

The Collective Teacher Efficacy Behaviours Scale: A Validity and Reliability Study

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Abstract: The concept of collective efficacy that can be defined as “a belief in their common ability to organize and realize plans to achieve goals” (Bandura, 1997, p. 477) has gained utmost importance in educational contexts. Therefore, there arises an emergent need to develop scales to evaluate teachers’ collective efficacy behaviours. To this end, the present study aimed to develop an instrument to assess collective teacher efficacy behaviours. For this purpose in mind, an item pool was created in line with the related literature and face-to-face interviews with teachers. Two participating groups were included in the study. There was a total of 833 participants, 475 of which were in the first group and 358 in the second group. The preliminary version of The Collective Teacher Efficacy Behaviours Scale (CTEBS), consisted of 26 items. Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were employed to test the construct validity of the scale with the available datasets. As a result of the EFA, a two-factored structure, namely social and professional relationship and professional development, was identified with 20 items. The two factors explained 58.798% of the total variance. Confirmatory factor analysis (CFA) was used to test the validity of the structure based on the EFA results. It was found that the CFA fit indices were $\chi^2/df=3.174$, RMSEA=.076, SRMR=.435, NFI=.902, CFI=.930, IFI=.931, and GFI=.872. The results implied that The Collective Teacher Efficacy Behaviours Scale, consisting of two dimensions and 20 items, was a valid and reliable instrument.

1. INTRODUCTION

Human beings, as social entities, may overcome difficult tasks, adapt to society, and accelerate personal and professional development more easily with a collective lifestyle. The individuals’ faster integration into society and their concordant actions are directly related to their acceptance by society. In this regard, individuals tend to meet their requirements to communicate effectively and act in cooperation with their environment. Similarly, individuals need to coexist with such concerns as preventing potential problems, improving working conditions, and increasing the existing level of achievement (Demir, 2019). Individuals who act together and support each other may be more effective and efficient in solving the problems

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they are likely to encounter. Collective power is supposed to arise among the individuals working together if they meet those requirements. Direct and indirect learning may emerge as a result of the relationships between individuals in organizations based on a collective understanding. The development and consequences of social relations between individuals is an area of interest for social cognitive theory. According to the mutual causality principle of social cognitive theory, individual and organizational factors mutually affect each other in organizations (Kurt, 2012). From this point of view, Bandura (1982) discussed the concept of collective efficacy, which implies a greater phenomenon than the sum of self-efficacies in an organization, and pointed out that people never live in isolation from the social environment and some hard work can only be achieved through working together.

The literature review introduces a great many definitions for the concept of collective efficacy. Bandura (1997) embraced the concept of collective efficacy from an organizational perspective and defined it as “a belief in their common ability to organize and realize plans to achieve goals” (p. 477). Tschannen-Moran and Barr (2004) dealt with this notion in terms of schools as educational organizations and described it as “a school characteristic that creates a difference on students’ schooling, unlike teachers’ self-efficacy” (p. 190). The main goal of schools is to improve the quality of education and training and ultimately increase student achievement. In the harsh conditions of our age, it is far from reality for teachers to increase student achievement solely with their separate efforts (Yılmaz & Turanlı, 2017). It is of great importance that teachers support each other and act in harmony for in-school activities in order to be more effective and efficient during the educational processes. The creation of an organization with collective efficacy depends on employees’ support for each other, teamwork, cooperation (Yılmaz & Uslu, 2018), and solidarity (Demir, 2019).

From the perspective of student outcomes, Abedini et al. (2018) identified the concept of collective efficacy as “the educators’ perceptions for their ability to positively affect student outcomes” (p. 2). Goddard et al. (2000) characterized it as “the interactive product of the group members at school for student achievement” (p. 483). As collective efficacy includes interactive, coordinated, and synergistic social dynamics unlike self-efficacy (Yorulmaz & Erdem, 2017), the concept of collective efficacy becomes even more and more important for school climate and the school outcomes concerning student achievement. Collective teacher efficacy has started to be frequently investigated, especially in educational studies, because of its positive effects on school outcomes (Koçak & Özdemir, 2019). Goddard et al. (2000) asserted that teachers are more effective on students at schools with high collective teacher efficacy. Collective efficacy, which is an organizational characteristic of schools (Schechter & Tschannen-Moran, 2006) is a phenomenon that positively or negatively affects cooperative teacher behaviours (Lee et al., 2011), instructional school decisions (Goddard, 2002), higher expectations and openness to new ideas (Donohoo, 2018), and their performance qualities (Abedini et al., 2018). In terms of students’ academic development, it can be alleged that schools with high collective efficacy may positively affect students’ development (Belfi et al., 2015), result in student learning and achievement (Eells, 2011; Goddard et al., 2000), significantly predict the level of success between schools (Goddard, 2002), reduce the negative effects of students’ sociodemographic variables (Ramos et al., 2014), and help teachers motivate their students better (Erdoğan & Dönmez, 2015).

