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Chapter 1

‘HEARING THE MULTIPLE RHYTHMS OF MUSIC TEACHER IDENTITY’: PRE-SERVICE MUSIC TEACHERS’ TEACHER AND MUSICIAN IDENTITIES[1]

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Introduction

Teacher effectiveness is one of the most important factors in educational outcomes (e.g., student achievement) (Barnes, 2021; Darling-Hammond, 2017) and it is a crucial concern that occupies teacher educators and policymakers from a diverse range of countries, such as the United States, the United Kingdom, Australia, the Netherlands, and Turkey (OECD, 2011, 2016). Teacher identity is at the heart of teacher effectiveness as it provides a basis for pre-service teachers (PTs) to know, feel, think, and act like effective teachers (Beauchamp & Thomas, 2009; Day, 2021; Feiman-Nemser, 2008; Yuan & Lee, 2015). The development of teacher identity is important and challenging for all PTs regardless of their fields of study (e.g., Graham & Phelps, 2003). It is even more important and challenging for pre-service music teachers (PMTs) because, unlike other fields of study (e.g., preschool teaching), music teaching requires PTMs to both 'learning to make music' and 'learning to teach music' (Haning, 2021; Scheib, 2006).

Indeed, music teacher identity could be considered as one of the crucial factors that potentially explain why substantial number of music teachers leave the teaching profession or change their current teaching positions in many countries such as the United States (Scheib, 2006; the United States Department of Education, 2014). The number of music teachers who leave the teaching profession or change their current teaching positions may vary from one country to another (e.g., Australia; Bergersen, 2019). This would not even be a serious concern for other countries such as Turkey due to the low number of demand for music teachers by the Ministry of National Education (MoNE) (National Education Statistics, 2018-2019). Nonetheless, having an effective music teacher identity is a prerequisite for music teachers almost in every country around the globe as it significantly relates to teaching and teacher quality (Haning, 2021).

Intriguingly, there appears to be less research on music teachers'/ PMTs' teacher identities (e.g., Beynon, 1998; Goldie, 2013; Tucker, 2020; Wagoner, 2011). Furthermore, PMTs' music teacher identities were either examined without considering the aspects of their musician identities (in the present study, the term 'musician identity' was used instead of the term 'performer identity' or 'musical identity' to better capture the extensive aspects of the PMTs' music-related identity) or investigated without taking into account the relationships between the aspects of PMTs' music teacher and musician identities (Roberts, 1991; Ballantyne, 2005; Harrison, 2010; Ballantyne et al., 2012; Bennett & Chong, 2018). This indicates that the specific aspects of PMTs' music teacher and musician identities and the relationship between music teacher and musician identities remains to be unexplored to date.

However, it is reasonable to address these issues in a single study because music teacher identity could include not only the music-related aspects (e.g., playing a musical instrument), but also teaching-related aspects (e.g., commitment to music teaching) (Kenny et al., 2015; Milbrandt & Klein, 2008). Additionally, in Turkey, most PMTs graduate from fine arts high schools that aim to develop students' basic competencies in relation to diverse fields of fine arts including music (MoNE, 2016). Therefore, PMTs from Turkey tend to gain music-related experiences (e.g., singing, listening, playing a musical instrument) before they enrol in music teacher education programmes. This is also true for PMTs from other countries, such as the United States and Australia (Hourigan & Scheib, 2009; Ballantyne & Packer, 2004; Brophy, 2002; Haning, 2021). As Woodford (2002, p. 677) emphasised, "many undergraduate music education majors and experienced music teachers are products of musical homes", indicating that PMTs are likely to gain music-related experiences in an informal manner by means of having musical parents or other family members.

On the other hand, such preliminary music-related experiences, coupled with the highly content-focused music teacher education programmes, could be detrimental to the development of a music teacher identity that includes both pedagogical and music-related aspects consistently. In line with this argument, Haning (2021) recently found that, when compared to science and mathematics teacher education programmes, there are more content-focused courses in music teacher education programmes in the United States. Haning (2021) argued that this could negatively affect the development of balanced teacher identity. Likewise, Harrison (2010) examined how PMTs recognised themselves, and found that almost half of the music teachers identified themselves as musicians whereas other music teachers identified themselves as teachers. The results of these studies indicate that music teacher identity should be considered together with the musician identity in order to understand the very nature of music teacher identity. It is highly important because the discrepancies between music teacher and musician identities could diversely affect PMTs' further motivations for teaching.

For example, based on the sample of PMTs from Singapore, Bennett and Chong (2018) showed that PMTs who described themselves as music teachers rather than musicians were more likely to persist in the teaching profession than their counterparts. These and similar studies (e.g., Ballantyne & Grootenboer, 2012; Ballantyne & Zhukov, 2017) clearly indicate that PMTs' music teacher and musician identities should not be investigated separately. However, as aforementioned, PMTs' musician and teacher identities have been mostly examined in a piecemeal manner and/

or without considering the multifaceted relationship between them. This can be because the relevant literature lacks a comprehensive theoretical model that enables researchers to examine PMTs' music teacher and musician identities simultaneously. Although a growing body of research has shown that music teachers'/PMTs' teacher and musician identities are not mutually exclusive (e.g., Harrison, 2010, Haston & Russell, 2012; Tucker, 2020), these studies have been mostly conducted based on the qualitative research designs, signifying that the results of these studies are highly limited in terms of their generalisability (e.g., Harrison, 2010; Tucker, 2020). Indeed, a research study in which PMTs' music teacher and musician identities are examined based on the mixed method research designs could enable researchers to examine whether the aspects of music teacher and musician identities are confirmed in a larger sample of PMTs, and allow them to investigate the relationships between the aspects of music teacher and musician identities comprehensively. In turn, the results of such studies could provide a comprehensive framework in which both the aspects of music teacher and musician identities and the relationships between them are evident.

Theoretically, this framework could provide a solid basis to develop more effective music teacher education programmes, which, in turn, could support the development of effective music teacher identity. Considering that ineffective teacher identity is related to significant concerns of the teaching profession, such as low motivations for teaching and career development aspirations (e.g., Bennett & Chong, 2018; Bruinsma & Jansen, 2010; Richardson & Watt, 2006; Watt & Richardson, 2007, 2008), such a comprehensive framework of music teacher identity in which both music-related and teaching-related aspects as well as their associations with each other are discernible, could enable policymakers and music teacher educators to develop more practical and effective strategies to address, for example, how and to what extent PMTs' music teacher and musician identities relate to their motivations for teaching and their decisions to leave the teaching profession. Practically, such a framework could also facilitate music teacher educators to give more effective feedback to PMTs with regard to their teacher identity development, and this, in turn, encourage PMTs to better combine pedagogical aspects of music teacher education programmes with music-related aspects during the initial phase of their professional development. Therefore, the current study focused on PMTs' music teacher and musician identities simultaneously and examined the relationships between them.

Conceptual framework

Music teacher identity

Teacher identity can be defined as "the self-concept or image that is central to the beliefs, values, and practices that inform the teacher's actions" (Chua et al., 2018, p. 551) (see also Beauchamp & Thomas, 2009; Walkington, 2005). The results of qualitative (e.g., Reid et al., 2008; Trent, 2011), and to a lesser extent, quantitative (e.g., Cheung, 2008; Chong et al., 2011) studies showed that teacher identity of teachers/PTs are multidimensional and both affect and are affected by the individual and contextual factors. For example, Cheung (2008) demonstrated that teachers' professional identities could be described by the three interrelated factors: student needs, school subjects and personal growth and development. Hsieh (2010) showed that teachers' professional identities were significantly affected by the individual factors (i.e., personal experience and occupational experience), practical/classroom-related factors (i.e., teacher education programmes, teaching schedules, and educational objectives), and external discourses linked to teaching and learning which were significantly differentiated by the individual-, class-oriented or dialogue-oriented characteristics of teachers. Yuan and Lee (2015) examined the factors influencing teacher identity development of PTs from China, and found that the content of teacher education programme, teaching practicum, relationships with students, and emotions significantly influenced teacher identity development of PTs.

Based on a theoretical model included the diverse factors of teacher identity (e.g., motivations for teaching, teacher education experience, career plans), and considering the dynamic and holistic interactions between these factors, Olsen (2008) examined the sequential interactions between the factors of teacher identity in a qualitative manner. The results demonstrated that the factors of teacher identity were sequentially linked to each other so that, for example, motivations for teaching (e.g., ability beliefs, love of the subject matter) was related to teacher education experience, which, in turn, was associated with current teaching context/practice. The results of these and similar studies (e.g., Granjo et al., 2021; Kelchtermans, 2009; Korhonen & Törma, 2016; Schepens et al., 2009) indicate that teacher identity is both complex and consists of cognitive (e.g., career plans), affective (e.g., professional commitment), motivational (e.g., reasons for choosing the teaching profession) and ethical aspects. Complexity and multidimensionality could be particularly prominent for PMTs' identities because, unlike other teacher education programmes, music teacher education programmes include many performance-oriented activities and courses aiming to develop musical performance of PMTs both individually and collectively (Gruhn et al., 2017; Haning, 2021; Sloboda, 2000). In turn, these could lead PMTs to develop a teacher

identity that constitutes both music-related and teaching-related aspects. Given that "many undergraduate music education majors and experienced music teachers are products of musical homes" (Woodford, 2002, p. 677), and also given that PMTs tend to gain music-related experiences before they enrol in music teacher education programmes (Ballantyne & Packer, 2004; Brophy, 2002; Haning, 2021; Hourigan & Scheib, 2009), it is highly likely that PMTs could also develop a musician identity which refers to how individuals perceive themselves in terms of having musical knowledge and abilities (Ballantyne, 2005; Roberts, 1991). Indeed, how individuals perceive themselves in terms of having musical knowledge and abilities are also relevant to music teacher identity as it refers to "one's conception of himself or herself as a music teacher" (Wagoner, 2011, p. 77). Nevertheless, it does not mean that the content of music teacher identity entirely overlaps with musician identity because the music profession and music teaching profession require related, yet distinctly different knowledge and abilities (Campbell et al., 2021), signifying that it is important to consider the relationships between the aspects of teacher and musician identities in order to better understand the comprehensive nature of music teacher identity.

By considering these relationships, one could also understand the results of previous studies which showed that musical skills were important parts of music teacher identity (e.g., Garnett, 2014), and could gain a deeper insight into the fact that music teachers/PMTs tend to perceive themselves as both musicians and music teachers (Ballantyne et al., 2012; Ballantyne & Zhukov, 2017; Bennett & Chong, 2018; Harrison, 2010; Pellegrino, 2009; Wagoner, 2011). In fact, the relationships between the aspects of music teacher and musician identities could reveal themselves through the diverse combinations of music teacher identity. For example, based on a qualitative research design, Chua and Welch (2020) found that music teacher identity was explained through the seven categories: self, activist identity, music, teaching, students, social reactions, and ecology of the social world. Similarly, Isbell (2008) found that PMTs' music teacher identity consisted of three categories: musician identity, self-perceived teacher identity, and teacher identity as inferred from others. Gruhn et al. (2017) examined the components of musician identity based on a sample composed of undergraduate students in the Estonian Academy of Music and Performing Arts, as experienced musicians, music educators, and music high school students. The results showed that musician identity included educational, social, and individual aspects. Based on the samples of elementary and middle school teachers, Ballantyne and Grootenboer (2012) showed that teachers mostly defined themselves as 'teachers', and to a lesser extent, as musicians, and that of those who defined themselves

as ‘musicians’ were more reluctant to sustain their careers as teachers. More recently, based on a narrative study, Hietanen and Ruismaki (2021) examined how the development of music teacher and musician identities influenced the formation of an entrepreneurial identity regarding music. The results demonstrated that entrepreneurial identity regarding music was considerably affected by the development processes of both music teacher and musician identities correspondingly.

The results of these and similar studies (e.g., Ballantyne & Zhukov, 2017; Frierson-Campbell, 2004) clearly underline the multidimensional and comprehensive nature of music teacher identity, and more importantly, indicate that it is equally important to understand PMTs’ music teacher and musician identities in order to uncover how music teacher identity relates to their motivations for music teaching and how the development of music teacher and musician identities lead music teachers to follow different career paths (e.g., entrepreneur in music). Moreover, as Hanna et al. (2019) argued, teacher identity includes not only cognitive (e.g., self-efficacy beliefs) and affective aspects (e.g., job satisfaction), but also motivational aspects (e.g., persistence in teaching). Therefore, in the current study, the music teacher and musician identities of PMTs were examined by considering not only the cognitive and affective aspects of their identities, but also motivational aspects that potentially lead them to persist in the teaching profession (e.g., Hanna et al., 2019) or encourage them to follow career paths other than teaching (e.g., Hietanen & Ruismaki, 2021). Notably, the potential relationship between music teacher and musician identities further indicates that music teacher and musician identities could be also considered within a comprehensive concept entitled ‘arts teacher identity’ (Jordan, 2015; Lim, 2006; Singer, 2016).

Arts teacher identity

Arts teacher identity has been mainly considered as a comprehensive concept that captures both teaching- and arts-related/artistic identities (e.g., Bremmer et al., 2021; Hall, 2010; Kuster et al., 2014; Thornton, 2011; Unrath et al., 2013) although the relationships between the aspects of these identities have not been elaborated clearly and comprehensively. Rather, previous studies on arts teacher identity mostly focused on the conflict between teaching- and arts-related identities of arts teachers (e.g., Zwirn, 2006; Graham & Zwirn, 2010). For example, based on the qualitative and quantitative data, Welch et al. (2011) examined career experiences of secondary school music teachers from the United Kingdom, and found that merely half of the teachers prefer to teach full-time and the need to create a balance between musician and teacher identities was evident for those who chose to teach full-time. Bremmer et al. (2021, p. 83) attract attention to the pedagogical consequences of the conflict between teacher and artist

identities by stating that "the teacher/artist identity conflict can also lead to feelings of professional aversion towards school systems and pedagogical knowledge among (future) arts educators, as these are perceived as threats to being an artist", and suggest that this conflict can be reduced by investigating "how they integrate into each other". As a matter of fact, this suggestion is highly reasonable given the aforementioned explanations regarding the relationships between music teacher and musician identities.

Likewise, considerable research showed that the mentioned conflict could be better addressed by gaining a deeper insight into the aspects of arts teacher identity as well as into the relationships between these aspects. For example, based on a qualitative research design, Kenny et al. (2015) examined arts teacher identities of PTs in Ireland, and found that PTs' identities were defined through the themes of personal/professional, practical/theoretical, previous experience/current experience and marginalized arts/valuing the arts. Andrelchik (2014) showed that the identity construction process of high school arts teachers (e.g., ceramics, jewellery digital photography, painting, sculpture) tended to be affected by the various factors, such as teaching practice, evaluation of practice, problem identification, and teaching strategy selection. The results of these studies indicate that arts teacher identity consists of both artistic and teaching-related aspects. However, as Milbrandt and Klein (2008) showed, many arts educators and graduate students could define themselves as teachers rather than artists and undertake roles according to their institutional needs, professional abilities, interests, and fields of expertise, indicating that arts teacher identity does not always contain a balanced view of arts and teaching-related aspects. Nevertheless, as Lucero (2011) argued, teacher and artist identities are not the opposite poles of the same continuum; rather, they complement each other (for empirical evidence, see Bremmer et al., 2021). This indicates that it is reasonable to investigate whether music teacher and musician identities of PMTs can be explained within the concept of arts teacher identity. Therefore, the relationship between music teacher and musician identities, which were described through both the first-order and the second-order factor models, were also examined in the present study.

Context and aim of the study

Professional identities of PMTs begin to cultivate in teacher education (Ballantyne et al., 2012; Ballantyne & Zhukov, 2017) and even earlier, when they were students, through the observations (Dobrow & Higgins, 2005; Hirschy et al., 2015; Lortie, 1975). PMTs from Turkey are by no means an exception in terms of the development of teacher identity (Koçak et al., 2012). Since the foundation of the Council of Higher Education (CoHE) in 1981, regardless of the fields of study, teacher education has

been provided at universities by the faculties of education as four-year degree programmes (Eren and Yeşilbursa, 2019; CoHE, 2018). Almost all PMTs enter music teacher education programmes after graduating from Fine Arts High Schools which are under the authority of the MoNE. Indeed, the MoNE is fully responsible for the supervision of all phases and types of pre-tertiary education in Turkey (Eren, 2016), including Fine Arts High Schools that offer four-year programmes regarding the diverse fields of arts (e.g., music).

PMTs are required to take many compulsory (e.g., educational psychology) and elective pedagogical courses (e.g., curriculum development) along with many compulsory (e.g., individual voice training) and elective (e.g., violin) music-related courses (CoHE, 2018). In their final year of study, like all PTs, PMTs also have to take two practicum courses, titled school experience and practice teaching in which they conduct observations and teaching practice respectively in elementary/secondary schools (Eren and Yeşilbursa, 2019; CoHE, 2018). In fact, music teacher education in Turkey is not entirely different from that of other OECD member countries (e.g., the United States, Australia) (Ballantyne, 2007; Haning, 2021; Hourigan & Scheib, 2009) and it is also in line with the Bologna Three-Cycle System (CoHE, 2018). This indicates that the context of the study is highly relevant to the current concerns of the music teaching profession, such as increasing music teacher quality (e.g., Allsup, 2015).

Thus, the present study aims to explore the aspects of PMTs' music teacher and musician identities, with the intention of examining the relationship between music teacher and musician identities. Specifically, the aim of this study was fourfold: First, to explore the aspects of music teacher and musician identities of PMTs; second, to examine the underlying dimensions of PMTs' music teacher and musician identities; third, to investigate the relationships between the aspects of PMTs' music teacher and musician identities; and fourth, to uncover whether music teacher identity and musician identity could be explained through the concept of 'arts teacher identity'. In line with these aims, four research questions were formulated: (1) What are the aspects of PMTs' music teacher and musician identities? (2) Do the aspects of PMTs' music teacher and musician identities emerge in separate and larger samples of PMTs? (3) Do the aspects of PMTs' music teacher identities significantly relate to the aspects of their musician identities? (4) Do music teacher identity significantly associate with musician identity?

Method

A sequential (i.e., qualitative to quantitative) mixed method research design was used to explore teacher and musician identities of PMTs as

well as to investigate whether these aspects emerge in separate and larger samples of PMTs (see Creamer, 2018; Ivankova et al., 2006). For all phases of the study (i.e., qualitative and quantitative phases), institutional review board approval was obtained from one of the large universities located in the Western Black Sea Region of Turkey.

Qualitative phase

Participants

A total of 45 (female = 28; male = 17) PMTs were conveniently sampled from the faculties of education of three universities located in the Marmara, Western Black Sea, and Central Anatolia regions of Turkey. With a mean age of 21.31 years (SD = 1.66), the sample included 22 third-year and 23 final-year PMTs, but excluded first and second-year PMTs. This is because third-year and final-year PMTs are more likely to be exposed to the effects of music teacher education programmes more than their first-year and second-year counterparts.

Research Instrument

A total of 11 open-ended semi-structured interview questions (see appendix), originally developed by the researchers based on the comprehensive literature review (e.g., Olsen, 2008; Wagoner, 2011), were used to collect the data in the qualitative phase of the study. Specifically, the questions were checked and rechecked first by the researchers to endorse that they are sufficient to uncover motivational, emotional, and cognitive aspects of music teacher identity. The questions were also checked by the researchers semantically with the assistance of a Turkish Language and Literacy expert. The questions were then cross-checked by seven experts from diverse majors (i.e., educational sciences, music teaching, psychology, and psychological counselling and guidance) and corrected accordingly.

Procedure

The data were collected during the 2016/17 academic year by the first author. Course schedules of PMTs were checked first to find potential participants. Following the determination of appropriate course schedules of PMTs, instructors of the selected courses were contacted. Instructors were fully informed about the study and their consent was sought. The researcher then entered the classrooms and asked for volunteers to participate in the study. Potential participants were fully informed about the study and it was clearly emphasised that their responses on the semi-structured interview questions will be recorded and kept strictly confidential. Consequently, the interviews were conducted with PMTs who volunteered to participate in the study. Specifically, the interviews were carried out on an individual basis in the instructors' offices when

the participants were available and felt they were ready to answer the interview questions. All interviews were audio-recorded using a digital voice recorder and transcribed verbatim (For a similar procedure, see Eren and Yeşilbursa, 2017). The data were stored in Word format. Each interview lasted approximately 30 minutes.

Data analysis

After the initial coding procedure through which the diverse codes were assigned to the utterances of PMTs in terms of their responses on each question sequentially, the data were analysed in an inductive manner (Strauss & Corbin, 1998) based on the two comprehensive phases (see Eren and Yeşilbursa, 2017; Miles et al., 2014). In the first phase, which was initiated with the data collection process concurrently, the researchers listened and re-listened the recordings of the interviews with PMTs, and the expressions of PMTs were grouped semantically in terms of their responses on each interview question. More specifically, the expressions of PMTs were grouped into same categories if they had the same or highly similar meanings; whereas they were grouped into different categories if they had diverse meanings. When constructing the categories, not only the quality (i.e., semantic contents of expressions), but also the quantity (i.e., number of equivalent expressions) was considered to ensure simplicity and clarity in data interpretation.

In the second phase, the researchers examined whether these categories could be classified under certain themes. Three major principles were taken into account in the description of themes: parsimony, inclusiveness, and consistency (Diamantopoulos & Siguaw, 2006; Shah & Ward, 2007). The parsimony principle refers to the simplest and common meaning that explains the categories constituting music teacher and musician identities, whereas the inclusiveness principle refers to representing the categories with the relevant themes as much as possible. The consistency principle refers to the semantic consistency between the themes and categories. An iterative approach was adopted in the classification process (Snodgrass et al., 2020; Srivastava & Hopwood, 2009), through which the classification process was conducted both systematically and recursively based on the aforementioned principles.

In the study, the iterative approach and the aforementioned principles were important to establish both content validity and credibility of the themes because they enabled the researchers to triangulate the data based on the extant literature on teacher identity as well as the relevant theories/models (e.g., the Factors Influencing Teaching Choice Framework, Watt & Richardson, 2007). The iterative approach and the aforementioned principles also enabled the researchers to cross-check the consistencies

between the themes and their categories. Consistencies between the themes and categories were examined by the researchers with the assistance of an expert from music. The results showed that the interrater agreement rates were all satisfactory (≥ 70%; Miles & Huberman, 1994). Any discrepancies between the researchers and the expert were resolved through discussion until full consensus was achieved.

Quantitative phase

An exploratory correlational design, which is frequently used when there is not sufficient evidence concerning the relationships between the research variables (Fraenkel et al., 2012; Gay et al., 2012), was adopted to investigate the relationships between the aspects of PMTs' music teacher and musician identities.

Participants

A total of 1065 PMTs (female = 707; male = 358) were conveniently sampled from the faculties of education of 11 universities located in the Marmara, Black Sea, Central Anatolia, and Aegean regions of Turkey. In contrast to the sample of the qualitative phase, the sample of the quantitative phase also included first-year and second-year PMTs in order to examine the generalisability of the aspects of PMTs' music teacher and musician identities. Thus, the sample consisted of 275 first-year, 294 second-year, 229 third-year, and 267 final-year PMTs (Mean age = 20.98; SD = 2.53).

Research instruments

The Teacher and Musician Identities Scale

An item pool was generated by the researchers based on the utterances of PMTs in relation to music teacher and musician identities. Item generation process was conducted by the researchers first through cross-checking of PMTs' utterances that best describe the themes of music teacher and musician identities. These utterances were examined by the researchers based on the relevant literature (e.g., Ballantyne & Zhukov, 2017; Frierson-Campbell, 2004; Taxer & Frenzel, 2015; Watt & Richardson, 2007), and then written/rewritten as the scale items. The items were also cross-checked in terms of their intelligibility by 12 PMTs (female = 8; male = 4) with similar backgrounds who were not included in the current sample.

Thus, a Teacher and Musician Identities Scale (TEMIS) was developed which captured the items regarding music teacher and musician identities. Specifically, the teacher identity dimension of the TEMIS consisted of 36 items represented with eight factors: social persuasion (3 items), modelling (3 items), value (3 items), efficacy beliefs (3 items), personality traits (4

items), self-oriented professional expectations (9 items), student-oriented professional expectations (8 items), and planned persistence in teaching (3 items). The musician identity dimension of the TEMIS included 25 items represented with 4 factors: social causes (6 items), personal causes (6 items), desire to demonstrate musical ability (6 items), and musicianship expectations (7 items). PMTs rated their responses on a five-point Likert-type scale, ranging from 1 (not at all true of me) to 5 (very true of me).

Procedure

The data were collected by the first author approximately two months following the qualitative phase conducted in the 2016/17 academic year. The TEMIS was applied to PMTs who volunteered to participate in the present study during one of the regular class hours. Specifically, the TEMIS was presented to the participants with brief explanations concerning the aim of the study and its major concepts. Any questions on the research process and variables were briefly and clearly answered. The data collection process lasted approximately 25 minutes.

Data analysis

The sample of the study (n = 1065) was randomly divided into two groups in order to examine the factor structure of the TEMIS. The first group (n = 434; female = 286; male = 148) consisted of 111 first-year, 122 second-year, 99 third-year, and 102 final-year PMTs (Mean age = 20.68; SD = 2.35). The second group (n = 631; female = 421; male = 210) included 164 first-year, 172 second-year, 130 third-year, and 165 final-year PMTs (Mean age = 21.19; SD = 2.64). Using principal component analysis with promax rotation (cut-off = 0.40) (Meyers et al., 2006), a series of exploratory factor analyses (EFA) were conducted to explore the underlying aspects of music teacher and musician identities of PMTs in the first group.

For both music teacher and musician identities, EFAs were conducted separately because it was observed that the items could be further grouped into diverse, yet related conceptual dimensions that enable the researchers to better understand the underlying aspects of teacher and musician identities (Reed, 2018; Watkins, 2018). In relation to music teacher identity, these conceptual dimensions were labelled as motivations for music teaching, self-oriented professional expectations, student-oriented professional expectations, and planned persistence in teaching; whereas, in relation to musician identity, these conceptual dimensions were labelled as motivations for musicianship, desire to demonstrate musical ability, and musicianship expectations. Thus, four separate EFAs were conducted for each conceptual dimension of teacher identity (i.e., motivations for music teaching, self-oriented professional expectations, student-oriented professional expectations, and planned persistence in teaching); whereas

three separate EFAs were conducted for each conceptual dimension of musician identity (i.e., motivations for musicianship, desire to demonstrate musical ability, and musicianship expectations).

Using the robust maximum likelihood method of estimation from LISREL 8.80 (Jöreskog & Sorbom, 2006), two separate Confirmatory Factor Analyses (CFA) were conducted to examine whether the factors derived from the EFAs would be confirmed in a separate sample of PMTs (n = 631) in terms of robust fit indices (i.e., Comparative Fit Index-CFI $\geq$ 0.90; Non-Normed Fit Index-NNFI $\geq$ 0.90; Root Mean Square Error of Approximation-RMSEA $\leq$ 0.08; Standardized Root Mean Square Residual-SRMR $\leq$ 0.08) (Brown, 2015; Schermelleh-Engel et al., 2003). The Satorra-Bentler scaled chi-square ($\chi^2_{S\text{-}B}$) values (i.e., mean-adjusted χ^2 values) were also reported for descriptive purposes. However, the $\chi^2_{S\text{-}B}$ value was not used as a fit index because it is highly sensitive to sample size (Brown, 2015; Kline, 2016).

Specifically, in the first CFA, the eight-factor model with 36 items were examined whereas, in the second CFA, the four-factor model with 25 items were investigated. Given that the EFAs were conducted based on the underlying conceptual dimensions of music teacher and musician identities, the CFAs enabled the researchers to examine whether music teacher and musician identities could be represented with these conceptual dimensions holistically and simultaneously. Cronbach's coefficients alpha (α) were calculated to assess the internal reliability of the factors of music teacher and musician identities (DeVellis, 2017).

Two alternative models were also created to examine whether the factors of music teacher and musician identities could be better explicated through the second-order factor models. In the first model, the eight-factor model with 36 items (i.e., the first-order factor model) was examined as the second-order factor model in which the eight factors were loaded on the single latent factor (i.e., music teacher identity). In the second model, the four-factor model with 25 items were examined as the second-order factor model in which the four factors were loaded on the single factor (i.e., musician identity). The alternative models were then compared with the first-order factor models by conducting model comparison analyses. The differences between the $\chi^2_{S\text{-}B}$ values (i.e., $\Delta\chi^2_{S\text{-}B}(\Delta df)$, $p < 0.05$) as well as the differences between the Akaike Information Criterion (AIC) values ($\Delta AIC > 10$) (Cheung & Resvold, 2002; Burnham & Anderson, 2004) were considered in the model comparison analyses. In contrast to the conventional chi-square difference test, the $\chi^2_{S\text{-}B}$ difference test cannot be used in model comparison analyses directly because the difference between two $\chi^2_{S\text{-}B}$ values for nested models does not yield the accurate results in terms of chi-square distribution (Bryant & Satorra, 2012; Satorra,

2000). Therefore, the $\Delta\chi^2_{S\text{-}B}$ values were corrected through the scaling correction factors (c_d) regarding the $\chi^2_{S\text{-}B}$ difference test (see Bryant and Satorra, 2012). The Normal Theory Weighted Least Squares χ^2 was used to calculate the c_d factors as recommended by Bryant and Satorra (2012) for the LISREL.

A latent-factor correlation analysis was conducted to examine the relationships between the first-order factors of music teacher and musician identities. An additional latent-factor correlation analysis was also conducted to investigate the relationship between music teacher and musician identities as the second-order factors. Additionally, two separate multivariate analyses of covariance (MANCOVAs) and a series of follow-up univariate analyses of variance (ANOVAs) were conducted to examine the possible effects of demographic variables on the factors constituting the TEMIS. Since *p* values are highly sensitive to sample size (Ferguson, 2009), the magnitude of the partial eta-squared values (η^2_p) were examined and the effects of the demographic variables were elaborated accordingly. Specifically, the η^2_p values lower than or equal to 0.06 were considered as negligible (Richardson, 2011; see also Cohen, 1988). The results showed that the univariate main effects and the interactional effects of the demographic variables on the factors of music teacher and musician identities were trivial ($\eta^2_p < 0.06$). Thus, the demographic variables were not considered any further.

Results

Qualitative analyses regarding music teacher identity

The themes of music teacher identity with sample utterances are presented in Table 1. As seen in Table 1, PMTs' teacher identities consisted of eight themes: social persuasion, modelling, desire for professional development, desire to teach and shape the future of students, planned persistence in teaching, professional expectations, professional beliefs, and beliefs about the personal characteristics of effective music teachers (henceforth personal characteristics only, unless stated otherwise). These themes captured many categories that highlighted the core characteristics of their respective themes. For example, social persuasion included the categories of parents, teachers, and significant others (e.g., friends) who encouraged PMTs to become music teachers. Modelling consisted of the categories of parents, father, cousin whereas the desire for professional development contained the categories of teaching, learning, and gaining experience. The former refers to motivations for music teaching whereas the latter refers to professional development aspirations.

Desire to teach and shape the future of students consisted of the categories of, for example, love to teach, transfer knowledge to students.

The planned persistence in teaching also captured the category of love to teach in addition to the category of persistence. Although these categories shared the same label (i.e., love to teach), they differed from one another in terms of their semantic emphasis. Specifically, in terms of the desire to teach and shape the future of students, love to teach was mentioned by PMTs as one of their motivational sources that led them to teach and shape the future of students whereas, in terms of the planned persistence in teaching, love to teach was mentioned by PMTs as one of the reasons that would lead them to persist in the teaching profession. Notably, PMTs' music teacher identities were also characterised by the themes of professional expectations, professional beliefs, and personal characteristics each of which consisted of particular categories, such as becoming a beloved and notable teacher, efficacy beliefs, and being a patient person respectively. These results clearly indicate that music teacher identity can be described based on the PMTs motivations, expectations, beliefs, professional aspirations with respect to music teaching, and beliefs about the personal characteristics of effective music teachers.

Table 1 *The themes of music teacher identity with sample PMT utterances*

Theme	**Sample utterance**
Social persuasion	My parents encouraged me to become a music teacher.
Modelling	My cousin is a music teacher. I chose to become a music teacher because I took him as a role model.
Desire for professional development	I believe that I have to learn a lot to become an effective music teacher, which motivates me to develop professionally.
Desire to teach and shape the future of students	I would like to contribute to the development of students in every sense.
Planned persistence in teaching	I will never leave the teaching profession because I love teaching music.
Professional expectations	I want my students to love and respect me.
Professional beliefs	I believe that I am the right person to teach because the teaching profession requires one to understand students' thoughts and feelings and teach them accordingly.
Personal characteristics	A 'good music teacher' must be empathetic and patient.

Qualitative analyses regarding musician identity

The themes of musician identity with sample utterances are presented

in Table 2. As seen in Table 2, PMTs' musician identities consisted of six themes: social persuasion, modelling, interest in music, desire for professional development, desire to demonstrate musical ability, and beliefs about the professional characteristics of effective musicians (henceforth personal characteristics only, unless stated otherwise). Similar to the themes of teacher identity, these themes captured many categories that highlighted the core characteristics of their respective themes. Therefore, most of the themes of musician and music teacher identities were labelled similarly or identically. However, these themes differed from each other according to their emphasis (i.e., music teaching or musicianship) For instance, for musician identity, social persuasion refers to 'being encouraged to become a musician' whereas, for music teacher identity, it refers to 'being encouraged to become a music teacher'. The same was also true for the themes of modelling and desire for professional development for musician identity which consisted of highly similar categories to the themes of modelling and desire for professional development regarding music teacher identity (e.g., parents, friends). Musician identity also included the theme of personal characteristics which diversely consisted of cognitive (e.g., musical self-efficacy), affective (e.g., self-esteem), and performance-oriented (e.g., ability and hard work) categories.

Nonetheless, there were also considerable differences between the themes of music teacher and musician identities. For example, the theme of interest in music appeared as a part of musician identity because the main emphasis of the categories (e.g., interest, love) that constituted the content of this theme was related to making music rather than music teaching. Similarly, the main emphasis of the categories (e.g., demonstrating a good musical performance at the concerts, making the audience feel the music) that constituted the content of 'desire to demonstrate musical ability' was also related to making music rather than teaching music. These results indicate that music teacher and musician identities are related, yet distinctly different from each other in that the former was characterised by the pedagogical aspects whereas the latter was characterised by the musical aspects.

Table 2 *The themes of musician identity with sample PMT utterances*

Theme	**Sample utterance**
Social Persuasion	My music teacher encouraged me to become a musician.
Modelling	My father's interest in music deeply affected my active engagement with music.

Interest in music	I love making music. I am highly interested in music since elementary school.
Desire for professional development	Becoming a good musician makes me happy. Hence, I want to develop my musical ability to become a good musician.
Desire to demonstrate musical ability	I believe that I am both a good listener and a musician. I would like to give concerts that allow me to demonstrate my musical ability. It is pleasing that people greets you after concert.
Personal characteristics	A good musician must be talented and work hard at the same time

Quantitative analyses regarding music teacher identity

Exploratory factor analyses regarding music teacher identity

The results of the EFAs are summarised in Tables 3, 4, 5, and 6.

Table 3 *The results of the EFA regarding motivations for music teaching*

Factor Item	1	2	3	4	5
I want to become a music teacher because…					
Social persuasion	0.86				
1. My parents think that I can be a good music teacher					
2. My teachers think that I can be a good music teacher	0.90				
3. My friends think that I can be a good music teacher	0.81				
Modelling					
1. I take my parents as an example		0.85			
2. I take my teachers as an example		0.60			
3. I take my friends as an example		0.69			
Value					
1. Teaching is a sacred profession			0.86		
2. Teaching is my dream profession			0.87		
3. Teaching is a valuable profession			0.79		
Efficacy beliefs					
1. I am trained as a qualified teacher				0.41	
2. I can teach music effectively				0.86	
3. I believe that I have sufficient experience to teach				0.80	
Personal characteristics					
1. I am a patient person					0.73
2. I am an understanding person					0.89
3. I am an empathetic person					0.89
4. I am a good communicator					0.71

Table 4 *The results of the EFA regarding self-oriented professional expectations*

Factor **Item**	1
If I become a music teacher…	
1. I want to transmit my musical knowledge to students	0.84
2. I want my students to understand the importance of music	0.86
3. I want to affect my students cognitions about music	0.78
4. I want to proliferate my students' music knowledge	0.82
5. I want my students to love music	0.83
6. I want my students to exert effort to make music	0.86
7. I want to shape the future of my students	0.64
8. I want to prepare my students for life	0.75
9. I want my students to gain new perspectives	0.84

Table 5 *The results of the EFA regarding student-oriented professional expectations*

Factor Item	1
If I become a music teacher…	
1. I expect to be a beloved and a notable music teacher	0.80
2. I expect to be a sensible music teacher	0.81
3. I expect to be a patient music teacher	0.75
4. I expect to be a music teacher who is open to new ideas and learning	0.85
5. I expect to teach music effectively	0.85
6. I expect to develop my students in music	0.84
7. I expect to perform music education with full of joy	0.82
8. I expect to use diverse and effective teaching methods	0.77

Table 6 *The results of the EFA regarding planned persistence in teaching*

Factor Item	1
If I become a music teacher…	
1. I will teach until I retire	0.86
2. I will teach as long as I am competent physically and mentally	0.82
3. I will teach until I die	0.80

The initial results of the first EFA demonstrated that PMTs' motivations for music teaching could be best explained through the five-factor solution (Kaiser-Meyer-Olkin [KMO] = 0.89; Bartlett's test of sphericity-χ^2[df =136] = 3345.47, $p < 0.001$). Hence, the EFA was conducted again with the five-factor solution option. The results showed that the first (39.45%; Eigen value

= 7.10), second (8.98%; Eigen value = 1.62), third (7.39%; Eigen value = 1.33), fourth (6.72%; Eigen value =1.21) and fifth factors (6.01%; Eigen value =1.09) explained 68.6% of the total variance. The items were related to their factors with considerable coefficients ranged in magnitude from 0.41 to 0.90 (Table 3). Thus, the first, second, third, fourth, and fifth factors were labelled as social persuasion, modelling, value, efficacy beliefs, and personal characteristics respectively. Cronbach's coefficients alpha were also satisfactory for the social persuasion ($\alpha = 0.82$), value ($\alpha = 0.78$), efficacy beliefs ($\alpha = 0.76$), and personal characteristics factors ($\alpha = 0.83$) (DeVellis, 2017). However, Cronbach's coefficient alpha was computed as 0.60 for the modelling factor, indicating that the internal reliability of this factor was moderate (Cronbach, 1991). Nevertheless, it was included in the later analyses because the items were strongly related to their respective factor (i.e., modelling) and sounded semantically. Consequently, PMTs' motivations for music teaching were described through the five-factor model with 16 items.

The initial results of the second EFA revealed that PMTs' self-oriented professional expectations could be best explained through the one-factor solution (KMO = 0.92; $\chi^2[df = 36] = 2852.41$, $p < 0.001$). Therefore, the EFA was conducted again with the one-factor solution option. The results demonstrated that the one-factor explained 64.7% of the total variance (Eigen value = 5.82). Therefore, PMTs' self-oriented professional expectations were described through the one-factor model with nine items. As seen in Table 4, the items were related to the factor with substantial coefficients ranged in magnitude from 0.64 to 0.86 ($\alpha = 0.92$).

Similar results were also obtained regarding PMTs' student-oriented professional expectations (Table 5) and planned persistence in teaching (Table 6). The initial results of the third and the fourth EFAs demonstrated that both student-oriented professional expectations (KMO = 0.90; $\chi^2[df = 28] = 2455.17$, $p < 0.001$) and planned persistence in teaching could be best explained through the one-factor solution (KMO = 0.68; $\chi^2[df = 3] = 338.62$, $p < 0.001$). Hence, the EFA was conducted again with the one-factor solution option for both student-oriented professional expectations and planned persistence in teaching factors. For the student-oriented professional expectations, the result revealed that the one-factor explained 65.7% of the total variance (Eigenvalue = 5.25); whereas, for the planned persistence in teaching, the results showed that the one-factor explained 68.1% of the total variance (Eigenvalue = 2.0). For the student-oriented professional expectations, the items were related to the factor with considerable coefficients ranged in magnitude from 0.75 to 0.85 ($\alpha = 0.92$), while, for the planned persistence in teaching, the items were related to the factor with sizable coefficients ranged in magnitude from 0.80 to 0.86 ($\alpha = 0.76$).

Confirmatory factor analyses regarding music teacher identity

The results of the CFA revealed that the eight-factor model with 36 items (i.e., the first-order factor model) had good fit to the data (n = 631; $\chi^2_{S\text{-}B}(542) = 792.77$; CFI = 0.990; NNFI = 0.990; RMSEA = 0.027; SRMR = 0.051). As seen in Table 7, all the items were significantly predicted by their latent factors with substantial coefficients (i.e., standardised beta coefficients) ranged in magnitude from 0.45 to 0.89 (standard errors were equal to or smaller than 0.07). Cronbach's coefficients alpha were also acceptable for the social persuasion (α = 0.80), value (α = 0.76), efficacy beliefs (α = 0.73), personal characteristics (α = 0.77), self-oriented professional expectations (α = 0.91), student-oriented professional expectations (α = 0.91), and planned persistence in teaching factors (α = 0.78). On the other hand, Cronbach's coefficient alpha was computed as 0.59 for the modelling factor, signifying that the internal reliability of this factor was slightly weak (Cronbach, 1991). Nonetheless, it was included in the latent-factor correlation analysis because the items were strongly related to their respective factor (i.e., modelling) and sounded semantically.

Notably, the results of the CFA showed that the second-order factor model had also good fit to the data ($\chi^2_{S\text{-}B}(562) = 1044.43$; CFI = 0.990; NNFI = 0.990; RMSEA = 0.037; SRMR = 0.070). As shown in Table 8, all the first-order factors were significantly predicted by the second-order factor (i.e., music teacher identity) with considerable coefficients ranged in magnitude from 0.43 to 0.81 (standard errors were equal to or smaller than 0.09). For the second-order factor, Cronbach's coefficients alpha was computed as 0.93.

Table 7 *The results of the first-order CFA regarding music teacher identity*

Latent variable	Manifest variable	[a]β	[b]S.E.	[c]t
Social persuasion	Item 1	0.68	0.04	11.48
	Item 2	0.81	0.04	17.84
	Item 3	0.80	0.04	15.59
Modelling	Item 1	0.50	0.07	9.71
	Item 2	0.68	0.07	9.25
	Item 3	0.47	0.07	8.04
Value	Item 1	0.76	0.04	12.54
	Item 2	0.69	0.04	16.10
	Item 3	0.78	0.04	12.93
Efficacy beliefs	Item 1	0.63	0.05	12.77
	Item 2	0.74	0.04	18.14
	Item 3	0.77	0.04	18.58

Personal characteristics	Item 1	0.45	0.05	9.92
	Item 2	0.74	0.04	13.45
	Item 3	0.88	0.04	15.14
	Item 4	0.66	0.04	10.83
Self-oriented professional expectations	Item 1	0.75	0.04	9.23
	Item 2	0.83	0.03	11.59
	Item 3	0.73	0.04	10.61
	Item 4	0.84	0.03	12.38
	Item 5	0.89	0.04	11.30
	Item 6	0.80	0.05	8.81
	Item 7	0.51	0.04	9.46
	Item 8	0.61	0.03	10.48
	Item 9	0.75	0.03	11.11
Student-oriented professional expectations	Item 1	0.69	0.03	13.20
	Item 2	0.66	0.03	12.92
	Item 3	0.64	0.03	12.41
	Item 4	0.85	0.04	12.63
	Item 5	0.79	0.04	11.30
	Item 6	0.77	0.04	11.68
	Item 7	0.76	0.04	10.68
	Item 8	0.77	0.03	12.42
Planned persistence in teaching	Item 1	0.73	0.06	14.38
	Item 2	0.80	0.05	14.87
	Item 3	0.71	0.06	16.52

Note. [a]Standardised parameter estimation; [s] Standard error; [c]*t* value; all *t* values are at least significant at $p < 0.01$ level of significance.

