesson.

3. Creative drama activities should not be limited to Turkish lessons. Creative drama activities should be used in other lessons too.

4. This research can be repeated with prepared speech activities on different samples.

Statement of Responsibility

Özlem Öztürk-Pat; determining the conceptual framework, creating literatüre, resources, methodology, determination of sample group, scale development, determination of data collection tools data collection, analysis of data, writing - original draft, visualization, planning the research. Muamber Yılmaz; determination of problem situation, supervision of research stages, analysis of data, review and edit.

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Appendices

Appendix 1. Speaking Skill Assessment Rubric (SSAR)

Completely Unobserved(1), Unobserved(2), Partially Observed(3), Observed(4), Completely Observed(5)

Item No	A. Beginning of Speech	Completely Observed(5)	Observed (4)	Partially Observed(3)	Unobserved(2)	Completely Unobserved(1)
1	He/She speaks coherently.					
2	He/She associates his/her speech with daily life.					
3	He/She sticks to the main theme.					
4	He/She speaks by sticking to his/her mental plan.					
5	He/She speaks tenderly.					
6	He/She speaks less than necessary.					
7	He/She uses Turkish properly.					
	B. Linguistic Skills					
8	He/She uses his/her voice clearly and comprehensibly.					
9	He/She can speak before falling into repetition.					
10	He/She can speak İstanbul Turkish.					
11	He/She abstains from producing unnecessary sounds like ah, uh, um, etc. in his/her speech.					
12	He/She speaks in a suitable speaking speed rate that can be followed by the listeners.					
13	He/She uses ambiguous sentences.					
14	He/She enriches his/her speech with examples.					
15	He/She can make connections between his/her thoughts.					
16	He/She pays attention to stress and intonation.					
17	He/She can speak fluently.					
	C. Sound and Body Language					
18	He/She speaks at a tone of voice far from affectedness.					
19	He/She can make eye contact.					
20	He/She can focus on the topic he/she is talking about.					
21	He uses body language unnecessarily.					
22	He/She shows his/her emotions through appropriate tone of voice.					
23	He/She uses an audible tone of voice.					

Appendix 2. Some Sample Pretest – Posttest Questions Used in the Research

Sample Pretest Questions

- Why should we obey the school rules?
- How should we behave in public transport vehicles? Please tell.
- What should we do to prevent traffic accidents?
- What household chores do you share with your family at home?
- Do you believe that the nature is protected enough in the region you live in? Please explain.

Sample Posttest Questions

- What should we pay attention to in consuming vegetables and fruits?
- Why are there different job groups in the society?
- What do you do for embellishing the environment?
- What should we do to be healthy?
- What should we do to save street animals?

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An Investigation of Doctoral Dissertation Abstracts Written Between 2010-2017 in Turkey

Türkiye'de 2010-2017 Yıllarında Tamamlanmış Olan Doktora Tez Özetlerinin İncelenmesi

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ABSTRACT: This case study, based on qualitative research, aims to examine the doctoral dissertation abstracts written between 2010-2017. Therefore, in education, 3463 doctoral dissertations abstracts were accessed through Turkey's National Thesis Center website. The researchers developed an abstract review form. Each dissertation abstract was examined independently by two experts. Abstracts were examined by using the document analysis method. While almost all abstracts included aims and findings, most of them did not mention sample and data collection tools. However, a number of abstracts included data collection and sampling methods, and few abbreviations and references were used. The number of doctoral dissertations did not differ significantly regarding gender over the years. In conclusion, it is observed that there is insufficient information regarding dissertation abstracts, especially in method. The differences in dissertation abstracts, not only between university programs but also within universities, make it difficult to obtain an idea of the dissertations. In institutes' dissertation writing guides, the abstracts should be expressed in a new standard national template by considering the required qualifications.

Keywords: Abstract, academic writing, doctoral dissertation, education, postgraduate.

ÖZ: Nitel araştırma desenlerinden durum çalışması modelinde olan bu çalışmada 2010-2017 yılları arasında yazılan doktora tez özetlerinin incelenmesini amaçlanmıştır. Bu amaç doğrultusunda, Türkiye ulusal tez merkezi adresinden eğitim alanındaki 3463 doktora tez özetine ulaşılmıştır. Araştırmacılar tez özeti inceleme formu geliştirmiştir. Özetler doküman analizi yöntemi kullanılarak analiz edilmiştir. Her bir özet iki farklı uzman birbirlerinden bağımsız olarak incelenmiştir. Tez özetlerinin neredeyse tamamına yakınında amaç, bulgulara yer verildiği, çoğunda örneklemden ve veri toplama araçlarından bahsedilmediği görülmüştür. Bununla birlikte az sayıda tezde veri toplama ve örnekleme yöntemine yer verildiği, az sayıda kısaltma ve referans kullanıldığı görülmüştür. Yıllar içinde doktora tez sayılarının cinsiyete göre anlamlı farklılık göstermediği bulunmuştur. Sonuç olarak tez özetlerinde özellikle yöntem bilgisi eksikliği olduğu görülmektedir. Üniversiteler arasında, hatta üniversitelerin kendi içerisindeki programlardaki doktora tez özeti farklılıkları tez hakkında fikir edinilmesini zorlaştırmaktadır. Enstitülerin tez yazım kılavuzlarında, tez özetlerinin, gerekli nitelikler dikkate alınarak ulusal yeni bir şablonda ifade edilmelidir.

Anahtar kelimeler: Özet, akademik yazı, doktora tezi, eğitim, lisansüstü.

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Researchers need an abstract in an academic text as it summarizes the main focus. Most readers find the title and abstract sufficient to the article and often scan through other sections (Hall, 2013). Indeed, since they represent the elaboration of the title and the outline of the entire article, abstracts (if well-structured) provide readers detailed information about the content of the article. Abstract as a preliminary reading stage: 1) introduces the study and appeals to the reader, ultimately helping readers to decide whether to read the full text (or some of the text); 2) provides some language preparations for the text, where necessary, by mentioning the keywords and key concepts used in the article; 3) provides the outline of the article, and 4) helps to understand the purpose and text format of the authors. As a post-reading phase, abstracts help reinforce or reflect on what is being read, and readers relate the text to their knowledge and views. In this sense, research abstracts have a critical role in obtaining preliminary information about studies (Salager-Meyer, 1990).

Due to their practical functions and concise content, abstracts have been the tools used to obtain effective and fast information since the 1960s (Chan & Foo, 2001). The American National Institute of Standards (ANIS) describes an abstract as follows: "It is an abbreviated, complete representation of the content of a document, preferably prepared to be published by the author (s)" (ANIS, 1979, p. 1, as cited in Bhatia & Genre, 1993). An abstract, which is one of the parts of research, is the first part where the reader gets information about the research (Büyüköztürk, Kılıç-Çakmak, Akgün, Karadeniz, & Demirel, 2017). It should not be repetitive and should capture the general idea with the most essential and representative sentences taken from the text, and it should be as short as possible. Hovy and Lin (1999) define abstract as content produced from one or more texts, containing a significant portion of the information in the original text, and no longer than half of the original text. An abstract is an intensified representation of the research content and informative short text about the research with the most important information. Often researchers can reach only the abstract of the research. Students enrolled in the doctoral program are the researchers who have the potential to become qualified faculty members in the future of the countries and are expected to carry out the research and development activities required for the progress of the country.

Ph.D. graduates usually hold academic positions, senior positions in the bureaucracy, and specialist or executive positions in the private sector. One indication of the quality of doctoral education is the quality of a doctoral dissertation. One of the first read parts of the doctoral dissertation is the abstracts. The quality of the dissertation abstract might be evaluated as an indicator of the quality of doctoral education and the quality of the dissertation content. One of the important issues that have been considered in education research in Turkey is whether doctoral dissertation abstracts are consistent with the rules. Abstracts play an important information-sharing role (Fidel, 1986; Pinto & Lancaster, 1999; Tenopir, 1985). Thus, many researchers (Berkenkotter & Huckin, 1995; Dronberger & Kowitz, 1975) examined the role of abstracts in the process of obtaining academic knowledge acquisition. In their study, Berkenkotter and Huckin (1995) stated that scientists follow a scanning strategy to access new information and that the strategy includes title and abstract reading steps. Therefore, titles and abstracts have an important role in deciding whether to read the research. Similarly, when Dronberger and Kowitz (1975) investigated the study abstracts

published in the Education Research, they concluded that the reading rate of the abstracts is much higher compared to the reading rate of the entire study.

With the rapid increase in the world population, the education level in the world population has also been increasing in the last twenty years. There is a significant increase when considering the gross enrollment rates and higher education enrollment rates that show the ratio of the total number of the students enrolled in a certain level of education to the theoretical age group of that level of education in a given academic year. The speed and amount of this increase have been linked to the economic levels of the countries. In this sense, 1.500 of the 4.500 universities in the United States of America (USA), one of the world's leading economies, offer doctorate programs (Ph.D. Study in the USA, 2020). The number of graduates from the USA's doctorate programs increased by fifty percent during 2000-2018, and 4.5 million graduates completed these programs (U.S. Census Bureau, 2019). There was a rapid increase in the number of universities and institutes in the last decade in Turkey. With this quantitative increase, as of 2018, there were 5,735 doctorate programs in 155 universities that offered doctorate degrees. In addition, 94,840 students were doing their doctorate degrees in these programs (Council of Higher Education [CHE], 2018). This increase in Turkey has increased the number of doctoral programs and graduates from these programs. While the number of Ph.D. graduates was 4500 annually as of the end of 2013, it reached 6100 yearly as of the end of 2017. Scientific, technological, and academic competence led to the acquisition of a doctorate as a reward. Therefore, doctorate education is perceived as the highest level of advanced education worldwide and seen as the main priority of 21st-century universities (CHE, 2016).

Swales (1985) designed a research article format within a three-part structure identified and sequenced as Introduction (I), Method (M), Results (C), and Discussion (D), that is, IMRD. Other researchers have adapted the abstract of the research, adhering to this IMCD structure (Chan & Foo, 2000; Dos Santos, 1996; Keogh, 1994; Salager-Meyer, 1990). In the analysis, Hyland's (2000) classification technique consists of Introduction (I), purpose (P), findings (F), and the result (R) is frequently used. A thesis summary should include main titles such as purpose, method, findings, and suggestions.

In a comparison between abstracts written in universities that have and do not have dissertation writing guidelines in Turkey, significant differences were found in terms of method and the statement of the problem in the study. In addition, it was observed that the ranking of the textual elements of the abstracts written in universities with a guideline (Introduction + Method + Findings + Results) is more consistent than universities without one (Ülker, 2012). In dissertation abstracts, it is stated that the purpose of the dissertation, the measurement tools, method, content, and significant findings should be present, but the sources should not be cited in the abstracts (Büyüköztürk et al., 2017; KTÜ, 2004). In addition, it is stated that the elements such as diagrams and formulas, and abbreviations should not be used in the abstract. Long terms should not be abbreviated unless they are used several times in the abstract and should be abbreviated in the text appropriately (Aktaş & Uzuner-Yurt, 2015). When the factors determining the quality of the abstract are analyzed, it is seen that unnecessary details and detailed information should not be included in the abstract (Day, 2000). Higher education institutions cannot be evaluated independently of their social structure. On the contrary, the structural features, its introduction, and the conditions of higher education

affect the form of the social structure. In this context, higher education institutions also play an important role in transforming gender roles (Savaş, 2018; TÜİK, 2017)

Differences can be seen when education in Turkey is analyzed in terms of gender distribution and accessibility between female and male students during the transition to secondary education. These gender differences, which are seen during the transition to secondary education, started to change from the beginning of the 2000s. According to the Turkish Statistical Institute's (TSI) 2016 data, an increase is observed in the female students' schooling rate. While the gender equality index, which expresses the level of schooling (balance) of female and male students, is getting closer to 1, it expresses the equality between genders; values greater than 1 represent a change in favor of female students, values less than one is in favor of male students. This rate presented a result that generally shows equality as 1.009 for primary education, .943 for secondary education, and .964 for higher education in 2016 (TSI, 2017). Thus, it can be stated that female students in Turkey have achieved an equal opportunity with male students in recent years.

