



An Investigation of Preschool Teachers' Self Efficacy Beliefs on Supporting Children's Executive Function Skills *

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Abstract

The current study aims to investigate preschool teachers' self-efficacy beliefs on supporting children's executive function skills. It was carried out with 600 teachers working in preschool education schools in Ankara. Findings related to the scale's construct (concept) validity were determined by principal component analysis (PCA) and confirmatory factor analysis (CFA). Reliability findings were determined by using Cronbach Alpha reliability analysis. In addition, independent samples t-test and ANOVA were carried out for the discrimination test. As a result, the "Self-Efficacy Beliefs Scale on Supporting Preschool Children's Executive Function Skills – Teacher Form" is a valid and reliable scale consisting of twenty-five 4-point Likert-type items that can be used in measurement studies to be carried out in this context. It was concluded that teachers' self-efficacy levels were at a moderate level. In addition, teachers' self-efficacy levels differ significantly in terms of gender, age, professional experience, and the number of in-service trainings. As a result of the research, it was revealed that preschool teachers' self-efficacy beliefs on supporting children's executive function skills should be developed. However, in the light of the results on the factors affecting teachers' self-efficacy beliefs, suggestions for future research are presented.

Keywords

Early childhood education
Preschool teacher
Self-efficacy belief
Executive function skills
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Introduction

Executive function (EF) skills, which have been a significant focus of fields such as neuroscience, psychology, and education in recent years, can be defined as skills that enable the individual to manage mentally his or her thoughts and ideas. In studies conducted on the scope of EF skills, researchers explain these skills via the components of working memory, inhibitory control, and cognitive flexibility (Blair & Diamond, 2008; Carlson, Zelazo, & Faja, 2013; Diamond, 2013; Lehto, Juujarvi, Kooistra ve Pulkkinen, 2003; Meuwissen, & Zelazo, 2014). Working memory refers to keeping information in mind and mentally manipulating information. Inhibitory control refers to the ability to resist and control impulses, distractions, inhibitions, and habits. Cognitive flexibility can be defined as the ability to shift the way of thinking or acting in response to changing situations (Diamond, 2013). These three skills can

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be called neurocognitive skills that develop in parallel with the brain's frontal lobe. According to Diamond (2013), these skills are a structure consisting of three separate but interconnected components that develop by supporting each other and working together to lead to high-level executive processes (problem-solving and planning). These three skills lead to control attention actively and deliberately to achieve a specific goal (Miyake et al., 2000). EF skills enable children to demonstrate skills such as sustaining attention, keeping the information in mind, thinking before responding and controlling responses, coping with frustration, considering the consequences of behavior, and planning the following steps (Zelazo, Blair, & Willoughby, 2016). Garon, Bryson, and Smith (2008) proposed a hierarchical and integrative model, stating that each EF component is built on functions that develop in the first years of life and attention is the precursor skill of executive functions. According to this model, working memory is the first structure to develop, then inhibitory control skills develop, and finally, cognitive flexibility is built on these two skills.

Neuroimaging research results have shown that components of EF skills play an effective role in learning (Firoozehchi, Mashhadi, & Bigdeli, 2023; İlhan İldiz & Burak, 2023; Sung & Wickrama, 2018). Also, numerous scientific evidence has demonstrated that EF skills are related to children's school readiness and early academic skills (Amukune & Józsa, 2023; Blair, 2002; Blair & Raver, 2015; Blair & Razza, 2007; Çelik, 2016; McClelland et al., 2007; Morrison, Ponitz, & McClelland, 2010; Öğütçen, 2020; Şentürk Gülhan & Burak, 2023; Yılmaz, 2022). In their meta-analysis study, Jacob and Parkinson (2015) examined 67 studies focusing on three components of EF skills. They found that EF skills were positively correlated with reading and mathematics achievement (mean $r = .30$; $r = .31$). Among the three components of EF, cognitive flexibility had the highest correlation with reading and mathematics achievement ($r=.42$; $r=.34$).