Table 8 *The results of the second-order CFA regarding music teacher identity*

Second-order factor	First-order factor	[a]β	[b]S.E	[c]t
Music Teacher identity	Social persuasion	0.52	0.06	9.46
	Modelling	0.49	0.08	5.99
	Value	0.81	0.07	11.92
	Efficacy beliefs	0.43	0.05	8.56
	Personal characteristics	0.60	0.08	7.38
	Self-oriented professional expectations	0.79	0.09	8.44
	Student-oriented professional expectations	0.78	0.06	12.28
	Planned persistence in teaching	0.47	0.07	7.17

Note. [a]Standardised parameter estimation; [b]Standard error; [c]*t* value; all *t* values are at least significant at $p < 0.01$ level of significance.

Quantitative analyses regarding musician identity

Exploratory factor analysis regarding musician identity

The results of the EFAs are summarised in Tables 9, 10, and 11.

Table 9 *The results of the EFA regarding motivations for musicianship*

Factor Item	1	2
I want to become a musician because…		
Social causes	0.76	
1. My parents think that I can be a good musician		
2. My teachers think that I can be a good musician	0.86	
3. My friends think that I can be a good musician	0.81	
4. I take my parents as an example	0.59	
5. I take significant musicians as an example	0.49	
6. I take my friends as an example	0.71	
Personal causes		
1. It is important for me to make music to the audience		0.68
2. Musicianship is my dream since my childhood		0.68
3. Music making is valuable for me		0.94
4. I think I am talented in music		0.82
5. I believe I was born to be a musician		0.69
6. I believe I am productive in music		0.50

Table 10 *The results of the EFA regarding desire to demonstrate musical ability*

Factor Item	1
What do you desire to do If you become a musician?	
1. I desire to transmit my feelings to the audience	0.87
2. I desire to make music with emotions for the audience	0.89
3. I desire to demonstrate my musical abilities to the members of my band	0.83
4. I desire to demonstrate my musical abilities to the audience.	0.90
5. I desire to share similar feelings with the members of my band	0.86
6. I desire to demonstrate that I am competent in many aspects of music (e.g., singing, playing musical instruments, composition).	0.83

Table 11 *The results of the EFA regarding musicianship expectations*

Factor Item	**1**
What do you expect to do if you become a musician?	
1. I expect to be a hard working musician	0.80
2. I expect to be a humble musician	0.78
3. I expect to be a musician who has a high self-confidence	0.72
4. I expect to be disciplined musician	0.82
5. I expect to be a musician who has high technical abilities	0.87
6. I expect to become a highly competent musician	0.85
7. I expect to be a musician who can create genuine works of art	0.76

The initial results of the first EFA showed that PMTs' motivations for musicianship could be best explained through the two-factor solution (KMO = 0.89; χ^2[df = 66] = 2359.48, $p < 0.001$). Hence, the EFA was conducted again with the two-factor solution option. The results showed that the first (45.5%; Eigen value = 5.5) and second (10.2%; Eigen value = 1.2) factors explained 55.7% of the total variance. The items were related to their factors with substantial coefficients ranged in magnitude from 0.49 to 0.94 (Table 9). Thus, the first and second factors were labelled as social causes and personal causes respectively.

Although the content of the first factor of motivations for musicianship was highly similar to the content of the first factor of motivations for music teaching (i.e., social persuasion), this factor was labelled as 'social causes' in order to create a semantic equivalence between the labels of the first and second factors of motivations for musicianship. The content of the first factor of motivations for musicianship was similar to the contents of social persuasion and modelling, indicating that PMTs' motivations for musicianship were also mostly affected by their social environment. Likewise, the content of the second factor (i.e., personal causes) also captured the items emphasising values, beliefs, and motivations regarding musicianship, suggesting that these items could be classified within the concept of personal causes that led them to become musicians. Cronbach's coefficients alpha were satisfactory for the factors of social ($\alpha = 0.80$) and personal causes ($\alpha = 0.83$). Consequently, PMTs' motivations for musicianship were described through the two-factor model with 12 items.

The initial results of the second EFA demonstrated that PMTs' desire to demonstrate musical ability could be best explained through the one-factor solution (KMO = 0.91; χ^2[df = 15] = 2043.36, $p < 0.001$). The results demonstrated that the one-factor explained 74.5% of the total variance (Eigen value = 4.47). Hence, PMTs' desire to demonstrate musical ability was described through the one-factor model with six items. The items were related to the factor with considerable coefficients ranged in magnitude from 0.83 to 0.90 ($\alpha = 0.93$) (Table 10). Also, the initial results of the third EFA showed that PMTs' expectations regarding musicianship could be best explained through the one-factor solution (KMO = 0.91; χ^2[df = 21] = 1716.51, $p < 0.001$). The results showed that the one-factor explained 63.9% of the total variance (Eigen value = 4.47), indicating that PMTs' expectations regarding musicianship can be reliably described through the one-factor model with seven items. As shown in Table 11, the items were related to the factor with significant coefficients ranged in magnitude from 0.72 to 0.87 ($\alpha = 0.90$).

Confirmatory factor analysis regarding musician identity

The results of the CFA demonstrated that the four factor model with

25 items (i.e., the first-order factor model) had good fit to the data (n = 631; $\chi^2_{S\text{-}B}(254) = 467.34$; CFI = 0.990; NNFI = 0.990; RMSEA = 0.037; SRMR = 0.038). The results also showed that all the items were significantly predicted by their latent factors with significant coefficients ranged in magnitude from 0.38 to 0.90 (standard errors were equal to or smaller than 0.05) (Table 12). Cronbach's coefficients alpha were also satisfactory for the social causes (α = 0.78), personal causes (α = 0.85), desire to demonstrate musical ability (α = 0.91), and musicianship expectations factors (α = 0.91).

The results of the CFA revealed that the second-order factor model had also good fit to the data ($\chi^2_{S\text{-}B}$ (256) = 494.08; CFI = 0.990; NNFI = 0.990; RMSEA = 0.038; SRMR = 0.044). Likewise, all the first-order factors were significantly predicted by the latent factor (i.e., musician identity) with substantial coefficients ranged in magnitude from 0.83 to 0.95 (standard errors were equal to or smaller than 0.09) (Table 13). For the second-order factor, Cronbach's coefficients alpha was also computed as 0.93.

Table 12 *The results of the first-order CFA regarding musician identity*

Latent variable	Manifest variable	[a]β	[b]S.E.	[c]*t*
Social causes	Item 1	0.60	0.04	13.78
	Item 2	0.63	0.04	14.22
	Item 3	0.68	0.04	15.18
	Item 4	0.38	0.05	9.54
	Item 5	0.69	0.05	12.82
	Item 6	0.38	0.05	8.84
Personal causes	Item 1	0.76	0.04	17.07
	Item 2	0.69	0.04	16.81
	Item 3	0.68	0.04	11.51
	Item 4	0.65	0.04	12.60
	Item 5	0.66	0.04	16.19
	Item 6	0.54	0.05	12.00
Desire to demonstrate musical ability	Item 1	0.76	0.05	10.92
	Item 2	0.83	0.05	12.93
	Item 3	0.75	0.05	12.53
	Item 4	0.90	0.04	15.52
	Item 5	0.81	0.05	13.19
	Item 6	0.73	0.05	13.49
Musicianship expectations	Item 1	0.77	0.05	11.77
	Item 2	0.78	0.05	11.47
	Item 3	0.71	0.05	12.51
	Item 4	0.79	0.04	14.77
	Item 5	0.84	0.04	14.99
	Item 6	0.84	0.04	13.35
	Item 7	0.70	0.04	11.79

Note. [a]Standardised parameter estimation; [b]Standard error; [c]*t* value; all *t* values are at least significant at $p < 0.01$ level of significance.

Table 13 *The results of the second-order CFA regarding musician identity*

Second-order factor	First-order factor	[a]β	[b]S.E.	[c]*t*
Musician identity	Social reasons	0.92	0.07	13.23
	Personal reasons	0.95	0.07	14.53
	Desire to demonstrate musical ability	0.83	0.09	9.80
	Musicianship expectations	0.82	0.08	9.94

Note. [a]Standardised parameter estimation; [b]Standard error; [c]*t* value; all *t* values are at least significant at $p < 0.01$ level of significance.

Model comparison analyses

The results of the model comparison analyses demonstrated that the first-order factor models of music teacher (Table 14) and musician identities (Table 15) had significantly better fit to the data than the second-order factor models.

Table 14 *The results of the model comparison analysis regarding music teacher identity*

Model	$\chi^2_{S\text{-}B}$ (df)	AIC	$\Delta\chi^2_{S\text{-}B}(\Delta df)$	ΔAIC
First-order	792.77 (542)	1040.77	-	-
Second-order	1044.43 (562)	1252.43	301.46(20)***	211.66

***$p < 0.001$

Note. The $\Delta\chi^2_{S\text{-}B}$ was computed based on the difference scaling correction factor ($c_d = 1.34$); for the first-order factor model, the χ^2_{NTWLS} was computed as 1308.61(df = 542) whereas, for the second-order factor model, it was computed as 1712.57(df = 562).

Table 15 Model	$\chi^2_{S\text{-}B}$ (df)	AIC	$\Delta\chi^2_{S\text{-}B}(\Delta df)$	ΔAIC
First-order	467.34 (254)	609.34	-	-
Second-order	494.08 (256)	632.08	14.27(2)***	22.74

Table 15 *The results of the model comparison analysis regarding musician identity*

***$p < 0.001$

Note. The $\Delta\chi^2_{S\text{-}B}$ was computed based on the difference scaling correction factor ($c_d = 3.30$); for the first-order factor model, the χ^2_{NTWLS} was computed as 701.80 (df = 254) whereas, for the second-order factor model, it was computed as 748.90 (df = 256).

Latent-factor correlation analysis

The results of the latent-factor correlation analysis showed that the correlational model in which the first-order factors of music teacher and musician identities were allowed to correlate with each other had good fit to the data ($\chi^2_{S\text{-}B}[1678] = 3172.83$; CFI = 0.990; NNFI = 0.980; RMSEA = 0.038; SRMR = 0.059). The same was also true for the second-order factor models of music teacher and musician identities ($\chi^2_{S\text{-}B}[1717] = 3585.81$; CFI = 0.980; NNFI = 0.980; RMSEA = 0.042; SRMR = 0.071). The results are summarised in Table 16.

Table 16 *Descriptive statistics and latent-factor correlations*

Table 16 Variable	M	SD	Skewness	Kurtosis	1	2	3	4	5	6	7	8	9	10	11	12
1. Social persuasion	12.92	1.96	-1.12	2.23	-											
2. Modeling	11.85	2.57	-1.01	1.21	0.50	-										
3. Value	13.31	2.02	-1.45	2.54	0.45	0.45	-									
4. Efficacy beliefs	11.33	2.47	-0.40	-0.18	0.58	0.41	0.41	-								
5. Personal characteristics	17.38	2.56	-1.07	1.42	0.41	0.25	0.51	0.35	-							
6. Self-oriented prof. expect.	42.59	3.69	-1.99	5.11	0.32	0.29	0.62	0.24	0.44	-						
7. Student-oriented prof. expect.	37.65	3.38	-1.89	6.46	0.29	0.31	0.59	0.22	0.45	0.76	-					
8. Persistence in teaching	12.06	2.81	-1.10	0.86	0.31	0.34	0.52	0.36	0.32	0.27	0.28	-				
9. Social causes	24.23	4.27	-0.75	0.72	0.65	0.52	0.31	0.48	0.34	0.29	0.32	0.33	-			
10. Personal causes	25.49	4.06	-1.16	1.74	0.49	0.38	0.39	0.41	0.31	0.38	0.42	0.26	0.75	-		
11. Desire to dem. mus. ability	27.05	3.75	-1.95	5.71	0.36	0.29	0.29	0.28	0.31	0.35	0.43	0.13	0.55	0.74	-	
12. Musicianship expectations	31.69	4.13	-2.19	8.41	0.37	0.32	0.44	0.31	0.40	0.49	0.62	0.29	0.57	0.70	0.74	-

Note. All correlation coefficients are at least significant at $p < 0.05$ level of significance.

As seen in Table 16, the factors of music teacher identity were positively associated with each other, with correlation coefficients ranged in magnitude from moderate (r = 0.22) to strong (r = 0.76). However, the factors of musician identity were strongly and positively related to each other. Although the correlations among the factors of music teacher and musician identities were all positive, they were distinguishable in terms of the magnitudes of the correlation coefficients. Specifically, social persuasion was moderately related to personal causes, desire to demonstrate musical ability, and musicianship expectations whereas it was strongly related to social causes. Likewise, modelling was strongly related to social causes whereas it was moderately related to personal causes, desire to demonstrate musical ability, and musicianship expectations. The relationship between value and musicianship expectations was stronger than the relationships between value, social causes, personal causes, and desire to demonstrate musical ability.

The relationships between efficacy beliefs, personal causes, and social causes were stronger than the relationships between efficacy beliefs, desire to demonstrate musical ability, and musicianship expectations (Table 16). The relationship between personal characteristics and musicianship expectations was stronger than the relationships between personal characteristics, social causes, personal causes, and desire to demonstrate musical ability. The same correlation patterns were also observed regarding the relationships between self-oriented professional expectations, musicianship expectations, social causes, personal causes, and desire to demonstrate musical ability. Notably, student-oriented professional expectations were strongly related to musicianship expectations whereas it was moderately related to social causes, personal causes, and desire to demonstrate musical ability. When compared to the aforementioned relationships between the factors of music teacher and musician identities, the weakest relationships were observed between planned persistence in teaching, social causes, personal causes, desire to demonstrate musical ability, and musicianship expectations. This was particularly true for the relationship between planned persistence in teaching and desire to demonstrate musical ability (Table 16). Finally, it was observed that music teacher and musician identities as the second-order factors were strongly and positively related to one another (r = 0.68).

Discussion

Qualitative aspects of music teacher and musician identities

The results of the qualitative analyses demonstrated that PMTs' music teacher identities were explained by the motivational (e.g., desire to teach and shape the future of students), cognitive (e.g., professional beliefs),

affective (e.g., desire to teach and shape the future of students), and career-oriented (e.g., planned persistence in teaching) aspects with respect to music teaching. These results are in line with the results of previous studies which showed that music teacher identity is multidimensional and consists of many cognitive, affective, and motivational aspects (e.g., Cheung, 2008; Chong et al., 2011; Reid et al., 2008; Trent, 2011), and also consistent with considerable evidence showing that PTs'/teachers' motivations and professional plans about teaching are crucial to their teacher identities (e.g., Granjo et al., 2021; Hanna et al., 2019; Schepens et al., 2009; Korhonen & Törma, 2016).

Likewise, the Dynamic Systems Model of Role Identity, which is a theoretical model that incorporates diverse considerations from various perspectives on identity and motivation (Kaplan & Garner, 2018), strongly emphasises that teacher motivation and identity are not mutually exclusive. Importantly, the model provides a holistic perspective of teacher identity based on the fact that teacher identity cannot be reduced to its components as it is highly complex, dynamic, and contextualised (Kaplan & Garner, 2018). Thus, the contextualised nature of music teacher identity can be understood in terms of music teaching which further explicates why music teacher identity, similar to teacher identity, cannot be reduced to its specific aspects. This can be because, unlike other teacher education programmes, music teacher education programmes include many performance-oriented activities and courses aiming to develop PMTs' musical performances individually and collectively (Gruhn et al., 2017; Haning, 2021; Sloboda, 2000), which, in turn, could lead PMTs to develop more complex and dynamic music teacher identity.

The results of the qualitative analyses regarding musician identity revealed that PMTs' musician identities were also multidimensional and consisted of motivational (e.g., social persuasion), cognitive (e.g., beliefs about the personal characteristics of effective musicians), affective (e.g., interest in music), and goal-oriented (e.g., desire to demonstrate musical ability) aspects. The similarity between the aspects of PMTs' musician and music teacher identities can be explained based on the fact that the aspects of musician identity are not isolated from the aspects of music teacher identity because music teaching more or less requires PMTs to develop both pedagogical and musical skills (Garnett, 2014). This explanation is in line with the results of previous studies which showed that PMTs are likely to see themselves as both musicians and music teachers (e.g., Ballantyne et al., 2012; Ballantyne & Zhukov, 2017; Bennett & Chong, 2018; Harrison, 2010; Wagoner, 2011). For example, Hourigan and Scheib (2009) demonstrated that both pedagogical (e.g., classroom management skills) and musicianship skills were perceived by PMTs to be highly crucial prior to student teaching.

Nevertheless, there were also marked differences between the aspects of musician and music teacher identities. Specifically, in contrast to music teacher identity, musician identity consisted of motivational and goal-oriented aspects specific to musicianship (i.e., interest in music and desire to demonstrate musical ability). Given that musicianship requires one to have many performance-oriented skills (e.g., singing) in addition to cognitive (e.g., audiation: the ability to hear the music inside one's head-Houlahan & Tacka, 2008) and affective skills (e.g., feeling the music) (Houlahan & Tacka, 2008), and also given that music teacher education programmes contain many activities and methods aiming to increase such kinds of performance-oriented skills (e.g., playing musical instruments) (Haning, 2021; Hourigan & Scheib, 2009), it can be understood why musician identity contained PMTs' desires to demonstrate their musical abilities. Furthermore, as mentioned in the 'context and aim of the study' section, in Turkey, almost all PMTs enter music teacher education programmes after graduating from Fine Arts High Schools, indicating that PMTs' music-related experiences precede their teaching-related experiences. In turn, this could lead PMTs to develop an interest in music earlier than teaching and potentially explains why 'interest in music' appeared as a part of musician identity. Although PMTs' 'interest in teaching' did not appear as one of the aspects of their music teacher identities, it was embedded in their utterances regarding planned persistence in teaching as affective causes (…because I love teaching) that would lead them to persist in the teaching profession (e.g., I will never leave the teaching profession…) (Table 1).

Notably, the results further showed that music teacher identity was explained through more themes than musician identity, suggesting that the content of music teacher identity was far more comprehensive than the content of musician identity. Although the current music teacher education programmes in Turkey include more music-related courses and activities than pedagogical courses and activities (CoHE, 2018), it seems that it did not prevent PMTs to develop a comprehensive music teacher identity. This can be due to the fact that the ultimate goal of the music teacher education programmes is to prepare PMTs "with the knowledge and skills to teach music in the classroom" (Ballantyne & Packer, 2004, p. 299; see also Haning, 2021), which is also true for music teacher education programmes in Turkey (CoHE, 2018). It is likely that this may lead PMTs to recognise music-related courses and activities as more relevant to music teaching rather than musicianship, which, in turn, may explain why the content of music teacher identity was more comprehensive than the content of musician identity.

Quantitative aspects of music teacher and musician identities

In line with the results of the qualitative analyses, the results of the EFA regarding music teacher identity revealed that PMTs' music teacher

identities were significantly explained through the factors of motivations for music teaching which captured social persuasion, modelling, value, efficacy beliefs, and personal characteristics along with the factors of self-oriented professional expectations, student-oriented professional expectations, and planned persistence in teaching. Likewise, the results of the CFA confirmed that music teacher identity could be reliably explained based on these factors. These results are highly in line with the results of previous studies which demonstrated that PTs'/teachers' motivations for teaching were explained by social influences (e.g., social persuasion), expectations, and professional plans about teaching (e.g., Brookhart & Freeman, 1992; Ivanec, 2020; Watt & Richardson, 2007, 2008).

In fact, these results nicely fit into the Factors Influencing Teaching Choice Framework (Watt & Richardson, 2007; Watt et al., 2012). For example, the contents of social persuasion and modelling factors were highly similar to the contents of the social influences and prior teaching and learning experiences factors described in the FIT-Choice framework respectively. The contents of value, modelling, and personal characteristics were also similar the contents of intrinsic career value and ability factors defined in the FIT-Choice framework respectively. Additionally, the contents of self-oriented professional expectations, student-oriented professional expectations, and planned persistence in teaching factors were similar to the contents of planned effort, planned persistence, and professional development aspirations described in the Professional engagement and Career Development Aspirations (PECDA) framework (Watt & Richardson, 2008). Hence, these results clearly indicate that PMTs' music teacher identities can be reliably described based on both their motivations and professional aspirations for music teaching on the one hand, and underline the fact that PMTs are indeed likely to see themselves as both musicians and music teachers on the other (e.g., Ballantyne et al., 2012; Ballantyne & Zhukov, 2017; Bennett & Chong, 2018).

Nonetheless, the results of the EFA regarding music teacher identity more or less differed from the results of previous studies (e.g., Bennett & Chong, 2018; Ivanec, 2020). Specifically, the results revealed that PMTs' music teacher identities consisted of both self-oriented and student-oriented expectations. These results can be explained based on the premises of the Expectancy Value Theory of Motivation (Wigfield & Eccles, 2000) and Situated Expectancy-Value Theory (Eccles & Wigfield, 2020). These theories enable one to predict both self and other-oriented expectations as well as to predict self and other-oriented expectations are not mutually exclusive. Moreover, the Situated Expectancy-Value Theory (Eccles & Wigfield, 2020) further enables one to consider the effects of contextual and cultural factors on individuals' expectations and values.

Within this framework, music teaching can be considered as a context in which PMTs' music teacher identities are cultivated through the effects of diverse activities that are not only specific to making music (e.g., playing a musical instrument), but also specific to teaching music (e.g., music-related classroom activities). Thus, it can be understood why PMTs' professional expectations regarding music teaching were divided as self-oriented and student-oriented expectations because these expectations highlight two of the core aspects of music teaching (e.g., making music and teaching music) (Houlahan & Tacka, 2008).

The results of the EFA regarding musician identity showed that PMTs' musician identities were explained through the factors of motivations for musicianship which consisted of social causes and personal causes together with the factors of desire to demonstrate musical ability and musicianship expectations. Also, the results of the CFA confirmed that musician identity could be reliably explained based on these factors. Indeed, the factors of the musician identity were similar to the factors of music teacher identity. This can be because, as aforementioned, music teaching requires PMTs to develop both pedagogical and musical skills (Garnett, 2014), which further explains why PMTs perceive pedagogical (e.g., classroom management skills) and musicianship skills as equally crucial prior to student teaching (Hourigan & Scheib, 2009). On the other hand, musician identity considerably differed from music teacher identity as it also contained two diverse aspects specific to musicianship: interest in music and desire to demonstrate musical ability. As discussed earlier, musicianship requires one to develop many performance-oriented skills (e.g., playing a musical instrument) (Houlahan & Tacka, 2008). Furthermore, music teacher education programmes also serve to develop musical skills (Hourigan & Scheib, 2009) of PMTs who almost entirely enter music teacher education programmes after graduating from Fine Arts High Schools (CoHE, 2018). Notably, even before enrolling in Fine Arts High Schools, PMTs tend to have at least to some extent musical experience through their parents who are committed to support their children to learn, for example, playing musical instrument(s) (Margiotta, 2011). Likewise, the results of a recent research have indicated that music teachers were not likely to motivate their students toward music teaching when they feel they lack the academic preparation and/or the music-related abilities essential for achievement in a music teacher education programme (Porter et al., 2017). Taken all together, these explanations shed light on why PMTs' musician identities also included the factors of interest in music and desire to demonstrate musical ability.

Moving one step further away from the results of the EFAs and CFAs, the results of the model comparison analyses demonstrated that the first-order

factor models of music teacher and musician identities had significantly better fit to the data than the second-order factor models. This indicates that PMTs perceive the aspects of their music teacher identities as related, yet distinctly different from each other. This result can be explained based on the fact that although cognitions, motivations, and professional plans about teaching are prominent parts of any teacher identity (e.g., Granjo et al., 2021; Korhonen & Törma, 2016), teacher identity cannot be reduced to its components because it is highly complex, dynamic, and contextualised (Kaplan & Garner, 2018) as predicted by the Dynamic Systems Model of Role Identity (Kaplan & Garner, 2018). Following the same line of reasoning, it can also be understood why PMTs also perceive the aspects of their musician identities as related, yet distinctly different from each other because, similar to music teacher identity, musician identity is also highly complex and dynamic (Gruhn et al., 2017; Haning, 2021; Sloboda, 2000). Additionally, these results can also be explained based on the effects of music teacher education programmes on PMTs' identity development because they consist of many separate, yet related pedagogical and music-related courses and activities aiming to develop pedagogical and musical knowledge and abilities that are crucially relevant to music teaching (CoHE, 2018; Haning, 2021).

The relationships among the aspects of music teacher and musician identities

The results of the latent-factor correlation analysis further confirmed that the aspects of music teacher and musician identities were indeed related, yet distinctly different from each other. This indicates that the relationships both within and between the factors of music teacher and musician identities cannot be attributed to common method bias (Podsakoff et al., 2003) or cannot be interpreted as statistical artefacts (Sowey & Petocz, 2017).

Specifically, the results demonstrated that social persuasion was moderately related to personal causes, desire to demonstrate musical ability, and musicianship expectations whereas it was strongly related to social causes. Given that both social persuasion and social causes similarly emphasise the social influences (Watt & Richardson, 2007; Richardson & Watt, 2010) that lead PMTs to choose music teaching and musicianship as their future careers respectively, it can be understood why the relationship between social persuasion and social causes was stronger than the relationships between social persuasion, personal causes, desire to demonstrate musical ability, and musicianship expectations. Given that modelling refers to the adoption of an observed individual's behaviours who is perceived by the observer (e.g., PMT) as a role model (Bandura, 1986, 1999), it can also be considered within the framework of social

influences because the observed individual's behaviours (e.g., behaviours of parents/significant others who are perceived as role models) may also motivate the observer (e.g., PMT) to follow particular career paths. In turn, this explains the stronger relationship between modelling and social causes.

Furthermore, the results revealed that the relationship between value and musicianship expectations was stronger than the relationships between value, social causes, personal causes, and desire to demonstrate musical ability; whereas the relationships between efficacy beliefs, personal causes, and social causes were stronger than the relationships between efficacy beliefs, desire to demonstrate musical ability, and musicianship expectations. Seemingly, PMTs are more likely to connect the value of music teaching with their musicianship expectations whereas they are more likely to connect their efficacy beliefs about music teaching with personal and social causes that led them to consider musicianship. The former can be due to the effect of music teacher education programmes, which combine many pedagogical aspects with musical aspects to enable PMTs to become effective music teachers (Garnett, 2014; Haning, 2021; Wagoner, 2011), as well as due to the fact that musicianship requires one to develop many performance-oriented skills (Houlahan & Tacka, 2008), which, in turn, may lead PMTs to consider the value of teaching music along with their musicianship expectations because they are not mutually exclusive in terms of both making music and teaching music. Likewise, there is evidence showing that music teachers consider music-related skills as highly instrumental to effective music teaching (Thornton, 2013). In turn, this may also explain why desire to demonstrate musical ability was not perceived by PMTs as relevant to music teaching because, for example, demonstrating musical ability to the audience conceptually and practically differs from teaching how to play a musical instrument to students. These explanations also shed light on the weak relationship between planned persistence in teaching and desire to demonstrate musical ability because the teaching profession in general (Feiman-Nemser, 2008), and music teaching in particular (Haning, 2021), require PMTs to precede students' learning needs and desires rather than their personal needs and desires (e.g., desire to demonstrate musical ability to the audience).

This line of reasoning could also explain why PMTs were more likely to connect their efficacy beliefs about music teaching with personal and social causes that led them to consider musicianship as a future career because efficacy for music teaching and both social and personal causes well coincide with the fact that the main aim of music teacher education programmes is to prepare PMTs as effective music teachers who have sufficient "knowledge and skills to teach music in the classroom"

(Ballantyne & Packer, 2004, p. 299). It is obvious that such an aim requires PMTs to feel efficient in terms of their musical skills regardless of whether these skills are necessary for teaching music or making music. Thus, it can also be understood why the relationship between personal characteristic in relation to music teaching and musicianship expectations, as well as the relationships between self-oriented professional expectations, student-oriented professional expectations, and musicianship expectations, were stronger. In fact, these results can be expected because both teaching-related personal characteristics and student-oriented professional expectations are highly in line with PMTs' musicianship expectations (e.g., acquiring comprehensive musical knowledge, develop musical skills efficiently) each of which, as the crucial parts of music teaching (Garnett, 2014), nicely corresponds to their personal characteristics (e.g., I am a good communicator), self-oriented professional expectations (e.g., I want to transmit my musical knowledge to students), and student-oriented professional expectations (e.g., I expect to perform music education with full of joy).

Notably, the results demonstrated that the relationships between planned persistence in teaching, social causes, personal causes, and musicianship expectations were quite weak. This is because, when compared to other factors of music teacher identity (e.g., student-oriented professional expectations), planned persistence is unique in that it reflects PMTs' decisions to remain in the teaching profession which is, by nature, different from the music profession. The moderate relationships between the aspects of music teacher and musician identities can be explicated based on the premises of the Social Cognitive Career Theory (Lent, Brown, & Hackett, 1994) which postulates that learning experiences, efficacy and outcome expectations, along with interests and goals explain individuals' career choices, which, in turn, predict career-related performances and attainments. This suggests that individuals' career beliefs, goals, interests, expectations, and attainments are considerably related to each other. This can be particularly true for the challenging professions, such as music teaching because it requires one to acquire comprehensive pedagogical and music-related knowledge as well as to develop complex teaching and music-related skills simultaneously (Hourigan & Scheib, 2009).

More importantly, the results showed that the relationship between music teacher and musician identities as the second-order factors was strong and positive, signifying that there is a consonance between music teacher and musician identities rather than a dissonance. This result is highly in line with the results of previous research on arts teacher identity (e.g., Bremmer et al., 2021) which captures both teaching-and arts-related/ artistic identities (e.g., Bremmer et al., 2021; Hall, 2010). In fact, this result

clearly supports Lucero's (2011) argument that teacher and artist identities are not the opposite poles of the same continuum; rather, they complement each other. The discrepancies between the current result and the results of previous studies, which indicated a dissonance between teacher and artist identities rather than a consonance (Milbrandt & Klein, 2008; Welch et al., 2011), can be due to the differences between the characteristics of the samples of the present study (e.g., PMTs) and previous studies (e.g., arts educators and graduate students, Milbrandt & Klein, 2008; in-service music teachers, Welch et al., 2011).

Theoretical and practical implications

The results of the current study significantly contribute to the relevant literature by providing a theoretical framework in which the aspects of PMTs' music teacher and musician identities and the relationships between them are evident. Given that music teacher and musician identities were either examined separately or based on the qualitative methods only (e.g., Chua & Welch, 2020; Isbell, 2008), the current framework could inform music teacher educators and policymakers regarding the comprehensive aspects of music teacher and musician identities when PMTs are at the initial phase of their career. Furthermore, by providing not only the prominent aspects of music teacher and musician identities, but also providing how they are related to each other, the current framework could also enable music teacher educators and policymakers to develop more effective music teacher education programmes that are more relevant to the learning needs of PMTs because, as mentioned earlier, both pedagogical and music-related skills are perceived by PMTs as crucial prior to student teaching (Hourigan & Scheib, 2009). Indeed, this could positively impact the identity development of PMTs, which, in turn, significantly contributes to music teacher effectiveness given that teacher identity is one of the crucial factors that explains teacher effectiveness (Beauchamp & Thomas, 2009; Feiman-Nemser, 2008; Yuan & Lee, 2015).

Encouraging PMTs to develop a comprehensive and well organised music teacher identity could also reduce the tension between the aspects of their music teacher and musician identities (e.g., Milbrandt & Klein, 2008; Welch et al., 2011), and lead them to create a balance between their music teacher and musician identities. Notably, there is evidence showing that music-related skills are perceived by most of the music teachers as a prerequisite for motivating students to consider music teaching as a career (Porter et al., 2017), indicating that musical performance of students is perceived as a dominant factor in music teaching. However, the current results revealed that desire to demonstrate musical ability was weakly related to persistence in teaching, indicating that PMTs' did not perceive demonstrating musical ability as an important aspect of music teaching.

Thus, enabling PMTs to create a consonance between their music teacher and musician identities through pedagogical activities/methods (e.g., micro teaching) (Fernandez, 2005) and musical activities/methods (e.g., concerts) (Sands, 2007) during music teacher education process, could enable them to develop more realistic music teacher identities that are also consistent with their expectations of music teaching.

The current results demonstrated that PMTs' music teacher and musician identities were positively and strongly related to one another, suggesting that PMTs' music teacher and musician identities can be also examined based on the concept of 'arts teacher identity'. Given that arts teacher identity includes the diverse and many aspects of teaching- and arts-related identities (e.g., Bremmer et al., 2021; Hall, 2010), music teacher educators and policymakers should be aware of the fact that the consistency between the aspects of arts teacher identity is not warranted. Likewise, "teachers in arts education frequently struggle with their professional identity and feel conflicted" (Bremmer et al., 2021, p. 83) because they tend to consider that "their main responsibility is education at the expense of understanding themselves as artists" (Bremmer et al., 2021, p. 83). Nevertheless, as Lucero (2011, 2016, 2018) argued, teacher and artist identities are not mutually exclusive and the teaching profession does not prevent artistic creativity. According to Lucero (2011), an arts teacher can be considered as a conceptual artist who combines progressivist pedagogies (e.g., Dewey, 1938) with conceptual art practices efficiently (Cray, 2014). Hence, music teaching practicum activities during which PMTs find opportunities to develop their students' musical abilities by using effective music teaching methods (e.g., Kodály, Dalcroze, and Orff Schulwerk) could increase their awareness regarding the fact that the teaching profession does not prevent their musical performance and creativity (Abril & Gault, 2016). Such an awareness could reduce the number of music teachers who leave the teaching profession (Bergersen, 2009; Scheib, 2006; the United States Department of Education, 2014) by motivating them to persist in the teaching profession.

Limitations and directions for future studies

This study has some limitations which require further investigations. First, although the music teacher education, similar to other fields of teacher education (Darling-Hammond, 2006), can be considered as the earliest phase of PMTs' music teaching career, PMTs' teacher identities could significantly differ from the experienced music teachers' identities in terms of both their aspects and their associations with each other. Therefore, future studies in which both PMTs' and experienced music teachers' identities are investigated simultaneously could provide more comprehensive results regarding music teacher identity. Music teacher

identity should also be investigated along with musician identity because, as the current results indicate, they are considerably related to one another.

Second, although a mixed method research design was used to examine PMTs' music teacher and musician identities, the correlational design of the quantitative phase of the current study does not enable one to infer whether the development of PMTs' teacher identities precede the development of their musician identity or vice versa. Thus, future studies in which the development of PMTs' music teacher and musician identities are examined based on the longitudinal designs (e.g., cross-lagged panel design) could enable researchers to examine the relationship between the aspects of music teacher and musician identities in a sequential manner. Experimental studies in which clear feedback is given to PMTs regarding the development of their music teacher or musician identities could also enable researchers to infer causality regarding the possible effect of music teacher identity on musician identity or vice versa.

Third, although the results showed that PMTs' music teacher and musician identities could also be examined based on the concept of 'arts teacher identity', these results cannot be generalised to samples other than PMTs due to the complexity of the concept of 'arts' (e.g., ceramics, painting, sculpture) (Andrelchik, 2014). Hence, future studies in which teacher identities of PTs from diverse fields of arts (e.g., painting) are investigated could considerably enlarge the content of arts teacher identity. Fourth, the current results showed that the Cronbach's coefficient alpha for the modelling factor of music teacher identity was slightly weak. This can be due to the fact that Cronbach's coefficient alpha is highly sensitive to the number of items in a research instrument (Taber, 2018). Thus, future studies should investigate whether increasing the number of items of the modelling factor could lead to satisfactory coefficients of Cronbach's alpha (Taber, 2018).

Finally, variable-centred statistical analyses were conducted in the present study. Although the results of these analyses (e.g., factor analyses, latent-factor correlation analysis) revealed a comprehensive framework in which the relationships between the aspects of music teacher and musician identities were discernible, this framework did not include the person-level relationships between the aspects of music teacher and musician identities. Thus, person-centred statistical analyses (e.g., cluster analysis; see, e.g., Hennig et. al., 2015) could provide refined results regarding person-level relationships between the aspects of music teacher and musician identities, which, in turn, could enable researchers to uncover the diverse ways through which the aspects of music teacher and musician identities are combined by PMTs to generate their arts teacher identity.

Conclusions

The results of the study lead to five major conclusions. First, music teacher and musician identities were likely to be formed by PMTs at the initial phase

of their teaching careers. Second, PMTs' music teacher and musician identities were multidimensional and consisted of motivational, cognitive, affective, and goal-oriented aspects. Third, the aspects of PMTs' music teacher and musician identities were related, yet distinctly different from each other. Fourth, the aspects of music teacher and musician identities were positively and selectively related to each other. Fifth, music teacher and musician identities as the second-order factors were strongly and positively correlated with one another.

Overall, the results of the current study suggest that PMTs' music teacher identities should be considered together with their musician identities in order to understand the complexity of PMTs' music teacher identities at the initial phase of their teaching careers. Given that teacher identity is one of the most important factors that relates to teaching and teacher quality (Beauchamp & Thomas, 2009; Day, 2021; Haning, 2021), and also given that teacher identity potentially explains why substantial number of music teachers leave the teaching profession (Scheib, 2006; the United States Department of Education, 2014), the current results significantly contribute to current attempts aiming to reduce music teacher retention and/or to increase music teacher effectiveness by providing a comprehensive theoretical framework in which the diverse aspects of music teacher and musician identities are evident in music teacher education. Such a comprehensive framework could enable policymakers and music teacher educators to hear the multiple rhythms of PMTs' identities clearly and lead them to understand the professional needs of PMTs/music teachers accordingly.

Appendix

Interview questions

1. Name the reasons for choosing music teaching department?
2. Has the music teaching department met the professional expectations that you set for your future career?
3. Would you become an effective music teacher after completing the music teaching department?
4. Have your thoughts about your music teaching career changed after you enrol in this department?
5. Would you like to become a music teacher? To what extent are you planning to pursue this profession in the future? Why?
6. What do you expect in your career as a pre-service music teacher?
7. Do you think that you are the right person to become a music teacher? Why?
8. What does it mean for you to teach something to your students? How would you explain your feelings about teaching in your future experiences? Why?
9. Which one would make you happier, to be a musician or to be an effective music teacher? Why?
10. How would you define a good music teacher? What are their characteristics?
11. How would you define a musician? What are their characteristics?

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Chapter 2

8TH GRADE STUDENTS' OPINIONS ON NEW GENERATION MATH QUESTIONS[1]

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INTRODUCTION

The developing and changing world realities are reflected in many fields as well as in education. The rapid transition from agricultural societies to industrial societies and from there to information societies imposes different duties and responsibilities on individuals. Now the world needs people who think and produce rather than people who do what they are told. In this context, there are radical changes in education as well, and it comes to the fore to raise individuals who can understand what they read, solve problems, use mathematics effectively in their daily lives and reason in such situations (Doruk and Umay, 2011). These skills are considered today in relation to the concept of literacy, and individuals are expected to be mathematically literate, especially when it comes to mathematics education. Mathematical literacy is expressed as the capacity of individuals to formulate, use and interpret mathematics in various environments (Organization for Economic Co-operation and Development-[OECD], 2013). In parallel with these prominent skills, different methods and materials are now used in assessment and evaluation processes. One of the mentioned methods is international scale exams such as PISA and TIMSS. The Program for International Student Assessment (PISA) is an international study conducted by the Organization for Economic Cooperation and Development (OECD) every three years and is aimed at 15-year-old students. This exam was started to be applied for the first time in 2000, and our country was included in this exam for the first time in 2003 (Ministry of National Education [MoNE], 2020a). When the results of the PISA exams held in 2003, 2006, 2009, 2012, 2015 and 2018 are examined, it is noteworthy that students in Turkey are below the OECD average in all exams (MoNE, 2010a; 2010b; 2015a; 2015b, 2015c; 2019a).

The International Mathematics and Science Trends Study (TIMSS) is an achievement monitoring study conducted by the International Educational Achievement Assessment Agency (IEA) over a four-year period. It aims to measure the achievements of 4th and 8th grade students in the fields of mathematics and science and their habits of using the knowledge they have learned in this field in daily life (MoNE, 2019b). TIMMS exam has been applied since 1995 and our country participated in this exam for the first time in 1999 at the 8th grade level. He continued to participate regularly in the following period. According to the results of the mathematics test conducted in 1999, Turkey was ranked 31st among 38 countries participating in the project (MoNE, 2003). Accordingly, our country's TIMSS results were below the average. According to the results of the examination held in 2007, an increase was found in the percentage of students who were below the average, this time in the middle and

lower level (MoNE, 2007). Although Turkey's TMSS mathematics score increased in 2011 and 2015, it could not exceed the average (MoNE, 2014, 2016). Finally, in 2019, Turkey performed above the midpoint of the scale (500 points) for the first time in TIMSS applications with 523 points (MoNE, 2020b).

According to the PISA and TIMSS exam results, although it is known that the students in Turkey are generally successful in the multiple-choice questions, it is seen that they cannot make sense of how the information is used in a real context and questions that require high level skills for problem solving and therefore cannot solve it (Çepni, 2020). This means that our students graduate from our schools without internalizing knowledge, that is, without being information literate. In relation to this situation, there has been a need to question the education system, measurement and evaluation processes, and the examination system in our country, and it is aimed to transition from a assessment system in which various concepts, facts and formulas are memorized to a different system in which basic mental skills are measured (MoNE, 2018a). In this context, a number of changes have been made in the curricula, central exams and transition system between grades, and some restorations have been made in the central exams, in accordance with the nature of this approach, under the name of "life-based" or "new generation", "skill-based" questions (Altun and Bozkurt, 2018). New generation questions are known as questions that measure high-level thinking skills, which are difficult to measure with familiar objective items, which are expected to provide students with targeted skills and allow the student to associate the current situation of the problem with their own experiences while solving a problem (as cited in Kılcan, 2021). These question types, which include scenarios that can be encountered in real life and require the use of cognitive skills such as understanding, interpretation, application and analysis in solution processes, and which often have components such as long paragraphs, stories and visuals, tables, graphs, sample formulas, etc., are named as *new generation questions* in our country. (Kaplan and Bozkuş, 2021).

One of the central high-risk exams in Turkey is the High School Entrance System (LGS), which allows eighth grade students to enter high schools. This exam has been implemented since 2018 and includes questions known as context-based questions, skill-based questions and new generation questions, as in PISA and TIMSS (Erden, 2020). It is aimed to reflect the experience gained here in university exams.

However, it can be said that this change in the model of exams brings some uncertainties for students and teachers. As a matter of fact, according to the reports published by the Ministry of National Education

[MoNE] (2018b, 2019c) regarding the LGS exam, a significant proportion of the students left the questions blank in the mathematics course. With the thought that there could be a solution to this situation, the exam period of the quantitative section was extended in 2019, but still, a significant proportion of the students left the questions blank (Erden, 2020). This shows that the revisions made in the education bring along some different problems. From this point of view, in this study, it is aimed to obtain the opinions of the students about the new generation questions. The results of the research will reveal the students' perspectives on these questions and will show what possible obstacles may be encountered in the context of the student at the point of reaching the targeted points in education. In this context this study is important, and it is thought that it will contribute to the field.

METHOD

The research design of this study is case study survey research. In this design, researchers ask questions to examine individuals' opinions, behaviors, skills, beliefs, or knowledge as expressed by individuals themselves. The answers are analyzed in order to identify the tendencies of the individuals. The aim here is to make inferences about these trends (Mills, Durepos, & Wiebe, 2010).

Study Group

The students in the study group are 48 middle school 8th grade students studying in a public school. The students in the study group were chosen from among the students of the teacher conducting the research, who volunteered to participate in the study. Therefore, it can be said that convenience and criterion sampling methods were used in the selection of the students in the study group.

Data Collection Tools

The interview form (IF) developed by the researchers was used in the study. In this form, there are 9 open-ended questions to reveal students' views on new generation questions. Opinions of two lecturers and a teacher who are experts in the field were consulted regarding the validity of the questions. In line with these views, changes were made to some of the questions in the data collection tool, and the question statements were finalized in line with the suggestions made. After this process, a preliminary application (pilot study) was made for the reliability of the study and the questions were applied to 10 students with different academic achievements, selected from 8th grade students studying in a different class of the teacher who conducted the study. After the application, some questions were changed and the parts that were not understood by the

students were tried to be expressed more clearly. Also, it was seen that the answers to some questions were similar, so these questions were expressed in different ways and reduced to a single question.