Collective teacher efficacy is significant not only for student achievement (Goddard, 2002; Tschannen-Moran & Barr, 2004) but also in terms of teachers’ job satisfaction, commitment to their students, positive attitudes towards students, and professional development (Donohoo, 2018). Strengthening collective efficacy at schools would be possible with the development of co-working behaviours, the adoption of school vision by teachers, getting everyone’s ideas and

opinions in problem-solving, creating encouraging environments for student learning, and teachers' keeping themselves up to date (Turhan & Yaraş, 2014).

An examination of the related literature shows that a great many instruments have been developed to measure collective efficacy perceptions (Schwarzer & Jarusalem, 1999; Goddard et al., 2000; Goddard, 2002; Tschannen-Moran & Barr, 2004; Carroll et al., 2005; Pepe et al., 2008; Kurt, 2009; Erdoğan & Dönmez, 2015; Abedini et al., 2018). The social cognitive theory asserts that there are differences between people's levels of perception and their behaviours, that is, not every piece of knowledge and skill could be observed explicitly (Kurt, 2009). In this regard, the present study focused on measuring collective teacher efficacy behaviours, unlike their levels of perception, with a specific purpose to contribute to the relevant literature by developing a valid and reliable instrument to assess collective teacher efficacy behaviours. Besides, this scale is considered as the development of first original in the Turkish context concentrating on teachers' collective efficacy behaviours.

2. METHOD

In this part of the study, the scale development procedures for Collective Teacher Efficacy Behaviours Scale (CTEBS) are explained in detail. During this process, the following stages proposed by DeVellis (2017) were followed:

- Determining the behaviours to be assessed,
- Creating an item pool,
- Determining the measurement method,
- Taking the opinions of field experts,
- Implementing the scale,
- Analysing the items,
- Finalizing the scale based on the analyses.

2.1. Study Group

The research data were collected from two different groups and at different times in the academic year of 2020-2021. Exploratory Factor Analysis (EFA) was employed on the dataset of the first study group and Confirmatory Factor Analysis (CFA) was performed on the dataset of the second study group. The teachers in the study groups were active at schools. The demographics of the first and second study groups are presented in [Table 1](#).

According to data in [Table 1](#), it can be asserted that both sample groups were similar as the percentages of the variables for the first group in which the EFA was employed and the second group in which the CFA was performed were quite close to each other. Besides, exploratory factor analysis and correlation analysis were performed on the dataset of the first study group, while confirmatory factor analysis, 27% lower-upper group analysis, Cronbach's alpha, and composite reliability analysis were performed on the dataset of the second study group.

Table 1. The demographics of the first and second study groups.

		First Study Group				Second Study Group	
Variable	Group	N	%	Variable	Group	N	%
Gender	Female	261	54.9	Gender	Female	203	56.7
	Male	214	45.1		Male	155	43.3
Age	22-30	206	43.4	Age	22-30	167	46.6
	31-40	193	40.6		31-40	127	35.5
	41-50	64	13.5		41-50	51	14.2
	51 and over	12	2.5		51 and over	13	3.6
Level of education	Associate	4	0.8	Level of education	Associate	6	1.7
	Bachelor	415	87.4		Bachelor's	311	86.9
	Master	53	11.2		Master's	37	10.3
	PhD	3	0.6		PhD	4	1.1
Professional seniority	1-5	215	45.3	Professional seniority	1-5	160	44.7
	6-10	96	20.2		6-10	60	16.8
	11-20	120	25.3		11-20	102	28.5
	20 and over	44	9.3		20 and over	36	10.1
School type	Primary school	176	37.1	School type	Primary school	141	39.4
	Secondary school	175	36.8		Secondary school	129	36.0
	High school	124	26.1		High school	88	24.6

2.2. Scale Development Process

An item pool was initially created to assess collective teacher efficacy behaviours. During the formation of the item pool, both the literature was reviewed and the teachers were interviewed. A 41-item pool was created as a result of the review of related literature (Abedini et al., 2018; Bandura, 1997; Blatti et al., 2019; Borgogni et al., 2010; Çelik et al., 2018; Donohoo, 2017; Donohoo et al., 2018; Eells, 2011; Goddard et al., 2000; Goddard et al., 2004; Guskey & Passaro, 1994; Gürçay et al., 2009; Kurt, 2009; Özcan, 2017; Parker et al., 2006; Ross et al., 2003; Ross & Bruce, 2007; Schwarzer & Jarussalem, 1999; Turhan & Yaraş, 2014; Uğurlu et al., 2018; Ware & Kistantas, 2007; Yılmaz & Uslu, 2018; Yorulmaz & Erdem, 2017) and face to face interviews with 19 teachers individually.