EF skills can be taught through various approaches, regardless of the person's age. Supporting the development of these skills from the early years of life is highly significant. The reason for this is that early EF skills have been found to predict lifelong success, health, and well-being (Diamond, 2013). EF skills have attracted the attention of families and education specialists, as it has been demonstrated that the early developmental process of these skills is critical for the quality of the whole life. Current studies have indicated that supporting EF skills through various intervention practices is associated with children's academic success, school readiness, and social-emotional development (Blair & Raver, 2014; Pekince, 2022; Pears et al., 2013; Riggs, Blair, & Greenberg, 2004; Schmitt, McClelland, Tominey, & Acock, 2015). These studies mainly focus on the design of learning environments that systematically support children's EF skills. Early childhood educators play an important role in assisting children in engaging in these learning environments. Considering the components of EF skills and supportive strategies, teachers are expected to use verbal and visual cues, divide large tasks into smaller tasks, and use short instructions to support children's working memory. They are expected to encourage children to stop and think before immediately responding, reduce distractions, and establish predictable routines to support inhibitory control skills. Furthermore, they are expected to encourage children to suggest multiple solutions to problems and guide them by asking questions to think of different ways and perspectives to support cognitive flexibility (Center on the Developing Child at Harvard University, 2014). On the other hand, Barkley (2012) and Kaufman (2010) have stated that teachers are not proficient in the level of knowledge about EF skills and the strategies to be used to support these skills of children. It is stated that the possible reason for this may stem from that teachers perceive themselves as competent in this regard (Fairbanks et al., 2010; Perels, Merget-Kullmann, Wende, Schmitz, & Buchbinder, 2009). Considering this information, the current research focuses on preschool teachers' self-efficacy beliefs in supporting the EF skills of children. It is assumed that this evaluation will guide teachers in planning and designing the learning environments and practices in the process of supporting children's EF skills.

Self-efficacy belief is defined in educational studies as "a teacher's belief in his/her own ability to organize and execute the action plans required to teach a specific content" (Von Suchodoletz, Jamil, Larsen, & Hamre, 2018). Self-efficacy belief is not fixed, it can change and develop over time. According to Bandura (1997), self-efficacy belief is influenced by four basic sources of knowledge: mastery experience (such as professional experience), vicarious experience (such as observing the experiences of others), verbal persuasion (interactions with others such as chatting about one's experience) and physiological arousal (such as coping with stress). According to Mulholland and Wallace (2001), mastery experience makes the strongest contribution to self-efficacy beliefs. On the other hand, it has been observed that the self-efficacy beliefs of teachers who interact and collaborate with other colleagues increase (Guo, Justice, Sawyer, & Tompkins, 2011; Klassen, Tze, Betts, & Gordon, 2011). In some cases (e.g. when working with children who are difficult learners), teachers may experience anxiety and stress by being affected by the fact that the teaching method they use does not work, thus their self-efficacy beliefs may be negatively affected (Wyatt, 2013). In the national literature, it is seen that the concept of professional self-efficacy is frequently addressed in studies on preschool teachers' self-efficacy beliefs (Gömleksiz & Serhatlıoğlu, 2013; Kesgin, 2006; Tepe, 2011; Yılmaz, Tomris, & Kurt, 2016), however, there are studies such as self-efficacy beliefs related to gaining art and aesthetic values (Akyıldız, 2020), self-efficacy beliefs related to play teaching (Kadim, 2012) and a limited number of studies that examine self-efficacy beliefs specific to certain topics. In this context, it is thought that the current study will contribute to the related literature by examining self-efficacy beliefs in terms of supporting EF skills.

The aim of the study is; (i) to develop a valid and reliable measurement tool that can be used to assess preschool education teachers' self-efficacy beliefs in supporting children's EF skills, (ii) to determine the level of preschool education teachers' self-efficacy beliefs in supporting children's EF skills, (iii) to examine whether preschool education teachers' self-efficacy beliefs in supporting children's EF skills differ significantly according to the gender, age, professional experience and the number of in-service trainings received. The research questions determined accordingly are given below:

1. Is Self-Efficacy Beliefs Scale on Supporting Preschool Children's Executive Function Skills – Teacher Form valid for assessing preschool education teachers' self-efficacy beliefs about supporting children's EF skills?
2. Is Self-Efficacy Beliefs Scale on Supporting Preschool Children's Executive Function Skills – Teacher Form reliable for assessing preschool education teachers' self-efficacy beliefs about supporting children's EF skills?
3. What is the level of self-efficacy beliefs of the preschool education teachers participating in the study about supporting children's EF skills?
4. Do preschool education teachers' self-efficacy beliefs about supporting children's EF skills show a significant difference according to the gender, age, professional experience, and number of in-service trainings?

Method

This research was conducted by the survey model. Survey model research is defined as research in which the views of the participants or their characteristics such as interests, skills, and attitudes regarding a subject or situation are determined (Büyüköztürk, Çakmak, Akgün, Karadeniz, & Demirel, 2014).

