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Ortaokul öğrencilerine yönelik iş birliği becerileri ölçeğinin geliştirilmesi: Geçerlik ve güvenirlik çalışması

Development of a collaboration skills scale for middle school students: Validity and reliability study

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Bu çalışma, ikinci yazarın danışmanlığında yürütülen "Developing communication and teamwork skills of middle school students in science course" başlıklı birinci yazarın doktora tezinin bir bölümünü içermektedir.
Bu çalışma, Uluslararası Fen, Matematik, Girişimcilik ve Teknoloji Eğitimi Kongresi'nde sunulmuştur.

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ÖZ

Modern eğitim sistemleri, akademik başarının yanı sıra öğrencilerin sosyal, duygusal ve kişilerarası yetkinliklerinin geliştirilmesini de vurgulamaktadır. Bu çerçevede iş birliği becerileri; öğrencilerin grup ortamlarında etkili iletişim kurmalarını, fikir alışverişinde bulunmalarını, uzlaşmaya varmalarını ve sosyal etkileşim yoluyla ortak hedeflere ulaşmalarını sağlaması bakımından temel bir hale gelmiştir. Bu çalışma, ortaokul öğrencilerinin iş birliği becerilerini doğru ve tutarlı bir şekilde ölçebilen çok boyutlu bir ölçme aracı oluşturmayı amaçlamıştır. Araştırma genel tarama modeli kapsamında yürütülmüş ve Bursa ilinde farklı sosyo-ekonomik düzeylere sahip devlet ortaokullarında öğrenim gören 844 öğrenciden elde edilen verilerle analiz edilmiştir. Geliştirme sürecinde, 36 maddelik taslak form kuramsal temellere ve uzman değerlendirmelerine dayalı olarak tasarlanmıştır. Açımlayıcı Faktör Analizi (AFA) sonucunda, faktör yükleri .45 ile .73 arasında değişen ve toplam varyansın %56.9'unu açıklayan dört faktörlü bir yapı (Grup Çalışması ve Yardımlaşma, Fikir Alışverişi, Uzlaşma ve Ortaklık, Sosyal Etkileşim) elde edilmiştir. Ölçeğin nihai hali 17 maddeden oluşmaktadır. Doğrulayıcı Faktör Analizi (DFA), tatmin edici bir model uyumu göstermiştir (X^2/df = 1.79; RMSEA = .043; CFI = .94; IFI= .94; TLI= .93). Ayrıca, Cronbach alfa katsayısı (α = .88) ölçeğin yüksek güvenirliğini doğrulamıştır. Genel olarak bulgular, İş Birliği Becerileri Ölçeği'nin ortaokul öğrencilerinin iş birliği becerilerini çok boyutlu ve güvenilir bir şekilde ölçebilen geçerli bir araç olduğunu teyit etmektedir. Bu ölçek, sınıf içi uygulamaların planlanmasında ve öğrencilerin sosyal-duygusal gelişimlerinin desteklenmesinde öğretmenler için önemli bir değerlendirme aracı olarak kullanılabilir.

Anahtar Sözcükler: iş birliği becerileri, ölçek geliştirme, ortaokul öğrencileri

ABSTRACT

Modern educational systems emphasize fostering students' social, emotional and interpersonal competencies alongside academic achievement. Within this framework, collaboration skills have become essential for enabling learners to communicate effectively in group settings, exchange ideas, reach agreements and accomplish shared goals through social interaction. This study aimed to develop a multidimensional instrument that can accurately and consistently measure collaboration skills among middle school students. The research was conducted within the scope of the general survey model and analyses were made using the data obtained from 844 students studying in public secondary schools with different socio-economic levels in Bursa Province. During the development process, the 36-item draft form was designed based on theoretical foundations and expert evaluations. Exploratory Factor Analysis (EFA) resulted in a four-factor structure (teamwork and cooperation, exchange of ideas, consensus and collaboration, social interaction) accounting for 56.9% of the total variance, with factor loadings ranging from .45 to .73. The final version of the scale comprised 17 items. Confirmatory Factor Analysis (CFA) indicated a satisfactory model fit (X^2/df = 1.79; RMSEA = .043; CFI = .94; IFI= .94; TLI= .93). Additionally, Cronbach's alpha coefficient (α = .88) confirmed the high reliability of the scale. Overall, the findings confirm that the Collaboration Skills Scale is a valid instrument that can measure the collaboration skills of middle school students in a multidimensional and reliable way. This scale can be used as an important assessment tool for teachers in planning classroom practices and supporting students' social-emotional development.

Keywords: collaboration skills, scale development, middle school students

INTRODUCTION

Today, education systems are expected not only to improve students' academic achievement but also to support their social and emotional competencies (The Organisation for Economic Co-operation and Development [OECD], 2021). In this context, collaboration skills have emerged as one of the essential competencies that contribute both to individual development and to effective participation in social environments. Collaboration includes processes such as effective communication, shared responsibility, negotiation of ideas, and joint problem solving (the Partnership for 21st Century Learning [P21], 2018). The multifaceted nature of this skill makes it an important component of the life skills required in the twenty-first century. Learning environments in which students actively communicate, share responsibilities, and work together in groups contribute not only to academic learning but also to social integration and interpersonal development (Hidayati et al., 2023; Rahayu et al., 2021).

The concept of collaboration is generally associated with working together toward common goals and engaging in joint efforts to solve problems (Gillies, 2016; Welch, 1998). Friend and Cook (2010) describe collaboration as an interaction-oriented relationship in which individuals voluntarily participate in joint decision-making processes in order to achieve shared objectives. Similarly, collaboration is defined as a cooperative partnership formed by individuals who come together around common interests and goals. In educational settings, collaboration also incorporates social-emotional dimensions such as relationship management, empathy, conflict resolution, and innovative thinking (Johnson & Johnson, 2009). Within the scope of the OECD Education and Skills 2030 project, collaboration is considered one of the key competencies that enables individuals to become lifelong learners and effective members of society (OECD, 2021). These competencies support individuals in participating actively in group dynamics and achieving collective goals through interaction.

Educational policies and curricula have increasingly emphasized the development of collaboration skills. In Türkiye, the Türkiye Century Education Model (TCEM) introduced by the Ministry of National Education (MoNE) aims to cultivate individuals who possess not only academic competence but also strong social and ethical values (MEB, 2024a). Within this framework, collaboration is positioned as an important component of social-emotional learning (Collaborative for Academic, Social, and Emotional Learning [CASEL], 2020). In particular, science education offers rich opportunities for collaborative learning through laboratory activities, project-based learning, and group discussions, where students exchange ideas, solve problems together, and participate actively in the learning process (Çepni, 2010). Such environments support the development of collaboration skills while also contributing to scientific literacy and collective knowledge construction (Duschl & Osborne, 2002; Saavedra & Opfer, 2012).

A review of the literature reveals that several measurement instruments have been developed to assess collaboration and related constructs in different contexts (Care & Kim, 2017). Some scales focus on collaboration within specific relationships, such as teacher–parent communication (Atabey & Şahin, 2011), while others target different age groups including preschool children (Baş, 2011), university students (Büyükoğlu, 2015), and teachers (Basık & Dayı, 2024). In addition, collaboration has often been examined as a sub-dimension within broader frameworks such as twenty-first-century skills (Boyacı & Atalay, 2016; Kalemkuş & Özek, 2022). Studies such as Ball et al. (2010) and Eryılmaz (2020) have also measured collaboration within multidimensional learning competency frameworks. Studies have also focused on developing valid and reliable instruments to measure students' collaboration skills in different educational contexts (Faize et al., 2025; Chopra & Kauts, 2023). Although these instruments provide valuable insights, many focus on specific populations or address collaboration as part of broader skill constructs rather than examining it as a multidimensional competence in its own.

