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Cross-cultural adaptation and psychometric evaluation of the Engaged Teachers Scale among Arabic-speaking physical education teachers

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Background: Teacher engagement is a positive psychological state characterized by vigor, dedication, and absorption in professional activities, representing the opposite of burnout. While research has established the importance of engagement for teacher effectiveness, wellbeing, and student outcomes, validated measurement tools for assessing engagement among physical education teachers in Arabic-speaking contexts are lacking. This study addresses this gap by adapting a widely used engagement scale to the cultural and professional context of Arabic-speaking physical education teachers.

Objective: To adapt and evaluate the psychometric properties of the Engaged Teachers Scale for Arabic-speaking physical education teachers.

Method: The study involved 621 physical education teachers recruited in two phases: exploratory ($n = 182$) and confirmatory ($n = 439$). Participants completed an Arabic translated version of the Engaged Teachers Scale (A-ETS) and the Teacher Physical Education Job Satisfaction Inventory (TPEJSI). The exploratory sample included 44.2% female and 55.8% male teachers (mean age = 40.15 years), while the confirmatory sample comprised 45.8% female and 54.2% male teachers (mean age = 33.06 years). Teaching experience across both samples ranged from less than 5 years to more than 15 years. Factor structure was assessed through exploratory and confirmatory factor analysis, while reliability was evaluated using Cronbach's alpha and item-total correlations.

Results: The four-factor structure of the original scale was preserved in the Arabic version, explaining 77.51% of the total variance. Confirmatory factor analysis indicated excellent model fit for both first-order ($\chi^2 = 174.83$, $df = 98$, CFI = 0.98, RMSEA = 0.04) and second-order ($\chi^2 = 90.91$, $df = 101$, CFI = 0.98, RMSEA = 0.045) models. Internal consistency was strong for all dimensions, with Cronbach's alpha coefficients ranging from 0.88 to 0.89. Moderate positive correlations between A-ETS dimensions and TPEJSI factors supported the concurrent validity of the scale. While these correlations are modest

in magnitude, they are theoretically consistent and statistically significant, indicating appropriate discriminant validity between engagement and satisfaction constructs.

Conclusion: The Arabic version of the Engaged Teachers Scale demonstrates robust psychometric properties, confirming its validity and reliability for assessing engagement among physical education teachers in Arabic-speaking educational settings. This validated instrument enables further research on teacher engagement and its relationships with professional outcomes and student achievement in physical education contexts.

KEYWORDS

burnout, factor analysis, job satisfaction, physical education, professional engagement, psychometric properties, teacher motivation, work performance

Introduction

Work engagement represents a critical psychological state characterized by persistent, positive affective and motivational development in professional settings. This concept has gained significant attention as the antithesis of burnout, defined by three core dimensions: vigor (high energy and perseverance), dedication (strong involvement with enthusiasm), and absorption (complete focus and immersion in work tasks) (Schaufeli et al., 2002). Research consistently demonstrates that engaged employees exhibit enhanced work performance, innovative thinking, and contribute substantially to organizational success (Xanthopoulou et al., 2009; Bakker and Bal, 2010). Additionally, work engagement correlates positively with improved health outcomes, greater happiness, and higher life satisfaction among professionals (Morales-García et al., 2024), establishing it as a crucial construct in occupational psychology.

Teaching professions, particularly physical education, present unique challenges that differentiate them from standard classroom instruction. Physical education teachers operate within distinctive physical environments, manage safety concerns during physical activities, and often face marginalization regarding the status of their subject within educational curricula (Porsanger, 2023). These educators must simultaneously fulfill multiple professional roles, including instruction, student organization management, assessment administration, and bureaucratic responsibilities (Richards, 2015).

Physical education teachers face distinct professional challenges that differentiate their experiences from those of general classroom educators. These include managing dynamic physical environments, ensuring student safety during high-risk activities, supervising large groups in open spaces, and addressing the often-marginalized status of physical education within academic hierarchies (Casey and Goodyear, 2015). The physical demands of demonstrating activities, coupled with the need for constant vigilance regarding student safety, create unique stressors that may influence engagement patterns differently than traditional academic subjects. Combined with the documented high stress levels in teaching professions across various cultural and educational contexts, physical education teachers represent a population particularly vulnerable to burnout symptoms (Romano et al., 2020; Redín and Erro-Garcés, 2020; Skaalvik and Skaalvik, 2020). The job demands-resources model provides a comprehensive framework for understanding teacher burnout and engagement (Hakanen et al., 2006). Research across

diverse cultural contexts, including studies from Asia (Kim and Burić, 2020), the UK (Day and Qing, 2009), and North America (Klassen and Chiu, 2010), demonstrates that teacher engagement serves as a protective factor against burnout while promoting professional efficacy and student achievement. Physical education teachers face unique job demands, including safety management, equipment handling, and often marginalized subject status, which may differentially impact their engagement patterns compared to classroom teachers.