Analysis of Data

In the interviews, 8 open-ended questions were asked to the students and the answers were subjected to content analysis and the answers of the students were gathered under the appropriate categories. In this process, the teacher and the lecturer who conducted the research made the coding separately and applied for the reliability of the data obtained. The encoder reliability value calculated for consistency among researchers is 0.84.

FINDINGS

Findings Obtained from the First Question in IF

Student responses to the question of "What do you understand when the new generation says question?" are given in Table 1.

Table 1

Student Responses to the First Question in the IF

Categories	Sub-categories	Student Expressions	f
Expressions Regarding the Nature of the New Generation Questions	Statements Regarding the Degree of Difficulty	Long, challenging, difficult to understand, confusing questions	31
		Even reading is tiring.	4
		Students need to work harder	3
		It is not enough to have the knowledge	1
		Total	39
	Statements on the Solution Process	Requires processing capability	2
		Unsolved questions	2
		Time wasting questions	2
		Interpretive questions we can do if we find the logic	2
		Questions that require reading comprehension	1
		Contradictory questions	1
		Very problematic questions	1
		Total	11
	Other Statements	*I understand as new model questions*	4
		Making the acquisition questions more difficult and illustrating	1
Affective Expressions	Negative Statements	*I understand them as boring, challenging, brain-burning, frustrating questions.*	5
		Nasty question type	2
		Nothing, just very bad questions	1
		Difficult and long questions that even teachers can't do	1
		Total	9
	Positive Statements	*Questions that look long and scary but simple in content*	1
		Difficult and somewhat fun questions	1
		Total	2

When Table 1 is examined, it is seen that the students gave different answers within different categories. The answer category with the highest total frequency is related to the difficulty level of the questions, and the student statements with the highest frequency in this category

include that the questions are long, challenging, difficult to understand and confusing. After that, the answer category with a high frequency is related to the solution process of the questions. Student expressions with similar frequency distribution in this category include different difficulties related to the solution process of the questions. It was observed that the students expressed their feelings towards the questions in the answers outside of these categories. Accordingly, negative statements have a higher frequency than positive statements. Among the negative statements, student statements with the highest frequency include that the questions are boring, challenging, brain-burning, and frustrating.

Findings Obtained from the Second Question in IF

Student responses to the question of "How often did you encounter new generation questions until you passed in to the eight grade?" are given in Table 2.

Table 2

Student Responses to the Second Question in the IF

Student Expressions	**f**
Compared to the 8th grade, I encountered much less	24
Sometimes I met	6
I met a lot, it was very difficult, I'm struggling	5
Total	35
I did not meet	13

When the data in Table 2 were examined, it was seen that 43 students (90%) stated that they had never encountered new generation questions before or that they had encountered it much less frequently compared to the 8th grade. Therefore, it can be said that most of the students in the study group did not encounter such questions much before the eighth-grade level.

Findings Obtained from the Third Question in IF

42 students (88%) answered *Yes- I have difficulty*, 6 students (12%) answered *No, I do not have difficulty* for the third question as "Do you have difficulty in solving new generation questions? If your answer is yes, please state the reasons for this situation." in the IF. The reasons for the students who answered '*yes'* are given in Table 3.

Table 3

Student Responses to the Third Question in the IF

Categories	Student Expressions	f
Cause of strain	Although I understand the question, I don't know how to solve it	17
	I'm having trouble understanding the question	16
	I am not sure if the solution is correct	13
	Cause it sounds so long and complicated	11
	I don't understand how to write mathematically	8
	I don't understand what I have to do	2
	Because it is necessary to make the solution very detailed	1
	I can't come to a conclusion	1

According to the data in Table 3, it is seen that among the reasons why students have difficulty with new generation questions, the expressions with the highest frequency include not knowing how to solve the problem, having difficulty understanding the question, not being sure of the correctness of the solution, and the long and complex nature of the questions.

Findings Obtained from the Fourth Question in IF

Student responses to the question of "Which questions would you prefer to be asked in LGS exams? New generation or acquisition questions? are given in Table 4.

Table 4

Student Responses to the Fourth Question in the IF

Student Expressions	f
Acquisition questions should be asked, the new generation should not be asked, that is, it should be easy.	29
I think acquisition questions should be mainly asked, there may be a few new generations	9
I think half of both should be asked.	7
I think new generation questions should be asked	2
The new generation can be asked more easily	1

According to the data in Table 4, it was observed that approximately 60% of the students did not prefer the new generation questions to be asked in LGS exams, however, some students stated that these questions could be used partially in the said exams.

Findings Obtained from the Fifth Question in IF

33 students (69%) answered as *I do not support,* 5 students (10%) *I absolutely support*, and 3 students (6%) answered as *it would be more correct to include less* for the question of "Do you support new generation questions

being in the curriculum? Why?" in the interview form. The student reasons for this question are given in Table 5. When the expressions of the students in Table 5 are examined, it is seen that the expressions with high frequency generally indicate that the students do not support to include the new generation questions in the curriculum due to the difficulty of the questions.

Table 5

Student Responses to the Fifth Question in the IF

	Student Expressions	**f**
Reasons for negative responses	*There are often difficult questions, which makes us lose our enthusiasm for solving mathematics and turns people off from mathematics.*	10
	Yes, it's good, but it's too hard, I'm bored of solving questions because I can't do it.	4
	Unnecessarily long expressions are used, but they can actually explain it in one sentence.	1
	They don't want to solve it because it scares the students.	1
	Very silly and unnecessary difficult questions	2
Reasons for positive responses	*Because I think it is necessary for ease of elimination*	1

Findings Obtained from the Sixth Question in IF

Student responses to the question of "What do you think might be the reasons for being new generation questions to the curriculum?" are given in Table 6. When the student responses are examined, it can be said that the positive and negative opinions of the students regarding the reason for new generation questions to be in the curriculum have close frequency values. However, the frequency of negative ideas is higher than the other category. When the expressions used by the students are examined, it is seen that the expression with the highest frequency is *for forcing the children* and *for the ease of elimination*. Approximately 45% of the students gave this answer. When the positive statements are examined, it is seen that the reasons such as *the selection of successful students*, *the acquisition of reading habits*, *the measurement of intelligence/attention level*, and *the development of reasoning/interpretation skills* are listed.

Table 6

Student Responses to the Sixth Question in the IF

	Student Expressions	**f**
Negative	*To make the kids challenging, for ease of elimination*	22
	Added in vain	3
	To make us tired of more lectures	1
	Total	**26**

	To select the most successful ones and to measure the level of students	7
	For the development of the world	2
	To gain the habit of reading	2
	To measure intelligence or attention	2
	To prepare students for challenges	2
Positive	*To measure students' levels, but they can do it with regular questions*	1
	To better understand the subject	1
	To increase our math skills	1
	To make sense	1
	To improve our ability to interpret	1
	Total	**20**
Other	*I don't know*	11

Findings Obtained from the Seventh Question in IF

Student responses to the question of "Did the new generation questions have an impact on your interest and love for mathematics? If so, what effect did it have? Please explain." are given in Table 7.

Table 7

Student Responses to the Seventh Question in the IF

	Student Expressions	f
	Made me feel cold from math	31
Negative	*I like to solve the acquisition question, but when I see the new generation, my enthusiasm for solving it completely disappears.*	4
	It puts a huge burden on me.	1
	Total	**36**
	When I solve new generation, my interest and love increased.	3
Positive	*Made me even more hooked on math*	1
	I'm solving it now and I'm happy	1
	Total	5
Neutral	*It didn't happen*	**15**

When the answers in Table 7 are examined, it is seen that 75% of the students stated that the new generation questions have a negative effect on their interest/love for the mathematics lesson. In a large part of these answers, students similarly used the expression as *new generation questions caused me to alienate from the mathematics course*. Only five students (10%) stated that new generation questions increased their interest/love of mathematics lesson. 11 students (23%) stated that these questions did not have any effect on their interest in the course.

Findings Obtained from the Eight Question in IF

40 students (83%) answered *No*, and 8 students (17%) answered *Yes* for the question of "Would you like to choose a profession related to mathematics in the future? Could you briefly explain why?" in the interview form. The reasons given by the students regarding the choice of profession are given in Table 8.

Table 8

Student Responses to the Eighth Question in the IF

	Student Expressions	**f**
No, I don't want because…	*I don't want to because I don't understand math, it's a difficult job*	13
	I don't like math lesson, it doesn't interest me	6
	I don't want to choose it because I can say that I am alienated from mathematics because of new generation questions.	1
	Let's think of mathematics as a tree, and I'm a fish, so I can't climb that tree.	1
	I wish I could choose. All the fields that I am very interested in are in math, but I can't choose	1
	No, I can't keep my brain busy with math in the future.	1
Yes, I want because…	*I would like it because job opportunities are better*	2
	It's the only lesson I understand and can do properly, but I can change my idea in the future.	1
	Yes because I love math	1

When the student expressions in Table 8 are examined, it is seen that most of the students stated that they do not understand mathematics and do not prefer a related profession because they find it difficult. Students who wanted to choose a profession related to mathematics cited job opportunities as a reason. Only one student stated that he would prefer a related profession because he likes mathematics.

DISCUSSION AND CONCLUSION

As a result of this research, it can be said that students generally have negative feelings and thoughts about new generation questions. It is seen that the perceptions of the students in the study group about the new generation questions are mostly related to the difficulty level of the questions. Because the statements of the students for the first question reveal this situation. Students describe the questions first as difficult and difficult to understand, and then as unsolvable, contradictory and meaningless questions. For this reason, students generally see such questions as boring, very bad, disgusting questions that even teachers cannot do. These results are consistent with the study of Kayhan, Cangüven, Kayhan, and Kayhan (2022). The subject study, in which the effect of new generation questions on the psychology of secondary school students was investigated, it was revealed that the students' statements with the highest frequency regarding new generation questions in general were related to the difficulty level of the questions. In the research conducted by Şen and Ünal (2021) with mathematics teachers and secondary school students, 248 secondary school students took part. As a result of this research, the students stated that they had similar difficulties in the new generation questions. With a

similar result, Kablan and Bozkuş (2021) stated that in their study with secondary school mathematics teachers and 8th grade students, teachers and students evaluate new generation questions as difficult and based on interpretation.

When it is examined why the students find the new generation questions difficult, it is seen that the answers given are generally related to the structure of the questions. The students stated that they did not know how to solve the questions due to their long and complex structure, they had difficulty in understanding, they were not sure of the solution and they had difficulty in expressing the question mathematically. This fact shows one of the most important results obtained from this study. It can be said that the reason why students use such expressions in relation to new generation questions is largely due to the fact that they have not encountered such questions much before. Because, according to the data obtained from the second question in this study, most of the students stated that they had never encountered such questions before or they encountered them much less frequently than in the eighth grade. New generation questions are quite challenging for students who are faced with the problems in the textbook in general in the mathematics courses conducted in our country and who try to solve the question types they are familiar with in the assessment and evaluation processes in these courses. In studies on students' problem solving processes and approaches, it is stated that students are mostly exposed to routine problems that have only one solution and can generally be solved with simple operations (İncebacak and Ersoy, 2016; Kaya, Kablan and Rice, 2014). Similarly, Kaya and Kablan (2018) stated that new generation questions pose difficulties for students because they involve situations that students are not accustomed to and require the use of certain cognitive skills. Although it is an accepted fact that such questions increase the cognitive skills and literacy levels of students, unfortunately, trying to implement this reform without spreading time and not giving our children the time for the transition process, unfortunately, distracts our students from mathematics rather than achieving the planned goals. The experience of failure causes students to decrease their self-efficacy perceptions and thus lose their motivation towards the lesson. The data obtained from the eighth question in this study supports these thoughts. Accordingly, the majority of the students in the study stated that the new generation questions alienated them from the mathematics lesson and had a negative effect on their interest and love for the lesson. This situation, unfortunately, can be considered as an indication that the steps trying to be taken have not reached their goal on behalf of our country, which has a lower performance in mathematics than developed countries in international exams. Similarly, in the study of Kayhan et al. (2022), it

was concluded that new generation questions negatively affect secondary school students' feelings and achievements in mathematics. The teachers in the Erden (2020) study stated that the number of students who are not interested in mathematics increased with LGS.

This process, which is carried out to increase students' literacy levels and improve their mathematical skills, unfortunately does not make much sense for students. Because the answers given to the fifth, sixth and seventh questions in this research reveal this situation. Although some of the students listed the reasonable reasons for the new generation questions to be in the curriculum, it is remarkable that the rate of students who could not explain these reasons was higher. Nearly half of the students stated that the reason for being such questions in the curriculum was to eliminate more students in the exams by forcing the students. In this context, the majority of the students stated that they do not want the new generation questions to be in the curriculum and being used in the LGS exam. Unfortunately, all these results are undesirable. Because, first of all, students should be informed about all the innovations and reform efforts that will be made for the benefit of them, and the reasons for all the innovations should be planned to make. In this way, it is thought that the motivation of the students about taking part in the process will be increased.

However, another issue is the implementation way of innovations. The rapid use of new generation questions in the LGS exam, which is a very important career exam for students, can undoubtedly be considered as the general reason for all negative results obtained from this study. The way for our students to be successful in such questions is not their own cognitive efforts without learning the basic pedagogical methods for solving such questions from their teachers in a very short time. The way to achieve this goal is to involve our students in this process step by step. Moreover, the situation for teachers has similar difficulties. Şen and Ünal (2021) stated in their study that both students and teachers have difficulties in new generation questions. Similarly, in the study of Güler, Arslan and Çelik (2019), teachers mention the difficulty level of new generation questions for students. However, a significant part of the mathematics teachers in the study of Erden (2020) stated that the new generation questions and course outcomes are not fully compatible, the questions have over-achievement, exaggerated and long content, and these questions measure skills of different qualities. The teachers who took part in the same study think that the current curricula do not provide sufficient guidance to teachers and students in the solution of skill-based questions. In this context, teachers find the textbooks incomplete due to the fact that they do not include current topics, the evaluation of themes is simple, the visual content is not rich, and they do not have the competence to prepare students for LGS. In

Erden (2020) research, a significant number of teachers stated that they need in-service training in the context of skill-based teaching and problem solving.

New generation questions are based on real life scenarios and require the use of high-level thinking skills in solution processes. Such problems often require the use of mathematics in real-life situations. In order for students to be able to solve such questions, they need to understand the current situation and express (model) it in mathematical language. Modeling, on the other hand, is dealt with in a very limited way in the curricula applied in our country. For this reason, students have difficulty in understanding these questions and expressing them mathematically. The expression of *I don't understand what I should do* used by some students in the study group can also be accepted as an indicator of this situation. It can be said that overcoming this situation largely depends on the course contents and practices to be created for the solution processes of new generation problems, as well as the support to be given to teachers in this regard.

SUGGESTIONS

The findings obtained from this research and results of the literature study show that teachers and students need support for the solution processes of new generation questions. In-service training studies for teachers can be planned for the structures, components and solution processes of such questions. Such a requirement is also emphasized in other studies in the literature (Piber, Tuna, Uysal and Kabuklu, 2018; Ünal, 2019). In these studies, plans can be made for the concept of literacy to make sense for teachers and for the integration of literacy skills into the curriculum. Because the solution of new generation questions requires the use of such skills to a large extent. In the planning of educational processes, it is recommended that before the problems with long scenarios, short and simple daily life problems are handled and then transition to the solution processes of complex problems. Because the solution processes of complex problems require the use of more skills together. After the planned and implemented educational studies, the question of what can be done for students to gain skills regarding such questions can be brought up and the pedagogical methods of this can be discussed. In addition, mathematics teachers' examination and analysis of the problems in international exams such as PISA and TIMSS can be effective in developing new perspectives on the problem situations they will choose in their teaching and their approach to solving these problems. What is certain is that these processes need to be spread over time for both teacher and students. Because the new exam system and the problems used are a new situation for students and teachers. Therefore, certain habits can be difficult to change and change takes time.

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Chapter 3

RADIO PLAY APPLICATION IN LITERATURE COURSE[1]

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Introduction

Radio is one of the most important mass media. Radio broadcasting started in Turkey on May 6, 1927 on Istanbul radio, seven years after it started in the world. After a while, Ankara radio entered broadcasting life. In today's conditions, radio is no longer listened to from a fixed device, but has gained an aspect that can be listened to anywhere thanks to developing technology and internet technology. Radio broadcasting started in Turkey on May 6, 1927 on Istanbul radio, seven years after it started in the world. After a while, Ankara radio entered broadcasting life. Radio is still an important broadcasting tool today. Radio plays are an important part of radio. They have features that entertain, move, teach and entertain their listeners. According to Özden (1997), the general opinion is that Richard Hugs' A Comedy of Danger, published in 1923, was the first radio play.

In Turkey from the 1940s onwards, radio theater was produced, broadcasted and listened to in large numbers on TRT radios, a state institution. As well as adaptations of classical works of literature, original radio plays were also being written (Cankaya, 1997: 5). As television became widespread in Turkey and popular culture became dominant in society, the writing, production and listening rates of radio theater dropped significantly. While over a hundred radio plays were produced and broadcasted on Istanbul and Ankara Radios in 1949, this number dropped to less than 10 on Istanbul Radio in the 2000s. It is sad that a culturally important program format in Turkey's communication history is now disappearing" (Cankaya, 1997: 5-6), but it is pleasing that this genre can continue with today's developing technology.

Relationship between Radio Play, Literature and Education

Radio plays are an important branch of literature. The radio play, which experienced its heyday until the mid-1980s, became an important field in these years, especially with the devoted work and efforts of Behçet Necatigil. Behçet Necatigil defined the radio play as the closest genre to poetry; he stated that a well-established radio play with well-adjusted dialogues is an interpretation of poetry (Ayvaz, 2016; Sarısayın, 2018: 7). Based on the relationship between literature and radio plays, Behçet Necatigil argues that radio plays often speak in the language of metaphor. It is allegorical and tragic. It has nothing to do with tuluat, sketch or cabaret. It is thought-provoking. It expects a refined taste and attention from its readers and listeners. While the stage play comes from classical literature, the radio play is a branch of modern literature (cited in Ayvaz, 2016: 141).

A radio play is a play that originates from the theater genre of literature, but "reaches its receiver through hearing with only one of the five senses". (Duruel, 2004: 55). The radio play is a literary genre that

includes arts such as literature and theater in its nature. “The radio play is a genre that draws its strength from its deficiency, that is, its invisibility. Since it reaches its receiver through only one of the five senses, hearing, it turns directly to imagination and imagination. Precisely for this reason, it does not show like the arts (stage play, movie play, television play) in which it is also active in the eye, but makes the unseen more visible than the seen (Duruel, 2004: 55).

In short, radio plays and literature have close ties. Just as works of literature develop the imagination, introduce you to other worlds, give you life experience, sometimes make you happy and sometimes make you sad, so do radio plays. It offers its listeners opportunities to dream, empathize, meet new people, and share their loneliness. Since it appeals to the senses rather than the visual, according to Çalışlar (1995: 517), “Dialogues are more valuable than stage plays in conveying the situation, event, place and time. The integrity of radio plays depends on the listener’s perception and comprehension of the play and the action in his/her mind and imagination. According to Özdemir (2017: 5), thanks to him, listeners “could perceive and perceive the play heroes, various personalities, times, places, landscapes, which they shaped and molded in their own imagination, only with sound. They could find themselves in the middle of various loves, events, wars, earthquakes, earthquakes, beauties or visualize them”. As a matter of fact, as Özdemir (2017) states, literature enriches the imagination of people and brings events and people to life in our minds. In this sense, it is in close relationship with the novel genre.

Language is undoubtedly the most important means of communication. And in mother tongue education, the development of reading and listening skills as well as writing and speaking skills is of utmost importance. The use of radio plays as one of the practices aimed at developing oral communication such as speaking and listening is important depending on the scope of the study. It is possible to contribute to the development of language skills with radio texts. With these texts, students can gain fluent speaking skills with emphasis, intonation, diction, pronunciation exercises, especially in the field of speaking. The vocalization of the characters’ speeches based on the text contributes to the development of the ability to bring dialogues to life and empathize. In this way, the person recognizes the subtleties of his/her language and his/her ability to use the language increases. Radio plays can be included in the education and training process by using them for the development of comprehension and expression areas in language teaching. For this purpose, it is possible to use them in mother tongue teaching, especially in the field of oral communication such as speaking and listening. Apart from mother tongue teaching, it will contribute to the development of both listening and speaking skills and

learning the subtleties of the language in teaching Turkish as a foreign language. Studies aiming to show the usability of radio plays in teaching Turkish are not very many in the literature. Today, thanks to the developing technology and internet technology, radio can also be listened to on mobile phones with various applications such as Spotify, Youtube, TRT Dinle. In response to the fact that a program format that is culturally important in Turkey's communication history is now disappearing, in this study, the achievements for the use of radio, which is not used much anymore, and radio plays that are not listened to, especially in literature lessons by making them functional, are pointed out. In the content of the study, information was given about the definition, characteristics and historical course of the radio plays that the prospective teachers practiced and the contributions of radio plays to the use of technology, collaborative work, speaking and getting to know the literary work closely in literature lessons were interpreted.

Purpose of the Study

In the study, the thoughts of the students who prepared radio plays by working together and using technology, their attitudes towards collaborative learning and technology were discussed. The first of the questions sought to be answered for this purpose is the level of pre-service teachers' attitudes towards cooperative learning. Secondly, to investigate the level of pre-service teachers' perceptions of competence in using ICT, and thirdly to investigate whether gender is effective between the perceptions of cooperative learning and ICT use. Fourthly, it was investigated what the students thought about the radio play application they put forward.

Importance of the Research

In the study, it was tried to select the works of the period that are within the scope of the New Turkish Literature 1 course from the adaptations in "Behçet Necatigil's Speak So That I Can See You" Radio Play Adaptations 1, which made great contributions to the acceptance of Turkish literature and radio play as a literary genre and pioneered the development of radio play adaptations by popularizing them in a book. The plays Homeland or Silistria adapted from Namik Kemal's theater work of the same name, Recep Aga's Daughter adapted from Aziz Efendi's Muhayyelât, Zehra adapted from Nabizade Nazım's novel of the same name, and Secrets in Murders adapted from Ahmet Mithat Efendi's novel Secrets of Murders were performed by the students within the scope of the New Turkish Literature 1 course and tried to be presented as a radio play with elements such as music, sound and effects. It is thought that the resulting play will contribute to recognizing the work, contributing to diction and pronunciation, collaborative work and technological competence. The fact

that this study is one of the few studies in the literature on the use of radio plays in education is also important in terms of contributing to similar studies.

Method

Research Model

In the study, quantitative and qualitative data collection methods were used together, i.e. mixed method.

Study Group

The research was conducted with thirty-six students who took the NTL 1 course among the Turkish pre-service teachers of the Faculty of Education.

Data Collection Tools

The Cooperative Learning Scale (Kiper, 2016) and the Information and Communication Technologies Competence Perception Scale for Prospective Teachers developed by Şad and Nalçacı (2015) were used to collect quantitative data. A semi-structured interview form was used to collect qualitative data.

Quantitative Data Collection Tools

Cooperative Learning Attitude Scale

The "Cooperative Learning Scale" developed by Kiper (2016) consists of 20 items. Of these 20 items, 11 are positive and 9 are negative statements. The scale is organized in a Likert format with a 5-point scale ranging from "strongly agree" to "strongly disagree". Cronbach Alpha coefficient was calculated to reveal the reliability of the scale. Accordingly, the Cronbach Alpha value obtained for the total scale was calculated as 0.854.

Information and Communication Technologies Competence Perception Scale for Prospective Teachers

Another scale used in the study is the scale developed by Şad and Nalçacı (2015) on Prospective Teachers' Use of Information and Communication Technologies in Education. The scale form is organized in likert format with 5-point scale ranging from 'I am quite adequate' to 'I am quite inadequate'. Cronbach Alpha coefficient of the scale was found to be .968. The scale consists of 30 items.

Qualitative Data Collection Tools

At the end of the process in which the prospective teachers prepared a radio play, they were asked whether they enjoyed the work and why, whether they enjoyed vocalizing and why. In addition, their thoughts on

whether this practice helped them to get to know the work closely were discussed. In this context, three questions were prepared by the researcher and the opinion of a field expert was taken to ensure the internal validity of the questions.

Data Analysis

The quantitative data obtained in the study were analyzed using descriptive statistics and qualitative data were analyzed using content analysis. Kolmogorov-Smirnov and Shapiro-Wilk tests were used to check whether the numerical variables were normally distributed.

In the study, descriptive statistics were calculated in order to determine pre-service teachers' attitudes towards cooperative learning and their perceptions of competence in using information and communication technologies. In order to determine the level of participation from the scores obtained from the scales, the group width value was evaluated using the formula 4/5=.80 (Kaptan, 1998). In the words of Yıldırım and Şimşek (2006), with content analysis, the data are tried to be defined and the facts that may be hidden in the data are tried to be revealed. The main process in content analysis is to bring together similar data within the framework of certain concepts and themes and to interpret them by organizing them.

Procedure and Application

In the study, the works of the period covered by the course were tried to be selected from the radio adaptations in Behçet Necatigil's Speak So That I Can See You Radio Play Adaptations 1, which made great contributions to Turkish literature and to the acceptance of the radio play as a literary genre and pioneered the popularization and development of this genre by publishing radio play adaptations in a book. These play adaptations given below were vocalized by the students within the scope of the New Turkish Literature 1 course and tried to be presented in radio play format.

Radio Play Adaptations and Responsible Works:

Group 1: Homeland or Silistria, adapted from Namık Kemal's play of the same name

Group 2: Recep Aga's Daughter, adapted from the play Muhayyelât by Aziz Efendi of Giritli

Group 3: Zehra, based on the novel of the same name by Nabizade Nazım

Group 4: The plays titled Secrets of Murders, adapted from Ahmet Mithat Efendi's novel

The adapted plays were divided into groups according to the class size and given to the students with a narrator.

The process of the radio play implementation is as follows. In the first two weeks (1-8.10.2021), pre-service teachers were given information about the content of the study. The relationship between radio play, adaptation work, radio play, oral communication was discussed, the radio plays to be discussed, the number of people were determined and the subjects were distributed to the class. In the third and fourth weeks (15-22.10.2021), information was given about the adapted works and their authors. The role of each of the playwrights was determined, and it was ensured that people learned both their own roles and the entire work. In the fifth and sixth week (28.10.-5.11.2021), programs for effects, sound editing and other formatting were researched. They were allowed to start rehearsals. In the seventh and eighth weeks (12-19.11.2021), sample radio plays were sent. Prospective teachers continued to rehearse. In the ninth and tenth weeks (26.11.-3.12.2022), pre-service teachers continued to come together to read and rehearse, and followed each other's plays. Eleventh and twelfth weeks (10-17.12.2021) they continued rehearsing and made the necessary sound and efect editings. Thirteen and fourteenth weeks (24-31.12.2021), radio plays were analyzed and evaluated.

Acknowledgements

I would like to thank the Necatigil family and Yapı Kredi Publishing for allowing us to use the radio plays.

Ethics Committee Permission

The data collection tools were submitted to the Ethics Committee of Kütahya Dumlupınar University and it was stated that the study was in compliance with research and publication ethics with the decision presented below:

Board name = Kütahya Dumlupınar University Rectorate, Social and Human Sciences Scientific Research and Publication Ethics Committee

Date of decision= 15.02.2022

Document number number= E.78513

Findings

In this section, findings related to pre-service teachers' perceptions of Information and Communication Technologies (ICT) competence and their cooperative learning attitudes are presented.

Quantitative Data Findings

Table 1. Normal Distribution Values for the Total Scores of the Scales

	Kolmogorov-Smirnov		
	Statistics	Sd	P
ICT Competence Perception Scale Total	0,98	36	0,75
Cooperative Learning ScaleTotal	0,90	36	0,01

Data with a significance level greater than 0.05 obtained from Shapiro-Wilk normality tests exhibit a normal distribution. Therefore, it should be stated that parametric tests were applied in the analysis since the data showed normal distribution as seen in Table 1.

The results of the total score and descriptive statistics related to the first problem of the study, "What is the level of attitudes of pre-service teachers who realized the radio application towards cooperative learning?" are shown below:

Table 2. Pre-service Teachers' Attitudes towards Cooperative Learning

	N	Min	Maks.	Average	Standard Deviation
Cooperative Learning Scale	36	56	91	72.60	8.54

According to the results in Table 2, the mean score of the pre-service teachers from the cooperative learning attitude scale is 72.60, the standard deviation is 8.54, the lowest score is 56, and the highest score is 91. In order to determine the level of participation from the scores obtained from the scales, the group width value was evaluated using the formula 4/5=.80. For this purpose; 1.00-1.80 was taken as "very low level"; 1.80-2.60 as "low level"; 2.60-3.40 as "medium level"; 3.40-4.20 as "high level"; 4.20-5 as "very high level". It can be said that pre-service teachers' attitudes towards cooperative learning are at "high" level with the result of 3.6 for the total score divided by the number of items.

Table 3. Descriptive Results of Cooperative Learning Attitude Levels

	Level	n	%
Cooperative Learning Scale	Undecided	11	31,43
	I agree.	21	60,00
	Absolutely agree	4	8,57

As seen in Table 3, according to the mean scores, 60% of the pre-service teachers gave answers at the level of "agree", 31,43% at the level of "undecided" and 8,57% at the level of "strongly agree" in cooperative learning attitude.

The statistics related to the second problem of the research, "What

is the level of pre-service teachers' perceptions of competence in using information communication technology?" are given in the fourth and fifth tables below.

Tablo 4. ICT Competence Perception Score Values

	N	Min	Maks.	Average	Standard Deviation
ICT Competence Perception Scale	36	90	147	110,94	16,83

In Table 4, the mean score of pre-service teachers' ICT scores is 110.94, the standard deviation score is 16.83, the highest score is 147 and the lowest score is 90. The result obtained by dividing the ICT score by the number of items is 3,69. Their perceptions of competence in using ICT are at the "adequate" level.

Table 5. Descriptive Analysis Results of ICT Proficiency Levels

	Level	n	%
ICT Competence Perception Scale	Partially sufficient	14	38,89
	Adequate	15	41,67
	Quite enough	7	19,44

As seen in Table 5, 41,67% of the pre-service teachers stated that they were adequate, 38,89% stated that they were partially adequate, and 19,44% stated that they were quite adequate.

The result of the third problem of the research is that gender does not make a significant difference in the perceptions of competence in cooperative learning and information communication technologies as seen in the sixth table below ($p>0.05$).

Table 6. The Relationship between Collaborative Learning and ICT Competencies and Gender

	Gender	Number of people	$\overline{X}_{\pm SS}$	t	sd	p
Cooperative Learning Scale	Male	12	72,00±10,40	-0,32	33	0,75
	Female	24	72,95±7,49			
ICT Competence Perception Scale	Male	12	117,00±17,17	1,56	34	0,13
	Female	24	107,92±16,17			

Findings Related to Qualitative Data

Below are the opinions of pre-service teachers about the radio play study.

1. The answers to the first question of the study are as follows

Table 7. *Enjoying or not enjoying the work done*

Enjoying or not enjoying the work done	f
Yes, I enjoyed it.	33
I partially enjoyed it.	1
No, I did not enjoy it.	2

Examples of the opinions of students who enjoyed the radio play work in general;

"I enjoyed it very much, as it was an activity where I could use my voice and work like a presentation. I took the role of narrator and this role was just right for me." S3

"The radio theater we prepared had challenging stages, but there were also enjoyable aspects. While performing this task, I saw it as an educational activity for myself rather than seeing it as an assignment. It contributed a lot to me." S5

"I had a lot of fun in the radio theater activity we did. Especially when we could not do it when we got into the role, we both laughed and practiced again. In this way, we had a good time with my group friends and an activity that we will never forget. "S7

"I took it, the vocalization and role rehearsal stages were fun, enjoyable because it was a stage where I discovered myself and reminded me of my love for theater in my childhood. "S8

"I enjoyed it very much. The vocalization phase was very nice. It was very nice to vocalize a literary text. "S14

"I got it. I was excited to act out the radio play. "S16

"Yes, reading the script and starting to act it out was a very enjoyable process. "S17

"I enjoyed the work immensely. The process was already very enjoyable. The product that emerged when everything was finished was the most enjoyable part. "S33

"I enjoyed doing voice-over and acting." S30

"We progressed with pleasure while performing our work. In the vocalization part, the part we realized by putting ourselves in the place of the role is the part I had the most fun." S28

The comments of those who stated that they had difficulties due to the difficulties of coming together as a group are as follows:

"Sometimes I enjoyed it, sometimes I didn't. Sometimes it was difficult to meet because everyone may have a situation, they may not be able to participate, justifiably, of course, because of this." S6

"It was enjoyable, but it was sometimes difficult to get together as a group or to get along." S17

The views of students who expressed that working together was enjoyable:

"Radio theater was very enjoyable. We tried it for the first time with our friends and we had a lot of fun. "We learned something new. The recording phase was very fun." S1

"It was very enjoyable to achieve something together. "S9

"Yes, I enjoyed the study. I became more sincere with my friends and we did something outside after the study. This brought us closer, and we had to take the recording from the beginning, we repeated the places where we made mistakes by laughing, this was the part I enjoyed the most." S1O

"I enjoyed it. Every moment was good because I did it with friends I got along with. But despite that, sometimes there were differences of opinion. We had fun moments during rehearsals and recording." S23

"Yeah. It was a lot of fun singing as a group and getting into the roles. We had a good time together." S26

"Yes, I enjoyed it. It was a pleasant work with our friends. It was something I did for the first time and it was an experience. "S32

When we look at the answers of the students, we see that some of them expressed that it was exciting to realize such an application for the first time and to experience working together. We also see that there were those who stated that working with the curiosity of creating a product added a lot. We see that there were those who stated that it was a lot of fun to voice and give voice to another character, to record, to rehearse, and that the role they voiced was just right for them. A student who was not satisfied with the role he voiced stated that he had difficulty in vocalizing because it was a male role. There were pre-service teachers who stated that vocalizing and rehearsing were not only fun but also enabled them to discover themselves and added a lot to themselves.

2. The answers to the second question of the study are as follows; Those who admitted that they found the work enjoyable said that they sometimes felt uneasy about stalling, stumbling and mispronouncing. There were also

those who stated that their diction improved in general, that they strived to use their voices more effectively, that the study improved them in this respect, and that they tried to empathize in order to better vocalize the character they vocalized.

Table 8. *Did You Enjoy Vocalizing on the Radio App?*

Did vocalization/speaking give you pleasure? Why? In which ways did you feel incomplete or comfortable?	F
No	2
Yes	34

"Being able to use my speaking skill is the best job I enjoy in this world. I have never had a problem in the field of speaking, which I see as unique to me. "S3

"It is an application that helps to control our voices. In this way, we can provide effective speech." S20

"Using my voice in a good way made me even happier. It gave me great hopes in lecturing. "S21

"Although I had some difficulties at the beginning, I started to enjoy myself as we talked because I was excited about the project we were going to create. I felt a little inadequate in terms of diction, I had trouble saying the pronunciation of some words". S30

"It gave me a lot of pleasure because it improved my self-confidence." S31

Regarding the vocalization, they expressed that they enjoyed the work even though they had difficulties in making emphasis and intonation where necessary, getting excited from time to time and conveying emotions:

"It was fun to do the vocalization, but sometimes I made mistakes in intonation, I was a little deficient in that regard." S1

"Yes, I enjoyed it, I felt a little lacking in the emphasis and intonation part, but I did not feel any embarrassment while vocalizing, I was comfortable in this regard. "S4

"I realized that I had many mistakes while doing voice-over. Although I had a lot of difficulty at first, I continued to do it easily afterwards." S5"

It gave me pleasure. I felt incomplete in the part of stumbling or misreading." S17

The opinions of the students who expressed that they tried to get to know the characters they vocalized more closely by empathizing, that they tried to imitate them, and that they had difficulty, excitement

and felt incomplete from time to time are as follows:

"It was extremely enjoyable to do voice-over. I had a lot of fun practicing to get into that role and I felt very comfortable acting with my friends." S7

"It was enjoyable because trying to reflect emotions, I use empathic roles in daily life. I was good at enthusiastic and sad roles, but I can't say that I can do cheerful and happy roles very well.S8

"Yes, it was very enjoyable. I don't think I am very bad in terms of diction skills. But since the character I played was a man, I had a lot of difficulty in adapting my voice to him." S18

"Yes, but I felt a little incomplete because I thought that the dialogues of the character I voiced were not suitable for my tone of voice." S19

"It was a pleasure. I had a new experience. It is really difficult to understand the spirit of the character I am voicing and to make the audience feel it. Using diction and breathing correctly is another matter. But I think I overcame it because I trust myself. There were moments when my friends and I gave each other ideas. These made us realize the mistakes we made." S23

Negative opinions expressed their reasons as follows:

"It didn't give me much pleasure because my voice is usually low and I get excited. "S6

"I had difficulty in vocalization because it was a male role. I could not use my emotions in vocalization." S27

3. The findings for the third question are as follows;

Thirty-four students stated that it contributed and one student stated that it partially contributed. Examples of the reasons for these opinions are as follows:

Table 9. *Did the radio play application contribute to getting to know the work closely? Answers to the question*

	F
Yes, it did.	34
Partially provided.	2

The fact that they rehearsed the play by reading it many times caused them to get to know the work they were dealing with closely. Those who had not heard of the work before or those who had only heard the name of the work recognized the work in this way. The opinions of the students who said that this practice contributed to understanding the plot of the work and understanding the characters

they vocalized and the relationships between the characters more closely are as follows:

"It definitely helped me get to know the work very closely. With the rehearsals, it became easier for us to master the work. With this method, the work and the plot had an unforgettable importance for me. "S12

"Yes, because we came together by reading many times. I got to know him closely enough. "S6

"It contributed. Because when vocalization was involved, it became easier to understand the plot. "S7

"It contributed, it gave me an idea in terms of knowing the content of the work and recognizing the period. "S8

"Of course it contributed, I can say that I memorized the work." S9

"I got to know the text very well because we repeated it 2-3 times. " S14

"Yes, although I knew Namik Kemal, Vatan Yahut Silistre was a work I had not read. With the radio theater, I saw his work and language." S20

"I learned the author's writing style. It made me want to read his other works. "S17

"Yes, it was a play I had already read. But when it was up to us to reveal the feelings of the characters, I realized that we understood them better. "S18

"Since I had the opportunity to read and listen to the piece over and over again while rehearsing it, every time I realized the different mental states of the characters. "S21

"I got to know his work closely. I saw different perspectives." S22

"I learned the details of the work very well." S25

"It helped me to better understand the characters, the fiction, what is wanted to be told. "S26

"Yes, it did. He instilled in me the characteristics, thought structures, cultural and spiritual aspects of that period. "S27

"Yes, it contributed. When I acted out the characters in the work, I had the opportunity to feel their emotions better." S29

"Yes, we have mastered the content of the work. Since we got into the role, it was easier for us to understand the feelings and thoughts of the people. We also analyzed the work in detail." S33

Conclusion

In the study, prospective Turkish language teachers vocalized radio play adaptations of Turkish literature works and prepared radio plays. During the study process, the thoughts of the students who prepared radio plays by working together and using technology, their attitudes towards collaborative learning and technology were discussed. In the study, pre-service teachers carried out an application to get to know the works of the Tanzimat period closely through a radio play. Except for a few of the pre-service teachers, most of them stated that they were doing such an application for the first time, that making a voice-over was a lot of fun, that they enjoyed the radio play very much, that they encountered new technological applications related to sound editing in this process, that having made a production increased their self-confidence and that this situation made them feel successful. They also stated that they empathized with the character they voiced in the application they experienced and that they better understood the plot, characters and relationships between characters. In the current century, methods that can be considered traditional in the field of education and training can be revitalized and made functional with new technology and media tools. Radio can be listened to on cell phones with various applications such as Spotify, Youtube, TRT Dinle thanks to developing technology and internet technology. One of the studies on the use of radio plays in education belongs to Göçer and Kurt (2020). In the study, it is a theoretical study that deals with the benefits of using radio plays in oral communication skills. In his thesis study, Erdem (2020) conducted an applied study on the effect of text vocalization on speaking skills and obtained positive results in terms of the development of this skill. In addition, in the study conducted by Miçooğulları (2021), it was discussed that positive outcomes can be obtained in this sense by listening to radio theater as an activity to improve listening skills in teaching Turkish to foreigners.

In the literature, we see that radio plays have been discussed in various studies in terms of their development, history, education and current place. For example, Ahmet Özdemir, in his work titled Radio Theaters, included the texts he wrote and which are being broadcast as radio plays today. Ülkü Ayvaz's articles and reviews on Behçet Necatigil and radio plays are important for this field. In Nurhan Karadağ's (1976) study on radio theater education, the historical background of the radio play, concepts related to radio theater and information about its education were included. In n Serhat Doğan's thesis (2007), the change in radio listening habits in Turkey is discussed and radio theaters in some private broadcasts are examined. In another study conducted by Bulut (2021), Cahit Zarifoğlu's radio plays were discussed in terms of structure and theme. These studies can be multiplied.

The quantitative results obtained from the radio play application, which is the subject of this study conducted by pre-service teachers, indicate that pre-service teachers' perceptions of collaborative work for preparing radio plays are at the level of agree. From the qualitative data, it can be stated that their views on collaborative work are also positive. The statements related to this are generally that experiencing working together is exciting, fun, enjoyable and motivating. They stated that working with the group provided an opportunity to get to know their friends with whom they had not communicated before, that they had a good time and an unforgettable activity with their groupmates, and that it was a pleasure to achieve something together. They stated that working with the curiosity of creating a product added a lot to them. Looking at the qualitative data obtained regarding vocalization, the majority of the students stated that vocalization contributed to speaking skills. They also stated that vocalizing another character improved their empathy, that recording and rehearsing was a very fun and responsible practice at the same time, and that they sometimes got excited and had difficulties in matters such as imitation and intonation. In terms of permanence and getting to know the work closely, they stated that rehearsing the play by reading it many times caused them to get to know the work closely. Those who had not heard of the work before or those who had only heard the name of the work recognized the work in this way. The majority of the students said that this practice contributed to understanding the plot of the work and understanding the characters they vocalized and the relationships between the characters more closely. It was seen that pre-service teachers' perceptions of competence in using ICT were at a sufficient level; gender did not make a significant difference in their perceptions of competence in cooperative learning and ICT.

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Chapter 4

ZUR VERSPRACHLICHUNG DER EMOTIONALEN ZUSTÄNDE IN DER NACHRICHTENBERICHTERSTATTUNG

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Einleitung

Durch die Sprache, als ein primäres Kommunikationsmittel kann neben der Informationsübermittlung auch Gefühle bei der Beschreibung von Ereignissen und Sachverhalten ausgedrückt werden, um beim Rezipienten einen bestimmten Gemütszustand hervorrufen zu können. In der kommunikativen Tätigkeit wird daher von der emotiven Lexik der Sprache Gebrauch gemacht, welche auf die Gefühle Einfluss nehmen und die Wahrnehmung sowie Entscheidungen des Empfängers steuern können. Es besteht immerzu eine Wechselbeziehung zwischen Denken- Sprache und Emotion. Der emotive Bestandteil kann also von der Kommunikation nicht ausgeschlossen werden.

Die journalistischen Texte offenbaren die aktuelle Sachlage, Probleme sowie Einstellungen und Gefühle einer Gesellschaft zu bestimmten Ereignissen, sie spiegeln sozusagen das Stimmungsbild wider. Die Nachrichtenberichterstattung, als Kerninhalt der Massenmedien versorgt ihre Rezipienten mit Informationen, in der sie die Aufgabe zu erfüllen haben, über Ereignisse wahrheitsgemäß berichten sollen, wobei sie aber durchaus zu einer Meinungsbildung beim Leser beitragen können.

Im Mittelpunkt dieser Arbeit stellt sich nun die Frage, wie Gefühle bzw. Emotionen innerhalb der Sprache der Nachrichtenberichterstattung wahrgenommen und damit greifbar gemacht werden können. Damit wird in der vorliegenden Arbeit der Versuch unternommen, eine Bestandaufnahme im Hinblick auf die sprachlichen Phänomene zu machen, welche die Emotionen beschreiben oder benennen.