Despite the growing emphasis on collaboration in educational policies and research, there appears to be a limited number of comprehensive instruments specifically designed to measure

collaboration skills among middle school students. Considering that middle school years represent an important developmental period for social interaction and cooperative learning behaviours, the availability of valid and reliable measurement tools becomes particularly important. Such instruments may help educators and researchers better understand students' collaboration skills and design learning environments that support the development of these competencies.

Therefore, the aim of this study is to develop a valid and reliable scale that can measure collaboration skills among middle school students. The scale is designed to assess multiple dimensions of collaboration, including teamwork, exchange of ideas, consensus building, and social interaction. By providing a multidimensional measurement tool, this study aims to contribute both to the literature on collaboration skills and to educational practices that support students' social and collaborative development.

Theoretical Framework

Collaboration skills and their place in 21st century skills

Collaboration skills refer to a set of social competencies that enable individuals to work together effectively toward shared goals. These skills include components such as communication, responsibility sharing, empathy, problem solving, and conflict management (Johnson & Johnson, 2009). The social, economic, and technological dynamics of the twenty-first century increasingly require individuals to engage in teamwork, manage differences, and demonstrate flexibility in collaborative environments (Trilling & Fadel, 2009). Within the P21 framework of twenty-first-century competencies—critical thinking, communication, collaboration, and creativity—collaboration is particularly associated with active team participation and constructive social engagement (P21, 2018). Similarly, the OECD Education and Skills 2030 project identifies collaboration as a key social-emotional competence that supports lifelong learning and active participation in society (OECD, 2021). In educational contexts, collaboration enhances students' active participation in learning processes, strengthens knowledge retention, and promotes a sense of shared responsibility within groups (Hidayati et al., 2023). Therefore, fostering collaboration skills from the early stages of education has become one of the primary goals of contemporary educational systems.

Dimensions of collaboration skills

Due to their multidimensional nature, collaboration skills have been conceptualized in different ways across the literature. Johnson and Johnson (2009) identify five key elements that support effective collaboration: positive interdependence, direct interaction, individual accountability, interpersonal skills, and group process evaluation. These components are considered essential for sustaining productive group interaction. Similarly, Friend and Cook (2010) describe collaboration as a set of interrelated skills, including setting common goals, participating in decision-making, sharing responsibilities, communicating effectively, and resolving conflicts. These dimensions play a crucial role in enabling individuals to assume their roles within group processes and actively participate in collaborative tasks.

Empirical studies have also examined collaboration through multidimensional structures. Gillies and Boyle (2010), for example, examined collaboration through dimensions such as active listening, sharing ideas, conflict resolution, and contribution to group processes. Similar multidimensional approaches can also be observed in studies conducted in Türkiye. Yerlikaya and Doğruyol (2020) included dimensions such as communication, empathy, responsibility, and solution-oriented thinking in the collaboration scale they developed for adults. Overall, these perspectives indicate that collaboration should be understood not merely as the ability to work together but as a multifaceted competence that involves interpersonal interaction, communication, negotiation of ideas, and collective problem solving.

The dimensions of collaboration skills identified in the literature can be interpreted in relation to the theoretical components discussed in various frameworks. The dimension labelled as teamwork and cooperation is associated with the principles of positive interdependence and shared responsibility emphasized in cooperative learning theory (Johnson & Johnson, 2009). Similarly, the exchange of ideas dimension reflects communicative processes through which students share, discuss, and negotiate ideas within collaborative learning environments, aligning with the emphasis on collaborative interaction in the P21 framework of twenty-first-century skills (P21, 2018). The consensus and collaboration dimension relates to students' tendencies to consider different perspectives and reach shared decisions within group processes, which is consistent with competencies related to managing differences and achieving consensus emphasized in the OECD Education 2030 framework (OECD, 2021). Finally, the social interaction dimension reflects interpersonal processes that sustain collaboration and support relational dynamics within groups (Friend & Cook, 2010). These theoretical perspectives suggest that collaboration skills can be conceptualized as a multidimensional construct involving communication, cooperation, consensus building, and social interaction.

Türkiye century education model perspective and collaboration

TCEM, introduced by the MoNE in 2024, proposes a holistic educational approach aimed at raising individuals who are not only academically competent but also socially, emotionally, and ethically developed (MEB, 2024a). Within this framework, collaboration is considered an essential competence that supports effective communication within groups, shared responsibility toward common goals, openness to diverse perspectives, and collective knowledge construction. The model emphasizes the importance of Social-Emotional Learning (SEL), which reflects principles highlighted in international frameworks such as the OECD Future of Education and Skills 2030 initiative. In this initiative, collaboration is recognized as a key competence that enables individuals to sustain lifelong learning, demonstrate strong social capabilities, and contribute actively to society (OECD, 2021).

Aligned with this perspective, the science curriculum updated in 2024 encourages students to engage in collaborative learning processes through activities such as laboratory experiments, project-based learning, group discussions, and joint decision-making tasks (MEB, 2024b). These learning environments are designed to support students in sharing ideas, negotiating different perspectives, and participating actively in collective knowledge construction. In addition, the TCEM promotes collaborative pedagogical values such as community-based meaning making, multi-perspective thinking, and co-production of knowledge. Accordingly, the model emphasizes collective learning processes alongside individual knowledge acquisition and aims to equip students with key twenty-first-century competencies including collaboration, communication, and problem solving (Dede, 2010; P21, 2018; Saavedra & Opfer, 2012).

Consequently, within the TCEM, collaboration skills are considered not only as a curriculum component but also as a fundamental educational objective that supports cognitive development, strengthens social cohesion, and fosters ethical responsibility. Measurement tools and educational practices developed within this framework aim to make collaboration skills observable, measurable, and systematically developable.

METHOD

Research Model

This study was structured based on the general survey model, one of the descriptive research methods. The general survey model is a data collection process that aims to reach general judgments about a universe consisting of a large number of individuals, based on the entire universe or a representative sample (Büyüköztürk et al., 2020). For this reason, data were collected from a large and diverse group of students for the scale to be developed.

Participants

The study group consists of middle school students attending four public schools affiliated with the MoNE and located in three central districts of Bursa Province. The convenience sampling method, a non-probability sampling technique, was employed to select the participants. This method was preferred due to considerations related to accessibility and feasibility during the data collection process (Büyüköztürk et al., 2020; Cohen et al., 2018). As described in the literature, convenience sampling involves constructing the sample by reaching the most accessible participants until the desired sample size is achieved (Büyüköztürk et al., 2020).

In scale development studies, the primary objective is typically to examine the internal structure and psychometric properties of a measurement instrument rather than to obtain a statistically representative sample of a broader population. For this reason, non-probability sampling strategies are commonly employed in instrument development research. Within this context, convenience sampling was considered appropriate for reaching a sufficiently large group of participants who could provide reliable responses to the scale items. In addition, efforts were made to include students from different grade levels and schools located in different districts of Bursa in order to increase sample variability. Specifically, four public schools with varying socio-economic characteristics were included in the study so that the psychometric performance of the items could be examined across a relatively diverse group of learners. Such diversity may contribute to evaluating the stability of the factor structure and the reliability of newly developed measurement instruments. Accordingly, the sample obtained in this study was considered suitable for examining the psychometric properties of the Collaboration Skills Scale.