Participants

The convenience sampling method was used in the current study. Therefore, the researchers reached the sample by getting support from volunteer school administrators, starting with the most accessible teachers who volunteered to participate in the research (Yıldırım, 2023).

The research was carried out in two phases and at each stage, different participant groups were examined. In the first phase, PCA and reliability analyzes were performed. Demographic information about the teachers who participated in this phase is given in Table 1.

Table 1. Demographic Information of the Participants

Variable	Categories	Frequency	Percentage (%)
Gender	Female	273	91.0
	Male	27	9.0
Age	20-25 years of age	115	38.3
	26-30 years of age	113	37.7
	31 years of age and over	72	24
Professional Experience	Less than 3 years	170	56.7
	3 years and over	130	43.3
Status of Receiving In-Service Training	No training	48	16
	Those trained 1-15 times	195	65
	Those trained 16 or more times	57	19

According to Table 1, a total of 300 preschool teachers (91% female and 9% male) participated in the first phase of the study. In terms of age group, 38.3% of the participants were 20-25 years old, 37.7% were 26-30 years old, 24% were 31 years old and above. 56.7% of the participants had less than 3 years of professional experience and 43.3% had 3 years or more. Among the teachers participating in the study, 16% did not receive any in-service training, 65% received 1-15 trainings, 19% received 16 or more trainings.

In the second phase of the study, statistical analyses were conducted regarding CFA, and criterion validity analysis to examine preschool teachers' self-efficacy beliefs about supporting preschool children's executive function skills and examining them in terms of various variables. Demographic information about the participants included in this phase is given in Table 2.

Table 2. Demographic Information of the Participants

Variable	Categories	Frequency	Percentage (%)
Gender	Female	180	60.0
	Male	120	40.0
Age	20-25 years of age	96	32.0
	26-30 years of age	164	54.7
	31 years of age and over	40	13.3
Professional Experience	Less than 3 years	211	70.3
	3 years and over	89	29.7
Status of Receiving in-Service Training	No training	129	43.0
	Those trained 1-15 times	110	36.7
	Those trained 16 or more times	61	20.3

According to Table 2, 32% of the participants are 20-25 years old, 54.7% are 26-30 years old, and 13.3% are 31 years old and above. 70.3% of the participants have less than 3 years of professional experience, 29.7% have 3 years or more professional experience. 43% of the teachers did not receive any in-service training. However, 36.7% of them received 1-15 trainings and 20.3% received 16 or more trainings.

Instruments

The Preliminary Self-Efficacy Beliefs Scale on Supporting Preschool Children's Executive Function Skills – Teacher Form (SEB-SPCEF): In the first phase of the study, an item pool was formed. The "Executive Function Model" of Miyake et al. (2000) was used as the theoretical framework for the item pool. Miyake et al. (2000) stated that the structure of executive functions includes switching

between mental sets or tasks (cognitive flexibility), monitoring and updating (working memory), and inhibiting responses (inhibition). They emphasized that this three-factor structure is not completely independent of each other, these factors share a common feature. The items were written in association with these three components. An item pool consisting of 108 items was formed based on examining the studies in the literature on different paradigms and education programs supporting executive function skills in the preschool period, and considering which practices can support the executive function skills of preschool children. For assessing the content validity, the item pool consisting of 108 items was shared with a total of 6 field experts, including two assessment and evaluation specialists, and four early childhood education specialists. As a result of the opinions suggested by the assessment and evaluation specialist, the items were shortened without changing the content and meaning, due to the feedback that the items were expressed a long way. In addition, the items were removed from the first-person singular mode to make an objective evaluation by the reader, considering that it would increase the reliability of the scale. Twenty-two items were reorganized by taking expert opinions into account, 27 items were excluded because they did not measure the intended structure or were like another item. At the end of these processes, a scale form has 81 items. The data of the current study were collected with an 81-item scale form. In the scale, which was prepared in a 4-point Likert type, the responses of the participants are taken with the options "1: I do not trust at all, 2: I trust a little, 3: I trust, 4: I completely trust".

Preschool Teachers' Self-Efficacy Beliefs Scale: Preschool Teachers' Self-Efficacy Beliefs Scale was developed by Tepe and Demir (2012) to assess preschool teachers' self-efficacy beliefs. This scale was used to ensure criterion validity of the scale developed in this study. The scale consists of a total of 37 items under one dimension. The scale consists of 5-point Likert-type items with the options "1: never, 2: rarely, 3: sometimes, 4: often, 5: always". The total score obtained from the scale, which shows a one-dimensional structure and does not contain any reverse items, ranges from 37 to 185. As the score increases, the self-efficacy level of the preschool teacher also increases. The Cronbach Alpha reliability coefficient was calculated as $\alpha=0.97$. Moreover, the fit indices in the CFA result were reported as $\chi^2/sd=3.11$, $p=0.00$, CFI=0.95, NFI= 0.93, SRMR=0.34, RMSEA=0.05, GFI=0.92, AGFI=0.88. In the current study, the Cronbach Alpha reliability coefficient of the scale was calculated as $\alpha=0.915$.

