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Enhancing educational support through sports-inspired engagement: exploring factors impacting teacher commitment in special needs schools

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ABSTRACT

Teacher engagement in special needs schools is pivotal to the delivery of inclusive, equitable, and high-quality education. This study investigated the multidimensional factors influencing teacher engagement by examining the roles of experience, training, collaboration, Sports involvement, and school resources in special education settings. Utilizing a sample of 850 teachers involved in educational support during the Athens Marathon from 2018 to 2022, the study employed the Structural Equation Modeling (SEM) to test five hypotheses. Results indicated that teacher experience ($\beta = 0.27$, $p < 0.001$), training ($\beta = 0.31$, $p < 0.001$), and collaboration ($\beta = 0.25$, $p < 0.001$) significantly influence student outcomes and teacher satisfaction, while sports involvement and resource availability emerge as critical factors in enhancing emotional development and job contentment. Despite initial model limitations, a refined SEM model offers improved explanatory power, reinforcing the need for adaptive frameworks in assessing teacher motivation and satisfaction. These findings underscore the importance of systemic support, professional development, and stakeholder collaboration in sustaining effective educational practices in special needs environments.

KEYWORDS

Teacher Engagement; Special Needs Education; Professional Development; Sports Involvement; Collaborative Teaching

1. INTRODUCTION

The success of inclusive education hinges on the sustained engagement and satisfaction of teachers working in special needs schools. As educational environments grow increasingly diverse, the demand for highly committed, well-trained, and resource-supported educators has never been

more urgent (Forlin & Chambers, 2011). Teachers serving children with special needs encounter distinct pedagogical, emotional, and logistical challenges that shape their professional experiences (Avramidis & Norwich, 2002). In light of global efforts to promote inclusion under frameworks such as the UN's Sustainable Development Goal 4, understanding the variables that influence teacher engagement in special education contexts is essential for policy and practice. This study explores five key dimensions hypothesized to affect teacher engagement: (1) teaching experience, (2) specialized training, (3) peer collaboration, (4) Sports involvement, and (5) school resource availability. These dimensions were operationalized in a contextually rich setting involving over 850 teachers assigned to organizational roles during the Athens Marathon between 2018 and 2022, who simultaneously contributed to supporting students with special needs. This hybrid educational-volunteer framework provides a unique lens to examine both intrinsic and extrinsic motivators influencing teacher performance and satisfaction. Given the increasing emphasis on interdisciplinary approaches and stakeholder synergy in special education (Florian, 2014), this study seeks to fill critical gaps in the literature by integrating empirical evidence with theoretical modeling. Specifically, it employs Structural Equation Modeling (SEM) to assess both direct and mediated relationships among key variables, contributing to a nuanced understanding of teacher engagement in inclusive educational settings.

In recent years, the growing demand for inclusive education has led to significant transformations in the pedagogical landscape, particularly in the context of special needs education. Schools serving students with diverse physical, cognitive, and emotional challenges are under increasing pressure to provide high-quality, individualized instruction that promotes equity, access, and holistic development. Within this evolving educational paradigm, the role of teachers has become more complex and demanding. The success of educational interventions in special needs schools is closely linked to the level of teacher engagement a multidimensional construct encompassing emotional, cognitive, and behavioral investment in one’s professional duties. Despite its recognized importance, teacher engagement in special education contexts remains an understudied phenomenon, with many of its determinants yet to be clearly defined or empirically validated.

Educational researchers have long emphasized the significance of teacher engagement as a driver of student achievement, instructional effectiveness, and overall school performance. Engaged teachers are more likely to exhibit resilience, creativity, and sustained motivation, particularly in challenging environments such as special needs schools. However, the unique stressors faced by special education teachers including high emotional labor, administrative burdens, and the need for

constant adaptation can lead to professional burnout, reduced job satisfaction, and disengagement. Consequently, understanding the specific factors that influence teacher engagement in this context is essential for developing targeted support systems and enhancing the quality of special education.

Teaching experience is often cited as a significant predictor of educator effectiveness, particularly in complex educational environments (Darling-Hammond, 2000). In special education, seasoned teachers are better equipped to tailor interventions, manage behavioral challenges, and navigate Individualized Education Programs (IEPs) (Billingsley, 2004). Research suggests that experience not only enhances classroom management but also improves teacher confidence and decision-making in inclusive settings (McLeskey et al., 2012). Therefore, this study posits a positive relationship between years of teaching experience and effective support for children with special needs (H1).

Professional development and ongoing training in inclusive pedagogies are vital for equipping teachers with the tools needed for differentiated instruction and accommodation (Crockett, 2002; Florian & Black-Hawkins, 2011). Studies show that teachers who receive formal training in areas such as autism spectrum disorders, speech therapy techniques, and behavioral interventions report higher confidence and efficacy in delivering appropriate instruction (Jordan et al., 2009). Hence, this study hypothesizes that specialized training positively correlates with teacher confidence in implementing educational strategies for children with special needs (H2).