Textsorten in der Presse

Im Rahmen der publizistischen Texte in der Presse werden zwischen den meinungsbetonenden und den informierenden Textsorten unterschieden. Lüger (1995: S. 89) hat eine Klassifikation von journalistischen Textsorten vorgenommen, worauf in den nachfolgenden Ausführungen kurz eingegangen werden soll. Demnach gehören folgende Textsorten, die eine informative Funktion haben:

- Der Bericht
- Die Meldung
- Die Reportage

Der Berichte und die Meldung sind relativ kurz gefasste Texte, die darauf abzielen, den Lesern die wichtigsten Informationen zu übermitteln. Die Reportage ist weitaus länger gestaltet und gibt detaillierte Einblicke in das Geschehen.

Unter den meinungsbetonenden Textsorten können folgende aufgezählt werden:

- Kritiken
- Glossen
- Kommentare

Im Rahmen der vorliegenden Untersuchung wird hierbei der Fokus auf die Nachrichtenberichterstattung in der Presse gelegt, da im analytischen Teil die Untersuchung nach emotiven Lexemen anhand eines Berichts erfolgen wird.

Bericht und Meldung weisen nach Wolff (2011: 69) viele strukturelle und sprachliche Gemeinsamkeiten vor. Sie unterscheiden sich nur in ihrer Länge. Darüber hinaus gliedert Wolff den Bericht in drei Varianten:

- Der Zeitungsbericht
- Der Agenturbericht
- Der Magazinbericht

Wolff fasst die formalen, strukturellen und inhaltlichen Merkmale des Zeitungsberichts (Wolff, 2011: 95) wie folgt zusammen:

- Formale Merkmale:

Länge: mittel

Aufmachung: schlicht

Positionierung: schlicht bis Aufmacher

Überschriften: Hauptüberschrift und Unterzeile

- Strukturelle Merkmale:

Einstieg: W-Fragen

Ausstieg: Zitat

- Inhaltliche Merkmale:
-

aktuelle Informationen: typisch

Meinung: keine

Empfehlung: selten

Hintergrundinformationen: ausreichend

Prognose: Zukunftsabsatz

Der Zeitungsbericht hat eine informative Funktion, ist also nicht meinungsbetonend kann aber trotzdem einen bestimmten Gefühlszustand bei der Zielgruppe hervorrufen. Der Zeitungsbericht zielt nämlich darauf ab, Interesse bei seiner Leserschaft zu wecken. Aufbau des Zeitungsberichts ist nach Wolff (2011 :70) wie folgt:

1. Absatz: Leadabsatz. (Unter dem Leadabsatz werden für die Nachricht alle wesentlichen Informationen zusammengefasst.)

2. Absatz: Detailabsatz. (Hier werden vertiefende Einblicke in das Thema bzw. Ereignis gegeben.)

3. Absatz: Hintergrundabsatz. (Hier werden für die Nachricht von bedeutenden Hintergrundinformationen bearbeitet).

4. Absatz: Zukunftsabsatz. (Hier wird mit Zukunftsperspektive auf den Nachrichteninhalt Bezug genommen).

5. Absatz: Zukunftsdetailabsatz. (Dieser Absatz beinhalt die wichtigen Einzelteile zum Zukunftsabsatz.)

Es soll hier angemerkt werden, dass diese Untergliederung in ihren Einzelheiten unterschiedlich ausfallen kann, wenn beispielsweise von der Nachricht keine Information über den Hintergrund des Geschehnisses zu erhalten sind.

Die emotionalen Zustände in Texten

In den Texten treffen sich Sätze mit syntaktischen und lexikalischen Einheiten aufeinander und nach Schwarz-Friesel (2013: 212) können diese beiden Einheiten zur Emotionskodierung beitragen. Es gibt im Zuge der Kommunikation einzelnen sprachliche Phänomene die zur Verbalisierung der Emotionen dienen können. Im Folgenden soll kurz umrissen werden, welche Möglichkeiten die Sprache an sich bietet, um Emotionen hervorzurufen oder gar sie zu konstruieren.

Der Rezipient eines Textes erstellt ein Textweltmodell, wenn er den vom Sender intendierten Textinhalt reproduzierend aufnimmt und die darin eingebettete Informationen verarbeitet. Während dieses Vorgangs, der kognitiv bestimmt ist, kommen der emotionalen Bestandteilen der Sprache eine Bedeutung zu. Genau in dieser Phase der inhaltlichen Textrekonstruktion wird die Wahrnehmung von diesen emotionalen Elementen geprägt (Schwarz-Friesel, 2013: 213).

Fritz Hermanns (2002) hat bezüglich des emotiven Wortschatzes folgende Unterscheidung gemacht:

- Die Möglichkeit, Gefühle durch Lexeme und Phrasen, klar und direkt auszudrücken
- Erzeugung der Gefühle und Emotionen beim Empfänger auf indirekter Weise durch Begriffe und Wendungen

Ferner unterscheidet Fiehler (1990: S. 115 ff.) zwischen der begrifflichen Benennung auf der einen Seite und auf der anderen Seite der Beschreibung von Emotionen durch erlebnisdeklarierende Formeln:

- Nominalausdrücke für grundlegende Emotionen:

Liebe, Freude, Glück, Hass, Wut, Zorn, Angst, Trauer

- dazugehörige Verben:

lieben, freuen, hassen, zürnen, trauern, ängstigen, fürchten

- dazugehörige Adjektive:

glücklich, fröhlich, wütend, zornig, traurig, ängstlich

Ortner betont, dass die emotionsbezeichnenden und emotionsausdrückenden Lexeme sich von ihrem semantischen Bezug her voneinander abgrenzen können (Ortner, 2014: 205).

Wörter, die für den Emotionswortschatz von Wichtigkeit sind, würden sich auf mehrere Aspekte beziehen:

- auf einen subjektiven, erlebten psychischen Zustand
- auf körperliche Prozesse, Ausdrucksverhalten und Handlungen
- auf den Auslöser eines Gefühls (sowohl Objekte, Personen als auch Sachverhalte und Situationen)

Emotionsausdrückende Lexeme sind laut Ortner (2014: 220)

- emotive Interjektionen (Bsp.: ach, ächs, p.: ach, ächs, ätsch)
- emotive Satzadverbien (Bsp.: ärgerlicherweise, hoffentlich)
- emotive Adjektive (Bsp.: sympathisch, eklig, gruselig)
- emotive Substantive (Bsp.: Schätzchen)
- emotive Verben (Bsp.: labern, verrecken)
- emotive Phraseologismen (Bsp.: sich die Haare raufen)

Emotionsausdrückende Lexeme treten im Gegensatz zu den emotionsbeschreibenden Lexemen häufiger auf. Diese Kontextgebundene Einheiten werden von Fomina folgendermaßen kategorisiert:

• Lexeme mit der emotiv-wertenden Komponente im denotativen Teil

der Bedeutung, also beispielsweise: herrlich, Emporkömmling, Frömmelei (durch Affixe ausgedrückt)

• Emotional-expressive Lexeme (brillant, faszinierend)

• Emotional-bildliche Wörter und Wörter mit metaphorischer Bedeutung

• Emotional-stilistische Wörter.

Das Gefühlte und die Emotionen, also das was man eigentlich empfindet zu versprachlichen bedeutet nun, diese Ausdruckrepräsentationen des inneren Zustandes jenseits unserer persönlichen Sphäre zu übermitteln. Emotionen sind demnach die Spiegelung unserer Befindlichkeit welche durch Versprachlichung der Gefühle verbal vermittelt werden können.

Ferner können sich Emotionen anhand von drei Realisierungsformen konkretisieren (Fries, 2000: 57):

- nonverbaler Ausdruck
- körperliche Zustände
- verbale Repräsentationsformen

Darüber hinaus haben die versprachlichten strukturellen Einheiten immer eine Grundbedeutung- die Denotation. Hier wird das Referenzpotential des Lexems festgelegt. Mit dieser Grundbedetung der Lexeme schwingt immer im mentalen Lexikon über Weltwissen abgespeicherte semantischeZusatzbedeutung mit- die Konnotation. (Fries, 2000: 162):

ANALYSE

In Anlehnung an die beschriebenen theoretischen Grundlagen wird in der vorliegenden Arbeit eine Nachrichtenberichterstattung für die Analyse herangezogen, mit dem Erkenntnisinteresse nach den emotional-expressiven Sprachgebrauch zu erkunden. Damit wird auf eine bloße Bestandaufnahme von jenen sprachlichen Phänomenen abgezielt, die für Lernende des Deutschen als Fremdsprache leicht erkennbar sind und folglich für ein besseres Textverstehen von journalistischen Textsorten dient. Die exzerpierten lexikalischen Einheiten werden nach ihren Emotionscharakter nach folgenden Kriterien beschrieben und analysiert:

• emotionsausdrückend: expressiv, emotive Wörter (Adjektive,Substantive, Verben, Phraseologismen, etc.)

• emotionsbezeichnend: deskriptiv referentiell, sekundär emotive

Wörter (Nominalausdrücke, Verben, Adjektive)

Die insbesondere in Europa bestehende Energiekrise und die damit verbundenen Sorgen der Verbraucher lässt die Erwartung steigen, dass in dieser Nachrichtenberichterstattung (siehe Anhang 1) emotiv, expressive lexikalische Einheiten sich greifbar machen.

In dem herangezogenen Text plädiert der Präsident der Bundesnetzagentur zur Bekämpfung der gegenwärtig bestehenden Energiekrise mit Energiesparmaßnahmen. Der Begriff Energiekrise ist recht aktuell und meint in diesem Textkontext, dass die Energie – also Erdöl, Gas, Strom – innerhalb von einer kurzen Zeitspanne stark verteuert wurde. Diese Preiserhöhungen bei Strom und Gas führen zu einer Erhöhung der Inflationsrate, was zu Mehrausgaben der einzelnen Energieverbraucher führt. Die Produktion und die Auslieferung der Güter werden durch die hohen Energiepreise eben teurer.

Die zahlenmäßig größte Gruppe innerhalb des expressiven Wortschatzes sind konnotierte Nomen in Verbindung mit einem konnotierten Adjektiv.

Für die Kombination von konnotierten Nomen mit konnotierten Adjektiven können folgende Textbelege innerhalb des expressiven Wortschatzes als Beispiel herangeführt werden:

(1) „Auch eine Überlastung des Stromnetzes durch den massiven Einsatz von Heizlüftern, sei derzeit unwahrscheinlich."

(2) „Im November, als es vorübergehend kalt gewesen sei, hätten die Menschen auf die „dumme und teure Idee kommen können, statt mit Gas mit Strom zu heizen. „

(3) „Das gebetsmühlenartige Scholz'sche Selbstlob (…)"

(4) „Das gebetsmühlenartige Scholz'sche Selbstlob zur angeblich schon gesicherten Versorgung"

(5) „Das gebetsmühlenartige Scholz'sche Selbstlob zur angeblich schon gesicherten Versorgung wiegt in falscher Sicherheit"

(6) „Nötig sei nun „eine sehr klare Kommunikation der Bundesregierung"(..)"

Die Beispiele (1) bis (6) zeigen, dass Adjektive in ihrer expressiven Wirkung das Nomen verstärken können. *(‚massiver Einsatz', ‚dumme und teure Idee', 'gebetsmühlenartige Selbstlob', ‚gesicherte Versorgung', ‚falscher Sicherheit', ‚klare Kommunikation'*).

Im Beispiel (5) entsteht zwischen den beiden Lexemen ein Kontrast und baut eine besondere Spannung auf - eine Sicherheit die aber falsch ist.

Des Weiteren konnten alleinstehende konnotierte Nomen vom Textbeleg exzerpiert werden. Dazu können folgende Befunde als Beispiele dienen:

(7) Wenn das ein Ausreißer bleibt, muss uns das noch nicht beunruhigen.

(8) (…) Jung ist die Gefahr einer Gasmangellage „trotz voller Speicher nicht vom Tisch".

(9) Es ist deswegen wichtig, dass wir mit den Sparanstrengungen (..)

(10) Selbstlob

Bei (8) und (9) handelt es sich jeweils um ein Kompositum, das negativ konnotiert ist wobei (7) in dem Textzusammenhang positiv konnotiert ist.

Ferner verleihen der Forschung zugrunde liegendem Material die Phraseologismen eine gewisse Bildhaftigkeit und Dynamik:

(11) Zum Glück hat das kaum jemand gemacht", sagte Müller.

(12) „Bei Temperaturen von minus zehn Grad schießt der Gasverbrauch in die Höhe", betonte er. Auch nach Ansicht des stellvertretenden CDU-Vorsitzenden Andreas Jung ist die Gefahr einer Gasmangellage „trotz voller Speicher nicht vom Tisch".

(13) Das gebetsmühlenartige Scholz'sche Selbstlob zur angeblich schon gesicherten Versorgung wiegt in falscher Sicherheit: Wir erwarten von Olaf Scholz Klartext statt weiter so."

(14) Es ist deswegen wichtig, dass wir mit den Sparanstrengungen nicht nachlassen und den ganzen Winter durchhalten", mahnte Müller.

Hier ist eine lexikalische Einheit, in ihrem Komponentenbestand relativ stabil, in ihrer syntaktisch-morphologischen Struktur fest und in ihrer Wendung reproduzierbar (Földes u. Hécz 1995: 26). Der bildhafte Charakter trägt dazu bei dem Text anschaulicher zu gestalten und die Aufmerksamkeit des Rezipienten wird auf den Inhalt gelenkt (Wittwen, 1995: 97).

Wenn Phraseologismen in politischen Nachrichten belegt werden, dann haben sie nach Burger (1999: 76-77) drei Funktionen zu erfüllen:

- politisches Handeln wird transparenter gestaltet und mit dem alltäglichen Handeln in Verbindung gebracht (Bsp. 12).
- feste Wendungen werden eingesetzt um politische Handlungsträger zu beurteilen (Bsp.13).
- Durch Einsatz von Phraseologismen wird eine Personalisierung zum politischen Vorgehen ermöglicht (Bsp.14).

Die im Text auftretenden Eigennamen sollen im Folgenden kurz beschrieben werden. Diese Eigennamen sind in der Regel Personen aus

dem öffentlichen Leben und nehmen in dem Nachrichtentext selber eine zentrale Stellung ein. Um eine klare Verbindung von der Person zum Inhalt des Textes herstellen zu können, bedarf es einer genauen Beschreibung, indem ihre Ämter, Titel, Funktion oder Beruf samt den Vor- und Nachnamen ausgelegt werden. (Schwiesau u.Ohler 2003: 229).

(15) Auch der energiepolitische Sprecher der Unionsfraktion zeigt sich beunruhigt.

(16) Die Bundesnetzagentur hält jedoch Einsparungen von 20 Prozent für nötig.

(17) „Aktuell liegen die Einsparungen insgesamt nur noch bei 13 Prozent“, sagte der Präsident der Behörde, Klaus Müller

Aus den Belegen geht hervor, dass reine Eigennamen (Klaus Müller) Eigennamen mit Weiterbildung (Präsident der Behörde Klaus Müller) und die Person mit Umschreibungen (der energiepolitische Sprecher der Unionsfraktion) und als Stellvertreter seiner Behörde (Die Bundesnetzagentur), benannt wurde.

SCHLUSSFOLGERUNG

Aus der Analyse wurde ersichtlich, dass in einer Nachrichtenberichterstattung, Sprache und Emotion eng miteinander verzahnt sind, selbst wenn der zur Analyse herangezogene Text aus einem einzigen Exemplar besteht. Es konnten darin verhältnismäßig reichlich viele emotiv, expressive lexikalische Einheiten belegt werden.

Der Textzusammenhang und das darin aufgegriffene Textthema dienten auch als Idikatoren für die Bestimmung der einzelnen Lexeme. Denn erst durch den Gesamtzusammenhang, wird der Leser in den Weg geleitet und begreift inwiefern die Lexeme emotional behaftet sind oder nicht.

In weiteren Studien ließe sich der lexikalische Ansatz zum emotional besetzten Inhalt weiterführen, indem sprachstrukturelle Einheiten der Texte anhand einer Korpuszusammenstellung, mit Seitenblicken zur Pragmatik und Semantik ausgiebiger untersucht werden. Darüber hinaus könnte eine konfrontative Studie angelegt werden, in der die Nachrichtentexte mit derselben Thematik in deutscher und türkischer Sprache in einem Korpus gesammelt werden und mit dem Tertium Comparationis ein systematischer Vergleich zwischen den beiden Sprachen gezogen werden.

Der in beiden Sprachen nach ihren Gemeinsamkeiten und Unterschiede ermittelten Belege für den emotiven Sprachgebrauch könnten im Rahmen des DaF- Unterrichts instrumentalisiert werden und die damit verbundene Förderung der rezeptiven und produktiven Fertigkeiten im fremdsprachlichen Unterricht in didaktisierter Form eingesetzt werden.

LITERATURVERZEICHNIS

Textbeleg:

URL-1: : https://www.tagesschau.de/wirtschaft/verbraucher/bundesnetzagentur-115.html

Burger, H. (1999*). Phraseologie in Fernsehnachrichten*. In: Wörter in Bil-dern – Bilder in Wörtern. Hrsg. von Rupprecht Baur/ Christoph Chlosta/ Eli-sabeth Piirainen. Hohengehren 1999 (= Phraseologie und Parömiologie 1): S. 71-106.

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ANHANG

Bundesnetzagentur zum Energiesparen „Nicht nachlassen“

Stand: 12.12.2022 10:35 Uhr

Die Gasspeicher sind gut gefüllt. Doch die Bundesnetzagentur warnt: Derzeit werde zu wenig gespart. Auch der energiepolitische Sprecher der Unionsfraktion zeigt sich beunruhigt - und fordert einen Energiespar-Appell des Kanzlers.

Die Bundesnetzagentur hat die Menschen in Deutschland aufgefordert, mehr Gas zu sparen, als sie es derzeit tun. „Aktuell liegen die Einsparungen insgesamt nur noch bei 13 Prozent“, sagte der Präsident der Behörde, Klaus Müller, dem „Tagesspiegel“. Die Bundesnetzagentur hält jedoch Einsparungen von 20 Prozent für nötig. „Wenn das ein Ausreißer bleibt, muss uns das noch nicht beunruhigen. In den nächsten Tagen wird es aber kalt bleiben. Es ist deswegen wichtig, dass wir mit den Sparanstrengungen nicht nachlassen und den ganzen Winter durchhalten“, mahnte Müller.

Füllstand von 95 Prozent

Derzeit seien die Gasspeicher mit einem Füllstand von 95 Prozent besser gefüllt denn je. Zudem sei Deutschland deutlich besser vorbereitet als im Sommer. „Wir bekommen jetzt Gas aus verschiedenen Quellen, wir haben bald drei Terminals für Flüssiggas, aus Norwegen und Holland, über Belgien und auch über Frankreich werden wir gut beliefert“, sagte Müller.

Auch eine Überlastung des Stromnetzes durch den massiven Einsatz von Heizlüftern, sei derzeit unwahrscheinlich. „Wir haben die Verkaufszahlen bei den Heizlüftern gesehen“, sagte der Präsident der Behörde. „Aber das Gute ist: Die Geräte werden nicht eingeschaltet. Sie stehen im Keller.“ Im November, als es vorübergehend kalt gewesen sei, hätten die Menschen auf die „dumme und teure Idee kommen können, statt mit Gas mit Strom zu heizen. Zum Glück hat das kaum jemand gemacht“, sagte Müller.

Eine längere Kältewelle sei aber dennoch riskant. „Bei Temperaturen von minus zehn Grad schießt der Gasverbrauch in die Höhe“, betonte er. Auch nach Ansicht des stellvertretenden CDU-Vorsitzenden Andreas Jung ist die Gefahr einer Gasmangellage „trotz voller Speicher nicht vom Tisch“.

„Das muss ein Weckruf für die Bundesregierung sein. Es muss kurzfristig gehandelt und stärker sensibilisiert werden“, sagte Jung und forderte einen Aufruf des Bundeskanzlers an die Bevölkerung, mehr Energie zu sparen. Nötig sei nun „eine sehr klare Kommunikation der Bundesregierung: Jeder Beitrag beim Energiesparen zählt!“, sagte der

CDU-Politiker. „Das gebetsmühlenartige Scholz‘sche Selbstlob zur angeblich schon gesicherten Versorgung wiegt in falscher Sicherheit: Wir erwarten von Olaf Scholz Klartext statt weiter so.“

Quelle: https://www.tagesschau.de/wirtschaft/verbraucher/bundesnetzagentur-115.html

Chapter 5

INSTRUCTORS' EXPERIENCES REGARDING TURKISH SIGN LANGUAGE (TID) TEACHING WITH DISTANCE EDUCATION PRACTICES IN COVID-19 PROCESS

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INTRODUCTION

World Health Organization (WHO) draws attention that 466 million people are individuals with hearing loss and emphasizes the importance of early diagnosis and intervention and accessibility opportunities. The WHO also emphasizes that it is mandatory to use visuals, in other words, sign language instead of auditory teaching activities when the hearing loss occurred at birth or before the language development (WHO, 2020). Sign language, the native language of the individuals with congenital severe and profound hearing loss, is a language that is created with the help of head, face, hand, fingers, and all body movements instead of auditory symbols, and has grammar rules (Kemaloğlu, 2016; Kubuş, İlkbaşaran, & Gilchrist, 2016; Piştav Akmeşe, 2019). Although the spoken language and sign language convey the same information, the visual-spatial features in sign language provide different structural features than spoken language. While spoken languages use sounds and sound structures in communication skills, sign languages actively use face, hands, and upper body. It has been seen that the sign languages used by the individuals with congenital severe and profound hearing loss are totally independent of spoken languages and have grammatical rules (Bellugi & Klima, 2001; Işıkdoğan Uğurlu, 2017; Sandler & Lillo-Martin, 2006). While it draws attention that sign language use has been increased in the world and our country in recent years; studies show that communication skills, academic, socio-emotional, language developments of the children with severe and profound hearing loss increase rapidly with sign language use (Piştav Akmeşe & Kayhan, 2017; Piştav Akmeşe, 2019; Vallotton, 2011). Thus, sign language that is started to be included in our lives in all levels of educational services was addressed especially in the higher education institutions, and programs were prepared in the scope of sign language courses and started to be applied. The sign language that was given as an elective course in the higher education institutions as of 2013-2014 academic year was included in the special education teaching undergraduate programs as a 3rd semester 2-credit compulsory course as of 2016-2017 academic year (Ministry of National Education, 2016; Piştav Akmeşe, 2019; Council of Higher Education, 2018). While the teacher candidates must learn the basics of sign language to effectively communicate with their hearing impaired and deaf students; there are some limitations in terms of online learning and receiving education, instant communication, face-to-face guiding, and giving feedback in sign language courses in special education teaching preparatory program (Middleton et.al., 2010). However, teacher training programs in special education are expected to enable teacher candidates and instructors who give the course to interact and provide opportunities for the development of learning and questioning skills. Thus, it is highly

significant to give sign language courses to the teacher candidates and enable them to communicate with their hearing-impaired students with sign language. Distance education practices have increased rapidly in many countries and our country with the COVID-19 outbreak. Interactive training was given through web or videoconference with distance education in teacher training all over the world (Pıştav Akmeşe & Kayhan, 2021; Vasile, 2020; Wilson & Hord, 2000). TID course was conducted online with distance education practice in the pandemic period. Distance education, unlike face-to-face education, provides an opportunity to use available sources in all environments ideally for the teachers, and can meet the cost and physical infrastructure needs, but, can cause some limitations in communication and interaction in applied education. Another limitation is in the technology use area. Because, the teachers can show different performances in the use of various digital learning applications and tools. Thus, it can be considered as a distinctive aspect of this study that it examines sign language use in distance education based on the experiences of the instructors who teach in higher education and also states the situations encountered. This study, which includes the situations encountered by the instructors who continue distance education in sign language course, an applied and interaction-based course, focused on the problems in sign language teaching and the strong aspects and limitations of online environments. This study includes details about how to conduct Turkish Sign Language teaching online and face-to-face with hybrid model applications, and technology use in sign language education. For this purpose, the answers to the questions below were sought:

Q-1) What are the experiences of the instructors who give TID courses with distance education regarding giving the course online?

Q-2) What do the instructors who give TID courses with distance education think about the difficulties encountered in the sign language education process in online environments?

Q-3) What do the instructors who give TID courses with distance education suggest to effectively teach sign language with distance education?

Q-4) What do the instructors who give TID courses with distance education suggest for the policy-makers, instructors in higher education, and teacher candidates for the access of the hearing-impaired and deaf students to quality education?

METHOD

This study, designed in qualitative research method, examines the distance education process specific to the Turkish Sign Language course

in detail with the inductive method based on the experiences and opinions of the participants.

Research Model

The study, designed in qualitative method (Creswell, 2005), aims to examine the experiences of instructors who teach Turkish Sign Language with distance education practıces ın covıd-19 process. The opinions and suggestions of the instructors regarding the age and level of the students who receive education, the content of the education, planning in the application process, and to what extent they benefit from the technology to achieve the goals of the course were received. The data were analyzed with content analysis and turned into findings (Kyngäs, Elo, Pölkki, Kääriäinen & Kanste, 2011).

Participants

The criteria for determining the participants of this study are to give Turkish Sign Language courses in higher education institutions at least once before and at least once during the distance education period and to be volunteer to participate in the study. Participant information is given in detail in Table 1.

Table 1. Participants' Demographic Information

Instructor	Age	Gender	Education	Year of Distance Educaiton	Course Fac/dept.	During	Size	Evaluation Process	Face-to-face Education Material	Distance Education Material
I1	47	M	UG	2	Edu., FoHS LST	2	70	Synchronou video	Power Point, Web 2.0 tools (quizizz and nearpod)	Digital Material, Zoom, Teams, Google Meet, E-mail, MoNE TID
I2	43	F	PHD	1	Law, Edu FoHS Sport Sci.	2	200	Camera on, video	PowerPoint presentation, Video, subtitle system	MoNE TID, Turkish Sign Language Student's Book A1-A2 Level
I3	40	M	G	1	Fac. of Edu. SET	2	10	Zoom	PowerPoint, Video	Digital material, MoNE TID
I4	40	M	PHD	1	Fac. of Edu SET. Basic and advanced sign lang. Edu.	2	77	Zoom, teams	Video, presentation, visuals	http://tidsozluk.net/https://www.tdk.gov.tr/icerik/basindan/turk-isaret-dili-sozlugu/ Intelligent Turkish Sign Language Preparation Book MoNE Dictionary (PDF)
I5	42	F	PHD	2	Fac. of Edu. SET	2	65	Zoom, video	Video, presentation, visuals	Digital material, MoNE TID
I6	43	F	PHD	1	Fac. of Edu. SET	2	60	Zoom, video	Video, ppt	Digital material, MoNE TID
I7	41	F	PHD	2	Fac. of Edu. SET	2	45	Zoom, video	Video, presentation, visuals	Digital material, MoNE TID
I8	55	M	UG	1	Fac. of Edu. SET	2	70	Zoom application	Video	MoNE TID, videos, Ankara Uni. Distance Education Portal
I9	50	F	UG	1	Fac. of Edu. SET	2	70	Zoom, Teams, Video	Presentation Application videos	Digital material, videos

MEB TID: MoNE (Ministry of National Education) Turkish Sign Language (TID) Portal SET: Special Education Teaching LST: Language Speech Therapy

Table-1 includes the demographic information of 9 participants and their pandemic experiences as sign language instructors. It is understood that the participants whose average age is 44.5, 4 of whom are male, 4 of whom have Ph.D. degrees, 1 of whom has associates degree, have been giving sign language courses since the pandemic started (they have been teaching with distance education for 1-2 years). All instructors conducted a 2-hour-a-week Turkish Sign Language course which is included in the curricula of faculty of education department of special education thorough distance education in the 2020-2021 fall term; I1-I4 also taught in different faculties such as faculty of law, faculty of health sciences, faculty of sports sciences and department of language speech therapy. I4 conducted basic and advanced sign language courses at the faculty of education department of special education teaching. The participants, stating that they conducted the course minimum 10 (I3) maximum 200 (I2) participants, included tools such as PowerPoint, Web 2.0 tools (quizizz and nearpod), presentations, and videos in their courses before the pandemic, used digital materials, Zoom, Microsoft Teams, Google Meet, E-mail, and MEB TID portal, and digital environment materials during the distance education period.

Data Collection Instrument

A data collection instrument that included open-ended questions to obtained detailed data about the TID teaching experiences of the participants during the distance education was used. This form was developed by the researchers. The steps followed to develop the data collection instrument were shown in Figure-1.

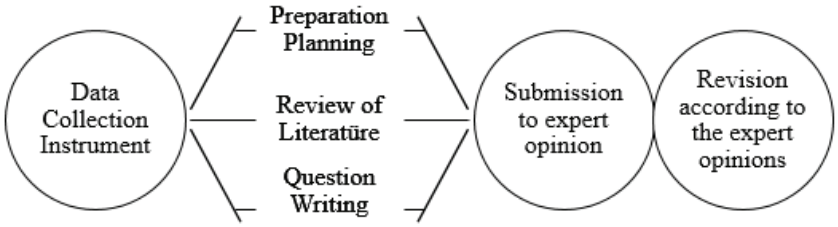

Figure1: Development of data collection instrument

The researchers examined the educational institutions and programs that the courses are conducted in accordance with the criteria such as how the TID course is given, ECTS, credit, and being an elective or compulsory course. Curricula of Department of Special Education Teaching in which the sign language is taught as a compulsory course in 2020-2021 academic year, and the faculties-departments-vocational school in which

sign language is included in the lesson pool as an elective course were examined by reaching the syllabi of the related departments from the web sites of higher education institutions. The units which included the TID course in the lesson pool were determined, thus, the purposive sampling technique was preferred. In this sense, the study includes the opinions of the instructors who work full-time and/or part-time at the faculties in which the TID course is conducted in the domestic state and foundation universities. Questions that will include the difficulties encountered by the instructors/lecturers who give this course due to the coronavirus pandemic, the educational adaptations they have made, and their suggestions to conduct the course that is currently a 2-hour theoretical course in higher education programs effectively were prepared. Some criteria were determined for the participation in the study: a) to give TID course at least two years, to experience face-to-face and distance education at different periods, b) to be an academic member of the departments in which the TID course is compulsory or elective. Then, the administrators who work in the department of special education teaching were reached through e-mail and telephone, and they were informed to receive support from the instructors/ academicians who work in their department and conduct TID courses for the study. As an elective course in the Faculty of Education Department of Special Education and other departments; the data were collected via e-mail with the form prepared by the researchers from the participants who give the course in the Vocational School of Health Services Faculty of Health Sciences, Language Speech Therapy departments. The form that includes the open-ended questions was prepared by three researchers all of whom received Turkish Sign Language Education, who teach sign language in higher education, are experienced in proceedings, articles, projects in the national and international area. The researchers scanned the literature regarding the communication, language and speech characteristics of the hearing-impaired and deaf individuals, Turkish Sign Language, professional competencies of the teachers, pre-vocational education of the experts (psychologist, language speech therapist, physiotherapist) who will work with the teachers in the special education field, and the effect of distance education practices on the hearing-impaired and deaf individuals in coronavirus pandemic. The existing research problem is to examine how the TID course is delivered in higher education and the experiences and opinions of the instructors who give this course about distance education. For this purpose, the data collection instrument that consists of two parts was prepared, sent to 3 experts, 2 of whom have distance education experience in the department of special education, 1 of whom has sign language education experience with hearing-impaired higher education students. The experts evaluated the questions in terms of sign language education in the online environment, material and

environment principle regarding sign language, comprehensibility, and being purposive. In accordance with the opinions received, the number of the participant students and the course hour per week were added to the demographic information part and an open-ended question that questions the technological competency of the online environment in terms of sign language teaching was added. Thus, the revisions were completed. The data collection instrument consists of two parts; in the first part, the participants were asked questions about age, gender, educational status, how many semesters they taught TID course, number/hour of the courses per week, material type, evaluation during and at the end of the education, and feedback. The second part consists of questions based on the opinions of the participants about their experiences about online sign language education with distance education, feedback from the students who take the course, their opinions including the observations about the process, adaptations they made in the online environment. The participants were asked 7 open-ended questions in total.

Data Collection and Analysis

The participants were informed about the aim and content of the study by the researchers. The forms that were sent via electronic mail to the instructors who accepted to participate in the study were filled in e-environment and sent back to the researchers. Development of the data collection instrument was completed in May 2021, and the application process of the data collection instrument was completed between July 1-30, 2021. The data, inductively analyzed using the content analysis method (Elo & Kyngäs, 2008), were summarized under 4 main themes and 10 sub-themes.

RESULTS

The themes obtained from the opinions of the participants are *"Education infrastructure-current situation and transitions, Competencies regarding the institution and personnel, Problems and monitoring studies, Technology use regarding learning opportunities"*; opinions related to each theme were described in the following chapter.

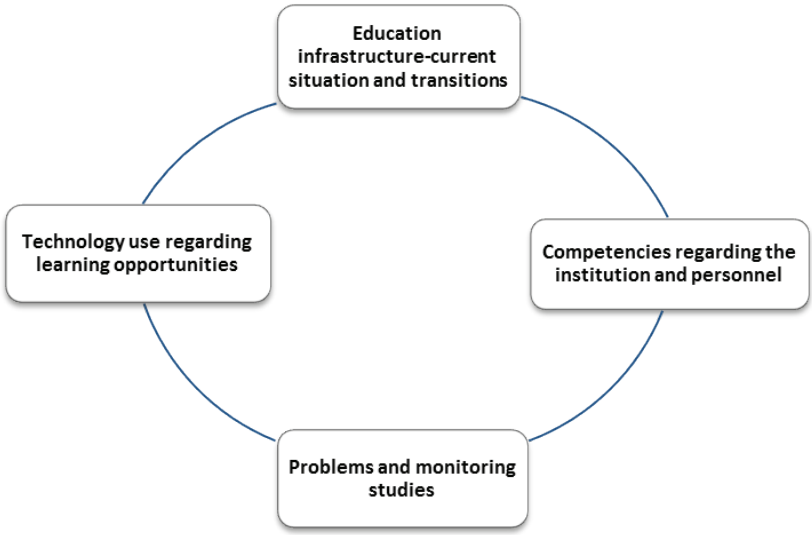

Figure-2. Main Themes

Education Infrastructure-Current Situation and Transitions

Participants, drawing attention to the distance education infrastructure and transitions with the outbreak of the pandemic, stated that plans that will provide equality of opportunity and transitions are limited in current situation. Participants, especially emphasizing the structure of electronic information systems of higher education institutions which have great differences in technological infrastructure and accessibility, stated that the classrooms were united and the classroom sizes increased, there was a lack of digital materials, there were limitations in the competencies of educational platform use of both instructors and students. For instance;

I1 Actually there wasn't a planning process, we had to teach online suddenly. I didn't have much difficulty as I am fond of digital teaching materials. But the formal procedure is troubling. There is a certain cost for using digital material. These were ignored in this process. I think Youtube could be highly effective for online courses. Its infrastructure is strong, it is easily accessible and it records on its own database. The world's leading universities had broadcasted their courses on Youtube before the pandemic.

I2 .....200 participants in total. There were no problems with the ones who followed the courses with their cameras on, but, the common idea is that face-to-face education is better.

I5 Two groups before the distance education were united as a single group with distance education and we taught in this single group;

words and usage in the context were included by first giving theoretical information, then sign language alphabet and themes created at the basic level. The course duration was determined as 50 minutes on average. Of course, this duration was not always sufficient.

It is understood that scheduling and planning were insufficient in informing, and accessible infrastructure systems in terms of the preparation for the transition to online education. It has been suggested that the personnel must be sufficient in number, a more holistic policy based on equality of opportunity should be conducted, and micro-teaching studies should be conducted as applied courses in free online environments. Participants, stating that sign language education should be an applied course, indicated that they prefer face-to-face education in sign language teaching unless there is a compulsory situation. They stated that the size of the screen, access to the tablet, computer, mobile phone, and characteristics of how the course is listened create experience differences in realizing the competencies, in terms of gestures and facial expressions, hand-arm movements, head-body movements (I3-I4-I5-I7-I8-I9)

Competencies Regarding the Institution and Personnel

It is seen that the participants emphasized the competencies regarding the personnel, student, and environment in the sign language teaching process (all participants). For example, participants, emphasizing that distance education and technology knowledge should be sufficient, and screen use is also important for showing the gestures and facial expressions properly, stated that the competencies of the instructors to prepare course materials in the digital environment in pandemic were limited (I1-I4-I5-I6-I8). On this subject;

I4 Materials are highly important for using sign language in both social area and academic area, however, it is seen that some course sources and materials have deficiencies in the visual area. The course can be conducted by using the sources and communicating with hearing-impaired individuals whose native language is sign language.

I2, I6, I7, I8 suggested that the instructor should have competency for technology use, besides, cameras should be turned on and multiple evaluations should be made for a more efficient sign language course. For instance, video record in the digital environment, one-to-one online dialogues, preparing education materials supported with visuals and subtitles, etc. However, they stated that the increase in the classroom size in the online environment is a limitation. They emphasized that the classroom size should be between 10-20 students in face-to-face education, this rate should be even lower in online environments.

Problems and Monitoring Studies

Participants who considered the problems regarding sign language education in the distance education process from different angles drew attention to the environment, lack of material, interaction, and access problems in general. They saw the opportunity for revision as a positive aspect, but it is a disadvantage that application is not possible. For example;

I4 *Some of the students who learn sign language online during the distance education process had problems in information technologies use or in terms of lack of opportunities. Sometimes, display resolution and sound quality were low, there were problems in watching or listening to the videos.*

I5 *Language acquisition should not be theoretically obtained by one-way acquisition of information, but on the contrary, it should be provided by practicing in two directions. The situation is not different in sign language, users are expected to learn the language based on interaction and use it.* Participants (I2-I3-I4-I5-I6-I7-I8), indicating that studying one-to-one when the cameras of both instructors and students are turned on increases the efficiency, stated that there should be standards regarding the classroom size, material, duration, and course in distance education.

Technology Use Regarding Learning Opportunities

Participants, drawing attention that more materials should be provided to develop learning opportunities and support both face-to-face and distance education processes with technology, stated that using a mutual platform created by Higher Education Institution and Ministry of National Education could be functional. They expressed that sign language dictionary, sign language word and sentence studies, and translation support services that allow reinforcement by watching the videos again can be provided in the context of digital environment user competencies. They suggested that the teacher candidates and teachers who teach in the schools that the hearing-impaired students continue can develop applications that will enable hearing-impaired and deaf individuals to make video talks in the digital environment (I4-I5-I6-I7-I8). They stated that the teacher candidates will have the experience of communicating with hearing-impaired, deaf students in this way in terms of teaching practice.

For example;

I4 *If this system will be used in the next term, the students have to turn on their cameras and microphones during the virtual courses and exams in the distance education process that should be added to Regulation on Education and Training. The definitions and standards of sound, camera, documents must be determined for the students who attend the courses.*

I7 *There should be applied materials in the Council of Higher Education lesson pool, subtitles and course videos should be accessible, students should receive this course as a theoretical and applied course weekly.*

DISCUSSION

The themes constituted in accordance with the opinions of the instructors were approached respectively and discussed with the studies in the literature. The first main theme is *"Education infrastructure-current situation and transition"*, it is seen that most of the instructors had difficulty in terms of informing, technological infrastructure access. The negative effects of the pandemic caused a fast transition and adaptation to the distance education process in all courses at all levels of education. The adaptation process caused many difficulties for both instructors and students. In an effective distance education process, physical equipment such as access to technological infrastructure, transfer of the sources to digital environments, students' access to digital devices should be in compliance with one another (Reimers et.al., 2020). Thus, cooperation could be enabled between the teachers and students who realized the first step of face-to-face and online distance education, and providing a teamwork becomes easier. Besides having a complex grammar structure, TID in which visual-spatial methods are used has visual characteristics, unlike spoken languages. Sign language includes many components such as the shape of hands, their position and direction, frequency of movement, gestures, movements such as facial expressions that do not use hands (Kubuş, İlkbaşaran, & Gilchrist, 2016; Piştav Akmeşe, 2019; Işıkdoğan Uğurlu, 2017). The instructors mentioned that the infrastructure of education services is not appropriate for the TID course in the transition to distance education and they experienced some deficiencies. Thus, they stated that this course that is based on application and has complex visual content should be given face-to-face because of the characteristics of the technological devices used and the multidimensional characteristics of TID. They also stated that there were limitations in reaching sample materials that consist of the multidimensional structure of TID and forming dialogues regarding the use in the transition process. In TID use, as the sign's direction, number, shape, position, gestures, facial expressions change, the meaning also changes. Thus, the students must make observations very well and be highly careful when using sign language. However, it is thought that some limitations have been experienced in TID courses due to the technological equipment and the lack of digital materials on this subject with the distance education started with the pandemic. Studies conducted about giving TID courses with distance education include similar findings and draw attention to the problems resulting from the fact

that the process started without any preparations (Işıkdoğan Uğurlu et.al., 2021; Piştav Akmeşe, & Kayhan, 2021). The majority of the instructors stated that they had limitations in especially preparing the course materials in the digital environment about *"Competencies regarding the institution and personnel"*. They also emphasized that competency is not only related to the instructor, also the students have an important role in this process. Toquero (2020), emphasized that the instructors need support to be competent in determining, planning, applying, and evaluating the student performances besides stating that the distance education process constituted various difficulties. In this study, the instructors stated that most of the students become successful when they have sufficient knowledge, skills, and motivation (Joe, Hiver, & Al-Hoorie, 2017; Knoors & Marschark, 2014). Thus, it is necessary to use different strategies to encourage students to learn and effectively use what they have learned, to focus on their strong sides, and to support their academic and emotional development. Instructors can make students participate in the classes more willingly and actively by motivating them in the courses like sign language that are based on application and communication. They can use various strategies that appeal to different senses to receive, process, and learn the information in online courses. Because, the students listen to the examples related to the sign language carefully while watching them in computer environments or television, save the important information such as body language, facial expressions, keywords and can review them in communication activities in different environments; this review constitutes one of the important strategies (Ally, 2004). Instructors generally stated that they experienced limitations resulted from the lack of environment and materials, lack of application, and communication interaction problems about *"Problems and monitoring studies"*. lshawabkeh et.al. (2021), in their study, stated that the instructors could reduce the burden of the courses by benefiting from different presentation methods, videos, visual discussion. Thus, instructor-student interaction could be formed in online classes with the opportunity of reaching students in different ways. It is also stated in the same study that the interaction will increase, the burden of the courses will decrease and the time for quality interaction will increase when different sources are used. Thus, in the study based on the research findings, the lack of material used in accordance with the course content and sources can be thought of as a problem for quality distance education services. It can be said that the students had difficulties in interaction skills due to this problem. Another limitation stated in the research findings is that the applications could not be conducted during the distance education process. The instructors reported problems resulted from lack of interaction, limitations in terms of time, and united classroom sizes about the sign language course based on application. While the literature consists of similar findings, it has been

emphasized that application was replaced with theoretical knowledge, the interaction with the students was insufficient in the distance education process (Pištav Akmeşe & Kayhan, 2021; Işıkdoğan Uğurlu et.al., 2021). Wang, Cheng, Yue & McAleer (2020), suggested that the syllabi of courses based on application should be rearranged in effective distance education process, students should reach quality materials easily in the digital environment, applications should be supported with various videos. In *"Technology use regarding learning opportunities"* theme, the last theme of the study, instructors stated that using platforms prepared mutually by Higher Education Institution and Ministry of National Education could be functional. It is also stated that the students should be able to save the videos to reinforce what they have learned, digital environment sign language dictionary, sentence studies, and translation support services should be provided. They suggested constituting visual applications for this purpose. The results of the study are supported by the literature, and it is thought that the importance of active sign language use by the students in social life is emphasized (Pištav Akmeşe & Kayhan, 2017). The instructors stated that this dimension of use should be continued in the digital environment when it is not possible to teach face-to-face due to the pandemic and supported with supplementary resources. Pištav Akmeşe & Kayhan (2017), parallel to the findings of this study, drew attention to the daily use of sign language in social life. They suggested that the teacher candidates should perform applications to use sign language functionally, frequently communicate with the individuals with hearing loss with sign language for active sign language use.