Demographic Information Form: The Demographic Information form was prepared by the researchers to collect demographic information about the participant teachers. The form consists of questions regarding teachers' gender, age, professional experience, and in-service training.

Data collection and analysis

Ethics committee approval was obtained from T.C. Aksaray University Rectorate Human Research Ethics Committee (Protocol No: 2021/01-41 Date: 22.02.2021). Necessary permissions were obtained from the Ministry of National Education. The data were collected from 600 preschool teachers working in the provinces and districts of Ankara in the fall semester of the 2022-2023 academic year. The data of the research were collected online, and the link of the scale form created with Google Forms was shared through the school administrations with the preschool teachers who could not be contacted directly. Participants participated in the research process voluntarily.

The data of the study were analyzed with quantitative analysis methods using SPSS 25 and AMOS 21 programs. Within this regard, descriptive statistical methods such as arithmetic mean, standard deviation, and frequency analysis were used to analyze the demographic information data and the self-efficacy levels of the participants. Findings related to construct (concept) validity were calculated by principal component analysis (PCA) and confirmatory factor analysis (CFA). Additionally, the normality of the data was examined whether it showed normal distribution or not, through skewness and kurtosis values. The finding regarding reliability was calculated by using the Cronbach Alpha reliability analysis. The participant teachers' self-efficacy levels in terms of various variables were analyzed through independent samples t-test, one-way analysis of variance (ANOVA), and Games-Howell multiple comparisons (post-hoc) tests. All analyzes were conducted and evaluated at a 95% confidence interval and $p<0.05$ significance level.

Results

Results on Principal Component Analysis

The first version of the 81-item version of the SEB-SPCEF was analyzed using principal components analysis and oblique rotation (direct oblimin) methods. In the examination, it was observed that there were items with overlapping features (items being under different sub-dimensions with factor loadings that differ less than 0.10) and items with factor loadings below 0.45. According to Büyüköztürk (2011), the factor loadings of the items should be at least 0.45 and should not show overlapping characteristics. Therefore, it was decided to repeat the analysis and it was aimed to reach the most appropriate structure. As a result of the repetitions, it was concluded that the scale did not show a structure with more than one sub-dimension and that construct validity was achieved with a unidimensional structure consisting of 25 items (m6, m15, m16, m24, m26, m28, m30, m31, m32, m33, m34, m35, m40, m42, m43, m44, m59, m60, m61, m63, m64, m65, m67, m69, m79).

As a result of the analysis, firstly, it was found that the sample adequacy was achieved (KMO=0.973; Bartlett Test of Sphericity $\chi^2(300)=5904,201$; $p=0.000$). Because, for suitability of the data for factor analysis, the KMO must be higher than 0.60 and the Bartlett Sphericity Test must be significant (Büyüköztürk, 2011). In addition, Field (2009) evaluates a KMO above 0.90 as “excellent” for sample adequacy. Therefore, in the current study, it was studied with a sample size that could be considered excellent. In order to decide the number of factors of the scale, scree plot was analyzed.

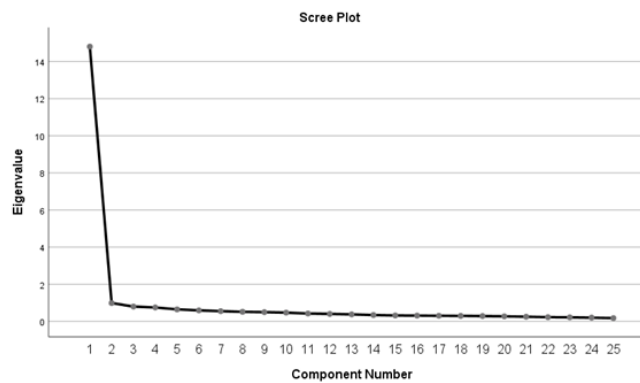


Figure 1. Scree Plot

When the scree plot was analyzed, it was seen that the scale showed a single-factor structure. The distribution of the items in the final scale according to the factors is given in Table 3.