A draft version of the instrument was developed based on the item pool. Three experts in the field of educational administration were consulted to examine the content validity of the draft version. The experts were asked to choose among the options of “*appropriate*, *should be improved*, and *inappropriate*” and were encouraged to express their opinions under the option of “*explanations*”. Büyüköztürk et al. (2018) uttered that the necessary arrangements should be made in case the items are unsatisfactory, and the inappropriate ones should be removed based on expert opinions. Accordingly, the scale was reduced to 26 items after the exclusion of 15 items that were deemed to be inappropriate for measuring similar behaviours by the experts. For the face validity, the 26-item draft form was edited by two assistant professors who are experts in the field of the Turkish language. A pilot scheme was conducted with 22 teachers to determine the level of understandability of the draft scale, which was finalized in line with their feedback.

A five-point Likert-type grading was used to determine whether teachers agree with the items in the scale. The options in the scale were “1- Do not agree at all, 2- Disagree, 3- Neutral, 4- Agree, and 5- Completely agree”.

2.3. Data Collection

The research data were collected during the Covid 19 pandemic in 2021. Due to the closure of the schools, the computer-assisted survey was formed to reach the teachers. The instrument consisted of three sections. The first part included the purpose of the study and an informed consent section where the participants declared their voluntary participation in the study. The second part consisted of five questions (gender, age, level of education, professional seniority, and school type) to determine their demographics. And in the third part a 26-item scale was given.

In the beginning, the sample size for the analyses was determined. While Nunally (1978) asserted that reaching a sample of 10 times the number of items would be sufficient, Tabachnick and Fidell (2001) pointed out that the sample size of 300 was acceptable and that of 1000 was perfect. In this regard, 475 participants were included in the first study group for the 26-item version and 358 participants were covered in the second study group for the 20-item version based on the statistical analyses for the first group data. The research data were collected in December 2020. Before the analyses, the research data were examined and a total of 17 surveys were excluded as the presence of outliers in the data set would affect the correlation size (Best & Kahn, 2017).

2.4. Data Analysis

At the first step, the EFA was employed to determine the construct validity of the draft version of the scale. Principal Axis Factoring (PAF) was used in the EFA since the researcher may prefer the principal axis factoring method to understand the latent variables among the observed ones (Karaman et al., 2017). This method also yields a composite result by combining the common and unique variables (Karaman, 2015). On the other hand, Tabachnick and Fidel (2012) specified that promax rotation may be preferred since the results to be obtained by a researcher to perform oblique rotation would be more applicable than the direct oblimin rotation for the future. In this regard, promax rotation was chosen among oblique rotation methods while performing exploratory factor analysis. Tabachnick and Fidel (2012) suggested that the factor loadings should be greater than .32 for the item to be a member of any factor. The present study conforms to the aforementioned criteria.

The CFA was employed to test and verify the structure obtained as a result of the EFA. There are a great many indices in the CFA to reveal the compliance of the structure. This study examined the chi-square goodness test, Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Comparative Fit Index (CFI), Parsimony Normed Fit Index (PNFI), Parsimonious Goodness of Fit Index (PGFI), Normed Fit Index (NFI), Incremental Fit Index (IFI), the Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR).

In order to test the criterion validity, the relationship between the current scale and the Collective Teacher Efficacy Scale (CTES) adapted by Erdoğan and Dönmez (2015) was examined. The reliability of the data was tested through Cronbach's Alpha and composite reliability methods. SPSS 22.0, AMOS 21, and Microsoft Excel were used for all calculations in the study. The composite reliability coefficient was estimated with formula-1 using path coefficients and error variances obtained from the CFA.

$$CR = \frac{\left(\sum_{i=1}^n \lambda_i\right)^2}{\left(\sum_{i=1}^n \lambda_i\right)^2 + \left(\sum_{i=1}^n \delta_i\right)} \quad (\text{Formula-1})$$

3. FINDINGS

Findings regarding the validity and reliability of The Collective Teacher Efficacy Behaviours Scale are presented in this section. The EFA and the CFA were employed to test the construct validity of the data obtained by using the CTEBS.

3.1. Exploratory Factor Analysis

The suitability of the dataset for the analyses was initially examined to employ the exploratory factor analysis. To that end, KMO and Bartlett's sphericity tests were conducted. KMO test is supposed to be greater than 0.60 and the Bartlett sphericity test is to be significant for the adequacy of sample size (İslamoğlu & Alnıaçık, 2016). Kalaycı (2006) affirmed that the KMO coefficient over 0.90 indicates a perfect dataset for analysis. In this study, the KMO coefficient was estimated to be 0.966, and Bartlett's test of sphericity ($\chi^2=9619,895$, $df=325$, $p <.000$) was found to be significant. Based on these, the dataset was determined to be convenient for the analysis.