In order to comprehensively examine the psychometric properties of the scale, the data collection process was conducted in a three-stage structure. First, a preliminary application was carried out with a pilot group of ten students to test the language, clarity, and comprehensibility of the scale items. Through this pilot study, the students' levels of item comprehension, potential ambiguities encountered, and the completion time of the scale were determined. Subsequently, EFA was conducted on a second sample group of 422 students to explore the factor structure (construct validity) of the scale. Finally, to test the accuracy and stability of the emerging structure, CFA was performed on a third independent group of 422 students, distinct from the EFA group.

According to gender distribution, 59.7% of the students were female (*n*=504) and 40.3% were male (*n*=340). According to the grade level, 21.3% were 5th grade students (*n* =180), 25% were 6th grade students (*n* =211), 26.8% were 7th grade students (*n* =226) and 26.9% were 8th grade students (*n* =227). Care was taken to ensure that the distributions of grade level and gender were comparable across the two groups. The demographic characteristics of both groups are presented in Table 1.

Table 1
Class Level and Gender Distribution of Students Divided into Two Groups

Groups	Gender	Grade 5	Grade 6	Grade 7	Grade 8	Total
	Female	54	63	67	67	251
EFA Group	Male	36	43	46	46	171
		90	106	113	113	422
	Female	54	63	67	67	251
CFA Group	Male	36	42	46	47	171
		90	105	113	114	422
	Total	180	211	226	227	844

When Table 1 is examined, EFA was conducted with the data obtained from a total of 422 middle school students from the fifth, sixth, seventh and eighth grade levels in the first group, and CFA

was conducted with the data obtained from the second group consisting of a total of 422 students with the same number.

Scale Development and Implementation

Before initiating the scale development process, a comprehensive review of both national and international literature was conducted to examine existing measurement tools related to collaboration skills. The review revealed that there was no measurement instrument specifically designed to assess collaboration skills in line with the indicators defined in the TCEM**.** Therefore, an initial item pool consisting of 36 items was generated by taking into account the collaboration skill indicators and learning outcomes presented in the common framework of the TCEM. These draft items were designed to reflect the key dimensions of collaboration emphasized in the model and were subsequently submitted to expert evaluation to assess their relevance, clarity, and alignment with the construct.

To evaluate the content validity of the 36-item draft scale, a total of nine experts were initially invited to review the instrument. Feedback was formally received from six of these experts who completed the structured evaluation form in detail. The expert panel consisted of two educational scientists specializing in collaboration skills, one specialist in measurement and evaluation, one educational psychologist, one science education expert, and one Turkish language teacher with experience in secondary education. The experts evaluated the items in terms of clarity, relevance to the construct of collaboration, and developmental appropriateness for middle school students. Based on the feedback received from these specialists, several items were revised to improve comprehensibility and to ensure that each item addressed a single outcome related to collaboration skills. In addition, complex expressions were simplified in order to better align with the cognitive levels of the target group. The expert feedback primarily focused on improving the clarity and wording of the items, and no recommendations were made regarding the removal of any items at this stage. This review process contributed to strengthening the content validity of the draft scale. The scale was designed as a 5-point Likert scale ("strongly disagree, disagree, undecided, agree, strongly agree") and there were no reverse coded items in the measurement tool. Before the main implementation of the scale, a pilot study was conducted with ten students from a public secondary school. This preliminary application aimed to examine students' comprehension of the scale items, identify possible ambiguities in wording, and determine the average completion time of the scale. The initial application conducted with 10 students was designed as a qualitative pre-testing phase (face validity) rather than a statistical pilot study. The primary objective of this stage was to evaluate the linguistic clarity and comprehensibility of the draft items before the large-scale implementation. In scale development research, such small-scale pre-tests are commonly used for cognitive debriefing, enabling researchers to identify potential ambiguities in item wording or interpretation within the target age group (Lamm et al., 2020). During this process, students were encouraged to provide feedback regarding the clarity and understandability of each item. The feedback obtained from the students indicated that the items were generally understandable for middle school students, and minor linguistic revisions were made where necessary. Consequently, this stage functioned as a preliminary quality check to ensure the clarity of the items before proceeding to the main data collection for statistical analyses.

The 36-item draft scale was made ready for the implementation process. Factor analysis was conducted to reveal the underlying structure of the measurement tool and to determine the relationships between the items and the constructs (Çokluk et al., 2021). Prior to the analysis, the adequacy of the sample size was evaluated based on established criteria in the literature. Although opinions vary - ranging from 150 participants being sufficient (Tabachnick & Fidell, 2007) to classifications where 300 is considered 'good' (Comrey & Lee, 2016) - Kline (1993) suggests that the sample size should be at least ten times the number of items. Accordingly, a minimum of 360 participants was targeted for the 36 item draft form in this study. The final sample size for the analysis was n = 422.

Data Analysis

In the data analysis process, SPSS 27.0 software was utilized for EFA, item analysis, and reliability calculations, while AMOS was employed for CFA. The scale is designed as a 5-point Likert-type instrument and includes no reverse-coded items. Possible scores on the final 17-item scale range from a minimum of 17 to a maximum of 85. For the EFA, a significance level of .05 was adopted. Following the extraction of a four-factor structure comprising 17 items through EFA, the construct validity was tested using CFA on an independent sample. CFA was conducted to test the four-factor structure obtained from the EFA. Finally, to assess the reliability of the scale, internal consistency was examined using Cronbach's Alpha coefficients.

In determining the factor structure of the scale, several criteria recommended in the literature were taken into consideration. The suitability of the data for factor analysis was evaluated using the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's Test of Sphericity. KMO values above .80 are considered very good, indicating that the sample size is adequate for factor analysis (Şencan, 2005). In exploratory factor analysis, the number of factors was determined based on the eigenvalue criterion (>1) and the examination of the scree plot (Büyüköztürk, 2023). Structures with eigenvalues greater than 1 were considered meaningful for the factor solution. In addition, the point at which the slope of the scree plot levels off was examined in order to identify the number of factors contributing significantly to the variance (Büyüköztürk, 2023; Çokluk et al., 2021).

For item selection, factor loadings and cross-loadings were evaluated. Previous studies suggest different threshold values for factor loadings, such as .30 (Şencan, 2005), .32 (Tabachnick & Fidell, 2007), and .45 (Comrey & Lee, 2016). In this study, a conservative lower limit of .40 was adopted. In addition, items with cross-loadings (defined as a difference smaller than .10 between loadings on multiple factors) were removed from the scale. Furthermore, an explained variance of approximately 50% or higher is generally considered acceptable for construct validity in social sciences (Tavşancıl, 2010).

CFA was conducted using the Maximum Likelihood (ML) estimation method. ML estimation is widely recommended when the data do not exhibit severe deviations from normality (Brown, 2015). In evaluating the model fit, several goodness-of-fit indices were considered. The chi-square to degrees of freedom ratio (χ^2/df) is commonly used as a basic indicator of model fit, and values below 3 are generally considered to indicate an acceptable model fit (Gürbüz & Şahin, 2018). In addition, values above .90 for CFI and TLI indicate acceptable model fit, while values above .95 indicate excellent fit (Hu & Bentler, 1999; Byrne, 2010). RMSEA values below .08 indicate reasonable fit and values below .06 indicate good fit (Brown, 2015).