Despite extensive research on teacher burnout, relatively limited attention has been paid to teacher engagement as a positive psychological construct, especially within specialized teaching domains such as physical education. While numerous studies have examined student engagement in educational settings (Cents-Boonstra et al., 2021; Saloviita and Pakarinen, 2021), research specifically investigating teacher engagement remains comparatively underdeveloped. This gap is particularly pronounced in Arabic-speaking educational contexts, where validated measurement instruments for assessing teacher engagement in physical education are virtually non-existent. This limitation significantly hampers research advancement and the development of evidence-based interventions targeting teacher wellbeing and professional development in these regions.

Based on these research gaps, our study aimed to adapt and evaluate the psychometric properties of the Engaged Teachers Scale (ETS) for Arabic-speaking physical education teachers, examining its factor structure, reliability, and concurrent validity. This adaptation aims to provide a culturally appropriate measurement tool to assess engagement among physical education teachers in Arabic-speaking educational settings, enabling further research into factors affecting teacher engagement and its relationship with professional outcomes, student achievement, and teacher wellbeing.

Methodology

Ethical approval

The study received approval from the ethics committee of the Higher Institute of Sport and Physical Education of El Kef, University of Jendouba, Jendouba, Tunisia (under the Reference number 088/2023). It also complied with the ethical and procedural

requirements for the conduct of sports medicine and exercise science research (Guelmami et al., 2024).

Sample size calculation

Sample size was determined using the formula proposed by MacCallum et al. (1999) for factor analysis studies: $N \geq 50 + 8p$, where p represents the number of items in the scale. With 16 items in the Engaged Teachers Scale, the minimum required sample size was calculated as $N \geq 50 + 8(16) = 178$ participants. This approach aligns with recommendations by Comrey and Lee (2013), who suggested that sample sizes of 200 are fair, 300 are good, and 500 or more are very good for factor analytic studies. To ensure robust statistical power for both exploratory and confirmatory analyses, we recruited significantly larger samples (182 for exploratory and 439 for confirmatory analysis), exceeding the minimum thresholds established in psychometric literature (Tabachnick and Fidell, 2007).

Participants

Participants were recruited through stratified random sampling from public schools across three Tunisian governorates (Tunis, Jendouba, and Gafsa) to ensure geographical representativeness. School lists were obtained from regional education directorates, and random selection was conducted within each stratum. Inclusion criteria included: (1) certified physical education teachers, (2) minimum 1 year teaching experience, and (3) willingness to participate voluntarily. A total of 621 physical education teachers participated in this study, recruited in two distinct phases. For the exploratory sample ($n = 182$), participants included both female (44.2%) and male (55.8%) teachers working in public primary and secondary schools, with ages ranging from 30 to 53 years (mean = 40.15, SD = 6.25) and teaching experience varying from 3 to 29 years. The confirmatory sample consisted of 439 teachers from primary ($n = 204$) and secondary ($n = 235$) schools, with a mean age of 33.06 years (SD = 8.62). This group included both female ($n = 201$; 45.8%) and male ($n = 238$; 54.2%) participants with teaching experience categorized as less than 5 years ($n = 202$), between 5 and 15 years ($n = 137$), and more than 15 years ($n = 100$).

Experimental design

The cross-cultural adaptation was conducted in accordance with international guidelines (Beaton et al., 2000). The process involved: (1) forward translation by two independent bilingual translators, (2) synthesis of translations by the research team, (3) back-translation to English by a native English speaker unfamiliar with the original scale, (4) expert committee review (comprising three university professors in educational sciences, a professional translator, and a bilingual English teacher) to achieve conceptual equivalence, and (5) pre-testing with 15 physical education teachers to ensure comprehensibility and cultural appropriateness.