Table 3. SEB-SPCEF Scale – Results on Principal Component Analysis (N = 300)

ID	Item	P	h ²
M6	Modeling the child in following the classroom rules.	0.797	0.635
M15	Providing opportunities for the child to unearth their strengths.	0.708	0.501
M16	Encouraging the child to offer suggestions/alternatives.	0.747	0.557
M24	Encouraging the child to produce self-motivation statements	0.747	0.558
M26	Using verbal cues in the activity that the child has difficulty with.	0.798	0.637
M28	Providing activities with multiple stages to the chld.	0.740	0.547
M30	Modeling for the child how to ask for help when he/she has difficulty.	0.788	0.621
M31	Modeling for the child how he/she should evaluate his/her work.	0.731	0.534
M32	Asking questions that will enhance the child's use of cognitive strategies.	0.743	0.552
M33	Modeling the child to monitor his/her work.	0.755	0.570
M34	Motivating the child in the learning environment.	0.783	0.613
M35	Progressively supporting the child in the learning process.	0.797	0.636
M40	Designing the learning environment to support the child's problem-solving skills.	0.767	0.588
M42	Creating a daily routine for children.	0.803	0.646
M43	Providing a classroom environment where the child can take responsibility for himself/herself.	0.784	0.614
M44	Enabling the child to take responsibility for routines in the school environment.	0.790	0.624
M59	Modeling through demonstration what is appropriate behavior for the child.	0.763	0.582
M60	Modeling for the child in focusing his/her attention.	0.785	0.616
M61	Offering games for the child that needs to focus his/her attention.	0.805	0.648
M63	Considering the temperament of the child when supporting him/her.	0.758	0.575
M64	Asking children to express what they understand or remember from a story told.	0.768	0.590
M65	Using tips that enable us to remember expectations.	0.763	0.582
M67	Modeling for the child in the process of making plans in line with his/her purpose.	0.756	0.572
M69	Positioning materials in the classroom by grouping them.	0.771	0.595
M79	Modeling for the child not to give up easily.	0.780	0.608
Eigenvalue		14.802	
% Variance		59.207	

The scale consisting of 25 items (m6, m15, m16, m24, m26, m28, m30, m31, m32, m33, m34, m35, m40, m42, m43, m44, m59, m60, m61, m63, m64, m65, m67, m69, m79) showed a unidimensional structure (eigenvalue=14,802) and the total variance explained by the scale was found to be 59.207%. Afterwards, it was seen that the common variance (communalities) values showing the contribution of each item to the common variance varied between 0.501 and 0.648, and since the values were greater than 0.50 (Yaşlıoğlu, 2017), it was decided that the contribution of the items to the common variance was at the desired level.

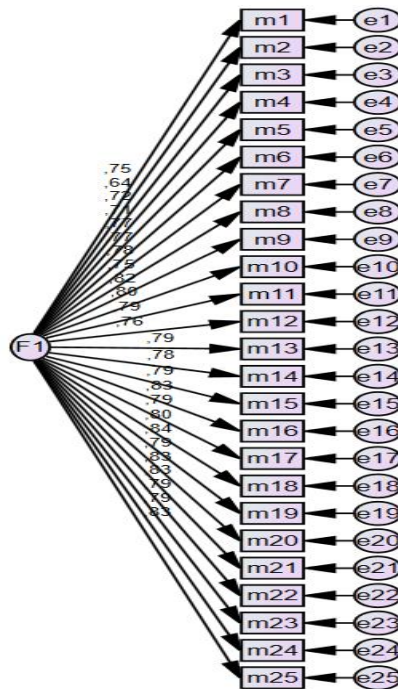
Results on Confirmatory Factor Analysis

Unlike the answers of 300 participants to whom PCA was conducted, CFA was conducted on the responses of a new group of 300 participants. As a result of the CFA, the structure of the scale was verified without the need for any modification (revisions made between the errors of some items). Confirmatory Factor Analysis Fit Indices are shown in Table 4.

Table 4. Global Fit Statistics for SEB-SPCEF for the CFA Sample (N = 300)

	Acceptable values	Calculated values	Result
CMIN/Sd	<3.00	2.324	Good fit
GFI	0.90<	0.915	Good fit
NFI	0.90<	0.905	Good fit
CFI	0.90<	0.943	Good fit
IFI	0.90<	0.943	Good fit
TLI	0.90<	0.933	Good fit
RMSEA	<0.08	0.065	Good fit

As seen in Table 4, CMIN/Sd was calculated as 2,324, GFI 0.915, NFI 0.905, CFI 0.943, IFI 0.943, TLI 0.933, and RMSEA=0.065. In the literature, CMIN/Sd less than 3 (Kelloway, 1998), GFI, NFI, CFI, IFI, and TLI greater than 0.90 (Hooper, Coughlan, & Mullen, 2008), and RMSEA less than 0.08 (Hu & Bentler, 1999; Schermelleh-Engel, Moosbrugger, & Müller, 2003) are suggested as acceptable good fit values. The Path Diagram obtained as a result of confirmatory factor analysis is given in Figure 2.