To evaluate the reliability of the scale, internal consistency coefficients were calculated. Internal consistency is commonly assessed using Cronbach's Alpha, which reflects the degree of correlation among scale items (Büyüköztürk, 2023). In general, alpha coefficients of .70 or higher indicate acceptable internal consistency, while higher values represent stronger reliability (Nunnally & Bernstein, 1994; Field, 2018). In addition to Cronbach's Alpha, Composite Reliability (CR) values were also calculated to further examine the internal consistency of the factors (Hair et al., 2019).

Criterion-related validity was examined to determine whether the scores obtained from the Collaboration Skills Scale were associated with theoretically related constructs. Criterion validity refers to the degree to which scores obtained from a measurement instrument are statistically related to scores from other established measures that are theoretically linked to the same construct (Anastasi & Urbina, 1997). To assess the criterion validity of the Collaboration Skills Scale, an additional independent dataset was collected specifically for this purpose. The developed Collaboration Skills Scale was administered concurrently with three theoretically related instruments. The Empathy Scale (Gökalp & İnel, 2021) was selected because empathy is considered a fundamental component of effective collaboration, particularly in understanding group members' perspectives and maintaining positive interpersonal relationships (Johnson &

Johnson, 2009). The scale is a 12-item, two-factor instrument (cognitive empathy and affective empathy) developed for middle school students, with a reported Cronbach's Alpha of .81. The Secondary School Students' Perception of Cooperative Learning Scale (Üzülmez, 2022) was included because cooperative learning processes are closely linked to collaboration skills, as students must coordinate, share responsibilities, and work toward shared goals within group settings (Slavin, 2011). This scale is a 26-item, two-factor instrument (individual-oriented perception and group-oriented perception) developed for middle school students, with a Cronbach's Alpha of .88. The Social Skills Scale (Kocayörük, 2000) was chosen as social skills represent a broader construct that encompasses collaboration competencies, including interpersonal interaction, communication, and cooperation (Friend & Cook, 2010). This instrument consists of 20 items developed for middle school students, with a Cronbach's Alpha of .75. These instruments were considered theoretically associated with the collaboration construct, and data obtained from a total of 350 students were analyzed for this purpose.

Research Ethics

All the rules stated in the "Higher Education Institutions Scientific Research and Publication Ethics Directive" were followed in the entire process from the planning, implementation, data collection to the analysis of the data. None of the actions specified under the second section of the Directive, "Scientific Research and Publication Ethics Actions" have been carried out.

During the writing process of this study, scientific, ethical and citation rules were followed; no falsification was made on the collected data and this study was not sent to any other academic media for evaluation.

Ethical approval was obtained from the Bursa Uludag University Research and Publication Ethics Committee (Decision Date: 24.11.2024, No: 2024/40). Research permission was also granted by the Bursa Provincial Directorate of National Education, and informed consent was obtained from students and their parents prior to data collection.

Research ethics committee approval information

Name of the ethics committee: Bursa Uludag University Research and Publication Ethics Committee(Social and Humanities Scientific Research and Publication Ethics Committee)

Date of the decision: 24.11.2024

Document issue number: 2024/40.

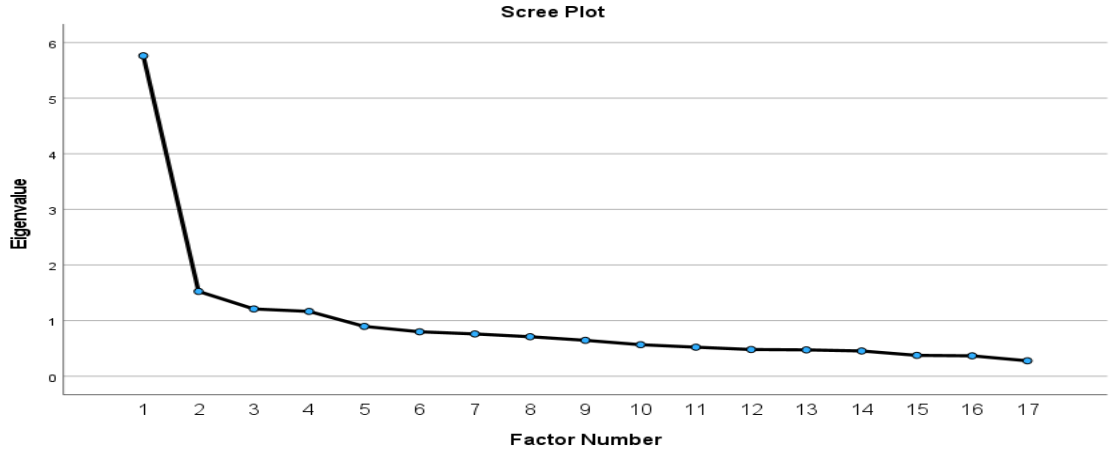
RESULTS

Exploratory Factor Analysis (EFA)

The suitability of the data for factor analysis was examined using the KMO measure and Bartlett's Test of Sphericity. The KMO value was found to be .870, indicating that the sample size was adequate for factor analysis. In addition, Bartlett's Test of Sphericity yielded a significant result ($\chi^2 = 2324.26$, $p < .001$), confirming that the correlations among the items were sufficient for factor analysis.

Following the confirmation of data suitability, EFA was conducted using the Principal Axis Factoring (PAF) method. Varimax rotation was applied in order to obtain a clear and interpretable factor structure. The scree plot for the Collaboration Skills Scale is presented in Figure 1.

Figure 1
Scree Plot Chart



In the initial stage of the analysis, items exhibiting high loadings on multiple factors (cross-loading) or low factor loadings (Items 3, 5, 6, 14, 15, 16, 17, 18, 19, 20, 21, 25, 26, 27, 28, 29, 30, 31, 36) were identified and removed from the scale. Following the exclusion of these items, the Exploratory Factor Analysis was repeated, revealing a distinct four-factor structure. This structure was further supported by the visual inspection of the scree plot.

The final factor loadings ranged between .45 to .73, and these four factors accounted for 56.9% of the total variance. Based on the content of the items, the factors were named as follows:

Teamwork and cooperation: 1, 2, 22, 23, 24

Exchange of ideas: 4, 7, 8, 9, 10

Consensus and collaboration: 11, 12, 13

Social interaction: 32, 33, 34, 35

The item numbers, factor loading ranges and variance explained for each factor are summarized in Table 2.

Table 2 presents the factor loadings and eigenvalue statistics of the Collaboration Skills Scale in detail. The first factor, labeled “teamwork and cooperation”, comprises items with factor loadings ranging from .51 to .57. The items within this dimension characterize students' ability to work collaboratively in group settings and the helping behaviors they exhibit during the collaboration process. The second factor is identified as “exchange of ideas”, with factor loadings varying between .45 and .72. This factor is named as such because the items reflect students' attitudes and behaviors regarding sharing and exchanging ideas. The third factor, “consensus and collaboration” (Items 11, 12, and 13), exhibits factor loadings between .52 and .64. These items signify the attitudes students develop toward diverse opinions and their tendency to cooperate to achieve common goals. Finally, the fourth factor is named “social interaction”, with factor loadings ranging from .52 to .73. The items in this dimension underscore that collaboration skills are fundamentally supported and sustained through effective social interaction.