An increase in the number of the current universities is an expected situation depending on the demands in education. This increase affected the involvement of women in higher education institutes as students and academicians. Women's involvement in higher education institutions in Turkey can be examined in three phases historically. In the first phase, women who found employment in academia with the principles provided by Atatürk began to become numerically more visible in academic life with the adoption process of these principles in the second period between 1940 and 1980. Lastly, with the opening of foundation universities in the 1990s, women were involved even more in academic life (Özbilgin & Healy, 2004). With this increase, the rate, which was %19 in the 1960s, increased to %34.6 in 1999 and %44 at present (CHE, 2019). In terms of career steps, which usually begin with a research assistant position and go up to the professorship at the highest level, the percentage of male and female research assistants who have taken office is equally stated as 50%. However, in the percentage of the gender distribution of professors, women were seen to decline down to %30 (CHE, 2019).

When the distribution of academics by gender is examined in Western countries, the percentage of female professors in European Union countries is 20%, according to the European Union (2013). In Turkey, the percentage of female academics is higher than in European Union countries, and this rate is given as 28%. This situation is not much different in the United Nations. A study conducted in the United Nations showed that women's recruitment to permanent positions is less likely than men's. In 2015, women were nominated for about half (48.9%) of all permanent positions, while only 38.4% of women were able to be recruited. Women had a ratio of more than half of assistant professor positions (51.5%) and close to the threshold in associate professor positions (44.9%), according to 2015 data. In the professor position, women had less than a third (32.4%). Women in academia performed more than half of all instructor positions (57.0%) in the lowest-ranking positions. While 22.1% of women worked untenured in faculties, this rate was 16.8% for men (Catalyst, 2019). The fact that women, who make up half the population, also take part in academic tasks will pave the way for increasing and diversifying the number of researches.

While the institutes' dissertation guidelines examined by the researchers contained formal requirements for the abstract, no information about the requirements for the contents of the abstract was found. There have been some effective studies on the sections of research articles so far (Chan & Foo, 2000; Dos Santos, 1996; Keogh, 1994; Salager-Meyer, 1990), introduction (e.g., Swales, 1981, 1990, 2004) on discussion (e.g., Holmes, 1997; Hopkins & Dudley-Evans, 1988) and on the results (e.g., Brett, 1994; Williams, 1999). However, although the dissertation abstracts have a key role in deciding whether to read the whole dissertation, there is scant research on this subject in the literature (Tavşancıl et al., 2010; Ülker, 2012). This research examines the abstract sections of all the doctoral dissertations written between 2010 and 2017 in Turkey in education using a form developed for its purpose. In this sense, it is thought that this study will inform researchers and decision-makers about how well the abstract section, perhaps the first place to be read in research, is written and will guide the researchers who are going to write a dissertation.

Research Questions

1. Are the doctoral dissertation abstracts written in education between 2010-2017 in Turkey produced in accordance with the abstract writing rules of the institutions?
2. Is there a statistical difference between gender over the years?

Significance of the Study

Although there are a few studies that examine the research abstracts (Karagöl, 2020; Şen, 2019; Tavşancıl et al., 2010; Ülker, 2012), there is no study that investigates the content of the doctoral dissertation abstracts in terms of form, especially in the field of education. Also, there were no similar studies examining all doctoral dissertation abstracts in a certain period of time. This research is the first one that explores the discourse structures of doctoral dissertation abstracts in Turkey. Some studies examine doctoral dissertations; however, no other research has been found that looks abstracts in terms of thesis abstract writing criteria. In addition, the abstract format in the dissertation guidelines of the institutes is examined for the first time with this research. Aiming to fill a gap in the field, the present study intends to attribute inexperienced researchers globally recognized academic discourse expression by developing awareness of the content and thematic structure organizations of academic discourse. For researchers, it is vital to have a standard dissertation abstract format among institutes or in each institute to ensure that dissertation has standards in scientific and common language. The results of the study are expected to be helpful to researchers and institute administrators. In addition, this study is also significant in terms of providing researchers, experts, and managers an idea of the applications in Turkey.

Method

Research Design

The research was designed as a case study based on the qualitative research model, one of the qualitative research designs. Yin (1994) defines a case study as researching an event in the context of real life. In this study, document analysis was used under the case study model. In the case of studies, besides observations and

interviews, records/ documents can also be examined. Documents can be personal, popular culture, and official documents (Bogdan & Biklen, 1998). In this research, doctoral dissertation abstracts, which are official documents, were examined.

Population and Sampling

Within the scope of the research, 3489 doctoral dissertations written in education between 2010-2017 were accessed, and 3463 of them were included in the research. In the research, no sampling method was made, and an attempt was made to access all the dissertations related to education through the website of CHE "https://tez.yok.gov.tr/UlusalTezMerkezi/". The names of dissertations were not included in the research, and they were given eight-digit codes. While the first four digits of the eight-digit codes indicate the year the dissertation was completed, the last four digits ended with a four-digit number, regarding the time order that started with a thousand in the year when the dissertation was completed. For example, a dissertation completed in 2015 and 300th in the dissertation ranking in 2015 was coded as 20151300. In this case, the dissertation codes start with 20101001 and end with 20171149.

Data Collection

This study aimed to investigate the doctoral dissertation abstracts completed during 2010-2017 in Turkey. For this purpose, the dissertations, written during 2010-2017 in education and published on the National Thesis Center of Turkey website, were examined. The search was done on the dissertation search page of the CHE (https://tez.yok.gov.tr/UlusalTezMerkezi/) using the advanced search option. The words to be searched are "education", the area to be searched is "all", the group is "social", and the leave status is "on leave". Words to be searched were determined as "Education, Year; 2010-2017, Thesis type; doctoral." and the search was carried out accordingly. After this screening, a total of 3489 doctoral dissertations were reached. However, the abstract of the 26 theses were not included in the study because they could not be found anywhere in the text in the pdf document. Later, these dissertations were excluded from the research. A total of 3463 dissertations, 465, 500, 525, 526, 562, 430, 306, and 149 dissertations were reached respectively from 2010 to 2017.

Instrument

Throughout the research, the "Dissertation Abstract Evaluation Form" (Appendix-1) including 18 different aspects (dissertation year, dissertation code, purpose, academic tone, research design, sampling method, sample group, data collection, data collection tools, data analysis, findings, suggestion, information that should not be abbreviated, reference, university name, department name, researcher gender, and title of the advisor) was developed by the researchers to provide a standard in the analysis of the dissertation abstracts. The researchers, five education experts, constantly updated the evaluation form during the pilot study. The main purpose of the pilot study was to determine whether the form works or not. When evaluating the dimensions, the absence of the relevant section in the form was coded with "0" and the existence of the relevant section was coded with "1".If it is inappropriate, the code "2" is used. Relevant numerical symbols are used in expressing the year and dissertation code. While the symbols were used to state the name of the university and the

department, gender is being stated as "1" for women, "2" for men, and consultants were coded as "1" for Dr. "2" for Assoc. Dr. and "3" for Prof. Dr.

Data Analysis

The descriptive analysis approach was used to analyze the data in this study, which focused on investigating the doctoral dissertation abstracts written in Turkey in education during 2010-2017 focusing on the abstract writing rules. The data were analyzed through the examination of documents (doctoral dissertations). Since the examination of the dissertation abstracts is the primary purpose of the research, document analysis was preferred. The main purpose of document analysis is to analyze written materials that contain information about the phenomenon or facts that are targeted to be investigated (Yıldırım & Şimşek, 2008).

Two researchers coded each dissertation abstract, and then the items that could not be reconciled were reevaluated by a third researcher. The "Doctoral Dissertation Abstract Evaluation Form" developed by the researchers was used in the evaluation process. As a result of the document analysis, the data was digitized. In other words, qualitative data has been quantified. The data obtained were expressed in frequency and percentage, chi-square test and direct quotations were included. The chi-square test was carried out to determine whether there was a difference between years in abstract numbers according to gender. Microsoft Excel and IBM SPSS 22 programs were used to analyze the data.

Results

The first concern of the study was to examine whether the doctoral dissertation abstracts written in education between 2010-2017 in Turkey were produced in accordance with the abstract writing rules of the institutions. The following findings were achieved as a result of the analysis.

The information regarding the purpose, academic tone, research design, sampling, sampling method, data collection, data collection tools, data analysis, findings, suggestions, information that should not be stated, abbreviations, and reference in the doctoral dissertations written between 2010 and 2017 are shown in Table 1.

Table 1

The Status of Stating the Sections of the Research in the Dissertation Abstracts

Parts of the abstract	Absent		Present		False	
	f	%	f	%	f	%
Purpose	314	9.1	3135	90.5	14	.4
Academic tone	233	6.7	3230	93.3	-	-
Research design	1520	43.9	1943	56.1	-	-
Sampling	828	23.9	2631	76	4	.1

Sampling method	2938	84.8	524	15.1	1	.0
Data collection	1511	43.6	1951	56.3	1	.0
Data collection tools	1233	35.6	2229	64.4	1	.0
Data analysis	1666	48.1	1788	51.6	9	.3
Findings	498	14.4	2961	85.5	4	.1
Suggestions	2987	86.3	473	13.7	3	.1
Abbreviation	3011	86.9	452	13.1	0	0
Reference	3169	91.5	294	8.5	0	0

When Table 1 was analyzed, it was seen that the purpose is 90.5% in the abstract sections of the doctoral dissertations, approximately 9% of the abstracts did not include the purpose, and 0.4% the purpose is improper. The academic tone was used in the vast majority of abstracts (93.3%). However, it can be stated that academic tone was not used leastwise (6.7%). The research design was included in more than half (56.1%) of the abstracts, and less than half of the abstracts did not mention the research design (43.9%). It was seen that there was a quite amount of abstracts in which the research design was not stated. While the research sample was present in two-thirds (76%) of dissertations, it did not exist in 23.9%. It was stated incorrectly in the four of the abstracts. How the sample used in the dissertation was obtained (sampling method) was absent in most of the abstracts (84.8%), while it was found in 15.1%. How the data used in the dissertation had been collected was stated in 56.3% of the abstracts but not expressed in 43.6%. Data collection tools used in the dissertation were included in 64.4% of the abstracts, while 35.6% was lack of it. Only in one dissertation was it stated incorrectly. While 51.6% of the abstracts included which statistical methods were used to analyze the data, 48.1% did not have it. In 0.3% of the abstracts, it was given incorrectly. The majority of the findings obtained in the dissertation were included (85.5%), while 14.4% were not. In 0.1% of the abstracts, it was given incorrectly. While the suggestions were not included in most abstracts (86.3%), it was included in 13.7% of them. In 0.1% of abstracts, it was stated incorrectly. While 86.9% of dissertation abstracts did not contain abbreviations, 13.1% had abbreviations. While 91.5% of abstracts did not include any reference, 8.5% of abstracts included them. The doctoral dissertation abstracts show a problem, especially in the sampling method, research design, data collection, data analysis, sampling, and findings.