Conclusion

As a result, this study examined the opinions of the teachers about TID through distance education, most of the instructors stated that they were unprepared for the distance education services that we transit quickly with the pandemic. They expressed that they had some limitations due to the lack of digital materials, information. It is thought that this situation also causes a lack of communication or unhealthy communication between the instructor and the students. It can be a problem to transfer all characteristics of the language to the other person in the digital environment as the TID requires a multidimensional use in terms of visual characteristics. The participants explained that they experienced problems resulted from interaction, application, lack of material, environment as well as information requirements about distance education. Thus, they suggested creating learning opportunities, and to develop language use skills with deaf individuals in digital environments.

Recommendations

Learning a language requires practicing a lot, so web and telephone applications can be used for the students to practice sign language by using theoretical knowledge. Or digital game-based learning applications can be developed to increase learning motivation and provide language learning. Universities and policymakers can prepare material pools in the scope of equality of opportunity to use online learning actively and overcome the obstacles in front of the students and courses. These digital materials can be reached free in the scope of equality of opportunity. Besides, standards can be published regarding who should be responsible for sign language teaching in higher education and the competencies of the instructors who will give this course. Regulations on how to give courses such as sign language that includes application, and characteristics of the materials can be developed; informative education about how to use digital-based simulations and software for application can be given to instructors.

Acknowledgements

We would like to thank the participants who conducted the Turkish Sign Language course at least once in higher education institutions.

We thank the experts who gave their valuable opinions in the preparation of the data collection tool in the research.

Conflict of Interest

The author(s) declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. No potential conflict of interest was reported by the author(s).

Ethical Approval

All procedures in studies involving human participants were performed following the ethical standards of the institutional and/or national research committee and with the 1964 Declaration of Helsinki and its later amendments, or comparable ethical standards. The participants were first given written and verbal information about the content of the study. Then, a letter of consent was obtained from the participants to voluntarily participate in the research.

Informed Consent

Informed consent was obtained from all individual participants included in the study.

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Appendix

Q-1) Which resources did you use in sign language course in distance education?

Q-2) How did you plan sign language course in distance education? (number of people, group, material, duration, etc.)

Q-3) What do you think about the motivation and course participation of the students who took sign language course with distance education? Please give information.

Q-4) What kind of experiences did you have while giving sign language course with distance education?

Q-5) What kind of regulations should universities make for sign language education with distance education?

Q-6) What kind of regulations should instructors make in order to make sign language course more effective?

Q-7) What kind of competencies should an instructor have in order to effectively teach sign language with distance education?

Chapter 6

SELF-EFFICACY PERCEPTIONS OF PROSPECTIVE EFL TEACHERS TOWARDS ONLINE LEARNING

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Introduction

The importance of online learning has been understood once again with the developing technology day by day and the Covid-19 pandemic, which has started in the world, including our country in recent years. As with everything else, Covid-19 has caused significant problems in education, and with the rapid change in our education system, our students and teachers had to start online education without psychological and technological infrastructure work. Therefore, the sociocultural, technological, and economical changes experienced in recent years have forced many fields to change, as well as forcing education to change for the benefit of people (Yeşilyaprak, 2003). At this stage, with the changing technology, there is a need for an expert educator who is competent in online education. Nevertheless, it is important for teachers to believe that they can fulfill these duties and responsibilities as well as fulfilling their professional qualifications. The beliefs and orientations of teachers also affect their behaviors toward the teaching profession (Bandura, 1997).

Along with the improvement of technology, online learning environments have eliminated the requirement of traditional education. Online learning is a learning procedure in which students perform their learning away from the sources by accessing many learning resources at the same time, in an environment different from face-to-face learning-teaching activities, and in most cases, they interact more than the classroom environment (Çalışkan, 2002). Moore and Kearsley (2011), on the other hand, define online learning as a planned and institutional arrangement where teachers and students are in separate places, that includes the application of designs and methods suitable for distance education, and that requires the use of different technological devices.

Covid-19 led to important problems in education as in everything else, and with the rapid change in our education system, our students and teachers have had difficulty keeping up with the new education system. Therefore, the renewed technology reveals the need for competent and expert educators in online education. Nevertheless, it is equally important for teachers to believe that they can fulfill these duties and responsibilities as well as fulfilling their professional competence. These beliefs and orientations of teachers also affect their behavior toward the profession (Bandura, 1997). In this sense, the concept of 'self-efficacy' has become a powerful factor.

The term self-efficacy is a concept developed by Albert Bandura. It was first used in the research of 1977 and then many types of research were carried out on this subject (Özerkan, 2007). Bandura (1997) defines self-efficacy as a quality that has an impact on teacher/pre-service teachers'

self-judgment and behavior regarding the organizing abilities and successful performance of the activities. The belief in self-efficacy shows how people should behave in difficult times and can be seen clearly in the behavior of the person. (Yaman, Koray and Altuncekiç, 2004). Pajares (2002) stated that although a teacher has the competence to do a job, there is a potential for not being able to do it if she does not have enough faith. Teachers' belief in their own competence is a display of their productivity. Teachers' high self-efficacy levels have a positive effect on education and training processes (Demirtaş & Yener, 2019). Individuals with developed self-efficacy beliefs can act with intrinsic motivation, without the need for external motivation to implement an event or complete a task (Kapıcı, 2003).

Sırakaya and Yurdugül (2016) investigated the readiness degrees of prospective teachers toward online learning regarding various variables in their study. The results of the study revealed significant gender differences between pre-service teachers' computer self-directed learning and self-efficacy sub-factors. Another study was conducted by Yıldız and Seferoğlu (2020). The purpose of the study was to reveal the self-efficacy beliefs of online technology students participating in distance education with respect to different factors. The results revealed that the students who took part in online education had high self-efficacy perceptions towards digital technologies and differed with respect to age, department, and gender. Uçar (2012) investigated the relationship between prospective English teachers' teaching self-efficacy beliefs, achievement orientation, involvement in an online learning environment, and frequency of using this environment. 186 prospective teachers enrolled in the last year of the Anadolu University, ELT undergraduate program participated in the study. According to the findings, the pre-service English teachers had high self-efficacy awareness and more than one achievement orientation.

Among the studies conducted on English teachers, Memduhoğlu and Çelik (2015) examined the English self-efficacy perceptions of undergraduate students who are or plan to be teacher candidates regarding some factors. 262 students from ELT and ELL departments participated in the study. The findings showed that the self-efficacy perceptions of the participants were close to the medium level, gender and year significantly affected self-efficacy levels but their high school and their types of faculty did not significantly affect their self-efficacy levels. The aim of this study is to examine the level of self-efficacy perceptions and classroom management capacities of teachers of English working in schools according to different variables. 188 English teachers took part in the research in the 2017-2018 academic year. The findings showed that no meaningful difference was revealed between the self-efficacy perspectives and classroom management

abilities of English teachers regarding gender, type of faculty, and class levels.

Ateş (2016) conducted a study to compare teacher candidates and teachers' self-efficacy beliefs

in Antalya. The objective of this research is to compare the self-efficacy beliefs of the pre-service teachers of Akdeniz University Education Faculty and the teachers working in Antalya. This study investigated whether the self-efficacy beliefs of teachers and teacher candidates differ significantly in terms of variables such as age, gender, school type, educational status, and branch. A significant difference was found in school type and branch factor. Self-efficacy perceptions of teacher candidates were found to be lower than that of teachers. Hampton and Mason (2003) conducted research on whether variables such as self-efficacy resources and learning disability have any effect on general self-efficacy and academic achievement. It has been revealed that self-efficacy sources affect self-efficacy belief and academic success.

The result of the research conducted by Yeşilyurt (2013) indicated that the self-efficacy degrees of the pre-service teachers were at an adequate degree. In addition, the research revealed a significant difference in the level of self-efficacy perception regarding gender, whether to work or not and the type of program. No significant difference was found regarding the academic achievement variable. Gömleksiz and Serhatoğlu (2013) conducted a study on preschool teachers' views on teacher self-efficacy beliefs. It was found that their teachers regarded their self-efficacy beliefs at a high level and it has been determined that these views do not differ according to gender, length of service, the institution where they work, and the socio-economic degree of this institution.

Due to the scarcity of studies, it is thought that investigating these problems and discussing the findings will contribute to the literature. In light of the findings to be obtained, researchers, educators, and administrators who will conduct research in this field will be able to have information about the level of self-efficacy beliefs of prospective teachers towards online learning and which variables change in line with it. It is thought that these research findings will be taken into consideration when there is any change or improvement in the program.

However, it has been seen that the studies on online learning are not aimed to measure the self-efficacy perception towards online learning. Since there are few quantities of studies on self-efficacy perceptions of prospective teachers toward online learning, this study is considered to make significant contributions to the literature. It is thought to offer suggestions for future research and contribute to professional development studies.

Although there are a variety of studies in the literature to investigate the self-efficacy beliefs for online learning with respect to certain factors, the education system that has changed due to the Covid-19 epidemic in the last two years has required research on this subject. The main purpose of this research is to examine the level of self-efficacy beliefs toward online learning of pre-service teachers studying in the departments of English language teaching and primary school education at Tokat Gaziosmanpaşa University in terms of certain variables. In line with this study, it seeks answers to the following questions:

1. What are the self-efficacy degrees of prospective teachers towards online learning?

2. Do the self-efficacy degrees of prospective teachers towards online learning show a significant difference according to gender?

3. Do the self-efficacy levels of prospective teachers for online learning show a significant difference according to the department?

METHODOLOGY

The research investigated the self-efficacy beliefs of prospective students towards online learning regarding different variables. The screening model, which was implemented in the current study, is one of the quantitative research methods. In the screening model, the researcher tries to define the interest, behavior patterns, and attitudes of the whole universe or sample (Creswell, 2005).

Participants

The respondents of this study consist of approximately 65 students studying in the Department of English Language Education at Tokat Gaziosmanpaşa University. The following are specifics from Table 1 regarding the respondents' demographics:

Table 1. Demography of the Participants

		f	%
Gender	Female	49	75
	Male	16	25
Department	ELT	43	66
	Primary School	22	34
Total		65	100

Data Collection Instruments

The current study used the "Scale of Online Learning Self-Efficiency" (OLSS) which was designed by Sun and Rogers (2020) and translated into Turkish by Çalışkan (2022). This scale consists of 4 sub-dimensions:

"Technology use self-efficacy (TU)", "online learning task self-efficacy (OLT)", "instructor and peer interaction and communication self-efficacy (IPIC)", and "self-regulation and motivation effectiveness". (SRM)". The technology use self-efficacy dimension (1-7) aims to investigate students' opinions about their capacity to carry out the technology. "Online learning task self-efficacy" (8-11 items) aims to examine online students' perceptions about achieving online duties. The next subscale, instructor-peer interaction and communication self-efficacy (12-18) aims to examine students' capacity to have an interaction with instructors and peers. The final dimension, self-regulation and motivation self-efficacy, (19-31) aims to investigate their beliefs to monitor themselves and motivate themselves for online learning. In addition, a personal information form designed by the researchers was applied to the respondents to achieve their personal data such as age, gender, and class.

Data Analysis

The average score for each dimension of the scale and the average score obtained from the whole scale will be calculated in order to examine the degree of prospective teachers' self-efficacy towards online learning and whether there is a difference in terms of variables. SPSS 21 program was used to analyze the research data. It is aimed to use an independent variable t-test and a one-way analysis of variance (ANOVA) to determine the difference between two, three or more independent variables.

The overall scale's lowest possible score is 31, while its greatest possible value is 155. Participants in this study who scored 31–72 on the scale had a low degree of self-efficacy, 73–114 had a medium level, and 115–155 had a high level of overall self-efficacy levels towards online learning. The lowest possible score of TU is 7 while its greatest possible value is 35. Participants in this study who scored 7–16 on the scale had a low degree of self-efficacy, 17–26 had a medium level, and 27–35 had a high level of technology use self-efficacy level. The lowest possible score of OLT is 4 while its greatest possible value is 20. Participants in this study who scored 4–9 on the scale had a low degree of self-efficacy, 10–15 had a medium level, and 16–20 had a high level of task self-efficacy level. The lowest possible score of IPIC is 7 while its greatest possible value is 35. Participants in this study who scored 7–16 on the scale had a low degree of self-efficacy, 17–26 had a medium level, and 27–35 had a high level of IPIC. The lowest possible score of SRM is 13 while its greatest possible value is 65. Participants in this study who scored 13–30 on the scale had a low degree of self-efficacy, 31–48 had a medium level, and 49–65 had a high level of SRM.

Results

1. **What are the self-efficacy levels of prospective teachers towards online learning?**

This part reveals the findings of the sub-problems for the purpose of the research presented in tables, respectively. The findings of the first research question were shown in Table 1.

Table 1. Self-efficacy overall levels toward online learning

Self-efficacy overall levels						Scale overall	
Low		Medium		High		$\bar{X}$	S
N	%	N	%	N	%	121.64	23.46
2	3	17	26	46	71		

As seen in Table 1, the mean score is 121.64 (N: 65) and the standard deviation is 23.46 across the scale, only two of the prospective teachers have low self-efficacy beliefs for online learning. According to Table 1, 26% (N: 17) of the participants had a medium level of self-efficacy beliefs, and 71% (N: 46) of them had a high self-efficacy belief toward online learning. Therefore, it could be concluded that the overall self-efficacy beliefs of prospective teachers are mostly high level toward online learning.

Table 2. Technology use self-efficacy levels toward online learning

						Scale overall	
Low		Medium		High		$\bar{X}$	S
N	%	N	%	N	%	28.84	6.33
3	5	13	20	49	75		

In Table 2, the sub-dimension of TU, the mean score is 28.84 (N: 65) and the standard deviation is 6.33 across the scale, only 3 of the prospective teachers have a low level of technology use self-efficacy beliefs for online learning. According to Table 2, 20% (N: 13) of the participants had a medium level of self-efficacy perceptions, and 75% (N: 49) of them had a high degree of technology use self-efficacy beliefs toward online education. Therefore, it can be concluded that the level of technology use self-efficacy beliefs of prospective teachers is mostly high level toward online learning.

Table 3. Task self-efficacy levels toward online learning

Self-efficacy levels						Scale overall	
Low		Medium		High		$\bar{X}$	S
N	%	N	%	N	%	15.49	4.62
9	14	16	25	40	61		

According to Table 3, for the sub-dimension of task self-efficacy levels, the mean score is 15.49 (N: 65) and the standard deviation is 4.62 across the scale, only 14% (N: 9) of the teacher candidates have low task self-efficacy beliefs for online learning. According to Table 3, 25% (N: 16) of the participants had a medium level of task self-efficacy beliefs, and 61% (N: 40) of them had a high degree of task self-efficacy levels toward online learning. Therefore, it might be concluded that the level of task self-efficacy levels of prospective teachers is mostly high level toward online learning.

Table 4. IPIC toward online learning

Self-efficacy levels						Scale overall	
Low		Medium		High		$\bar{X}$	S
N	%	N	%	N	%	26.60	5.87
1	2	25	38	39	60		

According to Table 4, for the sub-dimension of trainer-peer interaction and communication self-efficacy levels, the mean score is 26.60 (N: 65) and the standard deviation is 5.87 across the scale, only 2% (N: 1) of the pre-service teachers have a low trainer and peer interaction and communication self-efficacy level toward online learning. According to Table 4, 38% (N: 25) of the participants had a medium level of IPIC self-efficacy beliefs, and 60% (N: 39) of them had high self-efficacy levels toward online learning. Therefore, it is seen that the level of trainer and peer interaction and communication self-efficacy dimension is higher than average levels toward online learning.

Table 5. Self-regulation and motivation self-efficacy levels toward online learning

Self-efficacy levels						**Scale overall**	
Low		Medium		High		$\bar{X}$	S
N	%	N	%	N	%	50.70	9.88
1	2	26	40	38	58		

According to Table 5, for the sub-dimension of SRM self-efficacy levels, the mean score is 50.70 (N: 65) and the standard deviation is 9.88 across the scale, only 2% (N: 1) of the pre-service teachers have a low level of self-regulation and motivation self-efficacy levels toward online learning. According to Table 5, 40% (N: 26) of the participants had a medium level of self-regulation and motivation self-efficacy levels, and 58% (N: 38) of them had high self-efficacy levels toward online learning.

Therefore, it is seen that the level of self-regulation and motivation self-efficacy levels of prospective teachers are mostly medium and high levels toward online learning.

2. **Do the self-efficacy levels of prospective teachers towards online learning make a difference according to gender?**

For the second research question of the research, the findings of the independent t-test results of the scores obtained by the students from the "Online Learning Self-Efficiency Scale (OLSS)" were given in Table 6.

Table 6. Findings for students' research anxiety scores in terms of gender

	Gender	N	$\bar{X}$	S	t	p
Overall Results	Female	49	116.67	23.78	3.199	.002
	Male	16	136.87	14.50		

According to Table 6, there was a statistically significant gender difference in the participants' self-efficacy levels toward online learning [t (63) = 3.199, $p<0.05$]. Table 6 shows that male respondents scored higher on the online learning self-efficiency scale (X: 138.87) compared to female participants (X: 116.67). Because of this, it can be said that the gender variable has a statistically significant impact on the students' self-efficacy levels toward online learning.

3. **Do the self-efficacy levels of prospective teachers for online learning show a significant difference according to the department?**

For the third research question of the research, the findings of the independent t-test results of the scores obtained by the students from the "Online Learning Self-Efficiency Scale (OLSS)" were given in Table 7.

Table 7. Findings for students' research anxiety scores in terms of department

	Department	N	$\bar{X}$	S	t	p
Overall Results	ELT	43	119.88	24.69	.845	.401
	Primary School	22	125.09	20.94		

According to Table 7, there was not a statistically significant department difference in the participants' self-efficacy levels toward online learning [t (63) = .845, $p>0.05$]. Table 7 shows that both ELT respondents scored the same on the online learning self-efficiency scale (X: 119.88) compared to primary school participants (X: 125.09). For this reason, it can be concluded that the department factor did not have a statistically significant impact on the students' self-efficacy levels toward online learning.

Discussion and Conclusion

The main purpose of this research is to examine the level of self-efficacy beliefs toward online learning of pre-service teachers studying at Tokat Gaziosmanpaşa University in terms of certain variables such as gender and department. The respondents of this study consists of approximately 65 students studying in the ELT and primary school education departments at Tokat Gaziosmanpaşa University. The current study used the Online Learning Self-Efficiency Scale (OLSS) which was created by Sun and Rogers (2020) and was translated into Turkish by Çalışkan (2022).

The results obtained from the research showed that the overall self-efficacy beliefs of the pre-service teachers were mostly towards online learning at a high level. Other findings revealed that prospective teachers' self-efficacy perceptions across subscales were mostly high towards online learning. For the second research question, the gender variable has a statistically significant effect on students' online learning self-efficacy levels. For the last research question, it can be concluded that the department factor does not have a statistically significant effect on students' self-efficacy levels for online education.

The outcomes of the research were compatible with the previous studies (Çavuşoğlu & Ozsoy, 2018; Oğuz, 2012; Yıldız & Seferoğlu, 2020). In his study, Oğuz (2012) examined the academic self-efficacy beliefs of primary school teacher candidates regarding certain variables. The Academic Self-Efficacy Scale was applied to the primary school undergraduate students (n=148) who constitute the sample of the research. As a result of the research, it was found that the academic self-efficacy beliefs of the primary school teacher candidates differed significantly according to the variables of age, grade level, and being successful in KPSS. Çavuşoğlu and Özsoy (2018) examined primary school teachers' self-efficacy perceptions regarding mathematics lessons in terms of some variables. As for the factor of gender, it was concluded that female teachers' self-efficacy perceptions were higher than male students.

In another study by Yıldız and Seferoğlu (2020), the self-efficacy perceptions of participants for online learning were examined with respect to specific variables. One of the quantitative research methods, which is the descriptive research method, was implemented in the research. Participants consist of 175 students in associate degree programs in a distance education application and research center (UZEM). The findings of the study show that participants have high self-efficacy beliefs toward online technologies. It has been understood that self-efficacy towards online technologies differs according to gender, department, and

age variables. In another study conducted by Özdemir (2008), the self-efficacy beliefs of university students (classroom teaching) were examined according to various variables. It was revealed that the self-efficacy beliefs of the participants in some areas of the teaching process differed according to gender, the order of choosing the department, and the attitude variables toward teaching motivation. However, self-efficacy beliefs did not change regarding their current universities, the teaching style of the program, and secondary school graduation.

Another finding of this study reveals that gender has a significant difference in students' self-efficacy levels for online learning. This finding was supported by previous studies (Britner and Pajares, 2006; Çetin and Güngör, 2014; Pajares and Johnson, 1996). Similar to the results of this study, according to the results of different studies that deal with self-efficacy in terms of gender, male participants' self-efficacy perceptions are higher than female participants (Çetin & Güngör, 2014; Kabaran, Altıntaş, & Kabaran, 2016)

Other findings obtained from this research revealed no remarkable difference in students' self-efficacy degrees toward education regarding the department factor. However, Yıldız and Seferoğlu's (2020) research revealed significant results in the self-efficacy beliefs of students according to the department. This result shows that the students of the Internet and Network Technologies, Mechatronics, and Electricity departments have higher self-efficacy perceptions.

Pedagogical Implications

Instructional activities specific to students can be designed to help them successfully complete the learning-teaching process. It can be said that while designing these activities, it is crucial to consider the variables that affect the self-efficacy levels of students toward online technologies. Online learning systems, which will be prepared by examining the needs of students in a multidimensional way, can be designed in accordance with individual differences. The distance education programs can be revised in line with the feedback of the participants.

It is beneficial for a teacher to create environments in an online environment where students can define goals and create study programs to support their educational outcomes (Dabbagh & Kitsantas, 2012). They should provide direction by giving advice and offering ideas to encourage students' autonomy. According to Cho and Shen (2013), internal goals are more effective than external factors in helping children develop self-efficacy skills and achieve academic success. They suggested that educators could support this by implementing problem-based learning.

Self-efficacy can be created through instructor introduction, student introduction, and other introductory or ice-breaking exercises. Understanding others helps students realize that other people are not the only ones with similar emotional states. While working on an important assignment, students should learn to take a break to reflect on their achievements and plan their future steps.

Limitations

The current study has several restrictions. One drawback of the research was the limited quantity of the sample. For future research, more volunteers from various departments from Education faculty or from other areas could be included in order to produce more valid and generalizable results. Another drawback was that the quantitative data served as the only information source. In order to confirm the consistency of the findings, future research might collect qualitative data in addition to quantitative data**.** Another limitation was that gender, high school, age, and year factors could be involved in further studies.

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Chapter 7

EDUCATIONAL RIGHTS AND THEIR INTERPRETATION IN ENGLISH LANGUAGE CONCEPTS

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A. EDUCATIONAL RIGHTS

Educational rights refer to the rights of individuals to access education and to receive a quality education that meets their needs (Gearon, L., 2003; Kiral, 2019; Mertus etal., 2006). These rights may be provided for by law or by social norms, and they may vary depending on the specific context and the specific country in which they are exercised.

Generally, educational rights include the right to attend school, the right to receive an education that is appropriate for one's age and abilities, the right to receive an education that is free from discrimination or bias, the right to receive an education that is inclusive and accommodates individual differences, and the right to receive an education that prepares one for further education or employment (Howe& Covell, 2020; Mutongoreya, 2020). Educational rights may also include the right to participate in the decision-making processes that affect one's education, such as the right to have a say in the curriculum and the right to have a voice in the governance of the educational institution.

In many countries, educational rights are considered fundamental rights and are protected by law. However, in some cases, these rights may not be fully realized due to various barriers, such as economic, social, or cultural barriers (Du Toit & Verhoef, 2018; Hatipoğlu, 2022; Tekin & Çemrek, 2022). It is the responsibility of governments, educational institutions, and other stakeholders to ensure that individuals could exercise their educational rights. There are several international human rights instruments that recognize the right to education as a fundamental human right. The Universal Declaration of Human Rights (UDHR) is a fundamental document that sets out the fundamental human rights that are to be universally protected (United Nations General Assembly, 2021). Article 26 of the UDHR states that "Everyone has the right to education" and that "Education shall be directed to the full development of the human personality and to the strengthening of respect for human rights and fundamental freedoms."

The International Covenant on Economic, Social and Cultural Rights (ICESCR) is a legally binding treaty that sets out the economic, social, and cultural rights that are to be protected and promoted. Article 13 of the ICESCR reaffirms the right to education as set out in the UDHR and specifies that this right includes the right to free and compulsory primary education, the right to secondary education that is available and accessible to all, and the right to higher education that is equally accessible to all based on merit. Other international human rights instruments that recognize the right to education include the Convention on the Rights of the Child (CRC), which sets out the rights of children and young people, and the Convention on the Rights of Persons with Disabilities (CRPD), which sets

out the rights of persons with disabilities. In addition to these international instruments, many countries have also enacted national laws and policies that recognize and protect the right to education.

B. THE RIGHT TO HAVE EDUCATION

Education is a fundamental human right and is essential for the full realization of an individual's potential. It is a key driver of personal and societal development, and it plays a crucial role in promoting social and economic advancement (Riddle et al., 2021). Access to education is important for several reasons. Firstly, education is necessary for the development of personal skills and knowledge. It helps individuals to learn new things, to think critically and creatively, and to develop the skills and competencies needed to succeed in life. Education also helps to promote personal growth and self-esteem, as it allows individuals to learn about themselves and their place in the world.

Secondly, education is important for social and economic development. It helps to reduce poverty and inequality, as it allows individuals to gain the skills and knowledge needed to secure good jobs and to participate fully in the economic and social life of their communities. Education also helps to promote social cohesion and understanding, as it allows individuals from different backgrounds and cultures to learn and interact with one another (Geith & Vignare, 2008). Thirdly, education is important for the promotion of human rights and democracy. It helps to promote the values of tolerance, respect, and understanding, which are essential for the functioning of a healthy and just society. Education also helps to empower individuals, as it allows them to have a greater say in the decisions that affect their lives and to participate fully in the democratic process (Goodman et al., 2019).

Finally, the right to access education is a fundamental human right and is essential for the personal, social, and economic development of individuals and societies. It is the responsibility of governments, educational institutions, and other stakeholders to ensure that individuals could exercise this right and to receive a quality education that meets their needs. The right to quality education is an important aspect of the right to education and is essential for the full realization of an individual's potential. Quality education is education that is relevant and prepares individuals for the challenges and opportunities of the modern world and is taught by qualified and dedicated educators in a safe and supportive learning environment (Siddiqui et al., 2018).

C. QUALITY OF THE EDUCATION

Quality education is education that is relevant and prepares individuals for the challenges and opportunities of the modern world and

is taught by qualified and dedicated educators in a safe and supportive learning environment. It is the responsibility of governments, educational institutions, and other stakeholders to ensure that all individuals could receive a quality education. Educational rights are shaped by a variety of social, political, and cultural factors, which can vary significantly depending on the specific context and the specific country in which they are exercised.

Firstly, education should be relevant and should prepare individuals for the challenges and opportunities of the modern world. This means that the curriculum should be designed to address the needs and interests of students and should provide them with the skills and knowledge needed to succeed in the 21st century (Cafarella, 2022). This includes providing students with the skills and knowledge needed to succeed in the global economy, such as critical thinking, problem-solving, and communication skills. It also means providing students with a well-rounded education that includes subjects such as the arts, physical education, and social sciences, which are important for the development of the whole person.

Secondly, education should be taught by qualified and dedicated educators. This means that teachers should have the necessary knowledge, skills, and expertise to effectively teach their subject matter and to support the learning and development of their students. Teachers should also be passionate about teaching and committed to the well-being and success of their students. Education should be provided in a safe and supportive learning environment. This means that schools should be physically safe and secure and should have policies and procedures in place to prevent bullying and other forms of violence. It also means that schools should provide a supportive and inclusive environment that values and respects the diversity of their students and that provides equal opportunities for all.

One key factor that shapes educational rights is social inequality. In many societies, access to education is not equal and is often determined by factors such as one's socio-economic status, race, ethnicity, gender, and location. This can lead to a situation where some individuals have greater access to education and the opportunity to succeed, while others are disadvantaged and have fewer opportunities. Political factors can also play a role in shaping educational rights. Governments have a responsibility to ensure that all individuals have the opportunity to exercise their right to education, and the policies and investments that they make in education can have a significant impact on the quality and accessibility of education. Political instability and conflict can also disrupt education and limit the ability of individuals to exercise their educational rights. Cultural factors can also shape educational rights (Narang, 2012). For example, cultural values and norms may influence the type of education that is provided

and the subjects that are emphasized. In some societies, there may be a greater emphasis on certain subjects, such as math and science, while in others there may be a greater emphasis on the arts or humanities. Cultural values and norms may also influence the roles and expectations that are placed on individuals, which can impact their access to education and their opportunities for success. In conclusion, educational rights are shaped by a variety of social, political, and cultural factors, which can have a significant impact on the quality and accessibility of education. It is important for governments, educational institutions, and other stakeholders to take these factors into account to ensure that all individuals could exercise their right to education.

D. ENGLISH EDUCATION RIGHTS IN TURKISH AND GLOBAL SETTING

English language education rights refer to the rights of individuals and communities to receive education in the English language, or to have access to English language education as an option (Farrell et al., 2011; Palviainen & Curdt-Christiansen, 2022; Pan & Zhu, 2022). These rights may be provided for by law or by social norms, and they may vary depending on the specific context and the specific country in which they are exercised. In a global context, English language education rights are recognized and protected by various international human rights instruments, such as the International Covenant on Economic, Social and Cultural Rights (ICESCR) and the Convention on the Rights of the Child (CRC). These instruments recognize the right to education and the right to receive education in a language that is understood by the student, as well as the right to receive education that is appropriate for one's age and abilities.

In the Turkish context, English language education rights are protected by the Turkish Constitution and various other laws and policies. The Turkish Constitution recognizes the right to receive education in a language that is understood by the student, and the government has implemented various measures to promote the teaching of English in schools and other educational institutions. English is widely taught in schools in Turkey and is considered an important subject for career and academic success. However, despite these legal protections, English language education rights in Turkey have been a subject of controversy and debate. There have been concerns about the quality of English language education in Turkey, as well as about the lack of access to English language education for some students, particularly those from disadvantaged or marginalized backgrounds.

English language education rights are the rights of individuals and communities to receive education in the English language, or to have access to English language education as an option. These rights are recognized and protected by various international human rights instruments, as well as by national laws and policies. However, the realization of these rights can vary significantly depending on the specific context and the specific country in which they are exercised. In the Turkish context, English language education rights have been a subject of controversy and debate, with concerns about the quality and accessibility of English language education for some students(Güney,2021; Rovai & Pfingsthorn, 2022).

E. DIGITAL RIGHTS IN LANGUAGE EDUCATION

Digital rights refer to the rights of individuals and communities to access, use, and share information and communication technologies (ICTs). In the context of language education, digital rights are important for ensuring that students could access and use ICTs as a means of learning languages and improving their language skills. There are several ways in which digital rights are relevant to language education programs (Kiddle & Prince, 2019 ; Lytra et al., 2022; Wang, 2005). Firstly, digital rights are important for ensuring that students have access to online language learning resources, such as websites, apps, and online courses. These resources can provide students with a wealth of language learning materials and opportunities and can be particularly useful for students who may not have access to traditional language education resources. Secondly, digital rights are important for ensuring that students have access to language exchange programs and other online language learning platforms. These platforms allow students to interact with native speakers of the language they are learning, which can be a valuable way for students to improve their language skills and develop their cultural understanding.

Thirdly, digital rights are important for ensuring that students have access to digital tools and resources that can help them to learn languages more effectively. For example, students may use translation tools, language learning software, or online dictionaries to help them with their language learning. Fourthly, digital rights are important for ensuring that students have access to online language learning communities, where they can share their language learning experiences and get support and feedback from others. These communities can be a valuable source of motivation and support for language learners. Fifthly, digital rights are important for ensuring that students have the opportunity to use ICTs as a means of communication in their language learning. For example, students may use email, messaging apps, or social media to communicate with native speakers or other language learners.

Sixthly, digital rights are important for ensuring that students have the opportunity to use ICTs as a means of sharing their language learning experiences and achievements with others. For example, students may use blogs, podcasts, or social media to share their language learning journey with others. Seventhly, digital rights are important for ensuring that students have the opportunity to use ICTs as a means of collaborating with others on language learning projects. For example, students may use online collaboration tools to work on group projects or to create language learning materials. Finally, digital rights are important for ensuring that students could use ICTs as a means of creating and sharing language learning content. For example, students may use video editing software or social media to create and share language learning videos or other content. In conclusion, digital rights are important for ensuring that students could access and use ICTs as a means of learning languages and improving their language skills. These rights are relevant to language education programs in a number of ways, including access to online language learning resources, language exchange programs, and digital tools and resources, as well as the opportunity to use ICTs as a means of communication, collaboration, and content creation.

F. ROLE OF TEACHERS IN DIGITAL EDUCATION

Teachers play a critical role in digital education, especially in the field of English language teaching (ELT). With the increasing use of technology in education, teachers are increasingly being called upon to integrate technology into their teaching practices in order to enhance student learning and engagement (Lütge & Merse, 2021).

One key role of teachers in digital education is to provide students with access to a variety of digital learning resources and tools. This may involve introducing students to online language learning platforms, apps, and websites, as well as providing them with access to digital dictionaries, translation tools, and other resources. Teachers may also be responsible for introducing students to digital learning strategies, such as using online language exchange programs or participating in online language learning communities (Alhamami, 2018).

Another key role of teachers in digital education is to provide guidance and support to students as they learn and use digital tools and resources. This may involve helping students to navigate online platforms, troubleshooting technical issues, and providing feedback and support as students work with digital tools and resources. Teachers may also be responsible for helping students to develop digital literacy skills, such as the ability to critically evaluate online sources and to use digital tools and resources responsibly.

A third role of teachers in digital education is to integrate technology into their teaching practices in order to enhance student learning and engagement. This may involve using digital tools and resources to support language learning, such as using video conferencing software to connect with native speakers or using online collaboration tools to work on language learning projects. Teachers may also use technology to assess student learning, such as by using online quizzes or assessments to gauge student progress (Carrier et al., 2017; Podovšovnik, 2020).

In conclusion, teachers play a critical role in digital education, especially in the field of ELT. Their roles include providing students with access to digital learning resources and tools, providing guidance and support to students as they learn and use digital tools and resources, and integrating technology into their teaching practices to enhance student learning and engagement.

G. ROLE OF FAMILIES IN DIGITAL EDUCATION

Families play a crucial role in supporting their children's digital education, especially in the field of English language teaching (ELT). With the increasing use of technology in education, families could support their children's language learning by providing them with access to digital tools and resources and by helping them to develop digital literacy skills.

One key role of families in digital education is to provide their children with access to a variety of digital learning resources and tools. This may involve helping their children to find and use online language learning platforms, apps, and websites, as well as providing them with access to digital dictionaries, translation tools, and other resources. Families may also be responsible for introducing their children to digital learning strategies, such as using online language exchange programs or participating in online language learning communities.

Another key role of families in digital education is to provide guidance and support to their children as they learn and use digital tools and resources. This may involve helping their children to navigate online platforms, troubleshooting technical issues, and providing feedback and support as they work with digital tools and resources. Families may also be responsible for helping their children to develop digital literacy skills, such as the ability to critically evaluate online sources and to use digital tools and resources responsibly.

Families play a crucial role in the education of their children, particularly in the digital age. With the shift towards online learning due to the COVID-19 pandemic, families have had to adapt to new roles and responsibilities in the education of their children.

One of the primary roles that families play in digital education is providing the necessary technology and infrastructure for their children to participate in online learning. This includes ensuring that their children have access to a reliable computer or device, as well as a stable internet connection. In some cases, families may also need to purchase educational software or subscribe to online learning platforms.

In addition to providing the necessary technology, families also play a role in supporting their children as they navigate the challenges of online learning. This can include helping their children stay organized, setting aside a dedicated space for them to complete their schoolwork, and providing emotional support as they adjust to the new learning environment.

Families can also support their children's digital education by staying informed about the progress and goals of their children's online classes and providing additional assistance as needed. This may involve working with teachers to ensure that their children are keeping up with their coursework, as well as providing additional resources or support to help their children succeed.

Overall, the role of families in digital education is crucial, as they play a vital role in supporting and enabling their children's success in the online learning environment. By providing the necessary technology, emotional support, and additional resources, families can help ensure that their children are able to fully participate and succeed in their digital education.

H. ROLE OF SCHOOLS IN DIGITAL EDUCATION

Schools have a significant role to play in the digital education of their students, particularly in the current age of online learning. With the shift towards remote learning due to the COVID-19 pandemic, schools have had to adapt to new roles and responsibilities in the education of their students. One of the primary roles of schools in digital education is to provide the necessary technology and infrastructure for their students to participate in online learning. This includes ensuring that students have access to reliable computers or devices, as well as a stable internet connection. Schools may also need to purchase educational software or subscribe to online learning platforms in order to facilitate remote learning (Blake & Guillén, 2020; Wörner, 2021).

In addition to providing the necessary technology, schools also play a role in supporting their students as they navigate the challenges of online learning. This can include providing training and support to students and teachers as they adjust to the new learning environment, as well as ensuring that there is ongoing communication and support between

students, teachers, and parents. Schools can also support their students' digital education by staying informed about the progress and goals of their online classes and providing additional assistance as needed. This may involve working with teachers to ensure that students are keeping up with their coursework, as well as providing additional resources or support to help students succeed.

Overall, the role of schools in digital education is crucial, as they play a vital role in facilitating and enabling the success of their students in the online learning environment. By providing the necessary technology, support, and resources, schools can help ensure that their students are able to fully participate and succeed in their digital education.

I. ROLE OF NATIONAL POLICIES IN DIGITAL EDUCATION

National policies play a crucial role in shaping the direction and implementation of digital education in a country. These policies can have a wide-ranging impact on the access and quality of digital education for students, as well as the resources and support available to educators. One of the primary roles of national policies in digital education is to ensure that all students have access to the technology and infrastructure needed to participate in online learning. This may involve providing funding or subsidies for schools and families to purchase computers and other necessary equipment, as well as supporting the development of infrastructure such as broadband internet access.

National policies can also play a role in shaping the content and quality of digital education. This may involve establishing standards for online learning programs and resources, as well as providing funding for the development of educational materials and resources. In addition to supporting access and quality, national policies can also play a role in supporting the professional development of educators in the digital education field. This may include providing funding for training and professional development opportunities, as well as establishing standards and guidelines for online teaching.

Overall, the role of national policies in digital education is crucial in ensuring that all students have access to high-quality digital education and that educators have the resources and support they need to succeed in the online learning environment. By addressing these issues, national policies can help ensure that all students are able to fully participate and succeed in the digital education world.

J. SUGGESTIONS FOR ALL PARTS

Digital language education can provide many benefits and opportunities for teachers, students, and families. However, it is important

to ensure that these benefits are accessible and equitable for all. Here are some ways in which the rights of teachers, students, and families can be upheld in the realm of digital language education:

Teachers: Teachers have the right to receive training and support in order to effectively utilize digital tools and resources in their language education practice. This may include access to professional development opportunities, technical support, and guidance on how to integrate digital resources into their lessons.

Students: Students have the right to a high-quality language education, regardless of whether it is delivered in person or online. This means that they should have access to the same resources and materials as their peers, including digital tools and resources that support language learning. In addition, students should have access to adequate technological resources and support, such as reliable internet connectivity and sufficient devices, in order to participate in online language education.

Families: Families have the right to be involved in their children's education and to have a say in the decisions that impact their children's learning. This includes decisions related to digital language education. Families should have access to information about the digital resources and tools being used in their children's language education, and they should have the opportunity to provide input and feedback on these resources.

Overall, it is important to ensure that digital language education is inclusive and equitable, and that the rights of teachers, students, and families are respected and upheld. This can be achieved through ongoing communication and collaboration among all stakeholders, as well as through the provision of necessary resources and support.

K. SAMPLE LESSON PLANS FOR ELT CLASSROOMS

Sample Lesson Plan A

Here is a sample lesson plan on digital rights in English language teaching (ELT):

Title: "Understanding and Protecting Digital Rights"

Objective: To raise awareness among students about digital rights and how to protect them online

Materials:

Internet access

Projector or large screen

Handouts with information on digital rights and online privacy

Warm-Up:

Ask students to share any experiences they have had with their digital rights being violated or their privacy being compromised online.

Discuss as a class what students think their rights are when it comes to their digital presence.

Input:

Show a short video or presentation on digital rights and online privacy.

Review the handouts with students, highlighting key points such as the right to privacy, the right to control one's own personal information, and the importance of being aware of terms of service agreements.

Guided Practice:

Have students work in pairs or small groups to brainstorm ways they can protect their digital rights and privacy online.

Encourage students to consider things like using strong passwords, being cautious about sharing personal information, and being aware of what they post online.

Independent Practice:

Have students complete a short quiz or worksheet on digital rights and online privacy.

Encourage students to apply what they have learned by creating a list of best practices for protecting their digital rights and privacy online.

Closure:

Ask students to share one thing they learned about digital rights and online privacy during the lesson.

Emphasize the importance of being aware of and protecting one's digital rights and privacy online.

Assessment:

Use the quiz or worksheet as a formative assessment to gauge student understanding of digital rights and online privacy.

Use the list of best practices created by students as a summative assessment to evaluate their ability to apply what they have learned.

Note: This is just one example of a lesson on digital rights in ELT. The specific content and activities can be adapted and modified to suit the needs and level of the students.

Sample Lesson Plan B

Title: "Our Rights as Digital Language Learners"

Objective: To raise awareness among students about their rights as digital language learners and how to advocate for those rights

Materials:

Internet access

Projector or large screen

Handouts with information on digital language learning rights

Warm-Up:

Ask students to share any experiences they have had with digital language learning.

Discuss as a class the pros and cons of learning a language online.

Input:

Show a short video or presentation on digital language learning rights.

Review the handouts with students, highlighting key points such as the right to access high-quality resources and support, the right to privacy and security, and the right to fair and equitable treatment.

Guided Practice:

Have students work in pairs or small groups to brainstorm ways they can advocate for their rights as digital language learners.

Encourage students to consider things like speaking up if they feel their privacy is being violated, asking for help if they are not receiving adequate support, and standing up for themselves if they feel they are being treated unfairly.

Independent Practice:

Have students complete a short writing activity in which they reflect on their own rights as digital language learners and how they can advocate for those rights.

Encourage students to consider specific scenarios they may encounter and how they would respond in those situations.

Closure:

Ask students to share one thing they learned about their rights as digital language learners during the lesson.

Emphasize the importance of being aware of and advocating for one's rights as a digital language learner.

Assessment:

Use the writing activity as a formative assessment to gauge student understanding of their rights as digital language learners.

Use a class discussion or presentation of the writing activity as a summative assessment to evaluate students' ability to apply what they have learned and advocate for their rights.

Note: This is just one example of a lesson on digital language learning rights for EFL learners. The specific content and activities can be adapted and modified to suit the needs and level of the students.

Sample Lesson Plan C

Title: "Respecting Our Digital Rights"

Objective: To introduce elementary level EFL students to the concept of digital rights and encourage them to respect the digital rights of others

Materials:

Internet access

Projector or large screen

Handouts with pictures and simple explanations of digital rights

Coloring materials (optional)

Warm-Up:

Ask students to share any experiences they have had with technology and the internet.

Discuss as a class how technology and the internet can be used for learning and communication.

Input:

Show a short video or presentation on digital rights, using simple language and age-appropriate examples.

Review the handouts with students, highlighting key points such as the right to privacy, the right to control one's own personal information, and the importance of being kind and respectful online.

Guided Practice:

Have students work in pairs or small groups to discuss and role-play different scenarios in which they might encounter situations that involve digital rights.

Encourage students to consider things like asking for permission before sharing someone's personal information or photos online, being cautious about what they post online, and respecting the privacy of others.

Independent Practice:

Have students complete a coloring activity in which they color in pictures that represent different digital rights (e.g. a picture of a lock to represent the right to privacy).

As they color, have students think about ways they can respect the digital rights of others.

Closure:

Ask students to share one thing they learned about digital rights during the lesson.

Emphasize the importance of being respectful and mindful of the digital rights of others.