Table 2
EFA Results of the Collaboration Skills Scale

Item Number	New Item Number	F1	F2	F3	F4
V1	1	.575			
V2	2	.502			
V22	3	.514			
V23	4	.573			
V24	5	.512			
V4	6		.468		
V7	7		.697		
V8	8		.604		
V9	9		.721		
V10	10		.448		
V11	11			.522	
V12	12			.516	
V13	13			.640	
V32	14				.535
V33	15				.734
V34	16				.520
V35	17				.532

Confirmatory Factor Analysis (CFA)

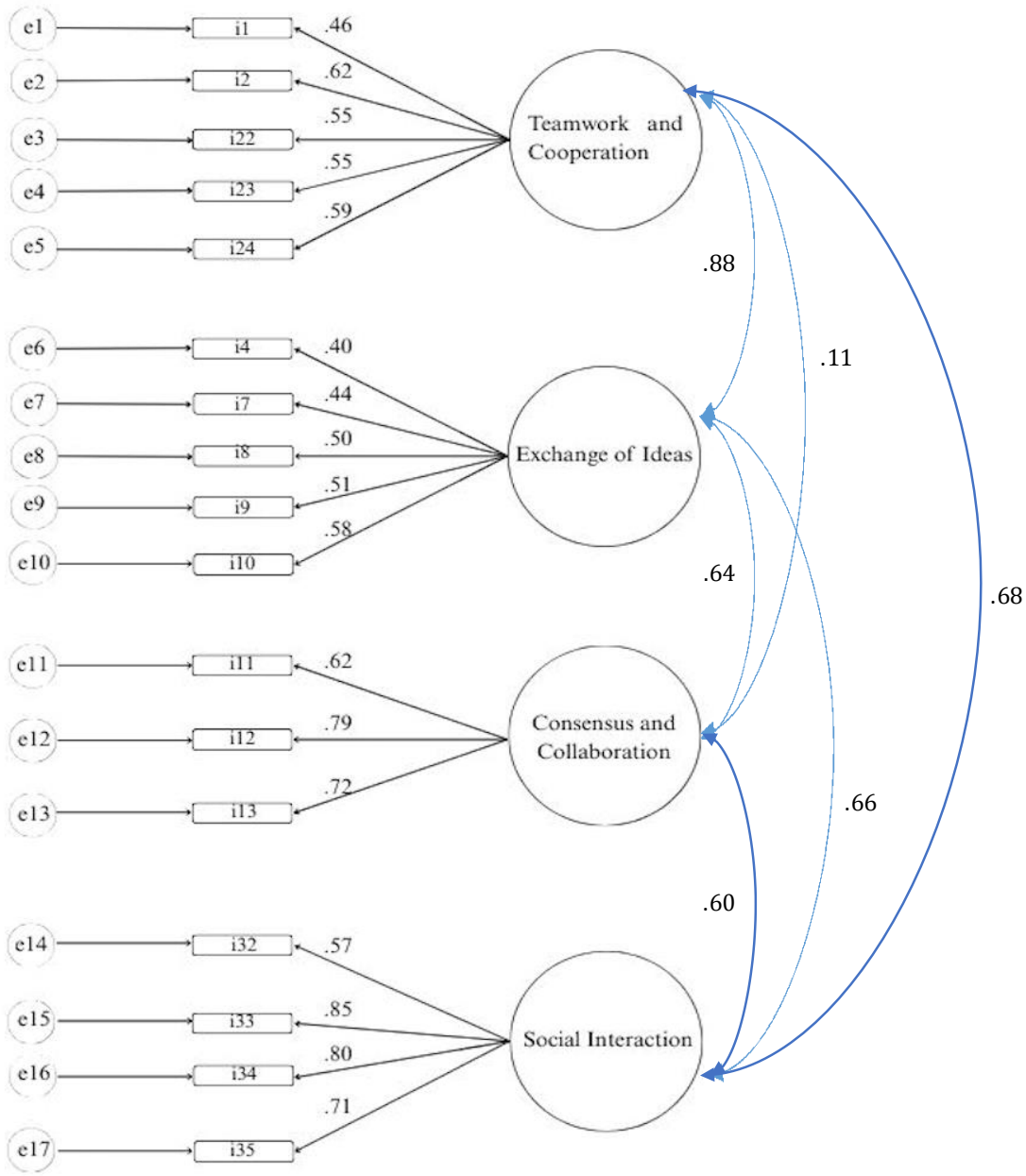
To verify the validity of the factor structure obtained from the EFA, CFA was conducted on a second independent subsample (n = 422) using AMOS software. The analysis produced a chi-square/degrees of freedom ratio (χ^2/df) of 1.79 (χ^2 = 202.372, df = 113, p < .001). The detailed fit indices obtained from the analysis are presented in Table 3.

Table 3
Confirmatory Factor Analysis Results

Index	Perfect Compliance Criteria	Acceptable Compliance Criteria	Finding
χ^2/df	0–2.5	2.5-3	1.79
RMSEA	≤.05	≤.08	.043
NFI	≥.95	≥.90	.87
CFI	≥.95	≥.90	.94
TLI	≥.95	≥.90	.93
IFI	≥.95	≥.90	.94

Table 3 shows that the model demonstrated an acceptable level of fit (RMSEA = .043, CFI = .94, TLI = .93, IFI = .94, NFI = .87). These results indicate that the four-factor structure obtained from the exploratory factor analysis was supported by the confirmatory factor analysis. The path diagram illustrating the standardized factor loadings is presented in Figure 2.

Figure 2
Values Diagram of Items CFA According to Collaboration Skills Scale



Reliability

The internal consistency of the developed scale was evaluated using both Cronbach's Alpha and Composite Reliability (CR) coefficients. The Cronbach's Alpha value for the overall scale was calculated as .88, indicating a high level of reliability. CR values were additionally computed for each sub-dimension, as CR is recommended as a complementary reliability indicator that accounts for the actual factor loadings of the items and is considered less sensitive to the number of items per factor than Cronbach's Alpha (Hair et al., 2019). Detailed Cronbach's Alpha and CR values for the sub-dimensions and the total scale are presented in Table 4.

Table 4
Cronbach's Alpha and Composite Reliability (CR) Values of the Scale

Sub Dimensions	Cronbach's Alpha	CR
Factor 1	.73	.61
Factor 2	.81	.69
Factor 3	.67	.73
Factor 4	.77	.75
Total	.88	

For the sub-dimensions, the values were calculated as follows: Teamwork and cooperation (α=.73), exchange of ideas (α=.81), consensus and collaboration (α=.67), and social interaction (α=.77). While the internal consistency coefficient for the consensus and collaboration sub-dimension (α=.67) is slightly below the general threshold of .70, studies in the literature suggest that values between .60 and .70 are considered acceptable, particularly for sub-scales containing a small number of items or in exploratory social science research (Field, 2018; Hair et al., 2019). In addition, CR values were calculated to further examine the internal consistency of the factors. The CR values ranged between .61 and .75. Although the CR value of Factor 1 (.61) is slightly below the commonly suggested threshold of .70, it exceeds the minimum acceptable level of .60 recommended for exploratory research (Hair et al., 2019). The remaining factors demonstrated CR values at or above .69, indicating adequate to good composite reliability.

Criterion Validity

Prior to the correlation analysis, the assumptions of Pearson correlation were examined. The descriptive statistics and normality indicators for the scales used in the criterion validity analysis are presented in Table 5.