In the dissertation review process, primarily “the purpose of the dissertation”, which is one of the criteria determined in common in many dissertations writing guides and literature, was examined. Following the coding set out above, 314 dissertation abstracts did not have a purpose sentence. From these dissertations, in the abstract of the dissertation 20101013,

> "The variety in magazines, which are published at certain time intervals, where information and thoughts about specific subjects are conveyed, is increasing day by day. Children's magazines are printed communication tools that have functions such as improving the child's thinking, language and reading skills, making the time he spends outside the school of higher quality, educating, raising and entertaining the child."

After giving the quoted general information about the subject in the scope of the research, the research group was defined, and no information about the purpose of the research was given. It is regarded as an important problem, at the doctoral level, to come across dissertations where "purpose" is not stated. On the other hand, there are 3135 dissertations with purpose sentences. In the abstract part of the dissertation 20111304, which is one of these dissertations, the purpose of the study is stated clearly:

> "In this research, the effect of the subjective well-being intervention program on the subjective well-being levels and the styles of coping with the stress of university students has been examined."

When the abstracts are analyzed in terms of academic tone, it is seen that in the abstracts of 233 dissertations, a language of expression far from an academic tone is used. As an example of these dissertations, when the language of the dissertation 20101005 is examined, "Translation education in universities today is directed towards specialization in different fields such as literary, oral or specialty translation. Our present aim in this study is to examine the specialization translation education starting from the historical stages, to give place to the theoretical and practical studies in this field in the world and in Turkey, and to provide insight into what the future in this area is." It is seen that the abstract is written in a language that is far from the academic tone, and the active voice is used. On the other hand, there are 3230 dissertation abstracts that properly used an academic tone. The dissertation 20161034 is an example:

> "The main purpose of the research is to examine the historical development of the administrative structure and the executive training process of the education system in Turkey; for this purpose, related literature was reviewed, and the Republic of Turkey in the present regulatory organization, the National Education Council, in the Development Plan ..."

When the dissertation abstracts were examined in terms of the research design, it was seen that the research design was not given in 1520 abstracts (43.9%). For example, in the abstract of the dissertation 20101045, it states:

> "It was investigated whether the creation of teaching environments was effective in the elimination of students' misconceptions about social studies lesson learning levels and social studies concepts which are the building blocks of learning. As a result of the research; learning environments suitable for students' learning styles..."

As it is seen, after mentioning the purpose of the research, it was directly switched to the research results, and no information was given about the design of the research. The absence of research design in so many dissertations reveals a critical problem in this regard. The research design was stated in 1943 dissertations (56.1%). As an example of these dissertations

> "In the study, Nested Pattern, which is one of the mixed pattern types, where the quantitative approach is dominant, and the quantitative approach is supported with a qualitative approach is used."

In the dissertation 20171120, it was seen that the model of the research was clearly expressed.

When the dissertation abstracts were analyzed in terms of sample size, it was seen that while the sample size was correctly stated in 2631 dissertation abstracts, there

was no information about the sample size in 828 dissertation abstracts. For example, in the dissertation 20161049 abstract it states,

> "A survey was conducted, and activities were formed in order to reveal the difficulties that the students come from Afghanistan to Turkey have encountered in learning Turkish and to reveal their learning status".

As seen in the statement, no information was given about how many people the sample group consisted. The fact that the sample size was not given was seen as a significant deficiency. Regarding the number of samples, in the dissertation 20121419 abstract

> "... the sample consists of a total of 20 students studying at 2, 3 and 4 grades at Afyon Kocatepe University studying bow instruments in Music in the 2010-2011 academic year, 14 of whom are violinists and 6 of them are violists."

It was seen that numerical information about the individuals included in the sample was given. In addition, in the dissertation 20121310 abstract, which states:

> "... Selçuk University, which provides education and training in Konya in the 2010-2011 academic year, was determined as the universe. The sample of the research consists of Selçuk University Ahmet Keleşoğlu Faculty of Education, Department of Art Education, undergraduate students, and Selcuk University Faculty of Fine Arts undergraduate students. "

It was seen that although there was a desire to provide information about the sample size, it could not be achieved as no numerical value was given. For this reason, it was evaluated as given incorrectly.

When the dissertation abstracts were examined in terms of the sampling method, it was observed that while the sampling method was given in 2938 (84.8%) dissertation abstracts, 524 (15.1%) dissertation abstracts did not include it. In the dissertation 20151003 abstract it states:

> "For this purpose, the research was carried out with 980 students from 16 universities determined by stratified sampling method."

Also, in the dissertation 20151024, it states:

> "The sample of the study, which was randomly selected, consists of 767 students from 4 Police Vocational High Schools from 4 geographical regions of Turkey and 28 instructors teaching Police Ethics courses".

It was clear that the sampling method was explained only in a statement. There were also abstracts in which the sampling method was not provided, such as in the dissertation 20101007 abstract:

> "The sample of the study consisted of 586 kindergarten students and their teachers and mothers in Istanbul in the 2008-2009 academic year. The mothers constituting the sample group, the Parent Self-Efficacy Scale, which was adapted to Turkish by the researcher, was again selected by the researcher."

Although there was information about the number of samples, no information was given about the method by which the sample group was selected.

In the dissertation 20141073, information about how the data was collected is provided as

> "...In the qualitative part of the research, the data were collected through semi-structured interviews with focus group students, focus group interviews and student science diaries during and after the experiment process…".

Similarly, in the 20141117 dissertation the information was given as

> "...the data were collected from international refereed journals and Turkish research articles from national refereed journals. The resumes of the American academic writers were examined on personal and corporate websites, and their education (Master's and Doctorate) was completed in the departments and academics working at a university were selected."

In the dissertation 20101004, it was also stated by the field experts that

> "the quality of the techniques is more important than the quantity, and the use of the most useful method and technique for social studies falls greatly on field research. It has been investigated whether learning has an impact on overcoming the misconceptions of social science concepts that are building blocks.".

It is seen that there was no information about how the data was collected.

When the data collection tools were analyzed, information about the data collection tools was provided in 1233 (35.6%) dissertation abstracts, while information about the data collection tools was not found in 2229 (64.4%) dissertation abstracts. The information about the data collection tools was given in the dissertation 20151048 as,

> "The data in the research were collected with the Adaptive Leadership Scale and the Motivational Language Scale for School Principals",

and again in the dissertation 20151059 as

> "In order to collect data in the research, the Value Orientation Scale and the Motivational Action Conflicts Scale were applied three times at different time intervals (when the sessions started, completed and three months after they ended)".

There were abstracts that did not provide information on data collection tools. In the abstract section of the dissertation 20101015 which states:

> "… how the developing literacy of the child directly affects the success in the school and how the mothers from different education and income levels guide their children aged 3 and 5 in the context of reading books together as a speech event; in other words, to what extent mothers' verbal interaction styles depend on education and income levels and the age of their children… ",

There was no information about which tool was used to collect the data from the mothers.

When the data analysis method was examined, there was information about the data analysis method in 1666 (48.1%) dissertation abstracts. However, there were no data analysis information in 1788 (51.6%) dissertation abstracts. Information on the analysis method was given in the dissertation 20151065 as

> "Covariance Analysis (ANCOVA) was used in the pre-test-post-test comparisons, and the t-test was used for the related samples in the post-test-permanence test comparisons."

and in the dissertation 20151070 abstract it was stated as

> "In the analysis of the research data, SPSS 13.00 and Lisrel 8.80 package programs were used. Path analysis technique was used to verify the structures of the scales. For non-parametric tests, Kruskal Wallis H-test, Mann Whitney U-test, and Wilcoxon Signed Ranks test were used for unrelated measurements. Also, Pearson Moments Product Correlation Coefficient, multiple linear and hierarchical regression analysis were applied."

There were abstracts without information about data analysis. The last paragraph of the dissertation 20111002 abstract states

> "...111 Communication Course; basic concepts, verbal communication, non-verbal communication, written communication, and business life, and communication subjects were taught to the experimental group by web-based teaching method and to the control group by traditional method for eight weeks. On the other hand, opinion determination forms in the qualitative method were interpreted."

And no analysis method was mentioned. There were also abstracts where the data analysis method was erroneous. For example, in the dissertation 20111036 abstract it was seen that the methods of analysis were incorrectly expressed as it states:

> "... After the validity and reliability tests of the scales were applied, the sample was applied to the groups between 15 March and 30 June 2010. "Percentage", "Frequency", "Independent Sample One-Way Variance Analysis (ANOVA)", "Related Sample One-Way Variance Analysis (ANOVA)", "Bonferroni Test" and "Tukey Test" were used in the analysis of the data".

When the dissertation abstracts were examined about whether the findings were included, it was seen that the findings were included in the 2961 (14.4%) dissertation abstracts and the information about the findings of the study was not included in 498 dissertation abstracts (85.5%). In the dissertation 20121501 abstract, the findings of the research were given as

> "As a result of the research, there was a significant difference in the hearing levels of the students depending on the criteria of deciphering solfeggio, weighing, dictation, and harmonic intervals, after the modal practices performed for 14 weeks."

However, in the dissertation 20101003 abstract, it was seen that the abstract of the dissertation was over, and there was no evidence for any findings:

> "it was applied practically for 10 weeks. According to the pretest and posttest results, the performance differences of the experimental and control groups were compared. In addition, the opinions of the students in the experimental and control groups regarding the study were taken in writing. The data obtained were evaluated with the help of SPSS (V10.0) software, using "Paired T-Test" and "Mann Whitney –U Test".

In the examination of whether suggestions were included in the abstract content, it was found that no suggestions were included in the 2987 (86.3%) dissertation abstracts. In the content of 473 (13.7%) dissertation abstracts, suggestions regarding the study were presented. It was seen that the suggestions of the study were presented in the dissertation 20121467 abstract in the sentence,

> "Accordingly, it can be suggested to apply the lesson model with small groups in teaching practice lessons and to focus on the applications that teacher candidates will carry out as a group in the planning, implementation and reflection cycle."

The dissertation 20131241 abstract was concluded without any suggestions:

> "... Problem-solving activities with the group carried out in D1 were more effective in the problem-solving process by taking the problem-solving steps. Depending on the results at the end of the study, some suggestions have been made to the researchers and educators who will work in this field."

As a result of the "abbreviations" in the abstracts, it was found that no abbreviation was included in 3011 (86.9%) dissertation abstracts, but it was seen that abbreviations were used in 452 (13.1%) dissertation abstracts. It was expected that there was no abbreviation in the abstract (Aktaş & Uzuner-Yurt, 2015). The dissertation 20121339 abstract can be an example of the abstracts with abbreviations:

> "The aim of this study is to develop a reliable, valid, and useful performance test that will positively affect education-teaching in the musical reading (solfege) dimension of MİOY course in Music Education Departments of Education Faculties."

On the other hand, it was seen that there was no abbreviation sample in the dissertation 20101016 abstract.

When the "reference" in the abstracts was investigated, it was seen that there was no reference in the content of 3169 (91.5%) dissertation abstracts, while there was a

reference in 294 (8.5%) dissertation abstracts. It was stated there should not be a reference in the abstract (KTU, 2004). For example, the dissertation 20121988 abstract can be shown as an example of the studies using reference:

> "Although there is no common opinion about who is gifted, what are the gifted criteria, or how to determine gifted individuals, when the theoretical approaches to explain giftedness are examined, the common emphasis in these theories is that it is individuals that differ from normal individuals in terms of distribution, frequency, timing and composition of their physical, mental, social and personality traits (Akarsu, 2004)."

On the other hand, it was seen that there was no reference in the dissertation 20121342 abstract.

The second concern of the present study was to analyze whether there was a statistical difference between gender over the years. In line with this concern, the following findings were achieved.