Assessment:

Use the role-play and coloring activities as formative assessments to gauge student understanding of digital rights.

Use a class discussion or presentation of the completed coloring pages as a summative assessment to evaluate students' ability to apply what they have learned and respect the digital rights of others.

Note: This is just one example of a lesson on digital rights for elementary level EFL students. The specific content and activities can be adapted and modified to suit the needs and level of the students.

Sample Lesson Plan D

Family Student Interaction Based Activities

Title: "Digital Language Rights Family Discussion"

Objective: To encourage family and student interaction and discussion about digital language rights and responsibilities

Materials:

Internet access (optional)

Handouts with information on digital language learning rights and responsibilities

Pen and paper for each student

Activity:

Begin by introducing the topic of digital language rights and explaining the importance of understanding and respecting these rights.

Distribute the handouts with information on digital language learning rights and responsibilities to each student.

Have students work with their families to discuss the handouts and brainstorm ways they can respect the digital language rights of others. Encourage families to consider things like:

Asking for permission before sharing someone's personal information or photos online

Being cautious about what they post online

Respecting the privacy of others

After the discussion, have each student write down one or two things they learned from the discussion or one way they plan to respect the digital language rights of others.

As a class, review and discuss the responses from the students. Encourage students to share their ideas and ask questions.

Assessment:

Use the responses from the students as a formative assessment to gauge their understanding of digital language learning rights and responsibilities.

Use the class discussion as a summative assessment to evaluate students' ability to apply what they have learned and advocate for the digital language rights of others.

Note: This activity can be modified to suit the needs and level of the students. For example, it can be adapted for younger students by using simpler language and providing more guidance and structure during the discussion.

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Chapter 8

THE ROLES AND RESPONSIBILITIES OF THE PROSPECTIVE TEACHERS AND MENTORS DURING PRACTICE PERIOD: THE SAMPLE OF CALIFORNIA

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To prepare effective teachers for 21st century classrooms, teacher education must shift away from a norm which only emphasizes academic preparation and course work loosely linked to school-based experiences. Rather, it must move to programs that are fully grounded in clinical practice and interwoven with academic content and professional courses. This demanding, clinically based approach will create varied and extensive opportunities for candidates to connect what they learn with the challenge of using it, while under the expert tutelage of skilled clinical educators. Candidates will blend practitioner's experience knowledge with academic knowledge as they learn by doing. They will refine their practice in the light of new knowledge acquired and data gathered about whether their students are learning the material (NCATE, 2010).

California has regulated its expectations in the California Standards for the Teaching Profession (CSTP), with a related subset of specific Teaching Performance Expectations (TPE) for prospective teachers completing pre-service preparation and obtaining their first credential.

The CSTP is a set of professional standards, and positions attainment of those standards for all teachers with the equally important goal of diversifying the teaching workforce. Teacher quality and teacher diversity are complementary goals that will best serve California's K-12 students. The CSTP and the TPE establish the standards of practice. In turn, the desired level of professional practice will be expressed through personal and professional dispositions possessed by teachers who are:

- Reflective
- Life-long learners
- Content specialists
- Resourceful
- Committed to actions that reflect beliefs that all students can achieve and learn
- Participants in collegial work
- Assertive in assuming leadership in all aspects of their profession

Reaching the goals of teacher quality and diversity requires pre-service preparation programs that emphasize social justice, multicultural education and culturally responsive teaching. The work of recruiting and preparing a diverse workforce is challenging, and it does not diminish the responsibility for pre-service programs to prepare all teachers to be culturally responsive educators (CTA, 2015).

Unlike other states, California has focused its policy on assuring that candidates have a robust preparation in terms of the content that they will be responsible for teaching to K-12 students. This is a primary rationale for why California requires candidates to complete a bachelor's degree in an arts and science area, which has led to the separation, quite often, of subject matter preparation from teacher preparation.

Unlike other states, California has completed the teacher training process in three stages. The first and second stage is the pre-service period for the teacher candidate, and the third stage is the two-year on-the-job training period that starts after the job has been assigned. The third stage, Continuing Early Career Support, is administered under the name of the BTSA is Induction program. The three phases are explained below:

FIRST STAGE: BACHELOR DEGREE

The first phase of the undergraduate education is must completed that universities accredited by the California Commission on Teacher Credentialing.

Becoming a teacher in California, it is important to know how to acquire a California teaching license. It is mandatory that candidates get bachelor's degrees from accredited colleges or universities. Students must then complete a teacher training program approved by the California Commission on Teacher Credentialing (CCTC). Teaching programs can be found through colleges, universities, community colleges, online schools, K-12 school districts, and certain community or regional service centers. Lastly, prospective teachers must pass certification tests, as determined by the CCTC.

SECOND STAGE: COMPLETING PRELIMINARY CREDENTIAL

(PRE-SERVICE PROCESS/ STUDENT TEACHER PROCESS)

The pathway to receive a teaching credential in California is through a post- baccalaureate program completed after receiving a BA or BS degree in a disciplinary field. The undergraduate degree is assumed to provide the necessary content knowledge as long as it has been earned through a Commission on Teacher Credentialing (CTC) approved subject matter program. The post-baccalaureate pre- service preparation program focuses on providing coursework to develop understanding of the principles of pedagogy combined with placement in a supervised teaching practicum. Pre-service program providers work with school districts to place pre-service teachers with master/cooperating teachers in K-12 classes for the multiple-subject candidates. In this process the master teacher models and

guides the pre-service candidate in day-to-day classroom management, planning, instruction and assessment, and gradually releases responsibility for the classroom to the pre-service candidate (CTA, 2015). The Multiple Subject Teaching Credential (Elementary School Teacher) authorizes the holder to teach all subjects in a self-contained classroom, such as the classrooms in most elementary schools, in grades preschool, K–12, or in classes organized primarily for adults. In addition, the holder of a Multiple Subject Teaching Credential may serve in a core or team teaching setting.

Requirements for the Preliminary Credential:

The preliminary credential is issued for a maximum of five years. If requirements for the clear credential are not completed before the expiration of the preliminary, the holder will be unable to teach in California's public schools with that credential until those requirements are met and the document is renewed. Applicants must satisfy all of the following requirements for the Five-Year Preliminary Teaching Credential:

1. Complete a baccalaureate or higher degree, except in professional education, from a regionally-accredited college or university.

2. Satisfy the basic skills requirement. Entitled Basic Skills Requirement (Pass the CBEST/ California Basic Assessment Educational Skills and CSET/ California Subject Examination for Teachers) for additional information.

3. Complete a multiple subject teacher preparation program including successful student teaching, and obtain a formal recommendation for the credential by the California college or university where the program was completed.

4. Verify subject matter competence by one of the following two methods:

a) Achieve a passing score on the appropriate subject matter examination(s). Information regarding the appropriate subject matter examination(s), including passing scores and registration, can be found in Commission leaflet CL-674M, entitled Verifying Subject Matter Competence by Examination for Multiple Subject Teaching Credentials.

b) Complete a Commission-approved elementary subject-matter program or its equivalent and obtain verification of completion from the authorized person in the education department of a California college or university with an accredited program.

5.Pass the Reading Instruction Competence Assessment (RICA). Individuals who hold a valid California teaching credential which was

issued based upon completion of a teacher preparation program including student teaching, are exempt from this requirement.

6. Satisfy the Developing English Language Skills, including Reading requirement by completing a comprehensive reading instruction course that includes the following: The systematic study of phonemic awareness, phonics, and decoding; literature, language and comprehension; and diagnostic and early intervention techniques.

7. Complete a course (two semester units or three quarter units) in the provisions and principles of the U.S. Constitution or pass an examination given by a regionally- accredited college or university.

8. Complete foundational computer technology course work that includes general and specialized skills in the use of computers in educational settings (CCTC, 2017). Teaching Credential Programs of all universities, contains information current with SB2042 and emphasizes standards and expectations of the California Commission on Teacher Credentialing (CCTC) and the National Council for the Accreditation of Teacher Education (NCATE). This program, connecting educational theory with collaborative field experience, and reflective teaching and learning. The CCTC monitors the implementation of standards and expectations set by California state law (SB2042) for preparing teachers. The California Standards for the Teaching Profession (CSTP) and their companions, the Teaching Performance Expectations (TPEs) and Clear Credential Standards, provide an interconnected framework for the academic and field experience components of the programs. These standards and expectations are embedded in signature assessments and infused with the criteria for evaluation of student teaching and other field experience (SDSU Teaching Credential Program Handbook, 2006-17). Preliminary Credential Programs (teacher preparation programs) are guided by the SB2042 standards and expectations. And same time, evaluation of candidate teacher according to The Teacher Performance Expectations (TPE) form the basis of statewide assessment of performance for Student Teachers. These standards can help student teachers identify areas to focus ongoing professional growth in their professional practices.

Historically, the structure and requirements for preliminary teacher preparation in California have been significantly different from other states in several key ways. The table below provides a comparative look at California and other states' requirements for teacher preparation (6E Information, 2014).

Table 1. Requirements for Teacher Preparation

Credential Requirement	**California**	**Other States**
Subject matter preparation	Undergraduate level Typically completed prior to teacher preparation (must be completed prior to student teaching) Typically separate from teacher Preparation curriculum Guided by explicit Subject Matter Requirements adopted by the Commission consistent with K-12 student academic content standards	Undergraduate level Integrated/simultaneous with teacher preparation curriculum
Professional preparation	Graduate level (other than for blended/integrated) Primary focus on professional teaching knowledge Lesser focus on subject- specific pedagogical knowledge	Undergraduate level, integrates both professional teaching knowledge and subject specific pedagogical knowledge may be graduate level
Allowable majors for prospective teachers	Must be Arts and Sciences, Undergraduate education major not allowed Typically, focus is solely on subject matter content and there is no integration of teaching methodology with subject matter content except in integrated/ blended programs	Typically undergraduate education major Typically undergraduate work blends teaching methodology with subject matter content
Relationship between subject matter faculty and education faculty	Typically no relationship unless specifically cultivated by a particular institution program	Facilitates an integrated approach with both subject matter and education faculty
Time frame for teacher preparation (prior to SB 5)	No specific time limit on obtaining a baccalaureate One-year limit on teacher preparation	No specific time limit typically a four-year undergraduate experience leading to a degree and credential

Unlike other states, California prohibits a prospective teacher from completing an undergraduate major in Education. In states where an undergraduate Education major may be earned, the candidate completes the requirements for a college degree at the same time as completing the pedagogical preparation to be a teacher. A benefit of an Education major is that the School or College of Education may have up to four years to work with the candidate and can carefully integrate the content and pedagogical preparation. A challenge within this approach is to make sure that the candidate has a fully robust preparation in both the actual content to be taught to K-12 students in alignment with the state's adopted student academic content standards and the pedagogical knowledge, skills, and abilities required to be an effective teacher in that content area (6E Information, 2014, p:3).

California The Preliminary Credential stage is based entirely on CCTC's standard expectations and evaluation criteria faculty and school cooperation.

The roles and responsibilities of mentee, faculty members, elementary school administrators and mentors were determined by each faculty within the CCTC standards. The duties and roles of the school administrators, mentors and teacher candidates involved in the process referred to below are cited from the Preliminary Credential Handbooks (SDSU, 2016; AIU, 2016) of state and private universities.

Student Teaching Partners:

Student Teacher/Candidate*:* When the Teacher Preparation Program Candidate has completed all program requirements for Candidacy, he/she is eligible for Student Teacher Placement. *Master Teacher (Mentor):* The Student Teacher is placed with a Master Teacher during the student teaching field placement. This site Master Teacher is eligible to guide the field service of the Student Teacher based on designated criteria.

Local School Administrator*:* Either the building principal or assistant principal serves as liaison between the University placement and the Master Teacher. Through discussion and negotiation with the University Field Supervisor, the local school administrator recommends a building teacher to serve, as appropriate, as the designated Master Teacher. Selection of a Master Teacher is the initial responsibility of the local school administrator, supporting a match between Student Teacher and Master Teacher.

1. Requirements of School Placement Site: The School of Teacher Education expectations are that the School Administrator will.

A. Placement identification, selection, and monitoring is the responsibility of the University Field Coordinator and University Field Supervisor, in collaboration with the local school district and school administrator, with appropriate consideration for the needs and responsibilities of the Student Teacher and Master Teacher.

B. The selected school placement site must effectively implement State adopted academic core curriculum and standards.

C. The selected school placement site must be accredited by the State of California.

D. The selected school placement site must have a culturally diverse student population.

E. Student Teachers are encouraged, during their semester of placement, to be placed in tw different teaching settings, if appropriate.

a. At least one of these settings must be in an under-performing school.

b. One classroom setting must be with English language learners.

c. One classroom must have documented evidence of special needs students mainstreamed into the regular education classroom.

d. Multiple Subject Candidates will be placed in classrooms settings which include two or more of the following grade clusters: K-3 and 3-6. Documented fieldwork experience with beginning readers is required.

F. Teacher as a professional, help him or her as a member of the school faculty, and encourage the acceptance of the Student Teacher by parents and students.

G. Introduce the Student Teacher to the philosophy of the school and its policies regarding attendance, home study, classroom control, instructional facilities, grading and reporting practices and special services.

H. Acquaint the Student Teacher with emergency procedures to be followed. The school handbook should be helpful for this purpose.

I. Orient the Student Teacher to the physical plant and the school community and introduce her or him to other staff members.

J. Encourage the Student Teacher to attend relevant school site professional growth opportunities that might be of interest or benefit.

K. Provide policies and procedures for reporting suspected child abuse and sexual harassment.

L. Work with the University Supervisor and/or Team Leader and Assist the Guide Teacher(s) and the University Supervisor by facilitating remediation of the Student Teacher if the need arises.

2. Requirements of Master Teacher (Mentor): The Master Teacher is a regularly employed public school teacher who has volunteered, and has been selected by local school district administrators based on pre-established criteria, to assist in the practical classroom training of prospective teachers. The local school administrator will assure required University standards of selected Master Teachers. Master Teachers render an invaluable service to the profession. The local school administrator will assure the receiving Master Teacher: 1. Has a minimum of four years' experience as a credentialed teacher in California. 2. Is an authorized CLAD, ESL, or SDAIE or equivalent authorized teacher with at least two years' experience successfully teaching English learners. 3. Has noted success working with special needs students mainstreamed into regular education classes. 4. Is credentialed in the parallel field (s) sought by the Student Teacher. 5. Is recognized as an effective reading teacher and possesses training in the district adopted reading program. 6. Familiar

with and gives evidence of exemplary implementation of the state adopted academic curriculum content standards, Common Core State Standards, and the Teacher Performance Expectations. 7. Gives evidence of effective development and implementation of classroom management strategies. And Master Teachers are given a small stipend and are paid directly through Universities versus their district payroll.

Guide Teachers (Master Teacher/Mentor) Roles and Responsibilities Include the Following

Planning: During the first week, it is helpful to develop a tentative schedule by which the Student Teacher will assume various responsibilities. The Guide Teacher should assign and examine the Student Teacher's daily lesson plans and long-range plans in advance of their use so suggestions for change may be implemented. Guide Teachers also can coach Student Teachers via modeling, observing, and conferencing.

Demonstrating: Guide Teachers provide important models for Student Teachers. Model effective strategies for teaching and learning, including class management. Arrange guided and independent observations of other teachers for the Student Teacher to see a variety of teaching and assessment strategies, effective management and discipline systems, and how students are evaluated and graded Guide Teachers should share how they evaluate and provide feedback leading to further student learning, and grade their students.

Encouraging Reflection: Ask Student Teachers to analyze and discuss the effectiveness of their own practices with their students. Encourage reflection by asking appropriate questions and debriefing lessons with the Student Teacher. The following are other ways Guide Teachers can encourage reflection:

- Discuss teaching methods with the Student Teacher, including a rationale for classroom practices.
- Help the Student Teacher acquire an overall picture of the aims, objectives, and subject matter for students in the class as set forth in the standards and curriculum guides.
- Help her/him understand ways to stimulate student interest and engagement in learning activities.
- Help her/him evaluate, analyze, and determine appropriate feedback (both formative and summative) and follow-up for student assessments.
- Participate in developing professional growth goals in triads with the Student Teacher and University Supervisor.

Giving Feedback: As a mentor, Guide Teachers need to frequently provide constructive feedback in written and verbal form to student teachers. The following are suggestions for doing so:

- Recognize strengths of the Student Teacher and give suggestions for overcoming weaknesses.
- Set aside a specific and regular time each week for conferencing and/or for participating in Supervision online private forums.
- Complete at least three formal observations of the Student Teacher and submit them in Supervision or Task Stream.
- Discuss professional problems, characteristics of learners, teaching skills, individual students, classroom atmosphere, management issues, record-keeping tasks, and general matters of routine.

Communicating with the University Supervisor: Guide Teachers should communicate regularly with the University Supervisor about the progress of the Student Teacher. They should ask the University Supervisor for help or suggestions when needed. When a special lesson seems to merit special attention, the Guide Teacher or the Student Teacher might wish to apprise the University Supervisor so she/he might arrange an observation that day. Guide Teachers should contact the University.

Assessing the Student Teacher's Professional Growth: A major responsibility of the Guide Teacher is to provide regular feedback to the Student. Teacher so that improvements can be made where necessary or desirable and also to reinforce teaching practices that should be continued. The written and oral feedback process is most frequently accomplished through conferences and observational notes concerning lesson plans, tests, and other teaching tools and practices. The Guide Teacher is required to complete a Progress Report during the student teaching experience, usually at the midpoint, and a Final Report at the end of the university semester. Assessments should be based on objective data collected from a series of observations and conferences and need to relate specifically to teaching abilities. It is important to provide written comments with specific examples of teaching behaviors, successful lesson activities, and written suggestions of ways the student teacher can improve his/her teaching performance in order to move forward on the professional growth continuum. The final report needs to be submitted to the University Supervisor by the assigned deadline.

3.Requirements of Student Teaching:

The Executive Order States: The candidate teacher shall have demonstrated personality and character traits that satisfy the standards of

the teaching profession. The teacher education faculty of the campus, who may also consider information from public school personnel and others, shall make the assessment of the candidates. The campus may use tests, observations, and interviews for this assessment.

The National Council for Accreditation of Teacher Education (NCATE) defines Professional disposition as follows: Professional attitudes, values, and beliefs demonstrated through both verbal and nonverbal behaviors as educators interact with students, families, colleagues, and communities. These positive behaviors support student learning and development. NCATE expects institutions to assess professional dispositions based on observable behaviors in educational settings. The two professional dispositions that NCATE expects institutions to assess are fairness and the belief that all students can learn. The candidates' successful completion of the credential program and becoming an employable new professional, is the ability to work with others. Essential elements of professional disposition include the following:

- Shows openness to new ideas
- Displays respect for the opinions of others
- Creates positive rapport with professors, colleagues/peers, guide teachers, other members of the school communities, and students
- Engages in respectful communication with all stakeholders, including students, parents, colleagues, professors, and school-site personnel
- Cultivates positive and productive relationships with guide teachers.
- Shows respect for the experience and knowledge of guide teachers and professors
- Avoids complaining and maintains a positive attitude
- Behaves with integrity, e.g., does not gossip or promote hidden agendas
- Takes active responsibility to incorporate corrective measures when advised
- Uses mature judgment when problem solving and includes the opinions of others in solutions
- Interacts appropriately with students and colleagues, e.g., avoids inappropriate joking, racist comments, sexist attitude
- Self reflects rather than blaming others

• Accepts own mistakes and responds to them as opportunities for self-improvement Under the direction of the Master Teacher, each Elementary Student Teacher, should do the following (after required observations and participation):

· Teach at least 8 weeks in a lower-grade level placement (K-3).

· Teach at least 8 weeks in an upper-grade level placement (3-6).

· Progressively go from "observer" to having full responsibility for running the classroom over each 8-week period. It may be the case that one student teacher will progress towards being able to assume full control of the classroom at a faster pace. Nonetheless, each candidate should be given the opportunity to experience full control of the classroom during each 8-week period.

Student Teacher Roles and Responsibilities

Student Teacher roles are multifaceted. The goal is to become adept at integrating theory and practice, using problem solving models and procedures, increasing student achievement, and reflecting on and self-analyzing teaching performance. Over the two semesters of student teaching, the depth of responsibility and the extent of teaching involvement increase. Roles and responsibilities appropriate for Student Teachers include the following elements of the California Standards for the Teaching Profession and universities' Student Teacher assessment system.

Professionalism. Teaching as a career demands professionalism demonstrated in appearance, attitude, and strong communication skills. Maintaining this image requires common sense and discretion, both in and out of the classroom. It demands a commitment to excellence in personal presentation, curriculum development, collegiality, and the hours invested in researching best teaching practices. Teachers are at the center of education. This position demands the continual development of pedagogical strategies and skills.

Instructional Planning. Well-planned instruction, meticulously orchestrated lesson plans, and carefully researched strategies are all hallmarks of excellent teachers. Planning requires research and a thorough understanding of State and District standards. It is important to make long-range and daily plans to provide for a continuous and satisfactory learning experience for all students. Motivating students will promote positive student attitudes.

Class Management. An essential element of a successful learning environment is effective management. It is important to establish and maintain a productive learning environment that includes clearly stated

expectations regarding student behavior. Student teachers must establish and/or maintain techniques for handling the administration of a classroom, such as taking attendance, maintaining a grade book, and dealing with other management tasks. The Student Teacher should seek the guidance of the Guide Teacher in the techniques of evaluating student work, behavior, and progress.

Getting Started. The first days in a classroom are full of opportunities to observe and begin to be a co-worker with the Guide Teacher, anticipating ways to be helpful and become established as an instructional leader. Student Teachers need to acquaint themselves with the routines and procedures that are in place and learn about the students.

Getting Acquainted with the School. During your first visits to the assigned student teaching site, the Student Teacher should gather information about the school, district, community, and classroom. Some of this information is available in the School Accountability Report Card (SARC) on school district web sites. Student Teachers will use the information gathered to compile the Context for Learning for your edTPA Teaching Event and Embedded Signature Assessments (ESAs). Multiple Subject candidates also will include the Context for Learning in their Content Area Tasks (CATs). Candidate teacher should be sure to check with the School Secretary/Administrative Assistant to complete a personal information card/form in case of an emergency while student teaching or in a class at the school site.

- Names of school site personnel; Principal, Vice Principal, Secretaries, Custodians, Nurse, Counselor(s), Special educators, Other faculty (especially grade-level faculty members.

- Emergency procedures to be followed, location of administrative offices, nurse's office, classrooms, restrooms, cafeteria, library/tech center, outside grounds and fields, book rooms, work, rooms, supply rooms, media materials and equipment.

- Classroom information; student names, student cultural backgrounds, special student needs/identification, daily Schedule, semester Schedule, classroom behavior management plan, special programs, classroom and school of routines and procedures, recording of attendance and grades, classroom organization, communicating with parents/guardians.

- Community information; demographics, physical surroundings, cultural characteristics.

- District policies and procedures; confidentiality, referral for special education, child abuse reporting, sexual harassment.

• Other important Information; school discipline plan, procedures for copying, duplicating, material acquisition, A-V check-out, field trips, campus, lunch area rules and consequences, notification procedures for absence from school.

Be familiar with and demonstration competency in implementation of:

· The California Common Core State Standards (CCSS)

The CCTC *Program Standards* www.ctc.ca.gov/profserv/progstan.html

The Teacher Performance Assessments:http://www.ctc.ca.gov/educator- prep/TPA.html

· The Teacher Performance Expectations

Additional guidelines include: Interact cordially and constructively with associates in the schools. Volunteer for instructional, extra-curricular and maintenance tasks. When confronted with a criticism, respond constructively. Demonstrate knowledge of subject matter through clarity of presentations. Prepare daily lessons that reflect an understanding of students as well as learning theory and methodology. Make expectations explicit to the students. Use a wide repertoire of teaching skills and strategies. Prepare and use a variety of media as a means for achieving instructional goals. Provide opportunities for students to practice self-discipline. Be able to conduct lessons with large groups of students and maintain a leadership role. Be able to individualize instruction and differentiate your lessons to meet the needs of each student. Implement democratic values in the classroom. Show respect for each student as an individual. And maintain accurate records for grades, attendance, and parent contacts. And then, candidate teacher meet to the Code of Ethics of The Education Profession: http://www.cta.org/Press/CodeOfEthics or http://www.nea.org/code.html.

Candidate teacher orientation which is include the following:

· Becoming familiar with the school site - such points as rest rooms, parking facilities (and permits), faculty eating areas, room locations, playground areas, use of the lounge, working room facilities, stock room organization (including the procedure to be followed in obtaining needed supplies), and the location of decentralized materials.

· Learning to know other school personnel and their roles in the school: The Principal, other teachers, secretary, custodian, nurse, district counselor, and other auxiliary personnel.

· Becoming familiar with district and school philosophy, policies and routines.

· Developing an understanding of the nature/culture of the school, the district, and the community, gaining insight into the total school organization, understanding the building's unique aspects, and learning about the pupils and the nature of the class.

· Learning where and how to obtain instructional materials or equipment, find supplies, operate equipment, and locate needed curriculum manuals or handbooks. **Candidate Teacher Qualities** are personal qualities and characteristics that will enable he/she to meet his/her responsibilities throughout the program. These qualities are those that University Associates desire in the teacher candidates they invite into their classrooms and these same qualities are those that administrators are seeking in new teachers.

They include:

ü A positive and cooperative spirit.

ü Enthusiasm about teaching and learning.

ü A caring attitude toward children and adolescents.

ü Willingness to listen to and learn from experienced teachers in the schools.

ü Ability to manage time, materials and responsibilities in an organized fashion.

ü Initiative and resourcefulness (Hufstedler School of Education Student Teacher/Master Teacher Handbook, 2015-2016).

THIRD STAGE: COMPLETING CLEAR CREDENTIAL/ INDUCTION/BTSA (NOVICE TEACHER/CANDIDATE TEACHER/ CLINICAL PROCESS)

Requirements for the Clear Credential: Individuals who complete a teacher preparation program and receive a five-year preliminary credential must earn a clear credential by completing one of the following three options:

Option 1, Complete a Commission-approved General Education Induction Program and submit their application for the clear credential through the Induction Program sponsor.

Option 2, Complete a Commission-approved General Education Clear credential program completed at a California college or university, securing that institution's formal recommendation for the clear credential, submitting their application through the Clear Credential program sponsor.

Option 3, Teachers who are certified by the National Board of

Professional Teaching Standards in one of the qualifying subjects listed below after obtaining the California Preliminary Multiple Subject Teaching Credential will be issued a Clear Multiple Subject Teaching Credential.

Recognized that revamping teacher education around clinical practice is not only a matter of adding more hours for student teaching, ensuring improved mentoring of candidates, or adding new courses here and there, even though many preparation programs have made these significant improvements (NCATE,2020, P:2)

In the formal process, the important variable that affects student success as a primer is seen as teacher quality (Wong, 2004; Darling-Hammod 2003). The Induction program is seen as a consistent and coherent, comprehensive and teacher-supporting process with each other. The program is considered part of lifelong professional development completed in two or three years. Each school district and education office is being developed within the framework of the Induction Program according to the California Teacher Professional Standards. Induction (BTSA) program is implemented in 27 states. The Induction program has been instrumental in maintaining career and increasing student achievement (CCSESA, 2016).

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Chapter 9

A CASE STUDY ON CHEMICAL WASTE AND ENVIRONMENTAL POLLUTION: SCIENCE TEACHER STUDENTS

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INTRODUCTION

Today, global climate change and environmental problems are one of the biggest problems threatening humanity. Environmental problems arise with domestic wastes and air, soil and water pollution caused by industrialization and agricultural producers, and they increase intensely and negatively affect surface resources (Gönültaş and Kızılaslan, 2021). Environmental pollution starts in water and becomes most intense in the soil (Güngör, Altuntaş and Yılmaz, 2022). Due to the rapidly increasing production in recent years, environmental degradation also occurs as a result of the use of fossil fuels as an energy input to a large extent. In this process, environmental pollution has caused us to face environmental problems such as global warming, air pollution, water pollution, soil pollution, depletion of the ozone layer, decrease in biodiversity, acid rain, by exceeding the capacity of nature to renew itself (Brown, 1991; Goodland, 1996; Linden, 1997; MacNeill, Winsemius and Yakushiji, 1991).

Since the main purpose of the countries is economic development, environmental problems were not taken into consideration at the beginning, but due to the fact that global warming and climate and environmental changes have become important problems, the questioning of the environmental pollution problem has been on the agenda as an important issue in recent years. Although developed countries have recently started to switch to environmentally friendly production systems to a large extent, developing countries have continued to increase their production at the expense of environmental degradation, not using new environmentally friendly systems due to higher costs. In fact, the world we live on is at a level that meets the needs of all people. However, the balance of the world is deteriorating day by day due to people's ambition to earn more (Alım, 2006).

The main source of environmental problems that we encounter today, which have negative effects on our lives and health, is the intervention of people in the environment (Buell, 2004). Behaviors of individuals that do not care about the environment cause these problems to increase. Increasing environmental problems have directly affected humanity, and it has been realized that local environmental problems also have global effects. These environmental problems are at a level that will affect not only our lives but also the lives of future generations (Cairns, 2002; Özey, 2001).

In recent years, educators have emphasized the concept of environmental education in increasing people's environmental awareness. The main purpose of environmental education is to make the individual sensitive to environmental issues, to develop a critical perspective in

interaction with the environment by acting consciously, and to leave a healthy and clean environment for future generations (Doğan, 1997). With environmental education, it is also aimed that people comprehend the ecological balance and their own place in this balance, develop an opinion on how they can live in harmony with the planet, and gain the necessary skills for an active and responsible participation (Geray, 1995). Although environmental education is an education that covers all segments of the society, the young generation is the most important target group of environmental education. Because the younger generation is not responsible for today's environmental problems, but at the same time it is the segment that will be most affected by these environmental problems. For this reason, it is the section that needs to gain the most knowledge, awareness and sensitivity in this regard (Erol & Gezer, 2006).

It can be said that the education system and teachers have a great role in the realization of comprehensive and effective environmental education and training and in the development of conscious behaviors about environmental problems. In researches, it is emphasized that it is necessary to train educators who will raise awareness of individuals in order to leave a livable environment-nature to future generations and to make environmental behaviors sustainable (Takmaz, Yılmaz, Kalpaklı, 2017). For this reason, the importance of examining the knowledge levels of teacher candidates on environmental issues becomes more important. Therefore, it is thought that this study will contribute to the literature in this context. For this purpose, in this study, it was aimed to investigate the basic knowledge levels of students studying in science teaching about chemical wastes and environmental pollution.

Within the scope of the research, answers to the following sub-problems were sought:

1. What is the level of knowledge of the students about chemical waste and environmental pollution?

2. What are students' cognitive levels and awareness of environmental awareness?

METHOD

Pattern of the Research

This study was carried out with students studying in the Science Teaching program. In the study, a case study, which is one of the qualitative research methods, was used to determine the knowledge of the students on chemical waste and environmental pollution. Case studies aim at a holistic interpretation of the work environment or events and allow the researched problem to be studied in depth and in a short time. Case studies allow

researchers to focus more on a specific case of an investigated problem (Çepni, 2021).

Universe and Sample

The participants of the study consist of 25 students studying in a state university's science teaching program in the 2022-2023 academic year. 17' 2 of the students are girls and 8 of them are boys. The criterion sampling method was used to determine the candidates. In the study, in order to collect more data in the determination of teacher candidates, taking the chemical wastes and environmental pollution course was determined as a criterion considering their interest in the subject.

Data Collection Tools

Data were obtained through written documents containing four open-ended questions created by the researcher in order to determine the knowledge of the students who took the chemical wastes and environmental pollution course. Study questions were given to the candidates during the semester. Thus, it was aimed to determine the existing knowledge of the candidates who took the course about the subject. In order to diversify the data, structured interviews were conducted with 4 randomly selected teacher candidates. The main purpose of conducting an interview is to obtain in-depth, detailed and multi-dimensional information about the subject. In these interviews, semi-structured questions were asked and the interviews with the candidates were completed in an average of 30 minutes. The questions asked to the candidates are shown below.

1. What is chemical waste?

2. Which chemical wastes do you think pollute the environment the most?

3. How can individual and social measures be taken to eliminate the harms of chemical wastes?

4. How did your studies within the scope of environmental lessons affect your thoughts on environmental awareness?

Data Analysis

Content analysis was made according to the information obtained through the written forms and structured interviews answered by the candidates individually, and the information obtained from the structured interviews was used to examine the subject in depth. Content analysis is defined as the objective and systematic examination of materials related to a topic. In this analysis, words or phrases that reflect the content of the subject are categorized and codes are created (Yıldırım & Şimşek, 2013). In order to determine the validity of the codes and categories determined

from the data obtained as a result of the analysis, the documents were examined by two academicians.

Validity and Reliability of the Research

In order to ensure the validity and reliability of the research, the situations where there was disagreement in the codes and categories were discussed and necessary arrangements were made. The calculation method proposed by Miles and Huberman (1994) was used to calculate the reliability of the findings, and the percentage of agreement was found to be 82% as a result of the coding. For internal validity, participants were included in the process. The data were coded independently by taking the opinion of a faculty member who is an expert in the field. Finally, the frequencies of each theme were calculated and reported in graphs. Sample answers of the students regarding the themes were given in accordance with each theme. In accordance with research ethics, candidates are coded as S1, S2… in order to ensure objectivity in the analysis and reporting process and to protect the confidentiality of the candidates.

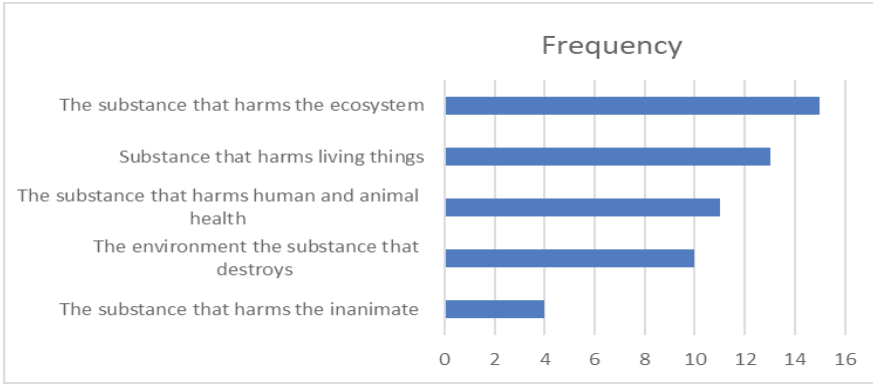
FINDINGS

The first sub-problem, "How is the knowledge level of the students about chemical waste and environmental pollution"? Questions 1 and 2 were asked to the candidates for the sub-problem, and the findings are presented in Figure 1 and Figure 2.

Regarding the first question "What is chemical waste?", five main themes emerged from the answers of the candidates. The views expressed and the frequency of occurrence are summarized in Figure 1. All of the participants stated that chemical wastes are harmful substances. These damages are (1) the substance that harms the ecosystem (f=15), (2) the substance that harms living things (f=13), (3) the substance that harms human and animal health (f=11), (4) the environment the substance that destroys (f=10) and (5) the substance that harms the inanimate (f=4).

Figure 1

Themes Emerging from Candidates' Opinions on Chemical Waste



In this question, the answers of the participants were grouped according to the themes and the answer examples were stated as S1, S2, .. It is seen that the sum of their frequencies exceeds the number of participants, as the candidates are told that they can write down all the answers that come to their minds for each question.

The opinions that emerged in the contact of substances that disrupt the eco system are as follows:

S12: "Chemical wastes cause the depletion of the ozone layer, the destruction of vegetation and global warming."

S15: "Acid rains affect the ecological balance negatively, while disrupting the ecological balance.

S17: "Chemical wastes destroy the vegetation by causing the emission of harmful gases to the environment.

S21: "Fossil fuels cause global warming by increasing air pollution and affect the ecological balance."

The opinions that arise in the contact of substances that harm living things are given below:

S1: "The deodorant, perfume, etc. cosmetics we frequently use threaten living things by causing the ozone layer to become thinne.r"

S3: "Mucilage emerging in the seas threatens living things."

S5: "Air, water and soil pollution caused by chemical wastes affect all living things."

The opinions that emerged in the contact of substances harmful to human and animal health are given below:

S13":Wastes generated due to oil transportation pollute our seas and threaten our health"e.

T15 "A waste that harms the environment means harm to human health."

S18: "Deodorants and sprays cause ozone layer depletion and this leads to an increase in skin cancers."

S24: "Chemical wastes; they are harmful wastes that are hostile to our nature, to our lives, to every breath we take."

The opinions that emerged in the contact of substances that harm the environment are as follows:

S14: "The increase in atmospheric temperature and drought show the damage to the environment."

S11: "The melting of the glaciers is the result of the damage we have done to the environment."

S20: "It takes 400 500 years to defrost plastic bags and bags thrown into the environment. It creates both visual pollution and soil and water pollution. "

S17: "Chemical wastes". Substances that may damage the environment and the environment.

The opinions that emerged in the contact of substances that harm the inanimate are given below:

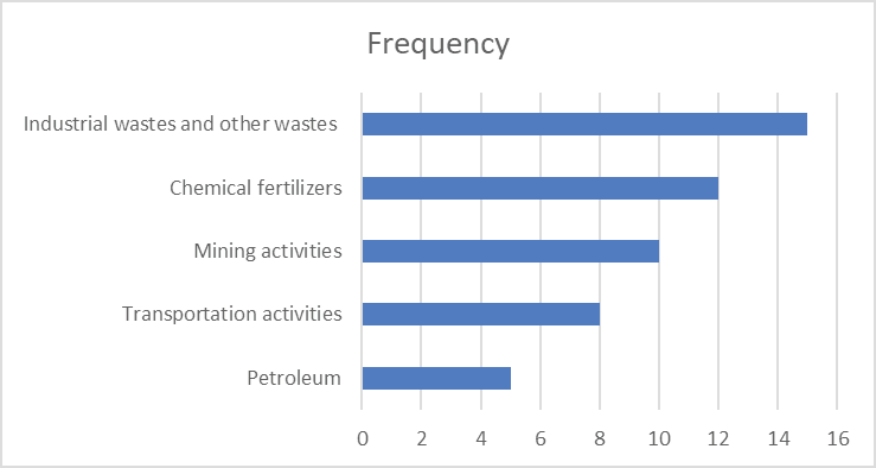
S8: "Acid rains caused by wastes destroy the environment and spoil the natural beauties."

S15: "Wastes are dangerous for all living and non-living things."

Regarding the second question for the first sub-problem was "Which chemical wastes do you think pollute the environment the most?", five main themes emerged from the answers of the teacher candidates. The views expressed and the frequency of occurrence are summarized in Figure 2. The most frequently mentioned themes were (1) Industrial wastes and other wastes (f=15), (2) Chemical fertilizers (f=12), (3) Mining activities (f=10), (4) Transportation activities (f=5) and (5) Petroleum (f=5). The results show that pre-service teachers' awareness of chemical wastes polluting the environment has improved after the lesson.

Figure 2

Themes Emerging from Thoughts on Which Chemical Wastes Contaminate the Environment Most



The opinions of the pre-service teachers regarding the themes that emerged in this question are as follows.

Opinions on the theme of industrial wastes and other wastes:

S2: "When batteries are exhausted and thrown away, they leak into the soil and create soil pollution, thus creating a danger."

S5: "Industrial wastes mixed with drinking water and ground water pose a great danger."

S7: "Factory wastes reaching the sea and oceans pose a danger to the imagination of all living thing.s"

S11: "Because the wastes cannot be recycled and accumulated, they cause erosion and pose a dange.r"

Opinions on the theme of chemical fertilizers:

S1: "As a result of heavy netals given to the soil, the soil becomes polluted and poses a danger to all living things. "

S4: " Unconscious and excessively used fertilizers in agricultural areas poison the soil. "

Opinions on the theme of mining activities:

S17:"Mineral exploration, extraction and processing activities both destroy the environment and cause soil, water and air pollution. "

S9:"Mining activities disrupt water regimes, geological structure, local climate and landscape. "

S13"Gases such as CO2, CO, SO2, NO2 released from coal mines have an effective share in the formation of air pollution. "

Opinions on the theme of transportation activities:

S1: "Gases released to the atmosphere cause air pollution due to the increase in transportation vehicles and people's need for vehicles. "

S19: "Lead and noise pollution caused by transportation are important causes of environmental pollution".

Opinions on the oil theme:

S3: "Petroleum and petroleum-derived fuels pollute the environment by triggering air pollution. "

In tanker transportation, oil spills cause pollution by flowing into the sea".

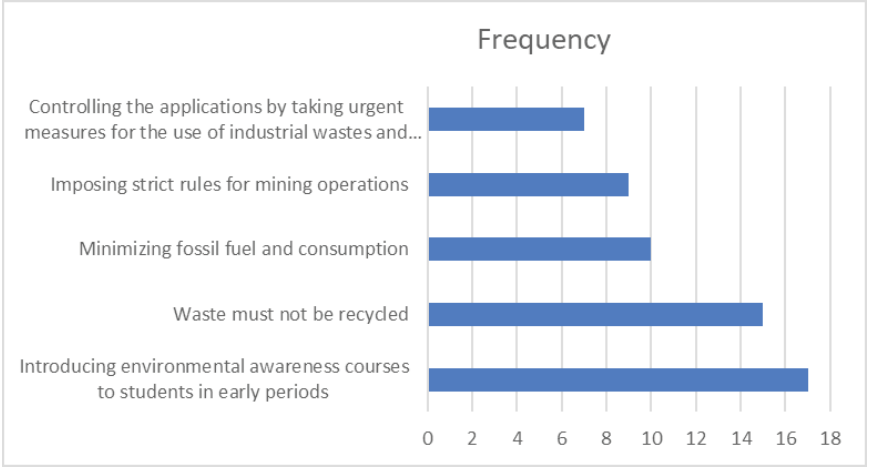
S11: "The polluted water in oil wells and extracted with oil during production is an important environmental problem".

Regarding the second sub-problem, "How are the cognitive levels and awareness of science teacher candidates about environmental awareness as a result of the studies conducted within the scope of the course?", questions numbered 3 and 4 were asked about the and the findings are presented in Figure 3 and Figure 4.

In the third question for this sub-problem, "What can be done individually and socially to eliminate the harms of chemical wastes?", five main themes emerged from the answers of the pre-service teachers. The views expressed and the frequency of occurrence are summarized in Figure 3. These themes were (1) Teaching students about environmental awareness in early periods (f=17), (2) Recycling wastes strictly (f=15), (3) Minimizing fossil fuel and consumption (f=10), (4) Imposing serious rules for mining enterprises (f=9 and (5) controlling the applications by taking urgent measures for the use of industrial wastes and fertilizers (f=7).

Figure 3

Themes for Individual and Social Measures to Eliminate the Harms of Chemical Wastes



The opinions of the pre-service teachers regarding the themes that emerged in this question are as follows.

Opinions on the theme of introducing environmental awareness lessons to students in early periods:

S24:"In order to get rid of incomplete and wrong information about chemical waste and environmental pollution and to raise awareness, the contents on environmental issues that are included in the programs should be started to be taught effectively since the primary school years."

S3:"Environmental education should be taught starting from primary school and practices should be done."

Opinions on the theme of absolutely recycling waste:

S4:"Recycling points should be increased in order to reduce the harm of wastes to nature and individuals should be directed to leave wastes at these points."

S18: "Battery wastes and medical wastes must be left at waste points."

Opinions on the theme of fossil fuel and minimizing its consumption:

S1: "Investments in renewable energy sources should be increased and if we want a sustainable environment, we should reduce the use of fossil fuels. "

S17: "Environmental fuels with low lead content should be used, and diesel vehicles should be abandoned."

Opinions on the theme of imposing serious rules on mining enterprises:

S19: "Mining exploration activities should not be allowed to threaten residential areas. Mining with cyanide should be brought under contro.l"

S4:"The economy to be obtained from mining should be examined as a whole with the environmental problems it will cause."