**Figure 2.** SEB-SPCEF Path Diagram

According to the path diagram, it is seen that the standardized factor loadings of the items vary between .64 and .84.

Results on Criterion Validity

To determine the criterion validity of SEB-SPCEF, a correlation analysis was conducted between the total scores obtained from the scale and the total scores obtained from Preschool Teachers' Self-Efficacy Beliefs Scale.

Accordingly, a weakly positive ($r=0.245$) but significant ($p<0.05$) relationship was found between the total scores obtained from the two scales. It can be said that SEB-SPCEF provides criterion validity. A weak relationship is an expected outcome because the Preschool Teachers' Self-Efficacy Beliefs Scale evaluates teachers' self-efficacy beliefs from a general perspective, not in terms of EF skills.

Results on Reliability

The Cronbach Alpha reliability value of the scale consisting of 25 items was found to be $\alpha=0.971$. According to Büyüköztürk (2011), a Cronbach Alpha value greater than 0.70 indicates that the internal consistency requirement is met. In addition, George and Mallery (2003) consider values of 0.90 and above as "excellent". Therefore, it was decided that SEB-SPCEF fulfils the reliability requirement perfectly.

Results on Teachers' Self-Efficiency Beliefs on Supporting Children's Executive Function Skills

The SEB-SPCEF scores of the preschool education teachers who participated in the study ranged between 36-100 and the mean score was 75.64 ± 17.02 . When the lowest and highest scores (25 and 100 points) are compared, it is possible to say that the self-efficacy levels of the teachers are at a moderate level with 67.52%. In addition, the skewness and kurtosis values of -0.128 and -1.494 showed that the scores were normally distributed.

Results on Teachers' Self-Efficiency Beliefs on Supporting Children's Executive Function Skills According to Various Variables

The self-efficacy beliefs of preschool education teachers about supporting children's EF skills were analyzed according to the gender, age, professional experience, and number of in-service trainings (Tables 5, 6, 7, 8).

Table 5. T-Test Results for Independent Samples Regarding the Comparison of SEB-SPCEF Scores According to Gender

Dependent Variable	Female		Male		T	sd	p	η^2
	\bar{X}	SS	\bar{X}	SS				
SEB-SPCEF	66.95	15.03	88.67	10.12	-13.867	298	.000	.04

It was found that teachers' self-efficacy beliefs about supporting children's EF skills differed significantly according to gender ($t(298)=-13.867$; $p<0.05$; $\eta^2=.04$). The mean self-efficacy score of male teachers ($\bar{X}=88.67$) was significantly higher than that of female teachers ($\bar{X}=66.95$). Since the self-efficacy of male teachers was significantly higher than that of female teachers, it can be said that gender factor significantly differentiates teachers' self-efficacy beliefs about supporting children's EF skills.

Table 6. One-Factor ANOVA Test Results Regarding the Comparison of SEB-SPCEF Scores According to Age

Dependent Variable	20-25 years of age		26-30 years of age		31 years of age and over		F	p	η^2
	\bar{X}	SS	\bar{X}	SS	\bar{X}	SS			
SEB-SPCEF	58.28	7.49	83.82	14.27	83.75	11.94	143.331	.000	.05

It was found that teachers' self-efficacy beliefs about supporting children's EF skills differed significantly according to age ($F=143.331$; $p<0.05$; $\eta^2=.05$). Thereupon, Games-Howell multiple comparison (post-hoc) test was performed to determine which groups the difference was between. When the results are analyzed, it is seen that the mean scores of teachers aged between 20-25 years ($\bar{X}=58.28$) are lower than the mean scores of teachers aged between 26-30 years ($\bar{X}=83.82$) and teachers aged 31 years and above ($\bar{X}=83.75$) and this difference is statistically significant.