The distribution of 3463 doctoral dissertations evaluated within the scope of the research by years and gender and chi-square tests are presented in Table 2.

Table 2

Distribution of Doctoral Dissertation by Gender over the Years and Chi-Square Test

Year		Female	Male	Total
2010	*f*	202	263	465
	%	43.4	56.6	100
2011	*f*	240	260	500
	%	48	52	100
2012	*f*	266	259	525
	%	50.7	49.3	100
2013	*f*	261	265	526
	%	49.6	50.4	100
2014	*f*	273	289	562
	%	48.6	51.4	100
2015	*f*	196	234	430
	%	45.6	54.4	100
2016	*f*	160	146	306
	%	52.3	47.7	100

2017	*f*	73	76	149
	%	49	51	100
Total	*f*	1671	1792	3463
	%	48.3	51.7	100

χ^2=9.22, *sd*=7, *p*=.237

When Table 2 was examined, it was seen that the most dissertations were written in 2014 (*f*=562, 16.2%), and the least dissertations were written in 2017 (*f*=149, 4.3%). Between 2010 and 2017, a total of 3463 theses on education were written, including 465, 500, 525, 526, 562, 430, 306 and 149, respectively. The number of dissertations increased between 2010 and 2014 and then started to decrease.

When analyzed by gender, the ratio of theses written by women in doctoral dissertations on education between 2010 and 2017 is 43.4%, 48%, 50.7%, 49.6%, 48.6%, 45.6%, 52.3% and 49%, respectively. Although the number of theses written by women and men is close to each other, it can be stated that women wrote more dissertations than men in 2012 and 2016, while men wrote more dissertations than women in other years.

In order to examine whether these differences were significant, a chi-square analysis was performed. According to the results of the analysis, it was found that the number of doctoral dissertations did not differ significantly between genders (χ^2= 9.22, *sd*=7, *p*>.05). Accordingly, the numbers of male and female authors were similar in writing doctoral dissertations over the years. This shows the positive developments in terms of gender equality in Turkey.

Discussion and Conclusion

Within the extent of research, it is observed that the number of doctoral dissertations related to education does not differ significantly in the terms of gender and year. The fact that women do the same or a similar number of academic studies as men could be interpreted as an improvement. It can be stated that Turkey's education, in the sense of equal opportunity, is equal in terms of gender, even at the doctorate level. This finding is in line with the TSI's data on the enrollment rates of girls and boys in 2016 (TSI, 2017). This finding coincides with Özbilgin and Healy's (2004) findings that display that women are more involved in academic life. Furthermore, as CHE statistics indicate (Academic Staff Numbers Summary Chart; see also: https://istatistik.yok.gov.tr/), it coincides with the information of an equal number of male and female research assistants.

In the abstracts of the doctoral dissertations, it was observed that the sampling method was not included in 84.8%, the data analysis was not included in 48.1%, the research model was not included in 43.9%, the data collection was not included in 43.6%, sampling was not included in 29%, and the findings were not included in 14.4% of the dissertation abstracts. It was concluded that there is a lack of methodology exclusively in these areas. Similarly, Tavşancıl et al. (2010) also state in their study,

examining postgraduate dissertations, that the expressions are used in a way that is unsuitable to the scientific research methods and techniques, and that the research is not conveyed well enough in the means of purpose, method, findings, and results that provide the research in a guiding structure to other researchers. As Berkenkotter and Huckin (1995) state, in the means of deciding whether to read the research, researchers initially look at the title and abstract of the research.

Although it is relatively less, it is seen that the purpose of the research is not stated in % 9.1, and the language used is not included in % 6.7. Like the present study, the study of Tavşancıl et al. (2010) regarding the academic language used in the abstracts, which investigated the dissertation abstracts in terms of language under three subtitles such as "suitability for report language", "third-person use in narration" and "avoiding expressions without information" also produced the same results, indicating that in doctoral dissertations, the language use was not consistent with the academic criteria reflecting the lack of competence of the students in these areas. Considering the importance of the influence of dissertation writing guides in creating a standard structure, as stated by Ülker (2012), it is seen that the universities which obtain dissertation writing guide are superior in the ranking of textual components of the abstracts than the universities that do not have a writing guide.

In this research, abstracts of doctoral dissertations were examined, and some disadvantages were encountered. It is suggested that the postgraduate seminars/courses or Research Methods courses, which would help new researchers, postgraduate students to be more informed about the proper way of abstract writing, which is the general picture of any study (Berkenkotter & Huckin, 1995; Salager-Meyer, 1990), to be carried out more efficiently at universities. In this research, dissertation abstracts in education were examined. Further studies focusing on dissertation abstracts written in different fields besides education and various parts of dissertations would provide better insight into the improvement of academic work and better dissertation work.

Considering these insufficiencies in the dissertation abstracts, it would be advisable to pay more attention to the current student advisory and dissertation supervision system. More student-supervisor meetings should be organized through regular intervals and more frequently to improve academic quality and academic writing skills to improve academic progress.

The doctoral dissertation abstract differences among universities or even among the programs of the same university in Turkey make it difficult to get an idea about the dissertations. It is recommended that in the institutes' dissertation writing guides, the dissertation abstract be expressed in a new national template considering the required qualifications.

Statement of Responsibility

Nuri Can Aksoy; conceptualization, document analysis, data analysis, investigation, resources, writing -original draft, writing -review & editing. Ersoy Karabay; conceptualization, methodology, document analysis, data analysis, writing -review & editing. Esra Eker Durmuş; writing, document analysis, writing -review & editing. Mehmet Göktaş; writing, document analysis, writing -review & editing. Fatma Çiloğlan Konur; writing, document analysis, writing -review & editing.

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The Effects of STEM Education on Academic Achievement in Science Courses: A Meta-Analysis

STEM Eğitiminin Fen Bilimleri Dersinde Akademik Başarı Üzerine Etkisi: Bir Meta-Analiz Çalışması

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ABSTRACT: In this research, a meta-analysis was conducted to find out the effect level of STEM education on students' academic achievement in science courses. Scientific studies which were conducted and published in Turkey between January 2018 and March 2020 were reviewed in the research. As a result of the literature review, 54 studies that were suitable for the purpose of the study were reached. In analyses conducted with a statistical analysis program, effect levels were compared in terms of subject area and number of participants in addition to approaches/method used. According to the results of this research, it was concluded that STEM education was more effective in increasing students' achievement in science courses when compared with teacher-centred teaching methods. According to the results examined according to other variables discussed in the research, significant difference was found in terms of the year in which the study was conducted, the researcher's job, application period of the study and the number of participants. According to the results of the examined variables, the largest effect size was found in the field of biology, at high school level, doctoral publications, in researchers who were teachers, with 81 and above participants, in studies conducted in 2019.

Keywords: Science education, meta-analysis, academic achievement, STEM education.

ÖZ: Bu araştırmada, STEM eğitiminin öğrencilerin fen derslerindeki akademik başarıları üzerindeki etki düzeyini ortaya çıkarmak için bir meta-analiz yapılmıştır. Çalışmada Ocak 2018 - Mart 2020 tarihleri arasında Türkiye'de yürütülen ve yayınlanan bilimsel çalışmalar gözden geçirildi. Literatür taraması sonucunda araştırmanın amacına uygun 54 çalışmaya ulaşılmıştır. Bir istatistik analiz programı ile yapılan analizlerde, etki düzeyleri, kullanılan yaklaşımlar / yöntemin yanı sıra konu alanı ve katılımcı sayısı açısından karşılaştırılmıştır. Bu araştırmanın sonuçlarına göre, öğretmen merkezli öğretim yöntemlerine göre STEM eğitiminin öğrencilerin fen derslerinde başarılarını artırmada daha etkili olduğu sonucuna varılmıştır. Araştırmada ele alınan diğer değişkenlerin sonuçlara göre çalışmanın yapıldığı yıl, çalışmayı yapan kişilerin görevleri, çalışmanın uygulama süresi ve katılımcı sayısı açısından anlamlı farklılık bulunmuştur. İncelenen değişkenlerin sonuçlarına göre en büyük etki büyüklükleri biyoloji alanında, lise düzeyinde, doktora yayınlarında, öğretmen olan araştırmacılarda, 81 ve üzeri katılımcıyla, 2019 yılında yapılan çalışmalarda bulunmuştur.

Anahtar kelimeler: Fen eğitimi, meta-analiz, akademik başarı, STEM eğitimi.

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Contemporary education approach aims to equip the individual with cognitive, physical and psycho-motor development. This understanding is the process of addressing the individual in all aspects and enabling the individual to reach the qualifications desired by both the individual and the society he/she is in (Yeşilyaprak, 2006). The fast developments in science and technology also change social life. Explaining and interpreting these developments, adapting to changes, enabling all fields to benefit from developments and meeting the needs of the society can be made possible by individuals who have received science education (Hançer, Şensoy, & Yıldırım, 2003). According to McComas and Murie (2014), science education is a scientific and practical discipline related to science content, scientific process and learning, teaching and evaluating the nature of science. In order to carry out an effective science education today, science must be associated with different disciplines. Due to technological competition, economically developed countries have begun to make more investments in education in order to raise individuals working in the field of science. Developing countries, including our country, aim to participate in this competition by carrying out reform studies in education (Ministry of National Education [MEB], 2016).

The potential of having qualified individuals is the basic condition for developing and competing in all areas. Each day, there is an increase in the need for individuals who can put forward original ideas in the field of science and who have high power of inquiry and creativity. In this context, The Programme for International Student Assessment-PISA and Trends in International Mathematics and Science Study-TIMSS reports include warnings about the deficiencies in the education system so that individuals can receive education in accordance with the desired workforce qualifications (United Nations Educational, Scientific, & Cultural Organization [UNESCO], 2015). The data below summarise the results of these exams related to science in which national and international measurements are made:

Table 1
TIMSS, PISA, TYT and LGS Exam Scores Regarding Science by Years

TIMSS – 8th Grade	2007	2011	2015
TIMSS average	500	500	500
Turkey average	454	483	493
Ranking	31	21	21
Number of participant countries	59	42	39
PISA	2009	2012	2015
OECD average	495	501	493
Average of all countries	471	477	465
Turkey average	454	463	425
Ranking	42	43	54
Number of participant countries	65	65	72
TYT		2018	2019
Number of questions		20	20
Average net		2.89	2.24

Success rate (%)	14.45	11.20
LGS	2018	2019
Number of questions	20	20
Average net	13.05	7.3
Success rate (%)	65.25	36.50

While 47 countries at 4th grade level participated in TIMSS 2015 study, Turkey ranked 35th among these countries and had an average science achievement of 483 points. While 39 countries at 8th grade level participated in TIMSS 2015 study, Turkey ranked 21st among these countries and had an average science achievement of 493 points. When we examined the changes in average scores of PISA science literacy field by years; we found out that there was an increase in the average of all countries and OECD average between PISA 2006 and PISA 2012, while a decrease was found in the average score of PISA 2015 conducted after PISA 2012. In the last report issued, we found that 79 countries participated, and Turkish students ranked 39th among all countries in science literacy and 30th among 37 OECD countries (OECD, 2019). Of the national exams, Basic Proficiency Test (TYT) includes 20 questions in the field of science. While the students' success rate in science in TYT, the first of which was applied in 2018, was 14.45% in 2018, this rate was found as 11.20% in 2019. In Transition System to High Schools (LGS), the first of which was applied again in 2018, the success rates of students in science were found to be much higher than university entrance exam. While the success rate of the students was 65.25% in 2018, it was found as 36.50% in 2019.