Table 5
Mean, Standard Deviation, Skewness and Kurtosis Values of the Scales

	Mean	Standard Deviation	Skewness	Kurtosis
1. Collaboration Skills Scale (CCSS)	75.5	9.6	.008	-.272
2. Social Skills Scale (SSS)	61.5	6.9	.932	.549
3. Empathy Scale (ES)	24.5	2.5	-.529	-.355
4. Cooperative Learning Perception Scale (CLPS)	100.5	10.9	.785	.491

The skewness and kurtosis values of all variables were within the acceptable range of ±1, indicating that the data were approximately normally distributed (George & Mallery, 2010; Field, 2018). Scatterplots were visually inspected to confirm linearity between variables, and no significant outliers were detected. Therefore, parametric statistical analyses were considered appropriate for the criterion validity assessment.

Pearson correlation analysis was conducted to examine the relationships between the Collaboration Skills Scale and three criterion measures, and the results are presented in Table 6.

Table 6
Criterion Validity Analysis Results

	1	2	3	4
1. Collaboration Skills Scale (CCSS)	1			
2. Social Skills Scale (SSS)	.312**	1		
3. Empathy Scale (ES)	.217**	.287**	1	
4. Cooperative Learning Perception Scale (CLPS)	.329**	.571**	.262**	1

*Note. ** p<.01*

The analysis revealed significant positive correlations between the Collaboration Skills Scale and all three criterion measures. Based on the correlation strength criteria suggested by Field (2018), the Collaboration Skills Scale showed a weak but significant positive correlation with the Social Skills Scale (r = .312, p < .001), a weak positive correlation with the Empathy Scale (r = .217, p < .001), and a weak to moderate positive correlation with the Cooperative Learning Perception Scale (r = .329, p < .001). These results indicate that the Collaboration Skills Scale demonstrates meaningful relationships with constructs that are theoretically associated with collaboration skills, thereby providing evidence for its criterion validity.

DISCUSSION and CONCLUSION

The present study aimed to develop a valid and reliable measurement instrument for assessing middle school students' collaboration skills across multiple dimensions. To this end, an item pool of 36 items was generated based on the collaboration competency indicators defined in the TCEM and the theoretical frameworks established in the international literature. Following expert review and a pilot study, the scale was administered to 844 middle school students. The data were randomly split into two independent subgroups: the first (n=422) was used for exploratory factor analysis, and the second (n=422) was used for confirmatory factor analysis. An additional dataset (n=350) was collected for criterion validity assessment. The analyses resulted in a 17-item, four-factor structure. The following sections discuss the findings in relation to the existing literature.

The factor structure obtained from the analyses was evaluated based on conceptual consistency and labeled with thematic titles. Within this framework, the four factors were named teamwork and cooperation, exchange of ideas, consensus and collaboration, and social interaction. These results align with views of Johnson and Johnson (2009) and Slavin (2011), who emphasize the multidimensional structure of collaboration. Similarly, Chopra and Kauts (2023) identified dimensions such as knowledge negotiation, collaborative skills, and positive interdependence in their scale for teachers, which structurally parallels the scale developed for middle school students in this study. Specifically, the “exchange of ideas” dimension overlaps with information negotiation, while the “teamwork and cooperation” and “consensus and collaboration” dimensions overlap with the collaboration and positive interdependence components. This parallelism suggests that the fundamental components of collaboration skills remain consistent across different age groups and learner profiles.

Beyond supporting previous theoretical perspectives, the four-factor structure identified in this study may also reflect the developmental and contextual characteristics of middle school learning environments. At the middle school level, students increasingly participate in structured group activities, collaborative problem-solving tasks, and peer interaction processes. These experiences may contribute to the differentiation of collaboration into several interrelated dimensions such as working together, exchanging ideas, reaching consensus, and maintaining social interaction. In this sense, the factor structure identified in the present study may represent how collaboration is experienced in everyday classroom practices rather than merely reflecting abstract theoretical constructs. Therefore, the findings of this study support

the multidimensional nature of collaboration suggested in the literature and provide a context-sensitive representation of collaboration behaviors among middle school students.

However, it is also noteworthy that several previous studies have conceptualized collaboration differently. For example, some measurement tools address collaboration as a single dimension or as a sub-component within broader frameworks such as twenty-first-century skills (Ball et al., 2010; Kalemkuş & Özek, 2022). In contrast, the present study revealed a four-factor structure that represents distinct but interrelated aspects of collaboration among middle school students. This difference may stem from the developmental characteristics of the target population as well as the context in which collaboration processes are examined. Middle school learning environments often involve structured group work, peer interaction, and joint problem-solving tasks, which may allow collaboration to manifest through more differentiated behavioral patterns.

The "teamwork and cooperation" sub-dimension aims to measure students' tendency to work together, their mutual support levels, and cooperation-based interactions. Literature findings underscore the importance of this dimension, stating that activities involving collective action reinforce solidarity, collaboration, and supportive behaviors (Arends & Kilcher, 2010; Joyce & Calhoun, 2024). Such environments not only enable peer learning but also support social-emotional development, reduce anxiety levels, and foster positive attitudes toward school (Kurtuluş, 2001). In this context, group-based learning processes strengthen individuals' ability to work together and increase their awareness of cooperation in achieving common goals. Nevertheless, it should also be acknowledged that cooperation in classroom settings may vary depending on instructional design and classroom climate. In educational contexts where group tasks are poorly structured or individual competition is emphasized, students may demonstrate lower levels of cooperative engagement. Therefore, the prominence of this dimension in the present study may also reflect the increasing emphasis placed on collaborative learning environments in contemporary curricula.

The "exchange of ideas" sub-dimension reflects students' level of participation in expressing their thoughts, discussing diverse perspectives, and co-constructing meaning through mutual sharing. Previous research indicates that collaborative learning environments strengthen classroom communication and promote active participation in discussions. For example, Akın Mart (2024) highlights that classrooms often exhibit a "silent structure" characterized by limited interaction prior to collaborative interventions; however, following such practices, students tend to express their ideas more comfortably, actively listen to peers, and engage in mutual discussions. Similarly, the literature suggests that group work enhances knowledge sharing and discussion among students (Greenop, 2007). Moreover, this interaction process may encourage the participation of shy students (Wichadee, 2007), allow learners to complement each other's knowledge gaps, and support reciprocal learning (Payne & Monk-Turner, 2006). Nevertheless, the extent to which students actively exchange ideas may vary depending on classroom dynamics, instructional design, and the degree to which collaborative interaction is encouraged by the teacher. In learning environments where group discussions are not sufficiently structured, opportunities for meaningful idea exchange may remain limited.

The "consensus and collaboration" sub-dimension is critical for maintaining harmony within the group. While the attitude towards diversity measures individuals' behaviors regarding differences of opinion, this dimension encompasses the broader capacity for unity and joint action. Johnson and Johnson (2009) emphasize that cohesion is fundamental for the effective functioning and success of group dynamics, stating that respect for differences and positive interactions facilitate conflict management.

The "consensus and collaboration" sub-dimension of the developed scale aims to measure students' ability to reach common decisions by synthesizing different ideas, manage differences of opinion, and act in unison by establishing consensus within the group. Johnson and Johnson (2009) emphasize that evaluating the group process and consensus-based decision-making are

primary components of effective collaboration. Dealing constructively with conflicts of opinion in a democratic environment improves students' capacity to respect diverse perspectives and find common ground. Campion et al. (1993) also state that coordination among members and focusing on a common goal are vital elements of collaborative learning that enhance group performance. However, reaching consensus in group settings may sometimes lead to conformity pressures or superficial agreement rather than genuine integration of perspectives. Therefore, the presence of this dimension within the scale may also reflect the complexity of collaborative processes in educational environments where negotiation and compromise are essential components of group functioning.