Table 7. T-Test Results for Independent Samples Regarding the Comparison of SEB-SPCEF Scores According to the Duration of Professional Experience

Dependent Variable	Less than 3 years		3 years and over		T	sd	p	η^2
	\bar{X}	SS	\bar{X}	SS				
SEB-SPCEF	70.48	16.93	87.85	9.24	-9.118	298	.000	.02

It was found that teachers' self-efficacy beliefs about supporting children's EF skills differed significantly according to the length of professional experience ($t(298)=-9.118$; $p<0.05$; $\eta^2=.02$). The mean scores of teachers with three years or more of professional experience ($\bar{X}=87.85$) were significantly higher than the mean scores of teachers with less than three years of professional experience ($\bar{X}=70.48$).

Table 8. One-Factor ANOVA Test Results Regarding the Comparison of SEB-SPCEF Scores According to the Number of In-Service Training Received

Dependent Variable	No training		Those trained 1-15 times		Those trained 16 times and over		F	p	η^2
	\bar{X}	SS	\bar{X}	SS	\bar{X}	SS			
SEB-SPCEF	59.22	8.17	88.48	10.43	87.20	9.22	355.689	.000	.01

It was found that teachers' self-efficacy beliefs about supporting children's EF skills differed significantly according to the number of in-service trainings received ($F=355.689$; $p<0.05$; $\eta^2=.01$). Games-Howell multiple comparison (post-hoc) test was performed to determine which groups the difference was between. According to the results, the mean SEB-SPCEF scores of the teachers who never received in-service training ($\bar{X}=59.22$) were lower than the scores of those who received in-service training for 1-15 times ($\bar{X}=88.48$) and those who received in-service training for 16 or more times ($\bar{X}=87.20$) and these differences were significant.

Discussion

It was observed that the SEB-SPCEF scale developed within the scope of the study showed a unidimensional structure. In some studies, on the scope of EF skills since the past, it has been pointed out that this term refers to a set of skills rather than a single skill (Dawson & Guare, 2010; Diamond, 2013; Miyake et al., 2000). In this study, it was aimed to carry out the item writing stage in a broad perspective by taking into consideration the views of researchers who consider EF skills as multidimensional. However, it is not an unexpected result that the measurement tool shows a unidimensional structure. It is thought that this is since these skills are skills that work in relation to each other, have common points and ultimately function as a whole.

The SEB-SPCEF scale was found to be a valid and reliable measurement tool that can be used to determine teacher self-efficacy beliefs in supporting preschool children's EF skills. Existing research emphasizes the importance of EF skills in learning, but teachers' awareness and self-efficacy beliefs regarding the support of these skills have not been sufficiently investigated (Gilmore & Cragg, 2014). The scale is the first scale developed for this purpose in the related literature. In a similar study aiming to determine the self-efficacy beliefs of kindergarten, primary and secondary school teachers in supporting children's EF skills, Phekoo (2021) emphasised the necessity of scale development studies by mentioning the limitations of measurement tools in this subject. It is thought that the SEB-SPCEF scale is a useful scale that can be preferred in the evaluations to be carried out in this context because it is a short, material-free and easy-to-apply scale. Determining the self-efficacy beliefs of preschool teachers on this issue will enable them to reveal how ready they are to implement the intervention/change in studies that require them to be involved in interventions related to EF skills.

It was determined that the self-efficacy levels of preschool education teachers participating in the study were at a medium level (67.52%). Teachers with high levels of self-efficacy beliefs are open to new ideas and teaching methods; they are willing to support children and create positive change (Cerit, 2019; Charalambous & Philippou, 2010). Meltzer, Pollica, and Barzillai (2007) suggest that teachers' feeling that they cannot support the deficiencies related to EF skills in the classroom will cause a delay in children's academic performance. Therefore, it is thought that improving the self-efficacy beliefs of preschool teachers in the current study will affect their motivation to support children's EF skills and the diversity of their methods of supporting these skills.

In the present study, it was found that various characteristics of teachers had a significant effect on their self-efficacy beliefs about supporting EF skills. It was observed that gender had a significant effect on self-efficacy beliefs about supporting EF skills and male teachers had higher self-efficacy beliefs than female teachers. Male teachers participating in the study may have higher levels of knowledge about EF skills and awareness of supporting them. Rapoport, Rubinsten, and Katzir (2016) state that the level of knowledge about EF skills is closely related to self-efficacy. Klassen and Chiu (2010) found that female teachers felt more stress in the classroom, experienced more job stress and had less self-efficacy beliefs than male teachers. The female teachers in the study may have felt more stress (physical arousal) or had less opportunity to interact with their colleagues (vicarious experience) (Bandura, 1997). On the other hand, it is seen that the findings of studies investigating the effect of gender in the literature vary (Bağcı, 2022; Kaya, 2019; Klassen & Chiu, 2010).