Table 2

Highest Scores Related with Science in PISA and TIMMS Exams and Turkey Average Scores

	PISA 2009	PISA 2012	PISA 2015	PISA 2018
Highest score	575 (China)	580 (China)	556 (Singapore)	590 (China)
Turkey	454	463	425	468
	TIMSS 2007	TIMSS 2011	TIMSS 2015	TIMSS 2019
Highest score	567 (Singapore)	590 (Singapore)	597 (Singapore)	608 (Singapore)
Turkey	454	483	493	515

When PISA 2009 results are examined, it can be seen that China got the highest score, 575 and Turkey got 454 points. According to PISA 2012 results, while China got the highest score, 580; Turkey got 463 points. According to PISA 2015 results, while Singapore got the highest score, 556 in science, Turkey got 425 points in science. According to the most recent PISA results, which was in 2018, Turkey got the highest point ever. In addition, China ranked in the first place by increasing its score in the previous years. According to TIMSS 2007 results, Singapore got the highest score, 567, in science, while Turkey got 454 points in science. According to TIMSS 2011 results, Singapore got the highest score, 590, while Turkey got 483 points. According to TIMSS

2015 results, Singapore got the highest score, 597, while Turkey got 493 points. According to TIMSS 2019 results, Singapore got the highest score, 608, while Turkey got 515 points. The difference between Turkey and the country with the highest score decreased from 2007 to 2019, although it was a slight decrease.

As Table 2 shows, Turkey's exam results in science are below the averages of all countries and much lower than the countries that are successful in these exams. It has become inevitable for new programs to be implemented to increase the success of Turkish students in national exams besides international exams. This situation has made it necessary to make changes in programs and to develop them. Such changes made in programs should be structured in a way that suits the needs of the society and individuals (Ayas, 1995). In addition, when subjects are interconnected and sequential in physics, chemistry and biology courses, students learn more meaningfully and permanently because they can gather information from different fields and see the relationship between these better (Keskin & Özay-Köse, 2019). For this aim, in the last decade, the Ministry of National Education also made significant changes in all teaching programs in 2013 and 2018. These changes aim to educate individuals to be able to produce information and use this information in daily life; to produce results for the problems encountered; to have a critical perspective and developed skills of entrepreneurship and communication; to be decisive; to have high empathy power and contribute to their society and the culture.

Science course, which has an important place to students in teaching the aforementioned skills, is taught between the third and eighth grades in the basic education process. When the changes in the curriculum of this teaching program made in 2018 are reviewed, it can be seen that Science, Engineering and Entrepreneurship practices are put in the units of all grades except for grade three and that skills specific for the field are taught. These skills are a) Scientific process skills, b) Life skills, c) Engineering and design skills. These skill areas include developing strategies to enable students to gain an interdisciplinary perspective to problems, to bring individuals to a level of being able to make inventions and innovations, to enable them to create a new product by evaluating the information, skills and experiences they have and how they can give added value to the products they create through integrating science with mathematics, technology and engineering (Science, Technology, Engineering, Mathematics -STEM) (MEB, 2018).

According to Yıldırım (2016), "STEM education is a contemporary approach that aims to use integrative approach while educating individuals and teaching them the necessary skills in daily life and scientific process that can meet the needs by equipping them with 21st-century skills." The word STEM is an abbreviation formed with the first letters of the words. In Turkish, it has been abbreviated as FeTeMM by using the first letters of the fields of Science (Fen), Technology (Teknoloji), Engineering (Mühendislik) and Mathematics (Matematik) (Yılmaz, Yiğit-Koyunkaya, Güler, & Güzey, 2017). It can be seen that while FeTeMM was frequently used in the early times when this concept was first studied in our country, the abbreviation STEM is used more today.

STEM education is accepted as an integrative approach that helps the individual associate the experiences in daily life with the teaching of the course. This education is important to educate individuals who can be aware of the developments in the international arena, suggest new inventions and adapt to new developments. In this

respect, STEM education has a structure that can be applied in each stage of education (Aydagül & Terzioğlu, 2014; Breiner, Harkness, Johnson, & Koehler, 2012; Bybee, 2010). STEM education gained momentum with European Commission, Scientific and Technological Research Council of Turkey (TÜBİTAK) and the institutions they cooperate with. STEM education is also applied in private schools, and supportive studies are conducted in the field of STEM in higher education (TÜSİAD, 2017) because with STEM education, academic disciplines can be associated with daily life subjects. This way, it is possible not to restrict STEM subjects to school only. It is possible to educate individuals with high scientific creativity who can compete well in the global economy and make innovations that will put society into action (Sanders, 2009). "Science, technology and innovation" article in the "competitive production and efficiency" section in Eleventh Development Plan (Turkey Presidency of the Strategy and Budget, 2019) emphasizes giving individuals the skills to generate information and use the generated information by creating an actively continuing research and innovation climate and increasing research and development and innovation studies to support services with high value-added products. In addition, in the "education" article of "qualified individual, strong society" section of this plan, an emphasis was made to educate individuals who have the characteristics of entrepreneurship and innovation with feelings of responsibility and self-confidence, internalized national culture and democratic values and who have developed perception and problem-solving skills. In this context, it can be said that science curriculum, which aims to develop engineering and entrepreneurship skills in addition to science, has a strategic significance.

When the literature is reviewed, it can be seen that a large number of studies have been conducted about STEM education by a large number of researchers who have realized the above-mentioned needs. Some of these studies have discussed the effects of STEM activities on academic achievement. Meta-analysis has also been conducted to find out the effect levels of these studies. In a study in which the effects of STEM education on students' success were examined, Becker and Park (2011) concluded that the Cohen's d effect size of 28 scientific research was .63. This means moderate effect size. In their study, Mustafa, Ismail, Tasir and Said (2016) conducted a meta-analysis of 11 studies in which science success in STEM education was discussed. In a study by Belland, Walker, Kim, and Lefler (2017), it was found that computer-based education in STEM disciplines had an average Hedges' g effect size of .46. In a meta-analysis study by Kim, Belland, and Walker (2018), it was found that computer-based STEM education had a Hedges's g effect size of .39 on cognitive outputs in problem-based learning. Saraç (2018) found that STEM education had a Hedges' g effect size of .44. As can be seen in the studies above, it has been found that, in general, STEM education had a small or moderate effect size on the academic success of students. In this context, the present study aims to conduct a meta-analysis to statistically show the effect level of STEM education on students' academic success by examining studies with experimental and control groups conducted after 2018. The sub-problems discussed in the study are as follows:

Does the effect of STEM education on students' academic achievement differ in terms of

- The number of participants,
- Types of publication,

- Application times,
- Application areas,
- Levels of education and,
- The years in which the applications were made?

Method

The present research is a meta-analysis. Meta-analysis is the statistical gathering of the findings of studies conducted independently from each other. A meta-analysis aims to ask a question and use the studies conducted as data to answer the question (Lodico, Spaulding, & Voegtle, 2006). In other words, meta-analysis is a method that aims to reach a new synthesis by examining the results of studies conducted following a predetermined subject and purpose (Cooper, 2015). Meta-analysis is a statistical method used for combining or comparing effect sizes or probability levels obtained from at least two studies (Rosenthal, 1984). In addition, this method is a literature review method in which statistical methods are used to bring research findings together and analyse them (Durlak & Lipsey, 1991). Meta-analysis is an analysis method that combines the results of many small and different individual studies using one or more statistical methods and provides information (Olkin, 1996).

Data Collection

The studies reviewed in the present research include the master's theses, doctorate theses and articles published in journals with reviewers on "STEM education" in Turkey between 2018 and 2020. To reach doctorate and master's theses, keywords related to the research's main independent variable, such as 'STEM' and 'FeTeMM', were used on the website of the Council of Higher Education (YÖK) Thesis Centre. 243 theses were reached in this study. Since the full texts of 2 studies which were limited for viewing could not be reached, the authors of the theses were contacted, and the data required for analysis were requested; however, the authors did not respond. The suitability of the data of 241 theses reached for meta-analysis was examined, and 201 theses were not included in this meta-analysis for reasons such as not having a relevant field of study, study subject and study group. Therefore, 42 master and doctorate theses were included in the meta-analysis.

In order to access articles published in national and international Turkish journals between January 2018 and February 2020, Google Academic and ULAKBİM Social Sciences Database were used. 32 studies were found as a result of this research. Since one of these studies was already added in the study as a master's thesis and since the data of 19 of these studies were not suitable for analysis, we excluded them from the analysis. As a result of the research, a total of 12 articles published in journals were included in the study. Since two experimental and one control group were used in one of these articles, they were included in the analysis as separate studies. As a result, a total of 54 studies, master's and doctorate theses and scientific articles, which had relevant data for meta-analysis and in which STEM education was used, were analysed in this research.

Analysis Characteristics

The following criteria were used in the selection of the studies included in the present study for meta-analysis:

- Researches conducted in one of the subjects covered in Science, Biology, Chemistry or Physics courses,
- Theses conducted in Turkey between 2018 and 2019; articles published in Turkey between 2018 and 2020,
- Studies conducted in English or Turkish,
- Master's theses and doctorate theses and articles published in journals with scientific reviewers,
- Studies in which academic achievement was dependent variable,
- Studies with experimental or semi-experimental design,
- Studies in which one of the STEM practices or activities was applied on the experimental group and in which teacher-centred or one of the approaches in existing teaching programs was used in the control group,
- Studies in which values are required for analyses such as arithmetic mean, standard deviation, number of students, t-test value, and academic achievement scores of the experimental and control groups were given.

Data Coding

In meta-analysis studies, coding the studies included in the research is an important stage. The data analysed should be coded correctly for minimum erroneous results. For this purpose, it is crucial to ensure scorer reliability. In order to ensure this, researchers should enter the studies to be analysed separately in the coding form and control all data after they are entered. Thus, a coding form consisting of three parts was formed to minimize the error rate in data. The first part constitutes the identity of the study. The identity of the research shows the number, title, publication year and publication type of the study. In the content of the study part, which is the second part of the coding form, there is information about the subject area in which STEM education was applied (physics, chemistry, biology, science) and level of education and the duration of the experimental study. The third part includes study data such as arithmetic mean, t-value, standard deviation and the number of participants.

The data were entered in the coding form independently by three different researchers. Two of these researchers are continuing their doctorate education in the field of science, while the other researcher is working as a faculty member in the related field. Miles and Huberman's (1994) formula were used in finding out the match percentage of the data researchers coded independently. The consistency level of the researchers' codes was found as 96%. For non-matching codes, the data were analysed together and coding was continued until a consensus was reached. Data on which no consensus was reached was removed from the coding form. Considering that 70% and higher match is considered as sufficient in such coding (Yıldırım & Şimşek, 2011), it was concluded that the reliability level of the coded data was sufficient.

Variables of the research

Dependent Variable

The dependent variable examined in the research is the academic achievement scores of the students in science courses.

Independent Variables

The main independent variable of the research is STEM education applied to the experimental group. For this purpose, STEM studies were included in the study. In addition, teaching/learning approaches the effects of which were examined on the control group are another independent variable of the research. In the applications conducted on the control group, the students should be passive, while the teachers should be active; in other words, they should be teacher-centred methods. The other independent variables in the research were the students' level of education (primary school, secondary school, high school and university), jobs of the researchers (academic or teacher/other), study sample, duration of the experimental study and the fields of the courses on which applications were made (physics, chemistry, biology or science). In studies conducted within the context of science courses in primary schools and secondary schools, separate coding was made as physics, chemistry or biology; and since more than one field was included in two studies, the coding was made as science.