Büyüköztürk (2002) pointed out that the eigenvalues should be scrutinized, the factors with a score greater than 1 should be assumed valid, and the line graph (scree plot) for the factor eigenvalues should be reviewed to determine the number of factors. On the other hand, Uyar (2012) noted that the most consistent criterion in determining the number of factors is parallel analysis while Pallant (2007) asserted that parallel analysis results should be included in the process of reporting the findings of studies in the fields of education and psychology. This method was used in the present study as it is claimed that the number of factors should be determined with the parallel analysis method (Brown, 2006). Table 2 indicates the factor eigenvalues of the draft version of the scale and the factor eigenvalues after the parallel analysis.

Table 2. *The findings of EFA and parallel analysis eigenvalues.*

Factor	EFA Eigenvalues	PA Eigenvalues	Conclusion
1	14.050	1.455	Accepted
2	1.715	1.384	Accepted
3	1.306	1.333	Rejected

Factors with eigenvalues of and above 1 are considered noteworthy in factor analysis (Pedhazur & Pedhazur Schmelkin, 1991). In determining the factors through parallel analysis, it is necessary to compare the eigenvalues of the real dataset with the randomly selected data and exclude factors up to the point where the eigenvalues of the real data are greater than those of the random data (Akbaş et al., 2019). When Table 2 is examined according to the aforementioned criteria, it can be seen that the first and second factors were accepted since the EFA eigenvalues were higher than those of the parallel analysis were. It can be explained that the scree plot, which is used as an auxiliary graph to decide the number of factors, will be cut in the area where the points are flattened and the following eigenvalues will be small and approximate (Çokluk et al., 2012). Graph 1 displays the results of the analyses. It was obvious that the slope in the line graph decreased significantly after the second factor. When the factor eigenvalues and scree plot were considered together, it was concluded that the scale could have a two-factor structure.

Graph 1. Scree plot.

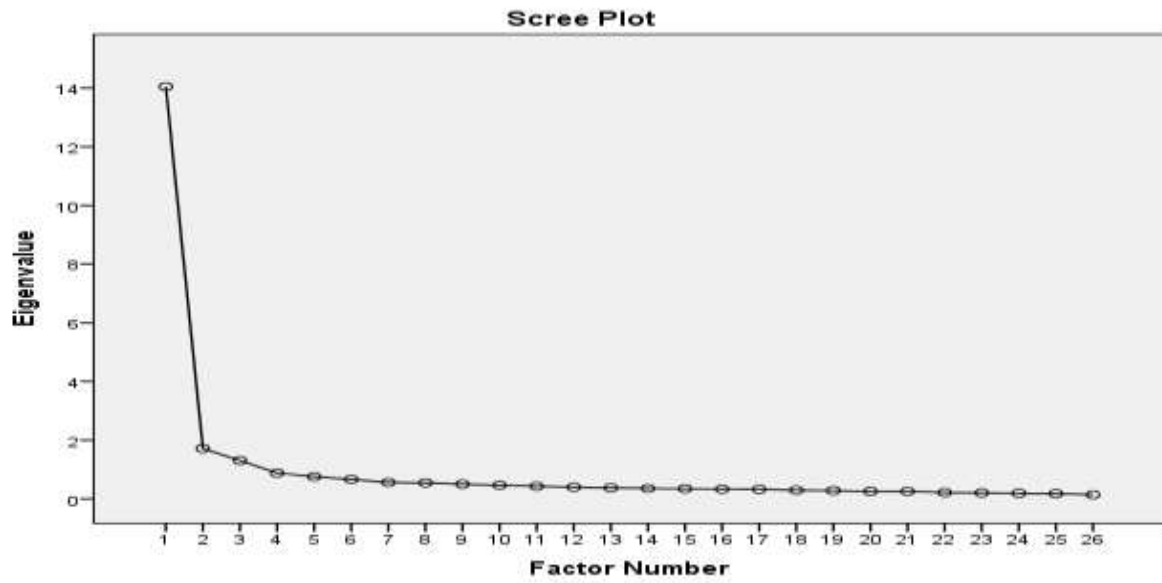


Table 3. Item factor loadings.