The “social interaction” sub-dimension aims to measure individuals' ability to strengthen group relationships, engage in emotional sharing, establish mutual communication, and support social integration. Arısoy’s (2011) qualitative findings support this view, indicating that collaborative learning processes strengthen social relations in the classroom and increase interaction levels among students. Views suggesting that all individuals must interact during educational processes (Beckman, 1990; Goodsell et al., 1992; Fisher & Frey, 2021) reveal that collaboration is not merely a summation of individual efforts; rather, it is a dynamic process based on mutual interaction. This demonstrates that collaboration skills are developed not just through group membership, but through a continuous and effective communication network; thus, the "Social Interaction" sub-dimension rests on solid theoretical and practical foundations. Effectively measuring these dimensions allows for the assessment of students' responsibility levels and participation in group work. Lou et al. (1996) found that collaborative learning significantly enhances academic performance, while Gillies and Boyle (2010) state that assuming joint responsibilities strengthens intragroup interactions and contributes to positive group dynamics. Nevertheless, the level of social interaction may also be influenced by classroom climate, teacher facilitation strategies, and students’ interpersonal competencies, suggesting that collaboration should be interpreted as both an individual and a contextual phenomenon.

Following the discussion of the multidimensional structure of the Collaboration Skills Scale, the criterion-related validity findings provide additional evidence supporting the validity of the developed instrument. Criterion validity analysis revealed significant positive relationships between collaboration skills and several theoretically related constructs, including social skills, empathy, and perceptions of cooperative learning. These relationships are conceptually meaningful, as collaboration processes in educational settings often require effective interpersonal communication, the ability to understand others’ perspectives, and participation in shared learning activities. The moderate correlations observed between the Collaboration Skills Scale and the Social Skills Scale, Empathy Scale, and Cooperative Learning Perception Scale indicate that the developed scale measures a construct that is theoretically connected to these competencies while still representing a distinct dimension of students’ social and collaborative abilities. This finding is consistent with the literature emphasizing that collaboration skills are closely associated with interpersonal interaction, emotional awareness, and shared learning experiences within group contexts (Johnson & Johnson, 2009; Slavin, 2011). Overall, the criterion-related validity results suggest that the Collaboration Skills Scale demonstrates meaningful relationships with theoretically relevant constructs, thereby providing further support for the validity of the measurement tool developed in this study.

In conclusion, the Collaboration Skills Scale developed in this study has emerged as a valid and reliable instrument enabling a multidimensional assessment of middle school students' collaboration processes. The four-factor structure-comprising “teamwork and cooperation”, “exchange of ideas”, “consensus and collaboration”, and “social interaction”-is consistent with both theoretical foundations and existing scales in the literature. The findings demonstrate that skills related to working together, sharing ideas, reaching consensus, and social interaction play a critical role in the holistic functioning of collaboration. Accordingly, this scale offers a functional tool to evaluate, support, and develop students' collaboration skills in educational

environments. Finally, adaptation studies for different age groups and further research enriched by qualitative data will expand the scale's utility and contribute significantly to the field.

Limitations of the Study

Despite its contributions, this study has several methodological limitations that should be acknowledged. First, the data were collected using a convenience sampling method from secondary schools in Bursa, which may limit the generalizability of the findings to the broader student population across different regions of Türkiye. Second, the study relies on self-report measures, which may be influenced by social desirability bias. Future research could incorporate additional data sources, such as peer evaluations or teacher observations, to provide a more comprehensive assessment of collaboration skills. Third, the research employed a cross-sectional design, capturing students' perceptions at a single point in time. Longitudinal studies may provide further insights into the developmental trajectory of collaboration skills throughout the middle school years.

In addition to these methodological considerations, several psychometric limitations should also be noted. During the scale development process, the initial pool of 36 items was reduced to 17 items following exploratory factor analysis. Although this procedure helped to obtain a clearer and more interpretable factor structure, it may have limited the representation of some aspects of collaboration skills. Future studies may examine the robustness of the factor structure by testing the scale with different samples and contexts.

In addition, the application of the scale in this study was limited to the secondary school level. Future research may examine the validity of the scale across different educational levels, such as primary and high school students, and employ mixed-method approaches to gain deeper insights into students' collaborative processes. Finally, test–retest reliability could not be examined because the data were collected at a single time point. Future studies may investigate the temporal stability of the scale by administering it to the same participants at different time intervals.

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Statement of Contribution Rate

The authors contributed equally to all stages of the research.

Declaration of Conflict of Interest

The authors declare that they have no conflict of interest.

Permission to Use the Scale

The "Collaboration Skills Scale" developed within the scope of this study is presented in Appendix 1. Researchers may use the scale in the form presented in the appendix for non-commercial scientific research without obtaining further permission, provided that appropriate citations are made in the text and listed in the references.

Statement of Use of Large Language Models

Artificial intelligence tools (specifically ChatGPT by OpenAI) were used in this study only for language editing, text organization, and improving clarity of sentences during the manuscript preparation process. AI tools were not used for data analysis, data generation, interpretation of findings, or producing original scientific content. All study questions, research design, data collection procedures, analyses, and interpretations were fully developed and conducted by the authors.

Statement of Publication Ethics

All the rules stated in the "Higher Education Institutions Scientific Research and Publication Ethics Directive" were followed in the entire process from the planning, implementation, data collection to the analysis of the data. None of the actions specified under the second section of the Directive, "Scientific Research and Publication Ethics Actions" have been carried out.

During the writing process of this study, scientific, ethical and citation rules were followed; no falsification was made on the collected data and this study was not sent to any other academic media for evaluation.

This study was conducted with the approval of the Ethics Committee of Bursa Uludag University Research and Publication Ethics Committee (Social and Humanities Scientific Research and Publication Ethics Committee) with the decision dated 24.11.2024 and numbered 2024/40. After the approval from the ethics committee, research implementation permission was obtained from the Bursa Provincial Directorate of National Education and data were collected from the relevant secondary schools in line with this permission. In addition, voluntary consent forms were obtained from both students and parents before data collection.

Research ethics committee approval information

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GENİŞLETİLMİŞ ÖZ

Giriş

Günümüzde eğitim sistemleri, bireyleri yalnızca akademik başarılarıyla değil, aynı zamanda sosyal, duygusal ve toplumsal yetkinlikleriyle de donatmayı hedeflemektedir (OECD, 2021). Bu çerçevede, 21. yüzyılın temel yaşam becerilerinden biri olarak kabul edilen iş birliği becerisi; öğrencilerin grup içinde etkili iletişim kurmaları, fikir alışverişinde bulunmaları, uzlaşma sağlamaları ve ortak hedeflere ulaşmaları açısından kritik bir öneme sahiptir (P21, 2018). İş birliği, sadece grup çalışması yapmak değil, aynı zamanda empati, sorumluluk paylaşımı ve çatışma çözümü gibi çok boyutlu süreçleri içeren dinamik bir yapıdır (Johnson & Johnson, 2009). Milli Eğitim Bakanlığı tarafından 2024 yılında yayımlanan Türkiye Yüzyılı Maarif Modeli de öğrencilerin bütüncül gelişimini merkeze alarak iş birliği becerilerini öğretim programlarının temel bileşenlerinden biri olarak konumlandırmıştır (MEB, 2024a). Alan yazını incelendiğinde, iş birliği becerilerini ölçmeye yönelik çeşitli araçlar bulunmakla birlikte, özellikle ortaokul düzeyindeki öğrencilerin gelişimsel özelliklerine uygun, güncel müfredatla uyumlu ve becerinin çok boyutlu yapısını (iletişim, uzlaşma, sosyal etkileşim vb.) kapsayan psikometrik özellikleri güçlü bir ölçme aracına ihtiyaç duyulduğu görülmüştür. Bu bağlamda araştırmanın amacı, ortaokul öğrencilerinin iş birliği becerilerini geçerli ve güvenilir bir şekilde ölçebilecek çok boyutlu bir ölçek geliştirmektir.