Data Analysis

In a meta-analysis, the studies examined should have some criteria. In the research, statistical data such as the number of students, arithmetic means, standard deviations were examined in studies which met the criteria. When the arithmetic means of students' academic achievement is obtained with different scales, meta-analysis group difference is conducted with study effect method (Cohen, 1988; Huffcutt, 2002; Lipsey & Wilson, 2001). In other words, in research effect method, transactions are made on the differences between average academic achievement scores of the experimental and control group (Hunter & Schmidt, 2004). A "d" value is obtained after this transaction. This "d" value represents effect size. Effect size is obtained by the standard deviation, arithmetic mean, F, t or r values of studies conducted independently (Çetinkıl, 2017). This value's being negative means that the control group's average score is higher than the experimental group. In comparison, positive means that the experimental group's average score is higher than the control group (Özdemirli, 2011). In this research, Cohen's d values calculated by dividing the differences between the mean academic achievement scores of the experimental and control groups by the combined standard deviation value were taken into consideration (Schulze, 2004). Effect size metric in the research was standardized differences in means which is also known as Cohen d. Within the scope of this research, the significance level of the statistics for Cohen's d value obtained from studies conducted independently on the subject was chosen as .05. In graphs, standard means given automatically by CMA program were used. Effect size classification based on Cohen's (1988, p. 40) averages is as follows:

- small .20 - medium .50 - large .80

In analyses, effect size is calculated separately for each study. Heterogeneity test is conducted to explain the different effect size in each study. Chi-square homogeneity test (Q statistic) is used to test whether there is actual heterogeneity in the studies included in the research. Also, the frame is examined using graphs and tables outside heterogeneity. In addition, standard deviations not dependent on sample size can also be used for heterogeneity.

Since the information obtained as a result of heterogeneity test will also be used to select the model that will be used in calculating the general effect, it is vital for the

study. p value and Q value are obtained as the output of heterogeneity test. Of these values, if the p value is smaller than the .05 significance value or the Q value is smaller than the value that corresponds to the degree of freedom of the Chi-square table, it is understood that the data examined has a heterogeneous structure. When this result occurs, it is recommended for the data to be analysed according to Random Effects Model (REM). If the p value is larger than the .05 significance value or the Q value is larger than the value in Chi-square table, it is understood that the meta-analysis examined has a homogeneous structure, and in this case, it is recommended for the data to be analysed according to Fixed Effects Model (FEM) (Dinçer, 2014).

If effect value differs, this is assumed to result from a sampling error (Borenstein, Hedges, Higgins, & Rothstein, 2009). In the model, it is accepted that the variance between the study results is due to data associated with each other (Okursoy-Günhan, 2009). REM is preferred when the studies are not homogeneous (Durlak, 1995). This is a model which enables concluding by taking into account the variance between the variance of the studies and other studies (Okursoy-Günhan, 2009). While standard deviation's state of being zero is calculated in REM, standard deviation's state of not being zero is calculated in FEM.

For this reason, REM has a more general use when compared with FEM (Murphy, 2003). For this research, Q was calculated as 685.98, while p was calculated as .000. According to this result, p value of the study was found as a value smaller than the critical .05. This shows that the studies examined in the meta-analysis have a heterogeneous structure. For this reason, the analyses were conducted according to REM in the study. Comprehensive Meta-Analysis (CMA) program was used in the analysis of the data obtained from the study and in forming the tables, graphs and figures.

Results

This section includes the analysis results of the data obtained as a result of combining research problems with meta-analysis method.

Effect Size Results of the Studies Examined in the Research

To calculate the effect sizes of the studies in which STEM education is applied, first of all, the meta-analysis model to be used should be determined. For this purpose, the homogeneity of STEM education was tested with FEM and REM for the data within the context of the study. Based on these procedures, the results regarding the homogeneity and overall effect sizes of the studies are given in Table 3 below.

Table 3

Results Related with Effect Sizes of the Studies According to Fixed Effects and Random Effects Models

	Average effect size (ES)	Degree of freedom (df)	I^2	Homogeneity level (Q)	Standard Error (Se)	95% Confidence Interval for ES	
						Lower Limit	Upper Limit
FEM	1.32				.05	1.24	1.41
REM	1.48	44	92.66	599.17	.17	1.14	1.81

When the studies were examined according to REM, average effect size value was found as 1.32. According to the homogeneity test results, the homogeneity of the effect sizes of studies included in the research, Q statistical value was found as 599.17. According to this value, effect sizes of the studies included in the research are heterogeneous. This result shows that the analyses of the studies examined should be made according to REM because heterogeneity test Q statistical value is within the range of 55.75 and 67.50, corresponding to df=44 value at 95% confidence interval in the table of $\chi 2$ critical values. Since Q=599.17 value is much higher than this value, it was concluded that the research data showed a heterogeneous structure. According to heterogeneity test results, if the research result is significant, REM should be used (Dinçer, 2014).

Analyses conducted according to REM show that the upper limit of 95% confidence interval is 1.81, while lower limit is 1.14 and average effect size is 1.48. This value shows that the effect sizes of the studies included in the study show homogeneity according to REM. Effect sizes were calculated in terms of standardized difference of means. The standardized mean difference can be compared between studies regardless of the sample and can be applied Cohen d to homogeneity testing for meta-analysis as long as it specifies the size and direction of the study (Kulinskaya, Dollinger, & Bjørkestøl, 2011). Effect size distribution of all the studies included in the study is given in Table 4.

Table 4
Distribution of Effect Size Values of the Studies

No	ES	Se	S^2	p	No	ES	Se	S^2	p	No	ES	Se	S^2	p
1	4.09	.24	.06	.000	16	1.47	.34	.12	.000	31	3.18	.24	.06	.000
2	-.26	.33	.11	.435	17	.95	.32	.10	.003	32	3.91	.60	.37	.000
3	.78	.30	.09	.009	18	.99	.32	.10	.002	33	2.55	.43	.18	.000
4	.87	.39	.15	.025	19	.99	.47	.22	.038	34	2.70	.35	.12	.000
5	5.08	.65	.42	.000	20	.29	.28	.08	.289	35	7.01	.59	.35	.000
6	1.70	.35	.12	.000	21	.79	.27	.07	.004	36	1.64	.30	.09	.000
7	1.87	.30	.09	.000	22	.76	.25	.06	.003	37	.62	.32	.11	.056
8	.84	.29	.08	.004	23	.74	.28	.08	.008	38	.23	.37	.13	.536
9	1.71	.20	.04	.000	24	.95	.33	.11	.004	39	1.11	.38	.15	.004
10	1.51	.28	.08	.000	25	.84	.38	.15	.028	40	.76	.25	.06	.002
11	3.48	.34	.12	.000	26	1.18	.43	.18	.006	41	.89	.43	.18	.037
12	.53	.25	.06	.034	27	.79	.27	.07	.003	42	1.04	.33	.11	.002
13	1.07	.17	.03	.000	28	.01	.29	.09	.985	43	2.35	.40	.16	.000
14	.32	.31	.10	.308	29	2.66	.37	.14	.000	44	.81	.21	.04	.000
15	.30	.30	.09	.319	30	.21	.36	.13	.563	45	2.25	.34	.12	.000

Table 4 shows the effect sizes, standard deviation, variance and p values of the 45 studies included in the study. When Table 3 is examined, it can be seen that while the smallest effect size is -.26, the largest effect size is 7.01. Effect sizes of the study are between these two values, and in general, they are grouped between .00 and 1.00. Besides, it was found that the range of effect size values of 45 studies examined in the study was 7.27.

Figure 1

Forest Plot Showing the Distribution of Effect Size Values of Studies

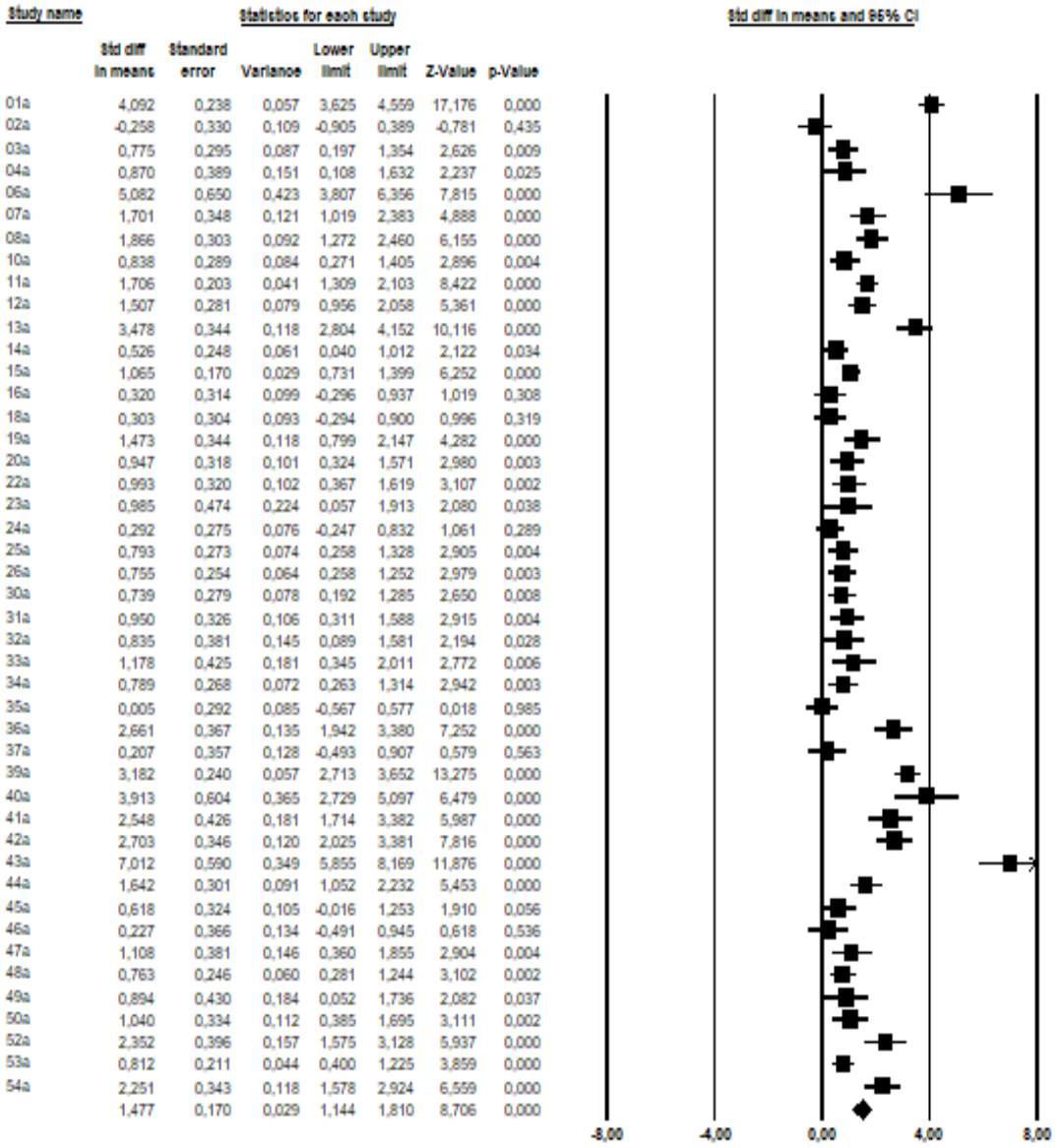
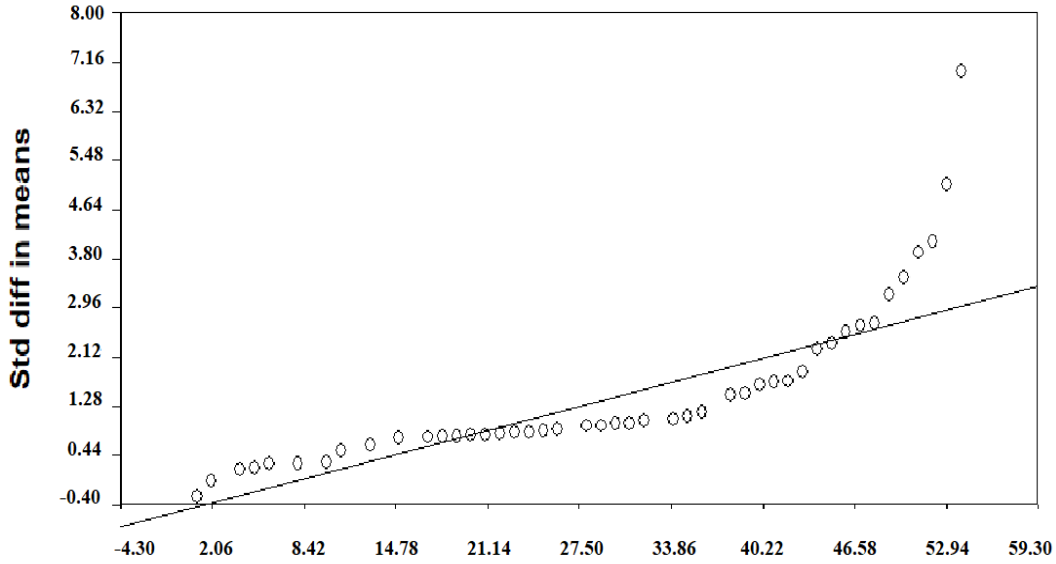