Item No	Factor	
	1	2
i12	.868	
i18	.803	
i10	.782	
i21	.773	
i9	.741	
i19	.739	
i23	.737	
i24	.687	
i11	.672	
i15	.666	
i8	.664	
i16	.646	
i22	.636	
i20	.633	
i13	.631	
i26	.580	
i14	.547	
i7		.954
i5		.907
i2		.838
i1		.774
i4		.736
i3		.634
i25		.481
i6	.374	.467
i17	.339	.406

According to Table 3, the item factor loadings varied between .339 and .954. The analysis results implied that there were statistical problems associated with item overlapping between the factors. Regarding the item overlap correlation, Büyüköztürk (2012) suggested that the difference between two high loadings should be .10 at least. Moreover, the lower limit of the item factor loadings was determined to be .32 in factor analysis (Tabachnick & Fidel, 2001). In this vein, the analyses were reiterated by respectively excluding the overlapping items (i6 and i17) and those deemed to be incompatible with the factors based on expert opinion (m8, i14, i23, and i25). The emergent structure is presented in Table 4. According to Table 4, a structure consisting of two factors and 20 items was obtained as a result of the reiterated EFA. The factor loadings of the items varied between .499 and .919.

Table 4. EFA loadings after the exclusion of items threatening construct validity.

Item No	Common Variance	Factor Loadings	
		Factor 1	Factor 2
i12	.722	.908	
i18	.639	.825	
i21	.717	.824	
i10	.578	.823	
i9	.698	.780	
i19	.437	.736	
i11	.568	.704	
i13	.625	.673	
i15	.528	.651	
i16	.579	.617	
i22	.533	.601	
i24	.433	.554	
i26	.472	.543	
i20	.340	.499	
i7	.752		.919
i5	.736		.865
i2	.595		.811
i1	.614		.751
i4	.617		.669
i3	.575		.628
Explained Total Variance: %58.798		52.544%	6.254%

3.2. Factor Labelling

The factors of the EFA were re-examined in terms of the expression of the items and the factors were labelled as in [Table 5](#).

Table 5. Factor labelling.

Factor	Number of Items	Items	Sample items
Social and Professional Relationship (SPR)	14	9, 10, 11, 12, 13, 15, 16, 18, 19, 20, 21, 22, 24, 26	All of us as teachers are with our fellow teachers in their special occasions and hard times. ... unite when a colleague of us is exposed to an unfairness.
Professional Development (PD)	6	1, 2, 3, 4, 5, 7	... keep ourselves up to date to ensure our professional development. ... make every attempt for our students' academic achievement.

3.3. Confirmatory Factor Analysis

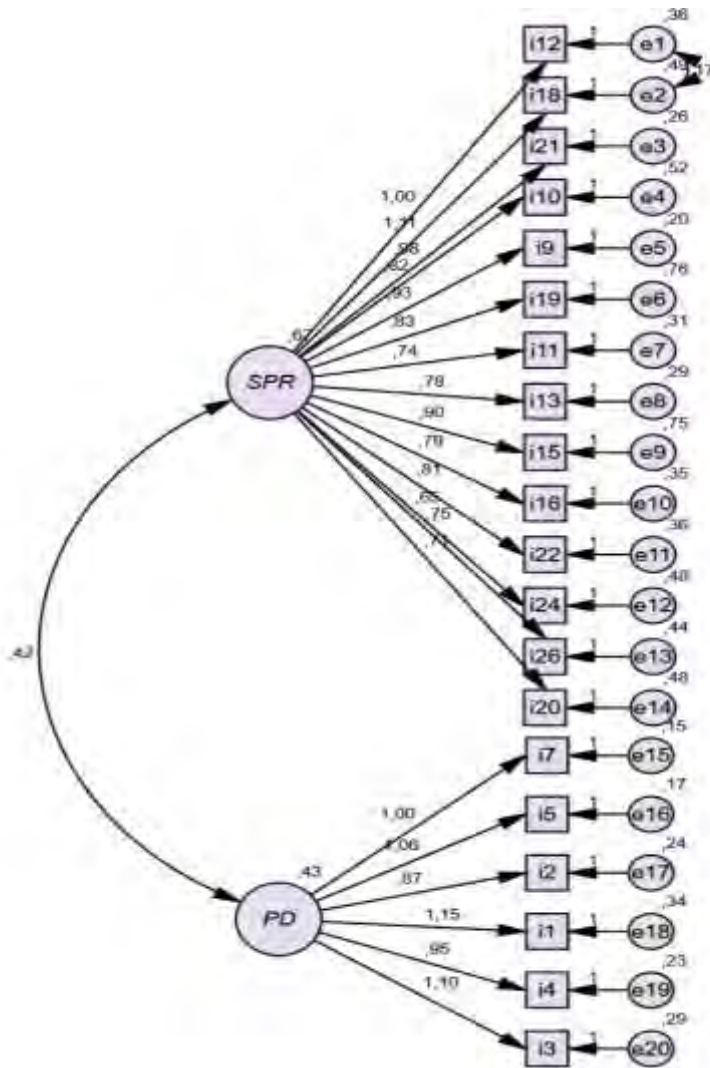
In the confirmatory factor analysis, the researcher tests the hypothesis suggested based on theoretical grounds (Balci, 2016). The CFA was employed to determine the compliance of the emergent two-dimensional structure with 20 items as a result of the EFA. Crowley and Fan (1997) recommended that various fit indices should be used as parameters in the CFA. In this vein, fit indices and the results based on the CFA are submitted in [Table 6](#).