Used tests

Two measurement instruments were utilized in this study:

1. The Engaged Teachers Scale (ETS): Originally developed by Yerdelen et al. (2018), this 16-item scale measures four dimensions of teacher engagement: emotional engagement (EE), cognitive engagement (CE), social engagement with students (SES), and social engagement with colleagues (SEC). The Arabic version (A-ETS) maintained the original structure and was rated on a 5-point Likert-type scale, ranging from “strongly disagree” (1) to “strongly agree” (5).
2. Teacher Physical Education Job Satisfaction Inventory (TPEJSI): Adapted from the Teacher Job Satisfaction Scale (TJSS-9) and validated for the Tunisian physical education context by Chalghaf et al. (2019), this scale consists of three dimensions: satisfaction with colleagues (3 items), satisfaction with parents (3 items), and satisfaction with student behavior (3 items). Items were rated on a 5-point Likert-type scale from very dissatisfied (1) to very satisfied (5) (Dhahbi et al., 2017).

Statistical analysis

All statistical analyses were conducted using IBM SPSS (version 26.0) and AMOS (version 23) software. Before analysis, data were examined for outliers and normality using skewness and kurtosis indices for item scores and the Mardia index for multivariate data.

For the exploratory phase, exploratory factor analysis (EFA) using Principal Axis Factoring with oblique rotation (Promax) was performed after confirming sampling adequacy using the Kaiser-Meyer-Olkin (KMO) measure (threshold value > 0.70). Factor retention was determined using parallel analysis in addition to eigenvalues greater than 1 and examination of the scree plot. Items with factor loadings below 0.40 were considered for deletion. Internal consistency was assessed using Cronbach's alpha coefficients and corrected item-total correlations.

For the confirmatory phase, confirmatory factor analysis (CFA) was conducted to evaluate model fit. Multiple fit indices were reported, including Chi-square, Root Mean Square Error of Approximation (RMSEA), Tucker-Lewis Index (TLI), Comparative Fit Index (CFI), Goodness-of-Fit Index (GFI), and Adjusted Goodness-of-Fit Index (AGFI). Acceptable threshold values included $p > 0.05$ for Chi-square, CFI and TLI > 0.95, AGFI and GFI > 0.90, and RMSEA < 0.08 (Padulo et al., 2019). Concurrent validity was examined through correlation analysis between A-ETS dimensions and TPEJSI factors.

Results

Exploratory factor analysis

Principal component analysis with Varimax rotation was performed on the exploratory sample data ($n = 182$). The Kaiser-Meyer-Olkin value was 0.94, exceeding the recommended threshold of 0.60, and Bartlett's test of sphericity was statistically significant ($\chi^2 = 6908.34$, $df = 120$, $p < 0.001$), supporting the factorability of the correlation matrix.

Descriptive statistics showed that scores for all 16 items were normally distributed, with skewness and kurtosis values within the

acceptable range of -1 to 1 (Table 1). Factor loadings for all items were robust, ranging from 0.72 to 0.84 , indicating strong representation within their respective factors.

The four-factor solution explained 77.51% of the total variance, with the following distribution: social engagement with students (SES) contributed 52.11% (eigenvalue = 8.46), social engagement with colleagues (SEC) contributed 9.61% (eigenvalue = 1.55), cognitive engagement (CE) contributed 7.71% (eigenvalue = 1.27), and emotional engagement (EE) contributed 7.08% (eigenvalue = 1.13).

Reliability analysis

Internal consistency analysis revealed strong reliability for all four dimensions of the A-ETS. Cronbach's alpha coefficients were 0.89 for emotional engagement (EE), 0.89 for social engagement with colleagues (SEC), 0.88 for cognitive engagement (CE), and 0.88 for social engagement with students (SES). Corrected item-total correlations were substantial for all items, exceeding 0.70 , which further supported the scale's internal consistency (Table 2; Čular et al.,

TABLE 1 A-ETS means standard deviations, skewness, kurtosis, and factor loadings.