Figure 1 shows the effect sizes of studies in which STEM education was applied to students' academic achievement scores. Effect sizes were calculated in terms of standardized difference of means. Effect sizes of the studies range between -.26 and 7.01. While the study with the lowest effect size was Neccar's (2019) study, the study with the highest effect size was Tırmacı's (2019) study with 7.01. All of the 45 studies except one had positive effect size. The figure below shows the normality distribution table of the studies examined in the research.

Figure 2

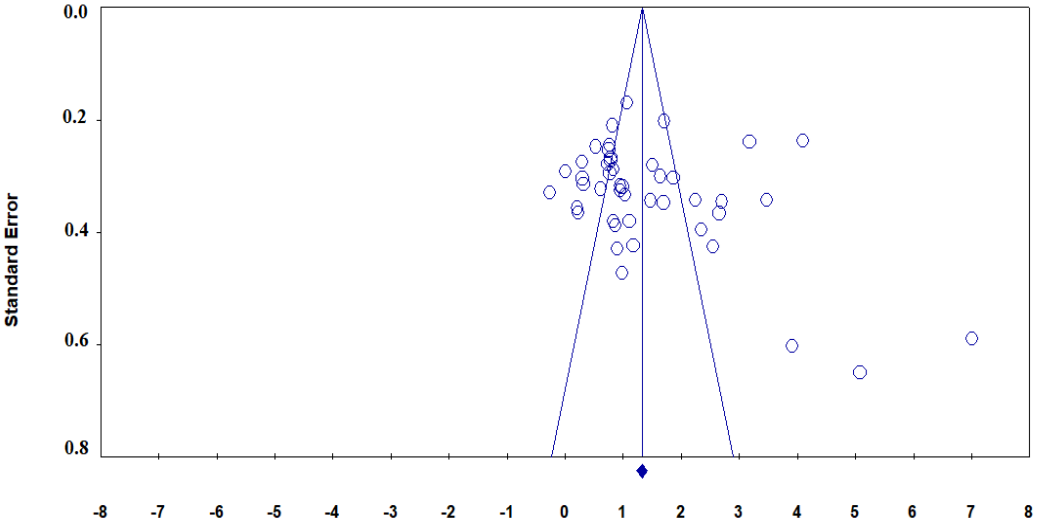
Normality Distribution Graph of Effect Size



Since the effect size values of the studies included in the study gathered around normal distribution line in general, it can be said that the studies were normally distributed. The figure below shows the funnel plot showing the distribution of effect sizes of the studies in the research.

Figure 3

Funnel Plot of Effect Sizes



When the plot is examined, it can be seen that the studies do not show an asymmetric distribution; in other words, it can be seen that the effect sizes of the studies intensify on both sides. This plot shows that there is no publication bias in the research. In studies with publication bias, a distorted and asymmetric distribution is expected in the plot (Üstün & Eryılmaz, 2014). According to data in this plot, corrected average effect size was found as 1.32. These data mean that publication bias is low in the study.

Moderator analysis enables the differences between subgroups to determine the differences between the average effect sizes of the variables (Littel, Corcoran, & Pillai, 2008). The statistical significance of the difference between moderator variables is

tested with the Q statistics method (Hedges & Olkin, 1980). In this method, the Q value is divided into two as Qbetween (Qb) and Qwithin (Qw) and executed as two different values (Borenstein et al., 2009; Hedges & Olkin, 1980). In this research, subgroup data were calculated using a single Q value. Subgroup analyses can help better understand which subgroups included in the study affect effect sizes and determine whether differences occur between these groups.

Effect Size Results According to Independent Variables Examined in the Study

Whether STEM education affects students' academic achievement is examined in the tables below comparatively in terms of different independent variables. Table 5 shows results about whether the effect sizes of the studies differ according to publication types.

Table 5
Effect Size Differences of the Studies According to Publication Types

Variable	Q	p	ES	n	Se	ES (%95 CI)	
						Lower limit	Upper limit
Study	.86	.65					
Article			1.38	8	.43	.53	2.22
Master's thesis			1.45	33	.20	1.05	1.85
Doctorate thesis			1.90	4	.48	.97	2.84

When Table 5 is examined, the result that approximately 73% of all the studies conducted on STEM education were master's theses is remarkable. This is followed by articles with approximately 18%. The type of study least conducted on STEM is doctorate theses with 9%. From the Chi-square tables of the studies, it was found that the critical value was 5.99 according to two degrees of freedom in 95% confidence interval. According to the type of studies, the homogeneity value (Q) of the studies, which were considered as three subgroups, was found as .86. Since the homogeneity value between the groups was smaller than the critical value, no statistically significant difference was found between the publication types STEM studies were conducted with in terms of academic achievement. According to the results of analyses, the largest effect size was found in doctorate theses with 1.90; while the smallest effect size was found in articles with 1.38. Effect size of master's theses was found to be smaller than articles (1.45).

Table 6
Findings Related to the Effect Sizes of Publication Years of Studies

Variable	Q	p	ES	n	Se	ES (%95 CI)	
						Lower Limit	Upper Limit
Year	9.19	.002					
2018			.91	13	.14	.64	1.17
2019			1.74	32	.24	1.27	2.20

When Table 6 is examined, it can be seen that 71% of the studies were published in 2019, while 29% were published in 2018. According to the analysis results, while effect size value of the studies published in 2019 was 1.74; the effect size value of the studies published in 2018 was .91. In Chi-square table, the critical value of these studies was found as 3.84 according to 95% confidence interval. Homogeneity value (Q) between groups formed in terms of the years of studies was found as 9.19. Since the homogeneity value between the groups was higher than the critical value, a statistically significant difference was found between academic achievement in terms of years of studies. In light of the findings, it can be said that academic achievement was found to be higher in studies conducted in 2019 when compared with the year 2018.

Table 7
Findings Related with the Effect Sizes of the Jobs of the Researchers

Variable	Q	p	ES	N	Se	ES (%95 CI)	
						Lower Limit	Upper Limit
Researcher	8.03	.045					
Academic			1.32	3	1.06	-.77	3.40
Teacher			1.71	29	.23	1.26	2.15
Multiple Researchers			1.03	7	.28	.48	1.57
Unspecified			.91	6	.18	.55	1.26

When Table 7 is examined, it can be seen that 64.44% of the studies were conducted by teachers, 6.66% were conducted by academics, 13.32% were conducted by researchers who did not specify their jobs and 15.55% were conducted by multiple researchers. According to the results of the analyses, the largest effect size was found in teachers with 1.71; while the smallest effect size was found in researchers whose jobs were not specified with .91. The critical value of the Chi-square tables of the studies was found as 7.81. Homogeneity value (Q) between groups formed according to the jobs of researchers was found as 8.03. Since the Q value, which is the homogeneity value between the groups, was larger than the critical value, significant difference was found according to the job of researchers in terms of academic achievement. In the light of findings, it can be said that academic achievement is higher in studies conducted by teachers when compared with other jobs.

Table 8
Findings Related to the Effect Sizes of the Field the Study was Conducted in

Variable	Q	p	ES	n	Se	ES (%95 CI)	
						Lower Limit	Upper Limit
Field	7.29	.06					
Biology			1.68	7	.38	.94	2.42
Science			.76	4	.25	.28	1.24
Physics			.59	9	.24	.12	2.05
Chemistry			.17	5	.41	.36	1.98

In Table 8, when STEM education was compared in terms of the field it was applied in, the highest rate was found to be associated with physics subjects with 64.44%. Studies followed this in biology with 15.55% and with studies in the field of chemistry with 11.11%. Since it was not included in a basic field category, it was found that 8.88% of the studies were conducted in the category of science, which is the name of the course in secondary school. According to the results of analyses, it was found that the largest effect size was found in studies conducted in the field of biology with 1.68; while the lowest effect size was found in studies conducted in the field of science with .76. According to Chi-square table, the critical value of the studies in 95% confidence interval was found as 7.81. The homogeneity value (Q) between groups formed according to subject area was found as 7.29. Since the Q value was smaller than the critical value, it can be said that there is no statistically significant difference according to subject area in terms of academic achievement.

Table 9
Findings Related with the Effect Sizes of the Education Level the Study was Conducted in

Variable	Q	p	ES	n	Se	ES (%95 CI)	
						Lower Limit	Upper Limit
Level	5.14	.16					
Primary			1.47	2	.34	.80	2.15
Secondary			1.53	35	.22	1.11	1.95
High School			1.63	4	.31	1.01	2.24
University			.94	4	.22	.51	1.37

When Table 9 is examined, it was found that the highest rate according to the education level STEM education was applied was found in studies conducted in secondary school level with 77.77%. This was followed in studies conducted in high schools and universities with 8.88%. Studies conducted with STEM education at primary school level were found to have the lowest rate with 4.44%. In terms of the level of effect size, it was found that the studies conducted in high school had the largest effect size with 1.63; while the studies conducted in university had the smallest effect size with .94. According to this grouping, the critical value of 95% confidence interval in Chi-square table was found as 7.81. It was found that the homogeneity value (Q) between the groups formed according to the education level the studies were conducted in was 5.14. Since this value, which is the homogeneity value between groups, was smaller than the critical value, it can be said that there were no statistically significant differences in academic achievements of students in terms of the education level.

Table 10
Findings Related to the Effect Sizes of the Application Period of the Study

Variable	Q	p	ES	n	Se	ES (%95 CI)	
						Lower Limit	Upper Limit
Period	2.27	.32					
2-5 weeks			1.45	21	.26	.94	1.97
6-8 weeks			.74	4	.34	1.06	2.41
≥9 weeks and unspecified			.19	0	.18	.84	1.53

According to the results in Table 10, the highest rate according to the experimental study periods STEM education was applied was found in studies conducted between 2-5 weeks with 46.66%. This was followed by studies conducted between 6-8 weeks with 31.11%. The rate of studies that lasted longer than 9 weeks and those the periods of which were not specified was found as .02%. In effect sizes of application period, the largest value was found in applications between 2-5 weeks with 1.45. This was followed with studies that lasted ≥9 weeks and unspecified with .19. It was found that the critical value of these studies at 95% confidence interval was 7.81 and the homogeneity value (Q) between groups formed in terms of study periods was found as 2.27. Since this Q value was found to be smaller than the critical value, it can be said that there were no statistically significant differences between students' academic achievement in terms of study period.