Opinions on the theme of controlling the applications by taking urgent measures for the use of industrial wastes and fertilizers:

S1:"Because the chemical fertilizers used to produce a large amount of product pollute the soil and water, controlled use must be ensured. "

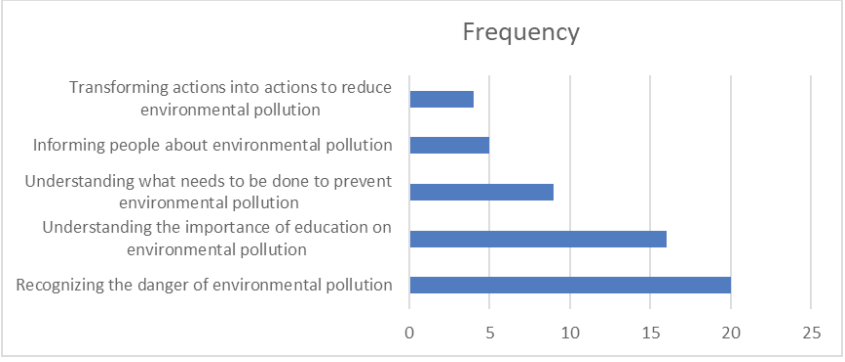
S3: "As pesticides used against agricultural pests pollute the soil and therefore biological materials, their random use should be prevented."

S25: "For-profit industrial organizations should be prevented from releasing wastes that will cause environmental pollution to nature uncontrolled."

Regarding the same sub-problem, in question 4, "How did your studies within the scope of environmental courses affect your thoughts on environmental awareness?", five main themes emerged from the answers of the pre-service teachers. All of the pre-service teachers stated that their awareness of the environment increased. The views expressed and their frequency of occurrence are summarized in Figure 3. These themes are (1) Recognizing the danger of environmental pollution (f=20), (2) Understanding the importance of education on environmental pollution (f=16), (3) Understanding what needs to be done to prevent environmental pollution (f=9), (4) Recognizing the importance of informing people about environmental pollution (f=5) and (5) transforming what is necessary to reduce environmental pollution into behavior (f=4).

Figure 4

Themes Related to the Question of Impact on Their Thoughts on Environmental Awareness



The opinions of the pre-service teachers regarding the themes that emerged in this question are as follows.

Opinions on the theme of realizing the danger of environmental pollution:

S10: "Thanks to the information we learned in the lesson and our research assignments, I realized how great dangers environmental pollution cause. I became conscious of how small and unimportant resource uses harm nature."

S11: "In one of the homeworks I prepared, I read that industrial wastes cause air pollution and therefore black snow falls. I can say that wastes and these pollutions cause such damage to nature and change the climate conditions, showing the future scenarios that should be feared."

S19: "During my course preparations, I realized how big the damage to the environment was while searching for mines. I was uneasy, thinking that if no action is taken as soon as possible, there will be irreversible loss."

Opinions on the theme of understanding the importance of education on environmental pollution:

S15:"I realized that the articles and news research I read within the scope of the course increased my interest in the environment, my awareness of environmental protection and my attention on this issue twice. For this reason, I think that training on this subject is very important."

S3: "When I am appointed, I will raise my students in an environmentally conscious manner. This world is not only ours but also the legacy of future generations."

Opinions on the theme of understanding what needs to be done to prevent environmental pollution:

S25:"The first thing I noticed in the news research I did within the scope of the course was that while there was a lot of destruction around me, I did not know the causes and the consequences. During the research I conducted within the scope of the course, I gained detailed information and realized many things. I learned about the factors that pollute the environment, what I can do and how to prevent the damages."

S19: "I know that if there are studies that will harm the environment in the future where I am assigned, I have to do the necessary work by raising the awareness of the people in my region on this issue."

Opinions on the theme of realizing the importance of informing people about environmental pollution:

S22: "I understood that factors such as family, education level, department studied, taking environmental education course, frequency of publication of environmental news in the media are effective in creating environmental awareness in people. "

S17: "In all the studies I researched, there are many factors that cause environmental pollution, but people harm the environment and all living things in order to live in better conditions and earn more, that is, all of these are human-induced. That's why educating and raising people's awareness is very important. "

Opinions on the theme of transforming what is necessary to reduce environmental pollution into behavior:

S9: "Some of my relatives still use coal as fuel. When I go to them, I think about explaining the pollution caused by coal and convincing them to switch to natural gas instead. "

S7:"I realized that it is not enough to have environmental awareness and it is important to reflect this awareness to our actions. In the simplest way, we cannot say that we are conscious about this issue unless we separate all the wastes as individuals, do not use nature-friendly fuel, although we know that exhaust fumes affect the environment negatively, consume unnecessary fuel on journeys by one person, use air conditioners and coolers when we can open the windows and cool off."

DISCUSSION AND CONCLUSION

In this study, it is aimed to evaluate the basic conceptual knowledge and awareness of science teaching program students at a state university about chemical wastes and environmental pollution. The discussion of the findings of the data obtained for this purpose with the relevant literature is included in this section.

Firstly, the candidates were asked the question "What is chemical waste?". All of the candidates stated that chemical wastes are harmful and dangerous, and these damages were evaluated under five main themes. "In contact with substances that harm the eco-system"; The most written answers were that chemical wastes destroy vegetation, cause events such as global warming, drought, acid rain, greenhouse effect, depletion of the ozone layer, and disrupt the ecological balance. In the theme of "substances that harm living things", it was emphasized the most for this theme that chemical wastes threaten living things by creating air, water and soil pollution. In the theme of "substances that harm human and animal health", the harms of oil spilled into the sea, exhaust gases caused by vehicles, wastes caused by industry and gases emitted from factories have been expressed on all human health. In the theme of "environmentally harmful substances", the

effects of climate changes and melting of glaciers on the environment, the effect of polymer-based materials that are thrown into the environment and do not disappear for hundreds of years, the pollution caused by the mucilage problem in the last period, and the pollution coming to the seas through rivers are expressed. In contact with substances that harm the inanimate, the most emphasized answers are acid rains destroying the environment and destroying their natural beauties. When the answers are examined, it is seen that the students do not define the concept of chemical waste and talk about the harms of waste. In the study conducted by Doğan (2013) with biology students, it was determined that their conceptual knowledge was not sufficient. In the study conducted by Küçük (2017), in which the effects of applied environmental education on environmental awareness in secondary schools were investigated, it is understood that students do not have much knowledge about the concept of waste. Many studies have found that students' knowledge of environmental concepts is insufficient (Kaplowitz & Levine, 2005; Fraj-Andres & Martinez-Salinas, 2007; Frick, Kaiser & Wilson, 2004; McDaniel & Alley, 2005; Alp et al., 2008). ; Pe'er et al., 2007; PCEE, 2000; Tuncer et al., 2009; Yılmaz, Morgil, Aktuğ, & Göbekli, 2002) . In the study conducted by Timur and Yılmaz (2011), it was stated that the students' knowledge about the environment was at a moderate level.

As a second question, "Which chemical wastes do you think pollute the environment the most?" was asked to the candidates and it was concluded from the answers of the pre-service teachers that the most pollution was caused by wastes, secondly by chemical fertilizers, and then by mining activities, transportation activities and petroleum. Candidates stated that most industrial wastes cause environmental pollution by polluting soil, water and air. In addition, they drew attention to batteries, petroleum-derived wastes, and waste materials for health. Heavy metals and pesticides have come to the fore in the pollution caused by chemical fertilizers. Similarly, in the research of Sönmez, Kaplan and Sönmez (2008), unconscious fertilizer applications can cause heavy metal accumulation, nutrient imbalance, nitrate accumulation in water, release of nitrogen and sulfur-containing gases into the air, greenhouse effect, etc. has been reported to create such problems. Students drew attention to the deterioration of water regimes, geological structure, local climate and landscape as a result of mining activities, and also emphasized that mineral exploration, extraction and processing activities cause soil, water and air pollution. The study by Fidan (2016) on the environmental evaluation of mining activities in the world and in Turkey supports the findings obtained from the students. In addition, students emphasized that air pollution occurs due to gases released into the atmosphere with transportation

activities, and also that pollution occurs as a result of spilling oil spills into the sea in tanker transportation.

Regarding how pre-service science teachers can take individual and social measures to eliminate the harms of chemical wastes; It has been determined that they are of the opinion that students should be taught environmental awareness in the early stages, Wastes should be recycled strictly, Fossil fuel consumption should be minimized, Serious rules should be set for mining activities, and applications should be controlled by taking urgent measures for the use of industrial wastes and fertilizers.

Five main themes emerged regarding the effect of the studies of pre-service science teachers on their thoughts on environmental awareness. In the theme of recognizing the danger of environmental pollution, the students stated that they became aware of how small and unimportant resource use and waste harm nature, that they realized how big the damage caused by mining activities to the environment, and that if necessary precautions are not taken, there will be irreversible losses. In the theme of understanding the importance of education on environmental pollution; They stated that the studies carried out within the scope of the course increased their interest in the environment, their level of awareness on environmental protection and their attention on this issue, so they realized the importance of education. In the theme of understanding what needs to be done to prevent environmental pollution, they stated that they learned the factors that pollute the environment and what they can do, how the damages can be prevented, and that they are ready to do what is necessary in this regard. In the theme of realizing the importance of informing people about environmental pollution, they emphasized the importance of factors such as family, education level, department read, environmental education, frequency of publication of environmental news in the media in the education of individuals. They stated that it is not enough to have environmental awareness in the theme of transforming what is necessary to reduce environmental pollution into behavior, it is important to transform this awareness into actions. The answers given by the students suggest that environmental awareness is formed. However, Yıldırım, Bacanak, and Özsoy (2012) stated in their studies that the sensitivity of students studying in science teaching to environmental problems is not much different from other students.

As a result, it can be said that it is important and necessary to organize lessons, in-school and out-of-school practices and activities that will deepen students' perspectives on the subject at all levels of education, provide information on the importance of the subject, and make the acquired knowledge permanent and adaptable to life. Within the scope of this study, it is seen that primarily the objectives and achievements of

the Chemical wastes and environmental pollution course are realized. As can be seen from the results of the study, pre-service teachers did not find it sufficient to raise awareness only of themselves, but also stated that they should raise awareness of their environment. It can be said that the pre-service teachers' perceptions of chemical wastes and environmental pollution have developed in a very positive way at the end of the study, and they have made significant contributions in areas such as environmental awareness and social responsibility.

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Chapter 10

THE EFFECT OF INTELLIGENCE GAMES COURSE ON STUDENTS' MATHEMATICS ACHIEVEMENT[1]

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Introduction

In parallel with the changes in scientific fields and technology, the behaviours and skills expected from individuals are also changing. Nowadays, access to information is very easy and people are equipped with different qualifications compared to the past. The needs of the developing and changing world also differ on this axis. The type of person needed in the world of the 21st century is not someone who has knowledge, but someone who can use knowledge. Because keeping up with the needs of life depends on the ability to adopt and apply different types of knowledge that are rapidly developing in every field. The use of knowledge in life is handled and evaluated on the axis of literacy skills today. Mathematical literacy, which we encounter in mathematics education, is expressed as the capacity of individuals to formulate, use and interpret mathematics in various environments (Organization for Economic Cooperation and Development-[OECD], 2013) and is measured by some international exams and the main purpose of mathematics education today is to raise individuals as mathematically literate.

NCTM (1989) states that the main purpose of school mathematics is for individuals to have the skills to use knowledge in real life and reveals some mathematical skills in this context. These are problem solving, reasoning, communication, connecting and using representations. In the same document, it is stated that these skills form the basis of mathematical thinking (as cited in Yavuz Mumcu and Aktürk, 2017). Because mathematical thinking requires the use of all mathematical skills expressed here together and appropriately in related situations. In this regard, it is stated in the MoNE (2013a) curriculum that one of the main goals of mathematics education is to train students to be good problem solvers with a developed mathematical thinking power, and similarly, in the NCTM (1991) document, the main purpose of mathematics education is for all students to learn to think mathematically (p. 21). In this context, the abilities like produce appropriate solutions to different problems encountered in real life, to evaluate current conditions, to establish cause-effect relationships, to make the best choices, to produce alternatives, to make assumptions, to make predictions about the future, etc. processes are tried to be gained to individuals with mathematical thinking ability.

One of the methods being used for students to gain mathematical thinking ability is games. Games in general and intelligence games in particular can be described as tools that serve this purpose (Dempsey, Hasey, Lucassen, and Casey, 2002). Kirriemuir and McFarlane (2004) stated that games develop strategic thinking, planning, communication, discussion, group decision making, data processing skills; Bottino and Ott (2007), on the other hand, mentioned that intelligence games are extremely important

in developing skills such as reasoning and strategic thinking. In addition to the positive effects of games on educational processes, it can also be mentioned that they contribute to increasing student motivation, increasing attention and developing positive behaviors (as cited in Yöndemli and Doğan Taş, 2018). Studies, especially when it comes to mathematics education, show that students in our country have negative attitudes and prejudices towards mathematics in general, they lack self-confidence for being successful in mathematics, they are afraid of mathematics, and they do not like mathematics in general (Yavuz Mumcu, 2020). In this context, teaching mathematics with games is important in terms of student motivation and interest towards the lesson. Karabacak (1996) stated that the first step to ensure effective learning in education is to arouse interest, focus and motivate. She also emphasized that teaching with games must be used in order to stimulate this interest and to attract student attention to the lesson. In this direction, it is emphasized that mathematics education should be different and fun, students can enjoy mathematics and achieve success just in this way (Yöndemli and Doğan Taş, 2018).

Intelligence games can be defined as activities offered for individuals to reveal their own potential, to make quick, appropriate and correct decisions, to produce unique solutions when faced with problems, and most importantly, to constantly renew themselves. In this respect, intelligence games can not only develop individuals in the field of mathematics, but also develop skills such as logic, problem solving, producing solutions, verbal and visual intelligence, designing patterns, forming shapes, three-dimensional thinking, and developing tactics through games that will improve their operational skills and strategic thinking skills. These games also improve critical thinking and creativity skills (Devecioğlu and Karadağ, 2014). Intelligence games can be defined as a gamified version of all kinds of problems, including real problems, and are effective tools in helping students to gain problem-solving and reasoning skills. In this context, a course called *Intelligence Games* has been started to be take place as an elective course at the secondary school level by Teaching and Trainig Association in the 2012-2013 academic year. There are six different game types within the scope of the intelligence games curriculum. These are reasoning and processing games, verbal games, geometric-mechanical games, memory games, strategy games and intelligence questions.

Within the framework of the general objectives specified in the Basic Law of National Education, it is aimed that students can realize and develop their intelligence potential, develop different and original strategies for problems, make fast and correct decisions, work individually, as a team and in a competitive environment by developing a systematic mindset within the scope of intelligence games. It is aimed for students to develop

thinking skills and develop a positive attitude towards problem solving (as cited in MoNE, 2013b). It is stated in the relevant curriculum that "the intelligence games course will enable students to develop their capacity to perceive and evaluate problems, to create different perspectives, to make quick and correct decisions when faced with a problem, to develop the habit of focusing on a subject and solution, and to develop their capacity to use reasoning and logic effectively" (p.1). In this context, it is important to investigate the effects of the relevant course on the students at the point of reaching the targeted goals and it reflects the rationale of this research. The aim of the research is to investigate the effect of the intelligence games course on the academic achievements of the students in the mathematics course and to reveal the students' opinions about the intelligence games. The sub-problems that are tried to be answered within the scope of the study are as follows.

- ✓ Is there a significant difference between the pre-test scores of the students in the experimental group who took the intelligence games course and the control group who did not take this course?
- ✓ Is there a significant difference between the post-test scores of the students in the experimental group who took the intelligence games course and the control group who did not take this course?
- ✓ Is there a significant difference between the pre-test and post-test scores of the students in the experimental group who took the intelligence games course?
- ✓ Is there a significant difference between the pre-test and post-test scores of the students in the control group who did not take the intelligence games course?
- ✓ What are the opinions of the students in the experimental group about the intelligence games lesson?

Method

In this research, a mixed design was used, which allows to present the events within a framework by using quantitative and qualitative research methods together (Gökçek, 2019). The reasons for this choice can be explained with two different reasons: testing the existence of close or consistent results for research results and ensuring that the findings obtained are presented in a wider framework by elaborating. In the scope of the study, sequential transformational design, one of the mixed pattern designs, was used. Accordingly, qualitative data can be obtained after quantitative data has been collected and analyzed beforehand, or this situation can be reversed depending on the priority or need of the researcher. Priority is given to any of the data types, but both data types

can be of equal importance. Data analysis is often combined in the discussion and interpretation sections. This design for the current study was preferred because it provides a better understanding of the studied phenomenon (Creswell, 2003; cited in Gökçek, 2009).

Experimental research method was used in the quantitative dimension of this research, and the case study method was used in the qualitative dimension. Therefore, it can be said that the study was carried out in two successive phases. In the first stage, the experimental study method was used in order to see the effects of the intelligence games course on the students. The quantitative study has a quasi-experimental design with pretest-posttest unequalized control group. The group in which the intelligence games lesson was carried out was determined as the experimental group, and the group consisting of the students who did not take the lesson was determined as the control group. The equality of the mentioned groups was provided by student grade averages and the pre-test results. In the second stage of the study, the case study method was used to identify and see the details that make up a situation, to develop possible explanations for a situation, and to evaluate a situation (Gall, Gall and Borg, 2007). At this stage, it was aimed to obtain the opinions of the students in the experimental group about the intelligence games lesson. The different stages mentioned were used in order to create stronger and more valid answers to the research problem created within the scope of this study by using both quantitative and qualitative data together.

Study Group

The study group in the quantitative part of this research consists of a total of 30 students studying in two different 7th grade branches of a public school in the 2nd semester of the 2021-2022 academic year. 15 of these students were in the experimental group and 15 of them were in the control group. In the selection of these students, convenient sampling method, which is one of the non-probabilistic sampling methods, was used. In this sampling method, the sample is selected in accordance with the conditions such as time, money, location, etc. The method in question was preferred, since this study was conducted with the researcher's own students.

In the qualitative part of the study, 15 students in the experimental group were studied. It can be said that criterion sampling, one of the purposive sampling methods, was used in the selection of the students here. Since the purpose of conducting the qualitative part of the study is to reveal the opinions of the students about the intelligence games lesson, the students in this stage consist of the students in the experimental group.

Data Collection Tools

In the study, the 'Achievement Test (AT)' and the 'Student Opinion Form (SOF)' to reveal the opinions of the students about the intelligence games, which were prepared by the researchers were used as data collection tools.

Achievement test

The development process of the achievement test can be expressed as follows.

- ✓ In the test development process, first of all, a table of specifications (Table 1) was prepared for the subjects and acquisitions to be included in the test.
- ✓ Using the assessment questions in the textbook, 25 questions were written in accordance with the specification table.
- ✓ Expert opinions were used for the validity of the questions and the opinions of two lecturers and two mathematics teachers were taken.
- ✓ For the test, which was finalized in line with expert opinions, a pilot study was conducted with 30 seventh grade students with similar academic success in a different public school.
- ✓ As a result of the item analyzes made as a result of the pilot application, 5 questions were removed from the test and a total of 20 questions were obtained.
- ✓ The mean difficulty of the test obtained was calculated as 0.42, and the mean discrimination was calculated as 0.66.
- ✓ For the reliability of the test, the KR-20 value was calculated as 0.938.

Table 1

Table of Specifications for the Questions in the Achievement Test

Topics	Acquisitions	Question No:
Operations with Whole Numbers	Performs addition and subtraction operations with whole numbers, solves related problems.	1
	Performs multiplication and division operations with whole numbers.	2
	Expresses the repeated multiplication of integers by themselves as exponential quantity.	3
	Solves problems that require operations with whole numbers.	

Operations with Rational Numbers	Performs addition and subtraction operations with rational numbers.	5
	Performs multiplication and division operations with rational numbers.	6
	Performs multiplication and division operations with rational numbers.	7
	Performs multi-step operations with rational numbers.	8
Algebraic Expressions	Performs addition and subtraction operations with algebraic expressions.	9
	Refers to the rule of number patterns by letter, finds the desired term of the pattern whose rule is expressed in letters.	10
	Multiplies an algebraic expression by a natural number.	13
Equation and Equilibrium	Understands the principle of the preservation of equality.	11
	Solves equations with a first-order unknown.	12
	Recognizes an equation with a first-order unknown and constructs an equation with a first-order unknown appropriate to a given real-life situation.	14
Ratio and Proportion	Determines the value that if one of the multiplicities in the ratio is 1, the other will receive.	15
	When one of the two multiplicities given the ratio to each other is given, finds the other. Studies are carried out on examples of daily life situations.	16
	Determines and interprets the proportional constant of two directly proportional multiples.	17
	Determines and interprets the proportional constant of two inversely proportional multiples.	18
	Solves problems related to correct and inverse proportion.	19
	Solves problems related to correct and inverse proportion.	20

Student Opinion Form (SOF)

In the Student Opinion Form, there were 4 open-ended questions aiming to reveal the opinions of the students about the intelligence games. These questions are as follows: (1) *What are your general thoughts about the intelligence games?* (2) *Do you think that these games have any effect on your mathematical thinking skills? If your answer is yes, can you explain the reasons for your answer?* (3) *Do you think that these games have any effect on your success in mathematics? If your answer is yes, can you explain the reasons for your answer?* (4) *Do you think that the intelligence games have an impact on your academic achievements in other lessons other than mathematics? Explain with reasons.* While preparing these questions, attention was paid to ensure that the study served its purpose and the questions were understandable by the students. In addition, the views of two faculty members were used for the validity of the questions. As a result of their feedback, the questions were finalized. SOF was applied to the students in the experimental group after the experimental intervention. During the application, it was tried to ensure that all students answered the

questions, and the answers that were left blank despite the feedback were not taken into consideration.

Process

In the experimental process of this study, the equivalence of the groups was tried to be ensured by using the mathematics course grade averages of the two groups and the pre-test results. After that, the researcher teacher conducted the process with the students who took the elective intelligence games course in the experimental group and with the students who did not take the course in the control group. At the beginning of the experimental study process, achievement test prepared by the researchers was applied to the students in the experimental and control groups. Within the scope of the intelligence games curriculum, *sudoku* from reasoning and operation games, *reversi, go* and *mangala* games from strategy games were determined. These games were introduced to the students in the first week and the game rules were taught, and then the students were allowed to play these games. The total process took 8 weeks. At the end of the process, the achievement test was applied to the students in the experimental and control groups as a post-test.

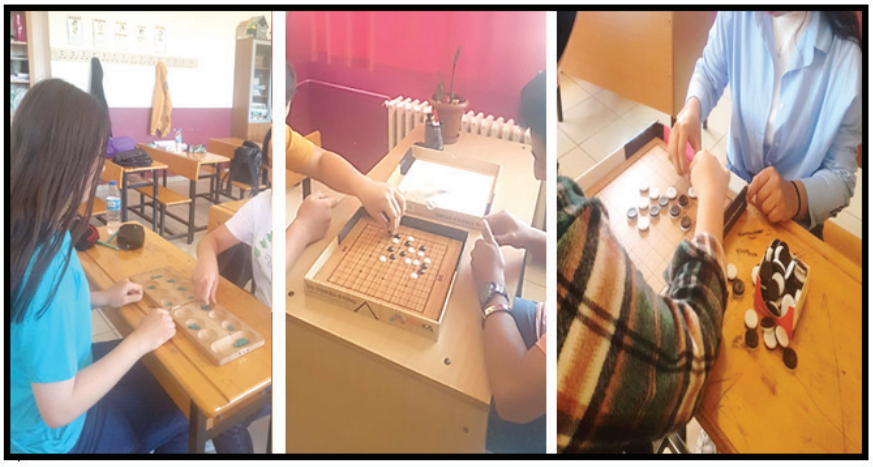

Figure 1. Game Processes of Experimental Group Students

Analysis of the Data

Wilcoxon signed-rank test and Mann-Whitney-U tests, which are non-parametric tests, were used to compare the pre-test and post-test scores during the study process. The rationale for using non-parametric tests within the scope of the study can be explained as follows. This study is a study conducted by the researcher teacher with his own students, and in this context, the number of students is limited to the mentioned

students. Working with a total of 30 students led the researchers to use nonparametric (non-parametric) tests instead of parametric as suggested by Kalaycı (2008). Because in the related study, non-parametric tests are recommended to be preferred in studies conducted with very small samples. In addition, as a result of the analyzes made, it was observed with the Shapiro-Wilk test that the data belonging to the relevant sample group did not meet the normality conditions ($p<.05$). For this reason, non-parametric tests were used in the study.

Content analysis was used in the analysis of the qualitative data obtained from the SOF used in the study, and the answers given by the students to the questions in the form were coded under certain categories and expressed with frequency (f) values. Frequency values used in student expressions show the frequency of related expressions. Because in this section, there is a case where any expression is used by more than one student, percentage values were not calculated and included in the findings.

Bulgular

Findings Obtained for the First Sub-problem

Since non-parametric tests were used in this study and as a result of these tests, the mean rank and rank totals of the groups were calculated instead of the average scores, the pre-test and post-test average scores of the experimental and control groups were included in this section first.

Table 2

Pre-Test and Post-Test Results of Experimental and Control Groups

	Pre-test	ss	Post-test	ss
Experimental Group	7.66	5.91	8.26	6.75
Control Group	8.93	5.88	9.00	5.78

When Table 2 is examined, it is remarkable that the test results of the students in both the experimental and control groups increased. It is seen that this increase rate is higher in the experimental group students compared to the other group. The results of the Mann Whitney-U test, which was conducted to determine whether there is a significant difference between the pre-test results of the students in the experimental group and the students in the control group, are given in Table 3.

Table 3

Mann Whitney-U Test Results Regarding the Pre-Test Results of the Experimental and Control Groups

	n	Mean Rank	Sum of Rank	U	p
Experimental Group	15	14.27	214.00	94.00	.461
Control Group	15	16.73	251.00		

The data in Table 3 show that the pre-test rank averages of the students in the control group were higher than the students in the experimental group, but this difference was not at a significant level (U=94.00, p>.05). Therefore, it can be said that the mathematics course achievements of the groups were equivalent to each other before the process.

Findings Obtained for the Second Sub-problem

The Mann Whitney-U test results on whether there is a significant difference between the post-test results of the experimental group students and the control group students are given in Table 4. When Table 4 is examined, it is seen that there is no significant difference between the post-test scores of the students in the experimental and control groups (U=99.00, p> .05). This situation shows that there is no significant difference between the mathematics achievements of the experimental and control group students who took and did not take the intelligence games course.

Table 4

Mann Whitney-U Test Results Regarding the Post-Test Results of the Experimental and Control Groups

	n	Mean Rank	Sum of Rank	U	p
Experimental Group	15	14.60	219.00	99.00	.595
Control Group	15	16.40	246.00		

Findings Obtained for the Third Sub-problem

The Wilcoxon Signed Ranks test results for the related measurements carried out to determine whether there is a significant difference between the pre-test and the post-test results of the experimental group students are given in Table 5.

Table 5

Wilcoxon Signed Ranks Test Results Regarding the Pretest-Posttest Results of the Experimental Group

Group	n	Mean Ranks	Sum of Ranks	Z	p
Negative Ranks	8	6.06	48.50	-.253	.800
Positive Ranks	6	9.42	56.50		
	1				

According to the data in Table 5, it was observed that there is no significant differences between the pre-test and post-test results of the experimental group students who took the intelligence games course (Z=-.253, p>.05). However, the increase in the averages and totals of the students is remarkable. The data in Table 3 and Table 4 also support this situation. Therefore, it can be said that there is an insignificant increase in the mathematics achievement of the students who took the intelligence games course before and after the process.

Findings Obtained for the Fourth Sub-problem

The Wilcoxon Signed Ranks test results for the related measurements performed to determine whether there is a significant difference between the pre-test and the post-test results of the control group students are given in Table 6.

Table 6

Wilcoxon Signed Ranks Test Results Regarding the Pretest-Posttest Results of the Control Group

Group	n	Mean Ranks	Sum of Ranks	Z	p
Negative Ranks	6	6.75	40.50	-.118	.906
Positive Ranks	6	6.25	37.50		
	3				

According to the data in Table 6, it was observed that there were no significant differences between the pre-test and post-test results of the control group students who did not take the intelligence games course (Z=-.118, p>.05). However, it is seen that the mean rank and total values of the students decreased. The data in Table 3 and Table 4 also support this situation. Therefore, it can be said that there is an insignificant decrease in the mathematics achievement of the students who did not take the intelligence games course before and after the process.

Findings Obtained for the Fourth Sub-problem

The findings obtained from the opinions of the students in the experimental group about the intelligence games are given in Table 7.

Table 7

Findings Obtained from Student Opinion Form

Questions		**Student Expressions**	**Frequency**
What are your general thoughts about the intelligence games lesson?	Positive expressions	Beautiful, enjoyable, fun, I'm happy when I'm playing	11
		I think it improved us mentally, it opened my mind, it made me think practically.	4
		Made me better in math class	2
		Educative	1
		I feel smart when I play	1
		It's like doing a math lesson	1
		Increases my interest in math class	1
	Negative expressions	It does not contribute much to my interest in the lesson.	1
Do you think the games in this lesson have any effect on your mathematical thinking skills? If your answer is yes, can you explain the reasons for your answer?	Yes …	Yes, I do (mathematical) operations faster (practice) like addition, subtraction, multiplication	6
		The lesson makes me understand the questions easier (better)	4
		Improves my mathematical thinking skills	2
		Makes me solve problems more easily	2
		I'm raising my grades	1
		I feel smart when I play games	1
		Develops intelligence	1
	Yes but...	Yes, but it does not increase my interest in the course.	
Do you think that the games in this course will have any effect on your success in the mathematics course? If your answer is yes, can you explain the reasons for your answer?	Yes …	It improves my thinking ability	5
		I can understand the math lesson better	4
		It makes calculations easier	3
		Allows me to solve more and faster (easy) questions	3
		I think it increased my success in math class	3
		The more I play games, the better I can pay attention to math lessons	1
	No	No, it is just a game, has no relation with the lesson	1
Do you think the mind games course will have an impact on your academic achievements in other courses other than mathematics? Explain with reasons.	Yes…	Improves my thinking ability (speed), intelligence	9
		Since there is no such thing as success/failure in games (I feel comfortable, I get away from exam anxiety), this allows me to be successful.	3
		I'm raising my grades	2
		Improved my paragraph decoding skills in Turkish lesson	2
		It makes all the lessons quick and easy to understand.	2
		My self-confidence is increasing	2
		It develops the human mind	1
		Makes people's life easier	1
		People feel smart	1
		Makes me love the lessons	1

According to the findings in Table 7, it is seen that the students' thoughts about the games are generally positive and in the first question, the students stated that they found the games enjoyable and entertaining. Apart from this, the statements are showing that the students understand the mathematics lesson better, their thinking skills are improved and their interest in the math lesson increases thanks to these games. In the second question, all of the students agreed with the statement that intelligence games increase their mathematical skills. In this context, students stated that they solved arithmetic operations and questions more easily and they understood the lesson more easily. In the third question, all students, except one, stated that intelligence games increased their success in mathematics lessons. One student stated that the game has no relation with mathematics lesson. In the last question, all of the students stated that intelligence games contributed to their academic success in other lessons. Some of the students' noteworthy statements in this question are; *Since there is no such thing as success/unsuccess I feel more comfortable*, *my self-confidence increases*, *I feel smart*, etc. As a result, it is seen that the student responses mostly include the positive effects of the intelligence games course on them.

DISCUSSION AND CONCLUSION

In this study, the effects of intelligence games on students' mathematics achievement and students' views on these games were tried to be revealed. According to the results of the study, although it was determined that intelligence games increased students' math performance, it was seen that this increase was not at a significant level. While the mean rank and rank total values of the experimental group students in the study increased after the process, the said values of the control group students decreased. This situation can be interpreted as the positive effects of the course on student achievement. However, the insignificance of this effect can be interpreted by the size of the study group and the limitation of the achievement test. Because it is thought that different results can be obtained in studies conducted with larger samples or in which measurement tools focusing on more specific mathematical skills are used. When similar studies conducted in the literature are examined, it is seen that the positive effects of intelligence games on students are generally mentioned. In the study of Taş and Akgün (2021), the effect of mathematics teaching that was supported by activities consisting of intelligence games and logic questions, on the mathematics achievement of 7th grade students was examined. In addition, students' opinions about the process were investigated. As a result of the study, it was seen that the process had a positive effect on the students' mathematics achievements. Students stated that their thinking, logical thinking and reasoning skills

improved with these games. Usta, Işık, Taş, Gülay, Şahan, Genç, Diril, Demir, and Küçük (2018) studied the effects of teaching mathematics with games on the mathematics achievement of 39 seventh grade secondary school students. As a result of the study, it was determined that teaching mathematics with games had more positive effects on students' success than the other teaching activities at school. Yondemli and Doğan Taş (2018) studied the effects of intelligence games on the mathematical reasoning of 8th grade students, they worked with a total of 20 students and concluded that there is a significant difference in favor of the posttest between the mathematical reasoning skill levels of the students who participated in the 20-hour intelligence games activity. It has been observed that these games have a positive effect on students' mathematical reasoning skills. Kurbal (2015), in his study, examined the effect of intelligence games on 6th grade students' problem solving strategies and reasoning skills. As a result of the research, it was understood that there was an improvement in the problem solving strategies and reasoning skills of the students who took the intelligence games course. Demirel (2015) aimed to determine the effects of using intelligence games on students' problem solving skills, strategic thinking skills and class participation in mathematics lessons. As a result of the research, it was concluded that the success of the students increased significantly and their opinions about the games were positive. Orak, Karademir and Artvinli (2016) stated in their study that games such as three stone, five stone, nine stone and mangala are effective on students' mathematics achievement, Dauvergne (2000) stated that chess, which is an intelligence game, affects students' IQ level and problem solving skills.

When the international studies in the related field are examined, similar results draw attention. In a study examining the effect of teaching with games on understanding mathematical concepts, Song (2002) designed interactive mathematics learning environments for primary school children. In the study, it was examined how to motivate children to explore mathematical concepts in learning environments, how to meet their emotional needs in these environments, and what design features can make mathematics more fun for children. In this context, a game-based interactive learning activity was developed and implemented to help primary school children understand fractions. The results showed that playing games helped children better understand the underlying mathematical concepts and there was a statistically significant difference in test scores. In addition, the results showed that the designs that provide motivating learning environments and the fun features of the games match the child's interests and help children enjoy learning activities. In his study, Olson (2007) examined the effect of games on students' mathematical reasoning skills. For the research, mathematical games were played to

preschool and primary school 1st, 2nd, 3rd and 4th grade students. As a result of the observations made for the research, it was concluded that the games provide the students with the opportunity to learn in fun environments and are effective in developing the students' mathematical reasoning. In their study, Houssart and Sams (2008) aimed to observe what kind of strategies students develop in order to win against the computer in a strategy game and to examine the effect of the process on mathematical reasoning skills. As a result of the research, it was determined that the students used their mathematical reasoning skills to win the game against the computer by working together and these processes affected the development of mathematical reasoning skills by having discussions with their friends in the language of mathematics. In the study of Bottino, Ott, Tavella and Benigno (2010), it was concluded that digital mind games affect reasoning and logic skills. In another study by Bottino, Ott and Tavella (2011) it was found that the relationship between intelligence games and some activities and school success was high. Reiter, Thornton, and Vennebush (2014) stated that the kendoku game, which is similar to the sudoku but includes some more mathematical operations, enables students to do the operations that form the basis of mathematics and to think more algebraically. In addition, kendoku game, which is an example of reasoning and operation games, provides problem solving, reasoning and thinking about the basis of mathematical problems. Niebaum and Bunge (2014) used various games, puzzles and difficult problems in their study. They concluded that these games and processes improve reasoning skills. It has been stated that this development activates many parts of the brain and serves logic. In the studies mentioned so far and similar studies it was determined that intelligence games in mathematics education have positive effects on students' problem solving, reasoning and mathematics achievements (as cited in Usta et al., 2018).

The other results obtained from this research are about the opinions of students about intelligence games. When the responses of the students who took the intelligence games were examined, it was seen that the students generally found the intelligence games enjoyable, the games helped them to understand the mathematics more easily and their interest in the mathematics lesson increased, the games helped them to increase their thinking skills, academic success and self-confidence for all lessons. Similar results were obtained in studies in the literature. In their study on seventh grade students, Sezgin-Memnun and Akkaya (2010) determined that the content of the intelligence games course is important in the attitudes of seventh grade students towards the mathematics, and most of the students like to learn math through games and activities. Aksoy and Kaleli Yılmaz (2011) found that the improvement in the attitudes of the students in the

experimental group with the game-assisted teaching was higher than the students in the control group, as a result of the study in which they examined the effect of the game-supported teaching mathematics lessons on the attitudes of the students. It is also seen in different studies in the literature that teaching with games affects students' attitudes towards mathematics lesson positively. Tural (2005) determined the positive effect of teaching with games and activities in primary school, on students' attitudes towards mathematics compared to traditional teaching. In the study of Orak et al. (2016), it was seen that mathematics teaching supported by intelligence and strategy games had a positive effect on students' attitudes towards mathematics. In the study of Devecioğlu and Karadağ (2014), the course of intelligence games was evaluated. As a result of the research, it has been determined that teachers and students learn by having fun in the lessons, think quickly and practically, and develop their minds more thanks to intelligence games. Therefore, it is seen that the results obtained from this study are consistent with the literature.

SUGGESTIONS

In this study, the effects of intelligence games on students' success in mathematics lesson were investigated and it was tried to reveal the general thoughts of students about intelligence games lesson. In the light of the positive results obtained from the study, it is recommended to integrate these games more into the lessons. However, this study was studied with a limited sample group. It is recommended to include larger samples in different studies on the subject.

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Chapter 11

THE LIFE SKILLS PROGRAM'S EFFECTS ON LIFE SKILLS, SELF-CONCEPTIONS AND SOCIAL-EMOTIONAL COMPATIBILITY LEVELS OF CHILDREN

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Introduction

In many countries around the globe, life skills training programs categorized as development, prevention, or early-intervention programs are applied to mitigate risk factors and to develop protective factors for children (Yavuz, 2004). Education based on life skills is defined as a model improving knowledge, attitudes and skills about health issues, and offering opportunities to implement and reinforce psychosocial and interpersonal skills on a cultural and developmental footing (Adewale, 2011). Education programs based on life skills are expected to raise individuals with the high levels of self-conception desired in the society, as well as esteem, respect and tolerance for others as well as oneself (Junge et al. 2003). The primary goal of schools should be raising their students as conscious and responsible individuals who are sensitive to the society they live in, and who live a successful and happy life without dependence on others (Kılıç, 2015). The life skills training programs designed with these goals in mind have been developed to help students cope the challenges they would face in daily life (Jordaan et al. 2017), and to spend their lives as healthy individuals (Nasheeda et al.2018).

The need to develop life skills training programs arose once the importance of equipping children with life skills became clear (Behrani, 2016). These programs aim to help students develop the ability to make well-informed and healthy decisions, as well as behavior to contribute to their own well-being as well as that of others. Supporting life skills is expected to facilitate the reduction of risky behavior, the improvement of academic performance, and positive social interactions among children (Cauthen, 2012). Studies focusing on the effects of life skills programs reveal that such programs lead to positive developments in self-control and self-awareness on part of the individuals, their interpersonal relationships and decision-making processes. Life skills help minors' efficient transition from childhood to adulthood, by facilitating healthy development of social and emotional skills. They also contribute to the development of social skills and problem-solving skills which help minors to establish and shape their identity (Kaya & Deniz, 2020; Saravanakumar, 2020). Life skills trainings were also observed to help individuals prepare for the roles of productive citizens who are competent in their social circles and responsible towards their environment (Aparna & Raakhee, 2011; Roohi, 2014).

However, the debate on the age group life skills trainings should focus on is still raging. Life skills prepare the individual for life, by instilling in the independence to make her own decisions, by living a life free from any dependence. In other words, an individual equipped with life skills would be an independent one who is able to fulfill her obligations, cope with the challenges she faces, make correct choices for herself, strive for the

goals she has. Therefore, it is essential to teach the life skills, which allow the individual to shape her own life, during childhood years (Kılıç, 2015; Ndirangu et al. 2013). The outcomes of life skills training programs lead to an emphasis on the extension of the interventions to early childhood, particularly in the case of psychosocial skills, and on the need for a comprehensive approach establishing a link between the school, home, and the society in the context of life skills training. Learning basic life skills is crucial for self fulfilment, healthy decisions, development of positive relations with friends and family on part of the children, and therefore is virtually a must for their valuable contributions to the society (Usbaş Kaya, 2021). Life skills help children understand themselves as well as their potential in life, and thus motivate them. Doing so allows the children set sensible life goals and use problem solving processes upon coming across with problems in life (Wahyuningtyas, 2019).

Purpose and Significance of the Study

Schools constitute the most important social environment in the life of children, and play a major part on their self-conceptualization. The social connections they build with their peers in school environments, and the emotional reflections of such connections on the children, along with their attitudes towards their physical features have significant effects on their social and emotional compatibility (Gökçe, 2013; Turaşlı, 2006). The increase in the life skills of children is found to be correlated with increased self respect (Amjad & Jami, 2020; Gramaleki Rajabi, 2010), reduced emotional and behavioral problems (Mutiso et al., 2018) increased social skill acquisition and social-emotional compatibility (Rahmeti et al, 2010; Yıldırım &Temel, 2020). A glance at the literature reveals a large number of studies focusing on life skills and social-emotional compatibility of children in various countries (Balda & Turan, 2012; Hanley et all. 2007; Pullen et all. 2013; Rahmeti et al. 2010). However, the studies on the relationship between the life skills and social-emotional compatibility skills of children in early childhood in Turkey are rather rare (Göktürk & İnce, 2014; Gölgüven, 2016; Kaya, 2016; Yıldırım, 2017). Moreover, no study analyzing the relationship between life skills and self-conception could be found. As a result, a study focusing on the effects life skills training programs designed for early childhood period would have on the children's life skills as well as social compatibility and self-conception would be a significant contribution to the literature.

Against this background, the present study aims to analyze the effects of the "Life Skills Program" designed for children in early childhood period, on the life skills, self-conceptions and social-emotional compatibility.

Research Problem

The research problem this study investigates is whether the Life Skills Program has any effect on the life skills, self-conceptions and social-emotional compatibility levels of children. To achieve this general objective, the children who attended the Life Skills Program were compared against their peers if there were any significant difference between the

1. Early Childhood Life Skills Scale scores obtained in the pre-test, post-test, and follow-up test,

2. Demoulin Self-Conception Test for Children scores obtained in the pre-test, post-test, and follow-up test, and

3. Marmara Social-Emotional Compatibility Scale scores obtained in the pre-test, post-test, and follow-up test for the two groups.

Methodology

The study pattern employed is a semi-experimental one employing a control group, and comprised of pre-test, post-test, and follow-up (permanence) test. The dependent variables investigated are the life skills, self-conception and social-emotional compatibility levels of children in 60-66 months age group, enrolled in preschool. The "Life Skills Training Program" constitutes the independent variable, with a focus on its effects on the life skills, self-conception and social-emotional compatibility levels of children.

Study Group

The study group is comprised of 41 children enrolled in two public preschools in Düzce Province Center. Twenty-two children (12 girls, 10 boys) are assigned to the experiment group whereas 19 (10 girls, 9 boys) are assigned to the control group. The schools included in the study were chosen through a procedure whereby the schools with similar numbers of students in a given class were listed. Schools where other projects are currently in place were excluded. Thereafter, the schools to comprise the experiment and the control groups were selected through random sampling. The comparable levels of starting positions among the groups is a must for such semi-experimental studies. To ensure the groups were comparable in that sense, the Early Childhood Life Skills Scale, Demoulin Self-Conception Test for Children, and Marmara Social-Emotional Compatibility Scale were applied as pre-test. The pre-test results showed no significant variation between the average scores obtained in the tests, confirming the decision to carry out the study with the groups thus created.

Procedure and Ethical Authorization

Before the data collection began, the required authorization was obtained from the Ethics Committee of Hacettepe University, to ensure

the ethical compliance of the study. Thereafter, authorization was obtained from Düzce Provincial Directorate of Education for the implementation of the Life Skills Program and the application of the "Early Childhood Life Skills Scale", "Marmara Social-Emotional Compatibility Scale (age 5)" and "Demoulin Self-Conception Test for Children (ages 5-6)". "Child-Parent Voluntary Participation Form" was issued to the families, who were asked to fill out the form to extend their consent for their children to be enrolled in the training program, and for the implementation of the activities and required scales.