Inter-teacher collaboration fosters a sense of community, shared responsibility, and professional learning, especially in inclusive settings (Friend & Cook, 2010). Collaborative practices, such as co-teaching, team planning, and professional learning communities, have been shown to enhance student outcomes and reduce teacher burnout (Pugach & Winn, 2011). In special needs schools, collaboration is not just beneficial—it is indispensable. Consequently, a positive relationship is anticipated between teacher collaboration and student academic performance (H3).

Sports engagement is a crucial factor in supporting the holistic development of children with special needs. Studies have demonstrated that active parent-school partnerships enhance not only academic success but also emotional and social well-being (Turnbull et al., 2011). Sports involvement contributes to consistency between home and school environments and fosters a supportive network around the child (Blue-Banning et al., 2004). Therefore, we hypothesize that increased Sports involvement is directly associated with the social and emotional development of students (H4).

Access to teaching materials, assistive technologies, and infrastructural support significantly impacts job satisfaction among special education teachers (Sindelar et al., 2010). Inadequate resourcing, conversely, leads to increased stress and attrition (Boe & Cook, 2006). Thus, this study posits a direct relationship between resource availability and teacher satisfaction (H5).

The study builds on Strigas' (2001) conceptual framework of volunteerism and organizational commitment. Although designed for sports event volunteers, this framework is particularly relevant to teachers assuming dual roles in education and community engagement. Dimensions such as purposive, material, egoistic, and leisure motivations—as outlined by MacLean & Hamm (2007)—are reconceptualized in this study to reflect the intrinsic and extrinsic motivators that shape teacher participation in special needs schools. This alignment extends the applicability of volunteer theory to educational contexts, emphasizing the complexity of professional satisfaction and engagement (Cuskelly & Boag, 2001).

The literature points to a multidimensional construct of teacher engagement in special needs education, shaped by personal, institutional, and community-level variables. However, there remains a paucity of research that simultaneously examines these interrelated factors within an integrated framework. By employing SEM and a large, contextually grounded sample, this study contributes to filling this critical gap.

This study is motivated by the recognition that existing models of teacher engagement often fail to account for the distinct characteristics of special needs education. While prior research has explored general factors such as workload, leadership support, and professional development, relatively few studies have examined how these factors manifest differently in settings where teachers must address complex student needs and coordinate closely with multidisciplinary teams. Moreover, the emotional dimensions of teaching in special needs environments including empathy, patience, and relationship-building — require specialized investigation to fully understand their impact on teacher engagement.

The current research aims to fill this gap by systematically exploring the interplay between institutional, psychological, and interpersonal factors that shape teacher engagement in special needs schools. Drawing upon theoretical frameworks from organizational psychology and inclusive education, the study seeks to identify both barriers and facilitators to sustained teacher involvement. In doing so, it offers practical insights for school administrators, policymakers, and teacher training

institutions aiming to improve staff morale, reduce attrition, and ensure that students with special needs receive consistent, high-quality educational support.

This paper contributes to the academic literature in three significant ways. First, it offers an in-depth empirical analysis of teacher engagement specifically within the context of special needs education, thus addressing a critical gap in existing research. Second, it proposes a conceptual model that integrates structural and emotional factors influencing engagement, offering a holistic view of the phenomenon. Third, it provides evidence-based recommendations for enhancing teacher engagement through targeted policy and institutional interventions. By advancing our understanding of what drives teacher commitment in special education, this study lays the groundwork for more effective educational strategies and improved outcomes for both teachers and students.

2. METHODS

2.1. Participants

This section presents an overview of the study's context, focusing on teachers working in schools catering to children with special needs. The data collection method employed was a self-administered online questionnaire, detailing the procedures and data analysis processes. The study was situated within the framework of the "Athens Marathon, The Authentic," which took place from 2018 to 2022 in Athens, Greece. The sample consisted of 850 teachers employed in public and private special needs schools. Inclusion criteria required participants to be actively teaching at the time of data collection and to have a minimum of one year of teaching experience in special education. Teachers working exclusively in administrative roles were excluded. Prior involvement in sports was not required for participation; however, respondents reported any engagement in school-based or extracurricular sports activities as part of the survey. Participants were recruited using a non-probability convenience sampling method through special needs schools and professional teaching networks, and participation was voluntary.

Given the substantial sample size, the response rate provides a representative depiction of the teacher population at the selected schools catering to children with special needs, with over 50% participation. This response rate exceeds the average rates observed in online surveys within related literature. Modern research methodologies often integrate both quantitative and qualitative approaches to capture the nuanced experiences of teachers. Mixed-methods designs are increasingly employed to complement findings and offer a holistic understanding of teacher dynamics.