Table 6. Acceptable indices and the results of the CFA.

Fit Index	Index	Perfect Fit	Acceptable Fit	Result
χ^2/df	3.174	$0 < \chi^2/df \leq 3$	$3 < \chi^2/df \leq 5$	Acceptable Fit
RMSEA	.076	$.00 \leq RMSEA \leq .05$	$.05 < RMSEA \leq .08$	Acceptable Fit
SRMR	.0435	$0 < SRMR \leq .05$	$.05 < SRMR \leq .10$	Perfect Fit
CFI	.930	$.95 \leq CFI \leq 1.00$	$.90 \leq CFI \leq .95$	Acceptable Fit
GFI	.872	$.90 \leq GFI \leq 1.00$	$.85 \leq GFI \leq .90$	Acceptable Fit
NFI	.902	$.95 \leq NFI \leq 1.00$	$.90 \leq NFI \leq .95$	Acceptable Fit
IFI	.931	$.95 \leq IFI \leq 1.00$	$.90 \leq IFI \leq .95$	Acceptable Fit
PNFI	.797	$.95 \leq PNFI \leq 1.00$	$.50 \leq PNFI \leq .95$	Acceptable Fit
PGFI	.698	$.95 \leq PGFI \leq 1.00$	$.50 \leq PGFI \leq .95$	Acceptable Fit

When the reference ranges of the indices in [Table 6](#) and the results for the dataset were examined together, it was clear that the two-factor model had an acceptable fit (Bentler & Bonett, 1980; Byrne & Campell, 1999; Schumacker & Lomax, 2010; Tabachnick & Fidel, 2012; Doğan, 2013; İlhan & Çetin, 2014; Karagöz, 2017). The path diagram for the model and factor loadings based on the CFA are presented in [Figure 1](#).

Figure 1. Path diagram for the model and factor loadings based on the CFA.



As a result of the CFA, the structure consisting of a total of 20 items, 14 of which are in the Social and Professional Relationship dimension and 6 of them in the Professional Development dimension, was confirmed. As can be seen in Figure 1, factor loadings ranging from .61 to .86 for the sub-dimensions support the model fit.

3.4. Criterion Validity

The correlation coefficients between The Collective Teacher Efficacy Behaviours Scale (CTEBS) and the Collective Teacher Efficacy Scale (CTES) adapted by Erdoğan and Dönmez (2015) were analysed with the data obtained from 53 teachers within the scope of criterion validity. The results are presented in Table 7.

Table 7. Criterion validity findings.

	CTES	Student Discipline	Instructional Strategies
CTEBS	.069	.047	.083
Social and Professional Relationship	.074	.051	.088
Professional Development	.008	.003	.012

An examination of Table 7 indicates that the correlation coefficient between the CTEBS and CTES is .069 and ranges from .003 to .088 for the dimensions. This finding implies that CTES, focusing on the collective perceptions of teachers, and CTEBS, concentrating on collective behaviours, intend to assess different aspects.

3.5. Reliability

The reliability of the emergent scale was determined through Cronbach's alpha and composite reliability coefficients. The scores are given in [Table 8](#).

Table 8. Reliability coefficients for CTEBS.

Factors	Cronbach's Alpha	Composite Reliability
Social and Professional Relationship	.912	.939
Professional Development	.919	.853
Overall	.938	.962

As displayed in [Table 8](#), Cronbach's Alpha coefficient of .938 for the *overall scale*, .912 for the *Social and Professional Relationship* dimension, and .919 for the *Professional Development* dimension were estimated. On the other hand, composite reliability coefficients were computed based on the factor loadings and error variances in the CFA. Composite reliability coefficients were determined as .962 for the *overall scale*, .939 for the *Social and Professional Relationship* dimension, and .853 for the *Professional Development* dimension. As the reliability coefficients over .70 indicate that an instrument is reliable (Liu, 2003), it can be alleged that the reliability coefficients for CTEBS are satisfactorily high in our study.

3.6. Item Analysis

Lower-upper group item analysis was conducted to determine item discrimination (Tezbaşaran, 1997). In this vein, independent samples t-test was performed for the lower (n=97) and upper (n=97) groups, based on rankings according to the highest and lowest scores for each item, and the item-total correlations are submitted in [Table 9](#).