Items	Mean	Std. deviation	Skewness	Kurtosis	Factor loadings
I1	2.96	1.11	-0.01	-0.54	0.77
I2	2.99	1.10	0.16	-0.53	0.84
I3	3.11	1.13	-0.02	-0.88	0.78
I4	3.09	1.09	-0.10	-0.50	0.76
I5	3.05	1.00	-0.07	-0.42	0.82
I6	3.10	0.97	-0.02	-0.56	0.79
I7	3.05	1.04	-0.10	-0.61	0.77
I8	3.02	1.03	0.12	-0.45	0.79
I9	3.02	1.07	0.06	-0.62	0.72
I10	2.88	1.09	0.06	-0.61	0.77
I11	2.79	1.08	-0.23	-1.01	0.77
I12	2.81	1.14	-0.01	-0.74	0.77
I13	3.02	1.11	-0.12	-0.57	0.83
I14	3.15	1.14	-0.10	-0.74	0.79
I15	3.09	1.12	0.02	-0.59	0.81
I16	2.87	1.15	-0.05	-0.77	0.80

TABLE 2 Internal consistency of A-ETS.

Items	Mean	SE mean	Cronbach's alpha	Corrected item-total correlation	Cronbach's alpha if item deleted
I1	3.03	0.043	0.89	0.76	0.86
I2				0.76	0.86
I3				0.76	0.86
I4				0.77	0.86
I5	2.89	0.043	0.89	0.78	0.85
I6				0.79	0.85
I7				0.75	0.87
I8				0.73	0.87
I9	2.81	0.041	0.88	0.69	0.86
I10				0.75	0.84
I11				0.75	0.84
I12				0.75	0.83
I13	2.97	0.042	0.88	0.77	0.84
I14				0.73	0.85
I15				0.74	0.85
I16				0.74	0.85

2021). Composite reliability values ranged from 0.89 to 0.91 for all dimensions, exceeding the recommended threshold of 0.70. Average variance extracted (AVE) values were: EE = 0.67, SEC = 0.69, CE = 0.65, and SES = 0.71, all exceeding the 0.50 criterion. The square root of AVE for each construct exceeded the inter-construct correlations, supporting discriminant validity.

Confirmatory factor analysis

Confirmatory factor analysis conducted on the validation sample ($n = 439$) supported the four-factor structure of the A-ETS. Both first-order and second-order hierarchical models demonstrated excellent fit indices with no significant difference between them. The first-order model yielded $\chi^2 = 174.83$, $df = 98$, $p < 0.001$, CFI = 0.98, TLI = 0.98, RMSEA = 0.04, SRMR = 0.03 (Figure 1). Similarly, the second-order model showed appropriate fit indices ($\chi^2 = 190.91$, $df = 101$, $p < 0.001$, CFI = 0.98, TLI = 0.98, RMSEA = 0.045, SRMR = 0.044) (Figure 2).

Table 3 presents a comprehensive summary of all fit indices for both first-order and second-order models, demonstrating that all values meet or exceed the recommended thresholds for excellent model fit.

Concurrent validity

Correlation analysis between the four dimensions of A-ETS and the three factors of TPEJSI revealed weak to moderate positive associations, supporting the concurrent validity of the scale. Emotional engagement showed correlations of 0.30, 0.32, and 0.27 with satisfaction with colleagues, satisfaction with parents, and satisfaction with student behavior, respectively. Social engagement with colleagues correlated at 0.27, 0.25, and 0.21 with the same three satisfaction factors. Cognitive engagement showed correlations of 0.20, 0.21, and 0.23, while social engagement with students demonstrated correlations of 0.20, 0.25, and 0.22 with the three TPEJSI factors (Table 4).

Additionally, moderate to strong intercorrelations were observed among the four A-ETS dimensions, with coefficients ranging from 0.50 to 0.60, indicating both relatedness and distinctiveness among the factors.

Discussion

This study aimed to adapt and validate the Engaged Teachers Scale for Arabic-speaking physical education teachers. Our findings confirm the robust psychometric properties of the Arabic version (A-ETS), preserving the original four-factor structure without the need to remove any items. The confirmatory factor analysis yielded excellent fit indices for both first-order and second-order models, while reliability assessments demonstrated strong internal consistency across all dimensions (Dhahbi et al., 2016; Zalleg et al., 2018).

The four-factor structure aligns with the original conceptualization by Klassen et al. (2013), supporting the cross-cultural validity of the teacher engagement construct. These results parallel findings from other cross-cultural adaptations, such as the Chinese version by Miao and Zhang (2024) and the international validation by Yerdelen et al. (2018), indicating that teacher engagement manifests consistently across different cultural contexts through emotional, cognitive, and social dimensions (Dhahbi et al., 2025). This consistency suggests that while cultural factors may influence specific expressions of engagement, the fundamental structure of teacher engagement remains stable across diverse educational settings (Ardigò et al., 2020).