Table 11
Findings Related to the Effect Sizes of the Number of Individuals the Study was Conducted on

Variable	Q	p	ES	n	Se	ES (%95 CI)	
						Lower Limit	Upper Limit
Sample	12.82	.00					
0-40			1.40	16	.27	.86	1.94
41-80			1.04	23	.13	.78	1.30
≥81			3.35	6	.65	2.07	4.63

According to Table 11, experimental studies in which STEM education was applied were conducted on 41-80 individuals with the highest rate. This was followed by studies in which 0-40 individuals participated with 35.55%. 6 of the studies conducted with ≥81 individuals were found to have the lowest rate. It was found that the largest effect size was found in studies conducted with 81 and more individuals with 3.35. The smallest effect size was found in studies conducted with 41-80 individuals with 1.04. Critical value was found as 7.81 at 95% confidence interval and it was found that the homogeneity value (Q) between groups formed in terms of the number of

participants was 12.82. Since this value was larger than the critical value, a significant difference was found between students' academic achievement in terms of the number of participants in studies. According to findings, when STEM education is applied to 81 and more individuals, it can give more effective results than when it is applied to fewer or more individuals.

Discussion and Conclusion

The present study includes an analysis of studies conducted to find out to what extent STEM education applied experimentally in science courses in Turkey after the year 2018 affects students' academic achievement. As a result of the literature review, we found a total of 45 studies. In the studies reviewed, while STEM education was used in the experimental group, teacher-centred approaches were used in the control group. We did not include studies which did not have a control group and which had missing data in our study. As a result of the analyses, we found that the studies had a heterogeneous distribution and according to this result, we decided to use the REM model. When it is considered that a total of 11 studies were reached about STEM education in Turkey in a study conducted by Saraç (2018), we found that there has been a serious increase in the number of studies since 2018. Kalemkuş (2019) also stated that studies about STEM began to intensify in 2018. The most important reason for this increase is the Science Curriculum which came into effect in 2017 and was updated in 2018 because a field with the title Science, Engineering and Entrepreneurship Practices was added to this curriculum. Studies on STEM education directly associated with this field began to attract interest in all levels of education. As a result, the number of experimental studies conducted on science courses with STEM education increased approximately 4 four times compared to before 2018.

The present study aimed to find out the general effect size of these educations that have a specific basis and application culture by analysing them with meta-analysis. Saraç (2018) analysed 27 studies in which STEM education approach was applied in science education. Saraç examined and compared the achievements of students in these analyses in terms of their attitudes and scientific process skills. The overall Hedges' g effect size of STEM education was found as .44 in these studies. This result means that the effect of STEM education is significantly higher when compared with teacher-centred methods. 25 of the studies the researcher analysed had positive effect size, while 2 had negative effect size. In the present study, overall effect size value of 45 studies conducted since 2018 was found as 1.48. According to Cohen et al.'s (2007, p. 521) effect size classification, this result means that STEM education had a strong effect on the academic achievement levels of students. In addition, when these results were compared with the results of the study conducted by Saraç (2018), an effect size larger than three times was found. While the effect size of 44 studies in the present study was positive, only 1 study was found to have negative effect. In their study, Becker and Park (2011) reached 28 studies and found that 7 had negative effect, while 21 had positive effect and that overall effect size was moderate (.63). All these results show that STEM education has a larger effect size than teacher-centred approaches in increasing the academic achievement of students in science courses. In addition to these, Young, Ortiz and Young (2017) examined 15 studies to conduct a meta-analysis of students' interest levels for science courses and found that the overall effect of these studies was 1.03.

Comparisons were made by forming sub-categories for the studies in the research. The first of these comparisons is the type of publication. According to classification made as article, master's thesis and doctorate thesis, the largest effect size was found in doctorate theses. Effect sizes according to master's theses and articles were found to be close to each other. According to all of these three groups, STEM education has a large effect on developing the achievement of students in science courses. It can be said that the reason why the effect sizes of doctorate theses were larger than master's theses is that researchers gain experience and minimize external factors and plan experimental process better. In Saraç's (2018) study, 9 of 11 studies were classified as article, while 2 were classified as master's thesis and it was found that theses had large effect, while articles had moderate effect. It can be said that this result and the results of the present study are consistent with each other.

When the effect sizes of the studies included in the present study were analysed, it was found that studies conducted in 2019 had larger effect size. When these effect sizes were examined, it was found that studies conducted in 2019 had significantly larger effect size in increasing academic achievement when compared with studies conducted in 2018. Saraç (2018) also concluded that studies conducted in 2018 had larger effect size when compared with the studies conducted previously. This result can be associated with the fact that the number of studies related with STEM education has increased in years (Banning & Folkestad, 2012, p. 732). In addition, the fact that researchers design their experimental studies more carefully and more elaborately by taking into consideration the recommendations of previous studies can be associated with the higher academic achievement of students.

The results of analyses performed for the other sub-categories of the study are as follows: The effect size of STEM education applied by teachers is larger than the applications of other researchers. While the subject area with the largest effect size was biology, the subject area with the smallest effect size was science. Effect sizes of studies conducted in physics and chemistry were also found to have large effect size according to classification by Cohen (2007). When the results of the meta-analysis by Saraç (2018) and the results of the present study were compared, it was found that both studies had moderate effect size in science. In their study, Becker and Park (2011) analysed the results of 13 studies conducted in the subject area of science and found that 5 of these studies had large effect size, while 8 had moderate and small effect size. This result can be evaluated as studies showing consistency in terms of the subject area.

In the comparisons made in terms of the education level STEM education was applied; the largest effect size was found in studies conducted on high school students, while the smallest effect size was found in studies conducted on university students. In addition, the effect size found in all education levels was found to be large. The results of the analysis of 18 students by Saraç (2018) are partly in parallel with the results of the present study. Saraç, who found only one study at university level, found that this research, had moderate effect level. It was stated that 16 of 18 studies were conducted on high school students and the effect size was small. In their meta-analysis, Becker and Park (2011) stated that there were studies with large and small effect size in all education levels. It was shown by authors that the largest and smallest effect size values were found in studies conducted in high school level. In a study conducted by Young, Ortiz, and Young (2017), it was found that the effect size of students' interest in STEM according to their grades did not show a specific tendency in terms of the increase or

decrease in grades. In addition, it was also found in another study that STEM applications out of school positively affected students' interest in STEM education. (Timur, Timur, Yalçınkaya-Önder, & Küçük, 2020). When the results of these studies are examined, it can be said that there is no specific tendency in effect size in terms of the education level of students. It can be said that this situation results from the fact that factors other than education levels are more effective in studies' effect sizes.

When the effect sizes of application times were compared in the study, it was found that the largest effect size occurred in studies that lasted 6-8 weeks. Studies with less than five weeks of application period had the smallest effect size. In terms of the groups formed in the study, it can be seen that the increase or decrease in the application period of the experimental study did not create a tendency in terms of effect size. In other words, the change between the length of study period and size effect values is not directly proportional. The fact that problems such as loss of motivation and attention occur as study period increases can negatively influence education states. It can be said that the reason why the smallest effect size occurred in studies with short application period results from low adaptation of students to STEM applications and the inexperience of the teacher in managing this process. The reason why effect size decreases after nine weeks can be the fact that students have too much responsibility in STEM education and that these practices, which seem different after a specific time, become tiring for students.

Another result of the study is the comparison of effect sizes in terms of the number of students who participated in experimental studies. In terms of the number of participants, the largest effect size was found in experimental studies with 76-100 participants. The smallest effect size was found in studies with less than 50 participants and in studies with 51-100 participants. It was stated in studies that increase in sample size contributed to the increase in effect size because this way, the accuracy and power of parameter estimations also increased (Hedges & Olkin, 1980). However, although increasing the number of participants to a large extent increases the external validity of the study, it can also cause the emergence of threats that are effective on internal validity, such as loss of subject and becoming mature (Karasar, 2005).

Implications

The present meta-analysis examined the effect of STEM education practices on students' academic achievement. Other variables frequently addressed, such as attitude, motivation, and scientific process skills, were not included in the scope of the study. It is predicted that it will be useful to analyse the effects of STEM education on other cognitive, affective and psycho-motor skills in addition to academic achievement because academic achievement is not a skill that occurs alone. It can be affected by both different cognitive skills and affective and psycho-motor skills directly and indirectly.

According to meta-analysis results, it can be seen that STEM education has a large effect size in increasing success in science courses. This result can contribute to teachers' using STEM education model, which is a contemporary teaching model, in science courses that have a low level of student achievement in general (Yaman, 2017).

In the present study, master's theses were found to make the greatest contribution. Considering that STEM education has about 5-6 years of past in Turkey, it can be assumed that the error levels on results will decrease especially with the increase in doctorate studies. For this reason, it will be useful for researchers to prefer STEM

education, especially at doctorate level, to reach less erroneous results of effect size. One of the most important indicators of this recommendation can be shown as the increase in effect size level as years advance because researchers conduct more controlled studies by considering correct and incorrect procedures.

A great majority of the studies analysed in the present study were obtained from studies conducted by teachers. Since teachers conduct both teaching activities and experimental activities together, it can be expected for errors in results to be higher. For this reason, an increase in studies conducted by academic staff at universities can be effective in decreasing the amount of error in meta-analysis results. In addition, it was found that the subject area most discussed in studies was physics. It can be said that this is because physics includes more concrete subjects when compared with the other areas of science. In addition, a great majority of these studies were found to be conducted at secondary school level. It is expected that increasing the number of studies conducted in both other education levels and biology and chemistry fields will give more correct results in terms of finding out the effect size for science with STEM education.

The results of the present study show that an application period of 6-8 weeks contributed to getting more effective results. Considering that most of the studies were conducted in secondary school and based on units, it can be suggested that this situation is normal because each unit of science course in basic education (12 years of primary, secondary and high school education) in Turkey include a period of 6-8 weeks (MEB, 2018). A large number of researchers considered this result in meta-analysis as normal since experimental studies were prepared by taking only one unit into consideration. For this reason, it can be said that for researchers who will carry our experimental studies on STEM education, designing 6-8 weeks long studies for one unit will help to get effective results. In addition, it is predicted that instead of working with very small or very large groups, designs with 76-100 participants will contribute to increase in effect size.

Some of the studies which were planned to be analysed in the present study were not accessed and it was not possible to include some studies due to missing data in them. Researchers' sharing their study is a necessity for qualitative study paradigm because experimental studies are studies in which results are expected to be generalized. The study conducted by each researcher will make significant contributions to reach the population parameters. Researches with missing data are not suitable for qualitative paradigm, and also, they should not be in a scientific study. It is thought that researchers who conduct such studies with missing data should be more careful and attentive about basic statistics that should be presented in a scientific publication and this should be provided with the supervision of editors and reviewers in articles and the jury in theses.

The scope of this research, consists of master's and doctorate theses and scientific articles published only in Turkey. Comparing the results of this research, with studies conducted abroad will make positive contributions for the generalizations of the results of STEM education, which is known to be applied intensively in the whole world since 2010.

Statement of Responsibility

Şadiye Karaşah Çakıcı; analysis, methodology, data collection, validation, resources, writing - original draft, writing - review & editing, visualization. Özge Kol; conceptualization, methodology, data collection, validation, writing - original draft,

writing - review & editing, supervision. Süleyman Yaman; design of the project, project administration, resources, writing - review & editing, supervision.

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