The self-efficacy beliefs of teachers aged between 20-25 years were found to be significantly lower than their colleagues aged 26-30 years and 31 years and above. Similarly, the self-efficacy beliefs of teachers with less than 3 years of professional experience were significantly lower than those of teachers with more experience. Based on these two findings, it can be said that teachers with more age and professional experience have higher self-efficacy beliefs than others. In his study, Phekoo (2021) found that the level of teaching did not play a determining role on the self-efficacy beliefs of teachers working at kindergarten, primary and secondary school levels, and like the current study, more professional experience was associated with having higher self-efficacy beliefs in supporting children's EF skills. Wolters and Daugherty (2007) conducted a study with 1024 teachers and found that professional experience had a significant positive relationship with self-efficacy beliefs. Fackler and Malmberg (2016) aimed to determine various variables related to teachers' self-efficacy beliefs in a large-scale study conducted with 44,701 teachers in 14 OECD countries. In the study, it was found that self-efficacy beliefs increased as professional experience increased. Although EF skills are a relatively new concept in the literature of preschool education, it is a current field of study on which many studies have been carried out in recent years. The effect of professional experience and age can be explained by the fact that teachers with more age and professional experience have more experience in knowing and applying different techniques and strategies. With the advantage of working in the field for many years, these teachers may have had the chance to attend more congresses, seminars, workshops, etc. than teachers with less experience and younger age, and may have increased their knowledge on this subject. In the study, it was seen that the self-efficacy beliefs of the teachers who had never received in-service training were significantly lower than all other teachers. In recent years, there have been significant developments in teaching approaches in early childhood education programs. Innovative approaches and strategies that have an impact on young children's learning are being adapted to programs (Von Suchodoletz et al., 2018). It is thought that these updates are also reflected in in-service trainings. Preschool education teachers may have encountered various theoretical and practical information within the scope of EF skills in the content of in-service trainings they attended. It is also known that teachers working in the same field have the chance to interact with each other during in-service trainings. Teachers thus can share their experiences. As a matter of fact, Tschannen-Moran and Hoy (2007) also found that having the opportunity to collaborate with colleagues is highly related to self-efficacy beliefs.

Conclusion and Suggestions

It was revealed that the SEB-SPCEF scale developed within the scope of the research has psychometric properties that can be used to determine preschool teachers' self-efficacy beliefs about supporting children's EF skills. The scale is the first scale developed in the related literature. It provides ease of use to the practitioner as it is short and does not require any material. The SEB-SPCEF scale can be used to determine the readiness of preschool education teachers before intervention studies that support children's EF skills. In addition, the scale can be used in studies aiming to determine the change in teachers' self-efficacy beliefs about supporting EF skills after intervention studies. In the process of supporting EF skills, mixed design studies can be conducted in which the classroom practices of teachers with different self-efficacy belief levels are examined. Self-efficacy belief levels of teachers who have children with different language and cultural backgrounds in their classrooms can be analyzed. Large-scale studies involving teachers working in different geographical locations can be conducted using the SEB-SPCEF scale.

It was determined that the self-efficacy beliefs of the preschool education teachers participating in the study regarding supporting children's EF skills were at a moderate level. Since it is known that supporting children's EF skills in the preschool period has a strong effect on their future achievements, it may be recommended to plan studies to increase preschool education teachers' knowledge and awareness levels about supporting children's EF skills.

It was observed that various characteristics of teachers (age, gender, professional experience, number of in-service trainings attended) had a significant effect on their self-efficacy beliefs about supporting children's EF skills. Based on the results of the analyses, intervention studies can be conducted to increase female teachers' self-efficacy beliefs about supporting children's EF skills. They can be encouraged to participate in in-service trainings and project studies carried out within the scope of EF skills. Teachers with less age and professional experience can gain experience in supporting EF skills by creating environments where they can share with their colleagues. Workshops can be organized where experienced and older preschool teachers can share the strategies, they use to support EF skills.

There are some limitations in the research. The sample size is limited to 600 teachers. Instead of a random representation, the sample included accessible teachers in the researcher's neighborhood. Another limitation is the geographical location of the participants. The data were collected from teachers working in preschool education institutions in the capital city. Data collected from preschool teachers working in different geographical locations may better represent self-efficacy beliefs about supporting EF skills. Finally, the data were limited to teachers' responses to the measurement tools. Teachers' self-efficacy beliefs about supporting EF skills can be evaluated with multiple data sources by combining quantitative data obtained from teachers' self-assessments with qualitative data obtained through observation/interviews.

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