The moderate positive correlations between A-ETS dimensions and job satisfaction factors support the concurrent validity of the scale and align with previous research identifying relationships between engagement and job satisfaction. Pepe et al. (2021) demonstrated that work engagement functions as a mediator between job satisfaction and psychological distress among teachers,

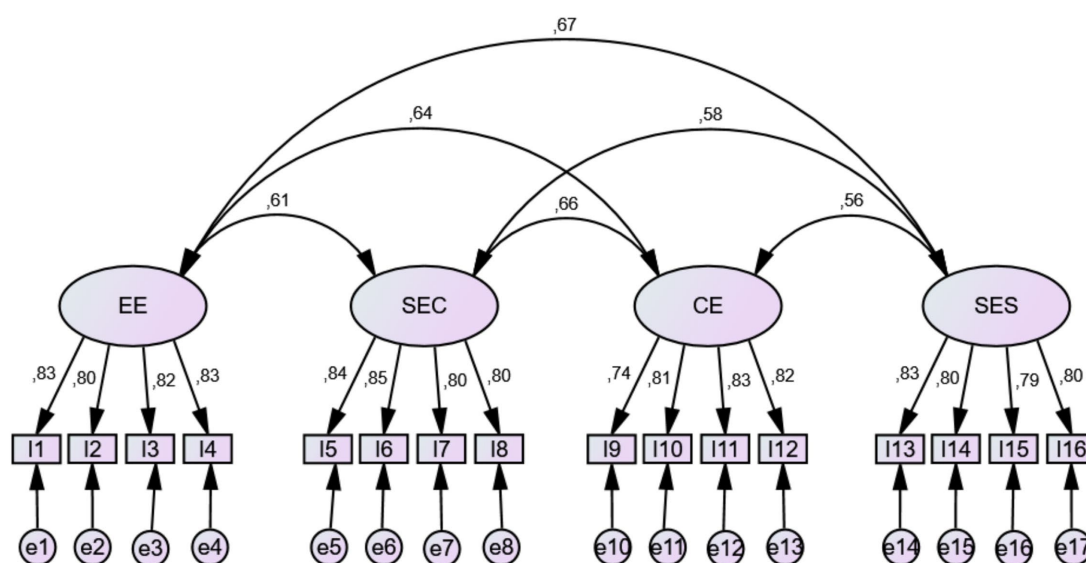


FIGURE 1

First-order factor structures for ETS. EE, emotional engagement; SEC, social engagement: colleagues; CE, cognitive engagement; SES, social engagement: students; TE, teacher engagement.