Yöntem

Bu araştırma, ortaokul öğrencilerinin iş birliği becerilerini belirlemeye yönelik bir ölçek geliştirme çalışması olup genel tarama modelinde desenlenmiştir. Araştırmanın çalışma grubunu, Bursa ilinin üç merkez ilçesinde bulunan ve farklı sosyo-ekonomik düzeylere sahip dört devlet ortaokulunda öğrenim gören toplam 844 öğrenci oluşturmaktadır. Katılımcıların belirlenmesinde, zaman ve iş gücü açısından araştırmacıya kolaylık sağlayan uygun örnekleme yöntemi kullanılmıştır (Büyüköztürk vd., 2020). Veri toplama süreci, ölçeğin psikometrik özelliklerini kapsamlı bir şekilde incelemek amacıyla aşamalı olarak yürütülmüştür. İlk aşamada literatür taraması ve uzman görüşleri doğrultusunda oluşturulan 36 maddelik taslak form, 10 kişilik bir pilot grupla dil ve anlaşılırlık açısından test edilmiştir. İkinci aşamada, ölçeğin yapı geçerliğini belirlemek amacıyla 422 öğrenciden elde edilen verilerle Açımlayıcı Faktör Analizi (AFA) yapılmıştır. Üçüncü aşamada ise ortaya çıkan yapının doğruluğunu test etmek için AFA grubundan bağımsız 422 kişilik farklı bir öğrenci grubuyla Doğrulayıcı Faktör Analizi (DFA) gerçekleştirilmiştir. Verilerin analizinde SPSS 27.0 ve AMOS programları kullanılmıştır. Güvenirlik analizleri kapsamında Cronbach Alfa iç tutarlılık katsayıları hesaplanmış, ölçüt geçerliği için ise Sosyal Beceriler Ölçeği, Empati Ölçeği ve İşbirlikli Öğrenme Algısı Ölçeği kullanılmıştır.

Bulgular

AFA öncesinde verilerin faktör analizine uygunluğu Kaiser-Meyer-Olkin (KMO) ve Bartlett Küresellik Testi ile incelenmiş; KMO değeri .870 ve Bartlett testi anlamlı ($p<.001$) bulunarak veri setinin analize uygun olduğu görülmüştür. Temel Eksen Çözümlemesi ve Varimax döndürme tekniği kullanılarak yapılan analizler sonucunda, özdeğeri 1'den büyük olan ve toplam varyansın %56.9'unu açıklayan dört faktörlü bir yapı elde edilmiştir. Faktör yükleri .45 ile .73 arasında değişen ve binişiklik göstermeyen 17 madde nihai ölçeği oluşturmuştur. Belirlenen faktörler içerikleri doğrultusunda; "Grup Çalışması ve Yardımlaşma", "Fikir Alışverişi", "Uzlaşma ve Ortaklık" ve "Sosyal Etkileşim" olarak adlandırılmıştır. Elde edilen bu yapının doğruluğunu test etmek amacıyla yapılan DFA sonuçları, modelin veriye iyi uyum sağladığını göstermiştir (X^2/sd = 1.79; RMSEA = .043; CFI = .94; IFI = .94; TLI = .93). Ölçeğin geneli için hesaplanan Cronbach Alfa güvenirlik katsayısı .877 olarak bulunmuş; alt boyutların güvenirlik katsayılarının ise .67 ile .81 arasında değiştiği tespit edilmiştir. Ölçüt geçerliği analizlerinde, geliştirilen ölçeğin literatürdeki ilgili diğer ölçeklerle pozitif yönde ve anlamlı düzeyde ilişkili olduğu saptanmıştır.

Sonuç ve Tartışma

Araştırmadan elde edilen bulgular, geliştirilen İş Birliği Becerileri Ölçeği'nin ortaokul öğrencilerinin iş birliği becerilerini ölçmek için geçerli ve güvenilir bir araç olduğunu ortaya koymaktadır. Ölçeğin dört faktörlü yapısı, iş birliğinin sadece bir arada çalışmak olmadığını; aynı zamanda fikir paylaşımı, uzlaşma kültürü ve sosyal etkileşimi de içeren karmaşık bir süreç olduğunu vurgulayan alan yazınıyla (Johnson & Johnson, 2009; Slavin, 2011) örtüşmektedir. Özellikle "Fikir Alışverişi" ve "Uzlaşma ve Ortaklık" boyutları, öğrencilerin demokratik bir ortamda farklı görüşlere saygı duyarak ortak paydada buluşabilme yeteneklerini yansıtması bakımından önemlidir. Bu ölçek, eğitimcilerin ve araştırmacıların öğrencilerin iş birliği becerilerini sistematik bir şekilde değerlendirmelerine, bu becerilerin gelişimini takip etmelerine ve eksik görülen alanlara yönelik öğretim stratejileri geliştirmelerine olanak tanıyacaktır. Gelecek araştırmalarda ölçeğin farklı eğitim kademelerine uyarlanması ve nitel verilerle desteklenen karma desenli çalışmaların yapılması önerilmektedir.

Appendix 1. Collaboration Skills Scale

		Kesinlikle Katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle Katılıyorum
1.	İş birliği yapabileceğim kişileri belirleyebilirim.					
2.	Yapılacak iş birliği için uygun koşulları (zaman, mekân) belirleyebilirim.					
3.	Ortak hedefleri olan bir grup oluşturabilirim.					
4.	Ortak hedefleri olan bir gruba dâhil olabilirim.					
5.	Grubumdaki üyelerle görev paylaşımı yapabilirim.					
6.	Yapılan iş birliğinin sonuçlarını fark edebilirim.					
7.	Fikir alışverişlerinin düşüncelerime etkisini fark edebilirim.					
8.	Fikir alışverişlerinin duygularıma etkisini fark edebilirim.					
9.	Fikir alışverişlerinin davranışlarıma etkisini fark edebilirim.					
10.	Fikir alışverişlerinin başkalarına olan etkisini fark edebilirim.					
11.	Grubumdaki kişilerin benden farklı düşündüğünü anlayabilirim.					
12.	Grubumdaki düşünce benzerliklerini belirleyebilirim.					
13.	Grubumdaki düşünce farklılıklarını belirleyebilirim.					
14.	Sosyal etkileşimlerin (kişilerin iletişim halinde olmaları) grup üyeleri açısından sonuçlarını sorgulayabilirim.					
15.	Sosyal etkileşimlere bağlı olarak elde edilen sonuçları sınıflandırabilirim.					
16.	Sosyal etkileşim sonuçlarını eyleme (harekete, aksiyona) dönüştürmek için plan yapabilirim.					
17.	Sonuçlara dayalı olarak yaptığım planı uygulayabilirim.					