Data Collection Tools

Child and parent demographics information sheet The Child and Parent Demographics Information Sheet was designed by the researcher, to collect information about the children and their parents. The form is comprised on a number of questions about certain demographic information such as the gender of the child, time spent in pre-school, parents' level of education, and parents' age.

Demoulin Self-Conception Test for Children: The test originally developed by Demoulin (2000) was adapted into Turkish language by Turaşlı (2006) for use with children in 60-72 months age group. The test is comprised of a total of 30 items organized in two sub-scales: self-respect (15 items) and self-efficacy (15 items). During the test's adaptation into Turkish language, one item in the self-respect sub-scale was dropped, to bring the overall item count to 29 items. The Cronbach's alpha score of reliability was found to be 0.885 (Turaşlı, 2014). The children's assessment on their self-perception within a group is covered by the self-respect sub-scale (the first 14 items), whereas the children's self-assessment is covered by the self-efficacy sub-scale (the last 15 items). The test is applied to each child individually, and independent of the group. In the present study, the Cronbach's alpha value of Demoulin Self-Conception Test for Children is found to be 0.735.

Marmara Social-Emotional Compatibility Scale (MASDU): In the present study the age 5 form of Marmara Social-Emotional Compatibility Scale was used. The validity and reliability assessment was performed by Güven & Işık (2006). The scale is comprised of the following sub-scales: Compliance with the Requirements of Social Life (9 items), Reaction in Line with Social Situation (4 items), Interaction with Peers (3 items), and Positive Attitudes towards the Social Environment (3 items) (Güven & Işık, 2006). The answers provided to the items in the scale are scored as follows: Never - 1 point, Sometimes - 2 points, Always - 3 points. The higher the score received in the scale the higher would be the assessment of the the child's social and emotional compatibility level (Güven & Işık,

2006). The scale is filled out by teachers. The Cronbach's alpha value of Marmara Social-Emotional Compatibility Scale in the context of the present study is found to be 0.788.

Early Childhood Life Skills Scale: The Early Childhood Life Skills Scale (ECYBO) is developed by the author, with a view to assessing the life skills levels of children in 48-72 months age group. The questions in the scale cover communications, interpersonal relationships, critical thinking, creative thinking, problem solving, decision-making, emotion management, coping with stress, self-awareness, empathy skills which are the 10 fundamental life skills named by World Health Organization, as well as the health and safety skills added by the author. The monolithic scale is composed of 56 items, scored on a 5-point likert scale. The scale was applied for each child individually, by the teachers. The assessment is based on the average of overall scores. The validity and reliability analysis found the scale's Cronbach's alpha internal consistency factor to be 0.98.

Data Collection Process

The work on the implementation and effectiveness assessment of the Life Skills Program took place in between February and June on school year 2017-2018. All three assessment tools were applied prior to the implementation of the Life Skills Program. The Early Childhood Life Skills Scale and Marmara Social-Emotional Compatibility Scale used in the study were filled out for individual students, by the teachers of the classes which comprised the experiment and the control groups. Filling out the two scales for a child took approximately 10 minutes. Demoulin Self-Conception Test for Children, on the other hand, was applied by the author in the company of the children. At the table, each child were given a paper containing the scale item and facial expressions. The researcher first iterated items of the scale one by one for each child, and then asked the child to paint the expression they feel most applicable for the case, using any colored pencil of their choice. The process for each child took an average of 10 to 15 minutes. The pre-test was carried out on February 5-9, 2018, the post-test was carried out on May 7-9, 2018, and the follow-up tests were carried out on June 4-6, 2018.

Table. Research Design

Group	Pre-test	process	Post-test	Follow-up test
D (experiment group)	O1.1	YBP (Life skills program)	O.1.2	O.3
K (control group)	O.2.1		O.2.2	

The letter D stands for the experiment group with which the Life Skills Program was implemented, letter K stands for the control group, O1.1 and O1.2 respectively stand for the pre-test and post-test assessments of the

experiment group, O2.1 and O2.2 respectively stand for the pre-test and post-test assessments for the control group, O3 stands for the follow-up test results for the experiment group, and YBP stands for the independent variable (Life Skills Program) applied with the experiment group.

Early Childhood Life Skills Program and Application

The Early Childhood Life Skills Program is developed by the author, to develop life skills of children in 48-72 months age group, to be applied for 12 weeks, for three days (Monday, Wednesday, Friday) per week. The activities took their final form upon consultations with experts.

Figure 1. Preparation of the Life Skills Program

The Early Childhood Life Skills Program prepared within the framework of the present study is based on the 10 fundamental life skills named by World Health Organization, along with health and safety skills. The life skills covered are grouped under "Social Life Skills", "Self- and Emotion-Management Skills", and "Healthy and Safe Life Skills" categories.

Figure 2. The Categorization of Life Skills Covered by the Author

(Topcu Bilir, 2019)

In order to ensure that the children are accustomed to and comfortable with the researcher, one week prior to the commencement of the program the researcher joined the experiment group class as a guest, and took part in the activities in the company of the class' teacher. As the researcher applied the activities in the program, the teachers also stayed in the classroom, and assisted the researcher where necessary.

Findings

Table 1 presents the average scores the children in the experiment group received in the pre-test, post-test, and follow-up test with the Early Childhood Life Skills Scale. Table 2 presents the average scores the children in the control group received in the pre-test and post-test with the Early Childhood Life Skills Scale. Finally, Table 3 presents the difference between the groups based on the difference in the scores received with respect to life skills.

Table 1. Wilcoxon test results showing the difference between average scores the experiment group received in pre-test, post-test, and follow-up test with ECYBO

	Experiment Group						Wilcoxon Signed Rank Test	
	n	X	Median	Min	Max	Std. Dev.	z	p
Pre-test Average with Early Childhood Life Skills Scale	22	4.02	3.96	3.48	4.61	.30	-4.10	.000
Post-test Average with Early Childhood Life Skills Scale	22	4.49	4.57	3.86	4.82	.25		
Post-test Average with Early Childhood Life Skills Scale	22	4.49	4.57	3.86	4.82	.25	-4.11	.000
Follow-up Test Average with Early Childhood Life Skills Scale	22	4.75	4.85	4.29	4.98	.20		

* $p < 0.01$

A glance at Table 1 reveals a statistically significant difference between the average pre-test and post-test scores the experiment group received with ECYBO ($z= -4.10$; $p<0.05$). The post-test results show a significant improvement, with average post-test scores for ECYBO ($X=4.49$) significantly higher than average pre-test scores ($X=4.02$). In the same vein, the comparison of the average scores the experiment group got in the post-test ($X=4.49$) and the follow-up test ($X=4.75$) with ECYBO reveals a statistically significant variation, with the results of the latter test showing improvement. ($z=-4.11$; $p<0.05$). The results support the argument that the life skills program thus applied brought about lasting positive improvements in the participating children's life skills levels.

Table 2. Wilcoxon test results showing the difference between average scores the control group received in pre-test and post-test with ECYBO

	Control						Wilcoxon Signed Rank Test	
	n	X	Median	Min	Max	Std. Dev.	z	p
Pre-test Average with Early Childhood Life Skills Scale	19	4.17	4.23	3.41	4.57	.31	-3.50	.000
Post-test Average with Early Childhood Life Skills Scale	19	4.37	4.38	3.70	4.66	.25		

* p < 0.01

A glance at Table 2 reveals a statistically significant difference between the average pre-test (*X=4.17*) and post-test scores (*X=4.37*) the children in the control group received with ECYBO (*z= -3.50; p<0.05*). The children in the control group, just like their peers in the experiment group, had higher average post-test scores with ECYBO. This finding leads to the conclusion that the education provided through the existing preschool education program also facilitates the development of life skills of children.

Table 3. Mann Whitney U Test on the difference between the groups based on the difference of life skills scores

		Group							Mann-Whitney-U Test		
		n	X	Median	Min	Max	Std. Dev.	Mean Rank	U	z	p
Life skills score difference	Experiment	22	0.46	0.44	0.05	0.83	0.21	27.52	65.5	-3.7	0.0001
	Control	19	0.19	0.16	-0.03	0.55	0.17	13.45			
	Total	41	0.34	0.32	0-.03	0.83	0.23				

* p < 0.01

A glance at the difference between the average pre-test and post-test scores the experiment and the control groups got for the ECYBO scale reveals a statistically significant difference in life skills scores *(U=65.5, z=-3.7; p<0.05).* The increase in the experiment group's life skills level (*x=0.46)* is also significantly higher than the increase in the control group's life skills levels *(x=0.19*). This finding suggests that the preschool education program supports the development of the children's life skills. However, a program tailored to improve the life skills, used in combination with the existing preschool education program, apparently brings about higher levels of lasting effect on the children's life skills levels. The comparison

of the pre-test, post-test, and follow-up test scores the children in the experiment and the control groups got in Demoulin Self-Conception Test for Children is presented in Tables 4 and 5.

Table 4. Wilcoxon test results showing the difference between average scores the experiment group got in the pre-test, post-test, and follow-up test with Demoulin Self-Conception Test for Children

	Experiment						Wilcoxon Signed Rank Test	
	n	X	Median	Minimum	Maximum	Std. Dev.	z	p
Pre-test - Self Efficacy Sub-Scale	22	36.59	37.50	27.00	42.00	3.90	-2.2	0.025*
Post-test - Self Efficacy Sub-Scale	22	38.41	39.00	30.00	42.00	2.94		
Post-test - Self Efficacy Sub-Scale	22	38.41	39.00	30.00	42.00	2.94	-0.255	0.799
Follow-up test - Self Efficacy Sub-Scale	22	38.36	39.00	35.00	42.00	2.13		
Pre-test - Self Respect Sub-Scale	22	40.05	40.50	35.00	43.00	2.52	-3.22	0.001*
Post-test - Self Respect Sub-Scale	22	42.05	43.00	37.00	45.00	1.76		
Post-test - Self Respect Sub-Scale	22	42.05	43.00	37.00	45.00	1.76	-1.46	0.142
Follow-up test - Self Respect Sub-Scale	22	41.55	42.50	37.00	45.00	2.36		
Pre-test - Total Self Conception Score	22	76.64	77.50	62.00	85.00	5.85	-3.02	0.002*
Post-test - Total Self Conception Score	22	80.45	81.50	69.00	87.00	4.14		
Post-test - Total Self Conception Score	22	80.45	81.50	69.00	87.00	4.14	-0.981	0.327
Follow-up test - Total Self Conception Score	22	79.91	81.50	72.00	85.00	4.15		

* $p < 0.05$

A review of Table 4 reveals that the experiment group's average scores in the post-test, for the self-efficacy subscale of the self-conception test (*x=38.41)* are significantly higher than the comparable average scores received in the pre-test *(x=36.59).* In the same vein, the experiment group's average scores in the post-test, for the self-respect subscale *(x=42.05)* are significantly higher than the comparable average scores received in the pre-test *(x=40.05).* The review of the average total self-conception scores of the experiment group also revealed a statistically significant difference between the average scores obtained in the pre-test and the post-test *(z=-*

3.02; p<0.05). The average post-test score *(x=80.45)* for Demoulin Self-Conception Test for Children is significantly higher than the average pre-test score *(x=76.64)* for the same test. The comparison of the average scores the experiment group had in the post-test and follow-up test with Demoulin Self-Conception Test for Children reveals no statistically significant difference between the average post-test score *(x=80.45)* and the average follow-up test score *(x=79.91)* in the case of self-efficacy and self-respect subscales *(z= -0.327; p>0.05*). The findings reached supports the argument that the early childhood education program applied within the framework of the study had lasting positive contributions to the self-conception levels of children.

Table 5. Wilcoxon test results showing the difference between average scores the control group got in the pre-test and post-test with Demoulin Self-Conception Test for Children

	Control						Wilcoxon Signed Rank Test	
	n	X	Median	Minimum	Maximum	Std. Dev.	z	p
Pre-test - Self Efficacy Sub-Scale	19	36.53	37.00	29.00	42.00	3.41	-0.49	0.624
Post-test - Self Efficacy Sub-Scale	19	36.16	36.00	31.00	40.00	2.79		
Pre-test - Self Respect Sub-Scale	19	40.00	41.00	32.00	43.00	3.07	-0.675	0.501
Post-test - Self Respect Sub-Scale	19	40.32	41.00	34.00	43.00	2.26		
Pre-test - Total Self Conception Score	19	76.53	78.00	63.00	83.00	5.66	-0.252	0.801
Post-test - Total Self Conception Score	19	76.47	77.00	66.00	83.00	4.45		

$p < 0.05$

A glance at Table 5 reveals no statistically significant difference between the average pre-test (*x=36.53*) and post-test scores (*x=36.16*) the children in the control group received for the self-efficacy subscale (*z= -0.49; p<0.05*). Again, no statistically significant difference was observed with the average scores for the self-respect subscale in the pre-test and post-test *(z=-0.675; p>0.05*). Still, the average scores obtained in the post-test (*x=40.32*) are nominally higher than the average scores obtained in the pre-test *(x=40.00*). A glance at the overall scores the control group had in the Demoulin Self-Conception Test for Children reveals no statistically significant difference between the average scores for the pre-test (*x=76.53*) and the average scores for the post-test (*x=76.47*) *(z=-0.252; p>0.05*).

These findings lead to the conclusion that the regular preschool education program the control group received did not lead to a statistically significant difference in the self-conception levels of children.

Table 6. Wilcoxon test results showing the difference between average scores the experiment group got in the pre-test, post-test, and follow-up test with Marmara Social-Emotional Compatibility Scale

	Experiment						Wilcoxon Signed Rank Test	
	n	x	Median	Min	Max	Std. Dev.	z	p
Pre-test - Compliance with the Requirements of Social Life	22	22.41	22.00	16.00	27.00	2.61	-3.9	0.0001
Post-test - Compliance with the Requirements of Social Life	22	25.55	26.00	21.00	27.00	1.57		
Post-test - Compliance with the Requirements of Social Life	22	25.55	26.00	21.00	27.00	1.57	-2.7	0.006
Follow-up test - Compliance with the Requirements of Social Life	22	27.86	27.00	22.00	45.00	5.68		
Pre-test - Reaction in Line with Social Situation	22	10.23	10.50	7.00	12.00	1.15	-3.09	0.002
Post-test - Reaction in Line with Social Situation	22	10.23	11.00	8.00	12.00	1.05		
Post-test - Reaction in Line with Social Situation	22	11.05	11.00	8.00	12.00	1.05	-3.07	0.002
Follow-up test - Reaction in Line with Social Situation	22	12.45	12.00	10.00	20.00	2.52		
Pre-test - Interaction with Peers	22	7.23	7.00	4.00	9.00	1.45	-1.33	0.182
Post-test - Interaction with Peers	22	7.55	8.00	6.00	9.00	.96		
Post-test - Interaction with Peers	22	7.55	8.00	6.00	9.00	.96	-3.204	0.001
Follow-up test - Interaction with Peers	22	8.91	9.00	6.00	15.00	2.20		
Pre-test - Positive Attitudes towards the Social Environment	22	8.59	9.00	6.00	9.00	.73	-0.687	0.492
Post-test - Positive Attitudes towards the Social Environment	22	8.68	9.00	6.00	9.00	.72		
Post-test - Positive Attitudes towards the Social Environment	22	8.68	9.00	6.00	9.00	.72	-2.23	0.026
Follow-up test - Positive Attitudes towards the Social Environment	22	9.50	9.00	8.00	15.00	1.79		
Pre-test - Overall Score for the Social-Emotional Compatibility Scale	22	48.45	48.00	43.00	53.00	3.07	-3.9	0.0001
Post-test - Overall Score for the Social-Emotional Compatibility Scale	22	52.82	53.00	45.00	56.00	2.79		
Post-test - Overall Score for the Social-Emotional Compatibility Scale	22	52.82	53.00	45.00	56.00	2.79	-3.6	0.0001
Follow-up test - Overall Score for the Social-Emotional Compatibility Scale	22	58.73	56.00	50.00	95.00	11.92		

$p < 0.01$

A glance at Table 6 reveals a statistically significant difference between the average pre-test (*x=22.41*) and post-test scores (*x=25.55*) for Compliance with the Requirements of Social Life (*z= -3.9; p<0.005*). Moreover, a statistically significant difference was observed between the average pre-test (*x=10.23*) and post-test scores (*x=10.23*) for Reaction in Line with Social Situation (*z= -3.09; p<0.05*). In addition, no statistically significant difference was observed between the average pre-test (*x=7.23*) and post-test scores (*x=7.55*) the children received for Interaction with Peers (*z= -1.33; p<0.05*). Again, no statistically significant difference was observed between the average pre-test (*x=8.59*) and post-test scores (*x=8.68*) the children received for Positive Attitudes towards the Social Environment (*z= -0.687; p<0.05*). The comparison of the average scores received in the post-test (*x=52.82*) and the pre-test (*x=48.45*) for Marmara Social-Emotional Compatibility Scale reveals a statistically significant increase by the post-test (*z=-3.9; p<0.05*). The comparison of the average scores the experiment group got in the post-test and the follow-up test with Marmara Social-Emotional Compatibility Scale reveals a significant difference between the Compliance with the Requirements of Social Life, Reaction in Line with Social Situation, and Interaction with Peers subscales (*p<0.05*), which are characterized by higher follow-up test scores compared to post-test scores. On the other hand, no statistically significant difference was observed between the average scores obtained in the post-test and the follow-up test for the Positive Attitudes towards the Social Environment subscale (*p>0.05*). The comparison of the average overall scores obtained in the post-test and the follow-up test for Marmara Social-Emotional Compatibility Scale reveals a significant difference in favor of the average scores obtained in the follow-up test (p<0.05), where the participants got higher average scores compared to their performance in the post-test. These findings support the argument that the early childhood life skills training program helps improve the social-emotional compatibility levels of children in the experiment group.

Table 7. Wilcoxon Test results for the Social-Emotional Compatibility Scale with respect to the variation in variables with the control group

	Control						Wilcoxon Signed Rank Test	
	n	Mean	Median	Min	Max	Std. Dev.	z	p
Pre-test - Compliance with the Requirements of Social Life	19	25.47	26.00	22.00	27.00	1.68	-0.058	0.954
Post-test - Compliance with the Requirements of Social Life	19	25.47	26.00	23.00	27.00	1.17		

Pre-test - Reaction in Line with Social Situation	19	10.84	11.00	8.00	12.00	1.01	-1.5	0.132
Post-test - Reaction in Line with Social Situation	19	11.11	11.00	8.00	12.00	1.05		
Pre-test - Interaction with Peers	19	8.32	9.00	6.00	9.00	1.11	-1.2	0.206
Post-test - Interaction with Peers	19	8.53	9.00	6.00	9.00	.84		
Pre-test - Positive Attitudes towards the Social Environment	19	8.53	9.00	5.00	9.00	1.02	-1.13	0.257
Post-test - Positive Attitudes towards the Social Environment	19	8.74	9.00	8.00	9.00	.45		
Pre-test - Overall Score for the Social-Emotional Compatibility Scale	19	53.16	54.00	43.00	57.00	3.66	-1.5	0.123
Post-test - Overall Score for the Social-Emotional Compatibility Scale	19	53.84	55.00	48.00	57.00	2.27		

$p < 0.05$

An analysis of Table 7 reveals the lack of a statistically significant difference between the average scores the control group got in the pre-test and the post-test for specific subscales of Marmara Social-Emotional Compatibility Scale as well as the overall scale (*p>0.05*). These finding leads to the conclusion that the regular preschool education program the control group received did not lead to a statistically significant difference in the children's social-emotional compatibility levels.

Discussion and Conclusions

The effect of the Life Skills Program developed by the author, on the life skills levels of children was assessed using the Early Childhood Life Skills Scale (ECYBO) developed again by the author, in a setting based on experiment and control groups, and pre-tests, post-tests, and follow-up tests. A statistically significant difference was observed between the ECYBO pre-test and post-test average scores of the children in the experiment group, who received the Life Skills Program. The children in the experiment group were observed to get significantly higher average scores in the post-test of ECYBO, compared to their average scores in the pre-test. Again, the children in the experiment group got significantly higher average scores in the follow-up test application of ECYBO, compared to their performance in the post-test. Therefore, one can reach to the conclusion that the Life Skills Program applied with the children in the experiment group brought about positive changes in their life skills. Another significant difference was observed between ECYBO pre-test and post-test average scores of the control group, comparable to the change observed with the experiment group. Again, the average scores obtained in

the post-test were higher compared to the ones obtained in the pre-test. On the other hand, the difference between the pre-test and post-test scores of the experiment group, which received the life skills training, was markedly higher than the difference registered in the case of the control group. In the light of this finding, one can forcefully argue that the official preschool education program in place in all schools in the country help improve the children's life skills levels, whereas a life skills training program to be implemented with specific emphasis on life skills would help increase the children's life skills levels further. There is a wealth of studies denoting the positive contributions of life skills programs on the life skills levels of children. For instance, Yıldırım (2017) observed that, in the aftermath of a 12-week life skills training program, the children exhibited significantly higher levels of life skills. In the same vein Mohtadi & Zboon (2017) observed that the life skills training program led to higher levels of healthy life skills among 5-6 years old children who attended the training program. Catherine (2002) showed that an education program to support life skills and health skills of children helped facilitate the development of life skills of children in the aftermath of the program. Botvin & Griffin (2004) demonstrated that the life skills program carried out with children helped them develop life skills including social confidence and autonomy. Against this background, the findings reached in the present study provide further support for the arguments presented in earlier research.

The study also investigated the Life Skills Program's effect on the children's self-conception levels, using Demoulin Self-Conception Test for Children in a setup comprised of pre-test, post-test, and follow-up test. A statistically significant difference was observed between the Demoulin Self-Conception Test for Children pre-test and post-test average scores of the children in the experiment group. It is also noteworthy that the experiment group received higher average post-test scores for both self-respect and self-efficacy subscales. The average overall scores obtained in the Demoulin Self-Conception Test for Children were, again, significantly higher in the post-test. On the other hand, no statistically significant difference was observed between the Demoulin Self-Conception Test for Children post-test and follow-up test average scores of the children in the experiment group. It is understood that the life skills program applied with the experiment group had a positive effect in terms of bringing about lasting self-conception levels of children. The comparison of the average pre-test and post-test scores in the Demoulin Self-Conception Test for Children applied with the control group revealed no significant difference with respect to the self-efficacy and self-respect subscales, even though the average scores obtained in the post-test with respect to the self-respect subscale increased. A statistically significant difference was

observed between the Demoulin Self-Conception Test pre-test and post-test average scores of the children in the control group. Other studies in the literature confirms these observations. For instance, Khera & Khosla (2012) analyzed the relationship between life skills and self-conception, and found a positive correlation between basic life skills and the students' self-conception. They observed that students who had a good grasp of basic life skills had better self-esteem on all fronts. In the same vein, Anuradha (2012) found a high level of correlation between the students' life skills and self-conception, whereas Mishal (2016), in a study on the relationship between self-conception and life skills, underlined the effect of life skills trainings on improving self-conception of children. The richer an experience the children have at the school, the faster they develop an awareness of their abilities as well as a positive self-conception (Karaca &Aral, 2016). Therefore, the activities to be implemented should focus on improving the children's skills and supporting their self-awareness. The lack of variation in the self-conception levels observed with the control group is probably due to the lack of adequate support for the development of self-conception among the children, through the activities included in the existing preschool program provided to the control group. Against this background, the activities designed within the framework of the Life Skills Program arguably had a positive effect on the self-conception levels of children.

The study also investigated the Life Skills Program's effect on the children's social-emotional compatibility levels , using Marmara Social-Emotional Compatibility Scale, in a setup comprised of pre-test, post-test, and follow-up test. The pre-test and post-test scores the experiment group had for Marmara Social-Emotional Compatibility Scale revealed a significant difference between the average scores obtained in both tests with respect to the "Compliance with the Requirements of Social Life" and "Reaction in Line with Social Situation" subscales. The average scores for these subscales were significantly higher in the post-test. On the other hand, no significant difference was observed between the average pre-test and post-test scores for the "Interaction with Peers" and "Positive Attitudes towards the Social Environment" subscales. A glance at the average overall scores for Marmara Social-Emotional Compatibility Scale reveals that the average scores in the post-test are higher than the average scores in the pre-test. The comparison of the average scores for the Marmara Social-Emotional Compatibility Scale in the post-test and the follow-up test, on the other hand, revealed a statistically significant difference, with average scores in the follow-up test cruising significantly higher. The life skills program applied with the experiment group thus had a positive as well as lasting effect on the social-emotional compatibility levels of children,

with effects increasing in time. The comparison of the control group's average scores in the pre-test and post-test for Marmara Social-Emotional Compatibility Scale revealed no statistically significant difference with respect to the overall scale as well as any subscales. The lack of any change in social-emotional compatibility levels in spite of the increase in the life skills levels of the children in the control group deserves further investigation. The Life Skills Program implemented within the framework of the present study involved a number of distinct learning and teaching techniques, including role play, small group activities, and scamper activities. The types of activities, outcomes, indicators and learning-teaching techniques employed for this purpose arguably improve social-emotional compatibility levels of children, bringing about the difference between the two groups. In the light of these findings, one can forcefully argue that the Life Skills Program implemented within the framework of the study had a positive effect on improving the social-emotional compatibility levels of children. The literature is rich in terms of studies investigating the effects of life skills on social-emotional compatibility and social skills. The conclusions reached in the present study are in parallel to those of earlier studies. Göktürk İnce (2014) observed that the peaceful life skills training program had a positive effect on social skills and compatibility of 5 years old children. Similarly, in a study with 4 years old children, Kaya (2016) found that the life skills program was followed by a significant increase in children's average scores in social skills, social cooperation, social interaction, social independence, and social acceptability. Göl Güven (2016) found that Lions Quest Life Skills Training Program brought about positive contributions on the climate in the school, students' behaviors, and the students' conflict resolution strategies. Rahmeti et al. (2010) revealed that life skills training had a significant effect on children's interpersonal relationships, communication and social skills. Liu et all, (2016) found that the life skills training program applied with children helped with their behavioral problems. Vranda & Rao (2011) reached the conclusion that life skills training facilitated the development of psycho-social competences, whereas Benitez, et all.,(2011) observed that the life skills training program was effective in reducing problematic behaviors and improving social skills on part of 4 years old children. Roodbari et al. (2013) found that life skills training had a positive effect on social-emotional compatibility of children, and that higher life skills levels led to further improvements in social-emotional and social compatibility. In the same vein, Hanley et al. (2007) observed reductions in problematic behavior on part of children who received support to improve their life skills. Eisenberg et al. (2003), in turn, noted that preschool children capable of social self-control had fewer negative emotions in their relations with their peers, and that children with the ability to self-control reacted in socially adequate ways even in

tense social circumstances. Against this background, one can forcefully state that existing studies in the literature are consistent with the findings reached herein.

In conclusion, the life skills training program developed for early childhood period not only improves their life skills levels, but also brings about positive changes in their social-emotional compatibility and self-conception levels. On the other hand, certain limitations of the study should be noted. The study was carried out with children in the 60-66 months age group. Future studies may investigate the effects of the life skills program developed in this context, on children in other age groups. Furthermore, subsequent studies may be needed to assess the Life Skills Program's effects on the life skills of children from different socioeconomic and sociocultural backgrounds and development levels.

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Chapter 12

MATHEMATICAL PROBLEM POSING AND SOLVING

Mithat TAKUNYACI[1]

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The problems that individuals will face in the future may be very different from the problems of today, so the individual who will live in a world of the future should be an individual who can reason according to the situation of the problems he encounters instead of memorizing the stereotyped information of today. The most important feature that makes mathematics valuable is that dealing with mathematics improves the ability of the individual to think, discuss, and reason (Altun, 2006).

The situation of reformulating the problem or presenting a new problem, which is stereotyped as "problem posing" in the international literature, has been referred to by different names in our country, such as "problem posing", "problem creation", and "problem designing". Problem posing is the process by which students can produce logical problems using their mathematical experiences and individual interpretation in accordance with the given situations (Stoyanova & Ellerton, 1996). Leung (1993) defined problem posing as reorganizing an existing mathematical problem. Cai and Hwang (2019) have said that constructing mathematical problems can be done in situations involving mathematical expressions or diagrams and by editing (reformulating) existing problems. NCTM (National Council of Teachers of Mathematics) (2000) states that problem-posing creates a new problem by taking advantage of a situation or experience. In the definition of problem posing made by Ersoy (2006), it is mentioned that the individual creates a new problem by renewing the values of the data, differentiating the given and desired information, or changing the content of an original problem. When the definitions of problem setting up in the literature are examined, it is seen that some common points are mentioned. This; is to reformulate the existing problem by benefiting from the individual's experience and to create a problem in accordance with the given situation.

Problem posing is one of the critical components of mathematical research (Cai & Hwang, 2002). Developing students' ability to present problems and express their daily experiences mathematically should be vital in mathematics teaching at all class levels. Reconciling mathematics with everyday life will (Stoyanava, 2003) undoubtedly make the course more engaging for students. Problem-posing is a powerful tool for associating mathematics with everyday life. Similarly, Turhan and Güven (2014) said that mathematics teaching with a problem-posing approach helps students discover problems in daily life. According to Leung (2013), problem-posing reduces students' negative thoughts toward the lesson. It has been observed that mathematics teaching with problem-setting approaches positively increases interest in the course and makes the lesson fun (Güzel & Biber, 2019).

Problem posing is not only limited to the activities carried out in the lessons but also a form of teaching. The problem-posing process is

an effective way to use, understand, comprehend and apply mathematical knowledge (Türnüklü, Ergin, & Aydoğdu, 2017); it is exciting and benefits conceptual understandings (Işık & Kar, 2012), it is a way that helps students to make sense of the mathematical subject, processes and expressions (Ada, Demir, & Öztürk, 2020), helps to gain basic processing skills and cognitive development of students (Albayrak, İpek, & Işık, 2006). According to Mestre (2002), problem formation is a measurement tool that can investigate students' conceptual understanding and reasoning ability. Similarly, Silver (1994) emphasized that composing a problem is a window to understanding mathematical thinking and concepts. In this respect, problem-posing is a tool to identify students' mistakes and misconceptions. Problem-making experiences provide a potentially rich space for students to explore the interaction between the cognitive and affective dimensions of their mathematical learning (Silver, 1994).

Problem-setting is a task that challenges students cognitively (Mestre, 2002). It is also a process of high-level mental actions that includes problem-solving skills (Bayazit & Kırnap-Dönmez, 2017). In addition, problem-setting allows students to think from different perspectives (Cai, 2003). Through problem-posing activities, students are introduced to exploring problem structures and solution paths rather than just focusing on finding solutions (Stoyanava, 2003). Effective problem-posing is a crucial factor in teaching high-quality mathematics. (Cai & Hwang, 2019).

Problem-posing exercises develop students' ability to express different situations. According to Tertemiz (2017), problem-posing exercises develop students linguistically and help them express the solutions to problems while improving their thinking skills. Forming problems allows students to make mathematical reasoning, explore mathematical situations and explain them orally or in writing appropriately (Akay, Soybaş, & Argün, 2006).

Gonzales (1988) added the problem-posing step as the fifth to Polya's four-step problem-solving step. Problem-solving and problem-posing are approaches that support each other. It has been observed that mathematics teaching, supported by problem-setting activities, improves problem-understanding and problem-solving skills and positively affects mathematics success. (Cai, 2003; Canköy & Darbaz, 2010; Cantürk Günhan, Light, Çiltaş & Kar, 2012).

The use of different forms of representation in mathematics is important for mathematical competence and being able to make sense of mathematical information with different representations makes the learning environment more efficient (Goldin, 2004; Van de Walle, 2004). Mathematical representations are representations that serve to establish

the connection between objects and mathematical symbols (Kaput, 1987). In addition, multiple representations appeal to students with different types of learning styles and provide an effective learning opportunity. Ainsworth (1999) stated that it would be useful to use different representations in the teaching process to increase the interest of students with individual differences in the courses (Mallet, 2007).

Problem posing is like opening a window to students' conceptual comprehension and mathematical thinking, and it is also possible to observe aspects of students' attitudes and tendencies toward mathematics through this window (Silver, 1994). The representations used in the teaching process should be appropriate to the nature of the subject and should be such that the student can understand and reason (Ball, 1993). That's why it's important to know which forms of representation students make better sense of. The dissemination of problem-posing studies for different forms of representation will contribute to a better understanding of the problem-posing area, and the relationship between problem-posing and math achievement and grade level will be strongly utilized.

Problem Posing Classifications

When the literature is examined, it is seen that there are different classifications of problem posing. The most commonly used of these is the free, semi-structured, and structured problem-setting situations that Stoyanova and Ellerton (1996) brought to the literature.

- **Free problem-posing situation:** It is the task of setting up a problem based on a situation, without much restriction on students. For example, it is a problem-setting situation that includes general instructions such as 'Set up a problem of medium difficulty', 'Set up a problem with fractions', or 'Set up a problem appropriate for the math test we are going to do'.

- **Semi-structured problem posing-situation:** When students are given explicit situations such as stories, pictures, inequalities, equations, tables, etc., situations inviting them to complete the data or setting up problems in accordance with the given ones are called semi-structured. Examples of semi-structured situations such as the task of setting up problems in accordance with the table showing the prices of some fruits, giving a few words or sentences, and completing the continuation.

- **Structured problem-posing:** In this case, students are given a well-structured problem or problem solution and asked to construct a different problem related to the given problem or solution. It is the task of the teacher to solve a problem on the board and ask the students to set up a problem in a similar way.

Christou, Mousoulides, Pittalis, Pitta-Pantazi, and Sriraman (2006) divided their problem-setting situations into four Organizing Quantitative Knowledge, Choosing Quantitative Knowledge, Comprehending Quantitative Knowledge, and Transferring Quantitative Knowledge.

- **Editing quantitative information:** Students are given stories, pictures, etc., to establish a problem.

- **Selecting quantitative information:** The task of establishing a problem involves structuring the given context appropriately according to the desired answer.

- **Comprehending:** It is the task that students need to construct problems from the mathematical equations or calculations given.

- **Translating quantitative information:** It is the task of setting up problems in accordance with the tables or graphics given to the students.

Silver's (2003) classification is divided into three headings: before the solution, within the solution, and after the solution.

- **Problem-posing before solution**: It is the case of establishing new problems that are different and original from the problem given to the students.

- **Problem-posing within a solution:** It is the case of reformulating or creating a problem that has been solved.

- **Post-solution problem-posing**: It creates new problems by changing the goals and conditions of an issue with a solution.

Canköy and Darbaz (2010) carried out different problem-posing activities in problem- posing based problem-solving training.

- **Puzzle-Shaped problem posing activity**: Students are given numbers and words in writing on the papers and asked to set up problems by ordering the given papers appropriately, just like a jigsaw puzzle.

- **Problem-posing activity in accordance with the given instructions:** Students are asked to set up problems in accordance with the numerical or verbal instructions given. For example, if you have a shopping problem that involves addition and subtraction.

- **Problem-posing activity by adding words:** Words are given as the beginning of the problem and the student is asked to complete the problem. For example, "I have 20 pounds of money in my pocket..." a context can be given for students to complete.

- **Problem-posing activity by using concrete objects or pictures:** Students are asked to set up problems with the help of the given object or picture.

Problem solving

One of the most studied topics within the scope of educational researchis problem solving. With the article "raising individuals who can solve problems", which is among the achievements of education curricula, it is aimed to raise individuals who can not only solve course problems but also cope with life problems (MEB, 2013). From this point of view, problem solving has been a subject that not only educational scientists but also psychologists have been working on (Kılıç & Samancı, 2005).

In individuals who can solve problems; Having a critical point of view, using different perspectives, analysis, synthesis and evaluation, algorithmic operations, making sense of schematic information, determining and using strategies, etc. behaviors develop more. The ability to understand mathematical information and to create the relationship between it occurs in the problem-solving process (Swings & Peterson, 1988).

The problem is basically a conflict situation in which the individual encounters inhibition in achieving a goal (Morgan, 1995). Olkun and Toluk (2004) define the problem as situations that arouse the desire to solve the problem in the person and the solution procedure is not ready, but the person can solve it by using their knowledge and experience. The way to succeed in math is directly related to good problem solving. In this sense, how the problem-solving process works in the teaching and learning of mathematics is very important. Since problem solving is also a scientific method, it requires critical thinking, creative and reflective thinking, and the use of analysis and synthesis skills (Soylu & Soylu, 2006).

Blum and Niss (1991) define a problem as an open-ended situation in which the person does not have enough direct knowledge of methods or algorithms to answer the questions. This definition suggests that the problem may vary according to the person; it means that situations that are a problem for one can only be an exercise for another. However, as a reflection of traditional understanding, when it comes to problem solving in mathematics, the first thing that comes to mind is verbal (traditional) problems (Blum & Niss, 1991)

A student's success in problem-solving depends on the development of his or her problem-solving skills (Kilpatrick, 1985). According to Polya (1945), problem solving occurs in four steps – understanding the problem, making a plan, implementing the plan, and checking back. The comprehension step is measured by critical behaviors such as being able

to express the problem in their own sentences, saying what is given and wanted, creating schematics or graphs appropriate to the problem.

It is claimed that the solution of a problem depends not only on the ability to calculate, but also on domain-specific knowledge. Types of information in the literature; semantic information is defined as schematic information, algorithmic information and strategic information and they emphasize that the individual should have these types of information in solving a problem (Karataş & Güven 2003).

Since different representations will be used continuously in the problem-solving steps, there is a linear relationship between the ability to use multiple representations and the ability to solve problems. Some studies have reached conclusions that support this opinion (Delice and Sevimli, 2010). Mathematical problems are confronted with one of the forms of representation such as schema, verbal representation, graphic representation, symbolic representation. Then the solution of the problem should be started by planning to the result with different representations appropriate to these problems. What is done in this process is to make sense of the representations with the transactions and to realize the hope of return between the representations. Similarly, Polya (1945), when talking about problem-solving steps, referred to transitions between representations in the step of understanding the problem.

The problems we encounter while continuing our daily lives also confront us with one of the types of representation such as verbal, formal and symbolic. What needs to be done when solving a mathematical problem is to make sense of the problem that we encounter with any type of representation, then plan and implement the plan. As such, multiple representations are actually the means of connection that connect real life with the lessons learned in schools. Similarly, NCTM (2000) attributes a student's problem-solving success to the selection, use, and conversion of representations in accordance with the mathematical idea.

Janvier (1987) states that mathematics, which is defined as the language of nature, can be related to natural phenomena and other sciences by using different notations in mathematics. All of these different languages and notations used in the literature on mathematics education are called multiple representations. In its most general sense, representations can be defined as the process of modeling abstract concepts or symbols through embodying in the real world (Kaput, 1998). Furthermore, in the same mathematical concept or problems, representations can be used as a flexible tool for problem solving, when transitions can be made in themselves or with each other (Monaghan, Sun & Tall, 1994).

Teaching students the use of tools to help them construct a mental representation of the problem situation is a much more effective approach than teaching them to simply convert numbers in the problem into an arithmetic operation sentence (Mayer & Hegarty, 1996; Willis & Fuson, 1988). Because individuals who are able to distinguish problem structures and create mental representations of problems are successful in problem solving (Fuson & Willis, 1989; Sweller, Chandler, Tierney, & Cooper, 1990).

In exams such as PISA and TIMMS applied around the world, there are contextual questions that aim to establish a connection between mathematics and life situations that represent daily life. In this way, it should be aimed to raise individuals who not only solve questions but also solve problems in schools. It is planned to switch from the mass of symbols that students cannot see in life and therefore cannot make sense of, to the types of questions that they can find their problem and solution in life. At this point, individuals who are proficient in reading and interpreting representations gain great advantages.

Multiple representations can be seen as advantages in that they make it easier for students to understand math topics, approach problem solving in different ways, and help build cognitive relationships (Keller & Hirsch, 1998). The importance of the use of multiple representations in the development of students' knowledge of concepts is also pointed out (Dufour-Janvier, Berdnarz & Belanger, 1987)

Umay (2007) states that the desired communication in mathematics cannot be achieved by knowing only "mathematics", and another language such as Turkish, English and Chinese is needed for this communication to be understandable. In other words, it needs verbal representation. Mathematical communication can be achieved when an effective bridge is established between the mathematical language and the mother tongue. Listening, speaking, reading and writing skills, which enable the development of the mother tongue, are also very important in mathematics.

Mooney (2002) states that the process of representing data consists of four dimensions. These processes are, respectively, being aware of the characteristics of multiple representations (graphs, tables, diagrams, etc.), noticing the same data in different representations, evaluating the effectiveness of representation types in representing data, and determining data units. So it's important to understand whether students see the relationship between representations (Ainsworth, 1999). In addition, the use of different representations of the same data will allow different ideas to emerge and debate (Mooney, 2002).

Multiple representations have been subjected to different types of

classifications with the studies carried out so far. Dufour-Janvier et al. (1987) stated that the term representation can be examined under two headings, and that these headings are internal and external representations. Goldin (1998) states that not all symbols in mathematical cognition are directly observable and can be explained by internal representations. In this context, internal representation; are the mental shapes, structures, and knowledge that the individual sees around, formulates, and reconstructs around his or her own knowledge (Goldin & Kaput, 1996). External representations are observable tools that enable the understanding and transmission of mathematical concepts and ideas (Goldin, 1998).

Internal Representations: Internal representations are the mental shapes, structures and information in one's brain that one sees, formulates, and structures around one's own knowledge. To grasp what concepts for mathematics mean, Hiebert and Carpenter (1992), who focused their work on the internal presentation of information and the structures of internal representation, based their hypotheses on the findings of Piaget and other cognitive researchers. Researchers who have built their studies on information networks have stated that information can become effective and permanent by strengthening the internal representation relationships created between these networks and concepts.

The connections of the networks formed by the arrival of new information are established more slowly than before. If the previous information is not correlated, there is a weakness between the networks, so the adequacy of internal representations cannot be mentioned (Hiebert and Carpenter, 1992). The understanding of a concept for mathematics can be measured by being part of the bonds in mental representation, and the degree of understanding can be determined by the number and strength of the bonds in the relationship. Hiebert and Carpenter (1992) based their framework of knowledge on internal representations that cannot be directly observed. The study results indicate that these internal bonds are influenced by external activities and stimulated by the construction of relationships between external representations. Since these internal connections cannot be directly observed, they must be presented in relation to some form of external representation. Examples of internal representations include image, formal representation, directional, heuristic, affective representations (Goldin, 1998). Internal representations can be extracted depending on the product of the external representations, they cannot be easily shown and communicated to other people. For example, the way to know how a child can form an internal representation of the number 2 is by being able to generate an external representation of the number. Internal and external representations play a role together in teaching and learning (Hähkiöniemi, 2004).

External Representations: External representations are an auxiliary tool that enables the understanding and transmission of mathematical concepts and ideas, and a language that allows problems and solutions to be discussed. External representations are observable, transmittable to others. Bruner (1966) was among the first researchers to use the concept of external representation in mathematics education and claimed that any knowledge could emerge with three types of external representation. He listed them as enactivated, iconic, and symbolic external representations. Inactivated representations characterize a series of actions in the area in which information acts on it. Iconic representations mean shapely expressions that contain an image or graphic summary without including the full definition of the domain. Finally, symbolic representations mean the recall of a set of logical or symbolic proposals from within rules and procedures (Bruner, 1966).

Dienes (1960) and Bruner (1966) have studied the role of external representations in learning mathematics; Expanding on these investigations, Lesh, Post, and Behr (1987) developed a model in which both diagnosis and interpretation can be made between external representations. Lesh and Doerr (2003) state that there are 8 different elements in the system of external representation. These; graphs, tables, equations, diagrams, experience-based metaphores, spoken language, concrete models, written symbols.

Lesh et al. (1987) drew attention to the importance of differences between representations, but also emphasized the importance of different types of representations and their transformation within the same representation model. So they used a model called the "*Lesh Transformation Model*" to analyze transition skills and determine their problem-solving success. In their studies, the process of students understanding the concepts of mathematics; "The student must be able to recognize the different types of representations contained in the concept; should have the flexibility to make transformations within the representation contained in the concept and should be able to transform the concept from one representation model to another" (Lesh et al., 1987).

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