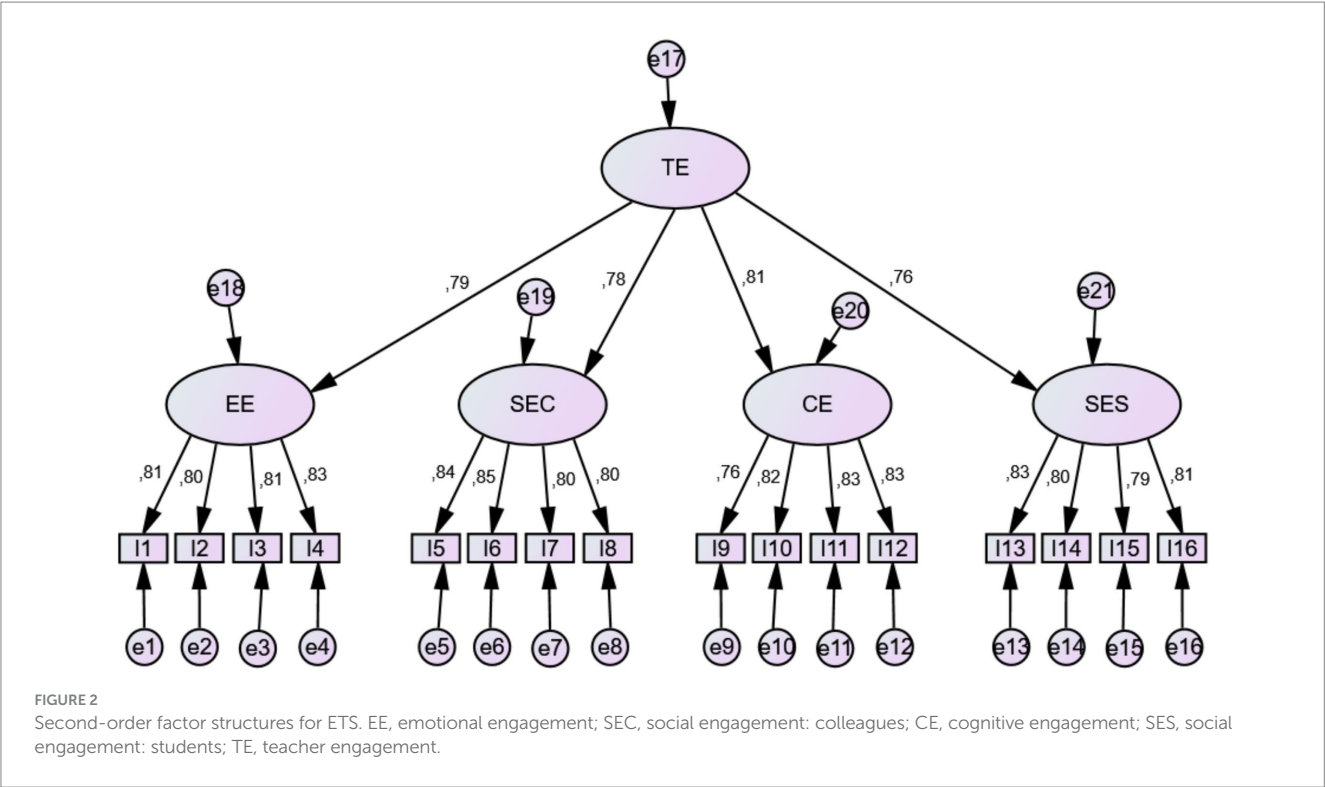


TABLE 3 Confirmatory factor analysis fit indices.

Model	χ^2	df	p	CFI	TLI	GFI	AGFI	RMSEA	SRMR
First-order	174.83	98	<0.001	0.98	0.98	0.92	0.89	0.04	0.03
Second-order	190.91	101	<0.001	0.98	0.98	0.91	0.88	0.045	0.044

CFI, Comparative Fit Index; TLI, Tucker-Lewis Index; GFI, Goodness-of-Fit Index; AGFI, Adjusted Goodness-of-Fit Index; RMSEA, Root Mean Square Error of Approximation; SRMR, Standardized Root Mean Square Residual.

TABLE 4 Correlation matrix between the dimensions of A-ETS and TPEJSI.

Dimensions	EE	SEC	CE	SES	F1	F2
SEC	0.55**					
CE	0.56**	0.58**				
SES	0.60**	0.52**	0.50**			
F1	0.30**	0.27**	0.20**	0.20**		
F2	0.32**	0.25**	0.21**	0.25**	0.55**	
F3	0.27**	0.21**	0.23**	0.22**	0.46**	0.43**

F1, Satisfaction with colleagues; F2, Satisfaction with parents; F3, Satisfaction with student behavior; EE, emotional engagement; SEC, social engagement with colleagues; CE, cognitive engagement; SES, social engagement with students. ** $p < 0.01$.

highlighting the interconnected nature of these constructs. Similarly, [Topchyan and Woehler \(2021\)](#) found that full-time teachers reported higher levels of engagement and job satisfaction compared to part-time teachers, with gender also influencing engagement levels.

Research by [Agarwal et al. \(2020\)](#) with medical trainees revealed negative correlations between work engagement and burnout, perceived stress, and dropout intentions, while [Chichra et al. \(2019\)](#) identified associations between high stress, low job satisfaction, and burnout among medical teachers. These findings collectively reinforce the understanding that teacher engagement represents a protective factor against adverse occupational outcomes and contributes to professional wellbeing.

The importance of teacher engagement extends beyond individual teacher outcomes to student experiences and academic success. Engaged teachers create supportive classroom environments, implement diverse teaching strategies, and foster positive student relationships, which enhance student engagement and achievement. As [Meland and Brion-Meisels \(2024\)](#) demonstrated, teachers who develop warm relationships with students experience greater wellbeing and reduced emotional stress, creating a reciprocal positive cycle in the educational environment.