Table 9. Item-total correlations and lower-upper group item analysis results.

Item No	Item Total Correlation	t	p
i1	.701	15.226	.000
i2	.653	11.735	.000
i3	.720	15.525	.000
i4	.730	13.691	.000
i5	.734	15.222	.000
i7	.714	14.316	.000
i9	.824	18.825	.000
i10	.736	13.937	.000
i11	.752	13.540	.000
i12	.816	19.841	.000
i13	.792	13.280	.000
i15	.748	13.042	.000
i16	.774	13.830	.000
i18	.788	2.573	.011
i19	.652	12.633	.000
i20	.618	11.987	.000
i21	.826	19.636	.000
i22	.745	13.510	.000
i24	.686	11.560	.000
i26	.708	13.627	.000

An examination of the findings in [Table 9](#) yields that t values for 20 items in the scale are between 2.573 and 19.841. Accordingly, the significance of t values implies that the items are discriminatory. It can also be observed that the item-total correlations vary between .652 and .826,

which implies that each item is coherent with the scale. The examination of item analysis for the lower-upper groups results indicate that all the items in the scale have a high level of reliability and item discriminations are significant (Büyüköztürk, 2012).

4. DISCUSSION and CONCLUSION

This study aimed to develop a valid and reliable instrument for collective teacher efficacy behaviours. For this purpose, the scale development stages suggested by DeVellis (2017) were followed. In this vein, a pool of 41 items was initially created by reviewing the relevant literature and interviewing the teachers. 30 items in the pool were created based on the literature review (Abedini et al., 2018; Bandura, 1997; Bandura, 2000; Blattivd, 2019; Borgogni et al., 2010; Çelik et al., 2018; Donohoo, 2017; Eells, 2011; Goddard et al., 2000; Goddard et al., 2004; Gürçay et al., 2009; Kurt, 2009; Kurt, 2012; Lee & Smith, 1996; Parker et al., 2006; Ross et al., 2003; Schwarzer & Jarusalem, 1999; Tschannen-Moran & Barr, 2004; Turhan & Yavaş, 2014; Ware & Kistantas, 2007; Yılmaz & Uslu, 2018; Yorulmaz & Erdem, 2017), and 11 items were based on the interviews with the teachers. Expert opinion was taken for the content and face validity of the scale. Based on the expert opinions, 15 items were eliminated and a 26-item draft scale was created. A five-point Likert-type grading including “do not agree at all, disagree, neutral, agree, and completely agree” was used for the items in the scale.

Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were employed to test the construct validity of the CTEBS. As a result of the first EFA, the overlapping two items (items 6 and 17) and theoretically incompatible four items (items 8, 14, 23, and 25) with the dimensions were respectively excluded and the EFA was reemployed. As a result of the second EFA, a two-factor structure consisting of 20 items and explaining 58.798% of the total variance was obtained. The factors were labelled as *Social and Professional Relationship* and *Professional Development* in line with the relevant literature. Bandura (1997) highlighted that individuals working in a group cannot be socially isolated from group members and Goddard et al. (2000) asserted that collective teacher efficacy is a result of the emergent interactive dynamics within a group. Therefore, the first factor was labelled as “social and professional relationship”. On the other hand, Parker et al. (2006) pointed out that collective efficacy is a crucial factor for explaining the differences in student achievement and expertise by experience is essential in improving student achievement. Considering that collective efficacy affects student success in the classroom (Ross & Gray, 2006) by conducting the necessary activities to create positive student outcomes (Goddard et al., 2004), the second factor was labelled as “professional development”.

The CFA was employed to determine whether the model based on the EFA was verified or not. The fit indices were reported together with the model (path diagram in [Figure 1](#)) based on the CFA. It was observed that the fit indices were within acceptable limits, and a two-factor model consisting of 20 items was confirmed. The examination of the EFA and the CFA results implied that the scale developed had construct validity. On the other hand, the “Collective Teacher Efficacy Scale” adapted by Erdoğan and Dönmez (2015) was used as a criterion and the correlation coefficients between the overall scores of the two scales and their dimensions were estimated to test the criterion validity of the scale. According to the results of statistical analysis, it was concluded that CTEBS and CTES assessed different aspects of collective efficacy.

Cronbach’s Alpha, composite reliability coefficient, and 27% lower-upper item analysis were computed to test the reliability of the data obtained by using the CTEBS. Cronbach’s Alpha coefficient of .938 for the *overall scale*, .912 for the *Social and Professional Relationship* dimension, and .919 for the *Professional Development* dimension were found. Composite reliability coefficients were determined as .939 for the *Social and Professional Relationship* dimension, and .853 for the *Professional Development* dimension. The reliability coefficients

over .70 indicate that the instrument is reliable (Liu, 2003; Tezbaşaran, 1997). Moreover, it was concluded that all the items were discriminatory based on the 27% lower-upper group analysis conducted to determine the distinctiveness of the items in the CTEBS.

The findings revealed that the CTEBS (Appendix 1) is a valid and reliable instrument to be used to test the collective efficacy behaviours of teachers working in primary, secondary, and high schools. For future studies, it may be suggested that the validity of the scale should be tested on preschool teachers as a different sample group. Considering the theoretical background of collective teacher efficacy, its relationship with such variables as organizational culture, academic achievement, leader-member exchange, teacher leadership, and organizational citizenship can be scrutinized.

Declaration of Conflicting Interests and Ethics

The authors declare no conflict of interest. This research study complies with research and publishing ethics. The scientific and legal responsibility for manuscripts published in IJATE belongs to the authors. **Ethics Committee Number:** Gaziantep University/Institute of Educational Sciences, E-39083294-050.06-185

Authorship Contribution Statement

Seyfettin Kapat: Investigation, Resources, Methodology, Visualization, Software, Data Collection, Formal Analysis, and Writing the Original Draft. **Sevilay Sahin:** Framing, Methodology, Supervision, and Validation. **Mevlut Kara:** Framing, Data Collection, Investigation, Methodology, Supervision and Validation, Software, Formal Analysis, and Writing the Original Draft.

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APPENDIX

The Collective Teacher Efficacy Behaviours Scale (CTEBS)

Dimension	Item No		Do not agree at all	Disagree	Neutral	Agree	Completely agree
Social and Professional Relationship		All of us as teachers ... Öğretmenler olarak hepimiz...					
	1	... are with our fellow teachers in their special occasions and hard times. ...öğretmen arkadaşlarımızın özel ve zor günlerinde yanında oluruz.					
	2	... have a dynamic relationship with our colleagues. ...meslektaşlarımızla aramızda dinamik bir ilişki vardır.					
	3	... act synergistically. ...sinerjik bir şekilde hareket ederiz.					
	4	... work in coordination. ...eşgüdüm halinde görev yaparız.					
	5	... have discussions with our colleagues to improve teaching activities. ...öğretim faaliyetlerinin geliştirilmesi için meslektaşlarımızla tartışmalar yaparız.					
	6	... frequently communicate with our colleagues to support our students' development. ...öğrencilerimizin gelişimlerini desteklemek amacıyla meslektaşlarımızla sık sık iletişime geçeriz.					
	7	... unite when a colleague of us is exposed to an unfairness. ...bir meslektaşımıza karşı adaletsiz bir durum olduğunda birlik oluruz.					
	8	... organize various outdoor activities (trips, social events, etc.) with our colleagues. ...meslektaşlarımızla okul dışı zamanlarda çeşitli etkinlikler (gezi, sosyal etkinlik vb.) düzenleriz.					
	9	... express opinions in decisions concerning the entire school. ...okulun tamamını ilgilendiren kararlarda fikirlerimizi belirtiriz.					
	10	... find solutions to the in-school problems with a common sense. ...okul içerisinde meydana gelen problemler karşısında çözüm yollarını ortak akılla buluruz.					
	11	... share with our colleagues when we learn new professional knowledge. ...mesleki anlamda yeni bir bilgi öğrendiğimizde bu bilgiyi meslektaşlarımızla paylaşıyoruz.					
	12	... try to help each other improve their teaching methods and techniques. ...birbirimize öğretim yöntem ve tekniklerini geliştirmeleri konusunda yardımcı olmaya çalışıyoruz.					
	13	... ask for feedback from teacher colleagues at school in improving education. ...okulumuzdaki meslektaşlarımızdan eğitim-öğretimin geliştirilmesi ile ilgili geri bildirim alırız.					
	14	... trust each other in professional matters. ...birbirimize mesleki konularda güveniyoruz.					
15	... attempt to motivate our students in their learning process. ...öğrencilerimizi öğrenme süreçlerinde motive etmek için çaba sarf ederiz.						

Professional Development	16	... make every attempt for our students' academic achievement. ...öğrencilerimizin akademik başarı elde etmeleri amacıyla her türlü girişimde bulunuruz.					
	17	... strive for our students to be successful. ...öğrencilerimizin başarılı olması için çaba gösteririz.					
	18	... fairly treat our students with different levels of academic achievement. ...akademik başarısı birbirinden farklı olan öğrencilerimize adaletli davranırız.					
	19	... use different teaching strategies for student development. ...farklı öğretim stratejilerini öğrencilerin gelişimi için kullanırız.					
	20	... keep ourselves up to date to ensure our professional development. ...mesleki gelişimimizi sağlamak için güncel gelişmeleri takip ederiz.					