Our findings contribute to the understanding of engagement specifically within physical education contexts, addressing a significant research gap. Physical education teachers face unique challenges related to teaching environments, safety considerations, and subject status that distinguish their experiences from those of classroom teachers. The

validation of A-ETS provides a valuable tool for investigating how these contextual factors influence engagement patterns among physical education teachers in Arabic-speaking educational settings.

Practical implications and cultural considerations

These findings have several important implications for educational practice in Arabic-speaking contexts. First, the validated A-ETS enables school administrators to systematically assess and monitor the engagement of physical education teachers, facilitating targeted professional development interventions. Second, the scale can inform teacher preparation programs by identifying specific engagement dimensions requiring attention. Third, policymakers can utilize engagement data to develop evidence-based support systems that address the unique challenges faced by physical education teachers in Arab educational settings.

Limitations

Several important limitations warrant consideration. First, geographic restriction to Tunisia limits generalizability across the broader Arabic-speaking world, as educational systems, cultural norms, and teacher working conditions vary significantly across Arab nations. Second, the cross-sectional design precludes causal inferences and understanding of engagement trajectory changes over career spans. Third, exclusive reliance on self-report measures may introduce social desirability bias and common method variance, particularly given the cultural factors that affect self-disclosure in Arab contexts. Fourth, validation against objective performance indicators, student achievement outcomes, or burnout measures would strengthen construct validity evidence. Fifth, the study focused exclusively on physical education teachers, limiting generalizability to other teaching specializations. Finally, qualitative methods were not incorporated to complement the quantitative psychometric evaluation, which would have enriched the understanding of cultural factors influencing teacher engagement manifestation in Arabic-speaking educational contexts.

Conclusion

The Arabic version of the Engaged Teachers Scale (A-ETS) exhibits robust psychometric properties, thereby supporting its validity and reliability in assessing engagement among physical education teachers in Arabic-speaking educational settings. The preservation of the original four-factor structure across cultural contexts reinforces the universality of the teacher engagement construct while providing a culturally appropriate measurement tool for Arabic-speaking researchers and practitioners. This validation represents a significant contribution to research in physical education and sports education, enabling a systematic investigation of teacher engagement in both primary and secondary school settings. Understanding the factors that enhance physical education teachers' engagement can lead to improved strategies for promoting teacher effectiveness, supporting professional wellbeing, and preventing burnout. Given the established connections between teacher engagement, classroom environment, and student outcomes, future research should explore these relationships within physical education contexts to develop targeted interventions that enhance both

teacher and student experiences. The A-ETS provides researchers and educational administrators with a validated instrument to assess and monitor teacher engagement, identify areas for professional development, and evaluate the effectiveness of interventions designed to enhance the teaching experience. By focusing on the positive psychological state of engagement rather than solely on burnout prevention, this approach aligns with the principles of positive psychology. It promotes a more comprehensive understanding of teacher wellbeing and performance.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors without undue reservation.

Ethics statement

Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

Author contributions

SB: Conceptualization, Data curation, Methodology, Writing – original draft, Writing – review & editing. NG: Formal analysis, Writing – original draft, Writing – review & editing. NC: Investigation, Software, Writing – original draft, Writing – review & editing. HİC: Formal analysis, Project administration, Supervision, Writing – original draft, Writing – review & editing. VS: Funding acquisition, Project administration, Visualization, Writing – original draft, Writing – review & editing. RM: Data curation, Writing – original draft, Writing – review & editing. WD: Conceptualization, Methodology, Supervision, Visualization, Writing – original draft, Writing – review & editing. ID: Conceptualization, Methodology, Project administration, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The authors declare that Gen AI was used in the creation of this manuscript. In preparing this paper, the authors used ChatGPT model 4o on May 12, 2025, to revise some passages of the manuscript, to double-check for any grammar mistakes or improve academic English only (Dergaa et al., 2023). After using this tool, the authors have

reviewed and edited the content as necessary and take full responsibility for the content of the publication.

Any alternative text (alt text) provided alongside figures in this article has been generated by Frontiers with the support of artificial intelligence and reasonable efforts have been made to ensure accuracy, including review by the authors wherever possible. If you identify any issues, please contact us.

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