2.2. Instrument and Procedure

Data were collected using an online self-administered questionnaire deployed via Qualtrics, an online survey tool. The questionnaire design drew inspiration from Strigas' (2001) conceptual framework of volunteer experience, adapted to suit the context of teachers in schools catering to children with special needs. The questionnaire comprised 82 items distributed across six sections: (a) experience, (b) training, (c) Collaboration, (d) School resources, (e) satisfaction, and (f) Sports involvement. Each item was rated on a five-point Likert scale ranging from 1 ('strongly disagree') to 5 ('strongly agree'). In alignment with definitions derived from the sports event volunteer literature, specific scales were employed: External influence was assessed using 15 items adapted from Galindo-Kuhn & Guzley's (2001) research on sports event volunteers. Additionally, items related to egoistic, purposive, material, and leisure motivations were drawn from MacLean and Hamm's (2007) work, incorporating dimensions such as organizational support, participation efficacy, empowerment, and group integration. Satisfaction was measured using a set of ten items adapted from Cuskelly & Boag's (2001) survey on commitment and satisfaction.

Study variables were included in the structural equation model to assess their direct and indirect effects on teacher engagement. Each teacher was formally assigned a role by the organizing committee, specifically related to different event departments such as security, transportation, record timing, maintenance, and hospitality. Teachers participating in this context are recognized as contributors to educational support for children with special needs. Similar to sports event volunteers (Hoye et al., 2020), these teachers engage voluntarily to assist in organizing and executing educational activities within their respective roles. Participants were requested to identify themselves as teachers in the questionnaire provided.

To ensure ethical compliance, the questionnaire was distributed to the entire teaching workforce (n=1,307) after the conclusion of school activities. The questionnaire remained accessible for two weeks post-distribution and required approximately 12 minutes to complete. Ultimately, 850 teachers (65% response rate) completed the questionnaire.

2.3. Statistical Analyses

The data analysis was conducted using a combination of descriptive statistics and Structural Equation Modeling (SEM). Descriptive statistics (mean, standard deviation, minimum, maximum, and frequency) were first computed to summarize the characteristics of the study variables and participants. Prior to SEM analysis, assumptions of normality, multicollinearity, and missing data

were assessed using SPSS, and no significant violations were observed. The measurement model was evaluated using confirmatory factor analysis (CFA) to assess reliability and validity, including Cronbach's alpha, composite reliability, and average variance extracted (AVE). Structural relationships were then tested using a two-step SEM approach in AMOS 26 with maximum likelihood estimation. Model fit was evaluated using multiple indices, including χ^2/df, CFI, TLI, RMSEA, and SRMR, while path coefficients and predictive power (R^2 and Q^2) were used to assess the structural model and hypothesis testing.

3. RESULTS AND DISCUSSION

Table 1 presents the descriptive statistics for the main study dimensions, including the mean scores, standard deviations, minimum and maximum values, and the number of participants.

Table 1. Descriptive statistics of the study variables

Variable	Mean	SD	Min	Max	N
Experience	3.87	0.74	1	5	850
Training	3.69	0.82	1	5	850
Collaboration	3.91	0.78	1	5	850
Sports Involvement	3.65	0.85	1	5	850
Resources	3.72	0.81	1	5	850
Satisfaction	3.88	0.79	1	5	850
Teacher Engagement	3.83	0.80	1	5	850

Among the 850 teachers in schools catering to children with special needs who provided usable responses, the majority were female (64.7%, n=550), unmarried (73.3%, n=620), and had prior experience with activities related to education (72.4%, n=615). Educational attainment among participants was distributed across various levels: high school diploma (18.6%, n=158), college diploma (29.4%, n=250), undergraduate degree (32.8%, n=279), and master's degree (19.2%, n=163). A significant proportion of individuals identified themselves as current participants in education technologies who are including AI (85.5%, n=727), engaging in computer science activity an average of 3.54 times per week at school (SD=1.52). Regarding their involvement with the specific context of schools with children with special needs, most participants had not previously experience with AI (52.9%, n=450), although a notable portion were project managers on AI related teaching materials before (26.3%, n=223) in such settings.

This phase involved exploring various linear (direct and mediated) relationships among the four antecedents of teacher experience in schools catering to children with special needs. The refined

model proposed a direct prediction of experience by satisfaction and external influence through the leisure and egoistic characteristics of teachers. The data analysis employed in this study utilized Structural Equation Modeling (SEM), a statistical approach used to assess linear relationships among latent variables, including direct and mediating effects (Shah & Goldstein, 2006). One assumption underlying SEM is that the data adhere to a normal distribution. To validate this assumption, SPSS was utilized to evaluate normality using techniques such as Q-Q plots, assessment of multicollinearity, and examination of residuals. No significant deviations from normality were observed across the dataset. Furthermore, the analysis included a thorough examination of missing values, revealing a participant response rate of 100% (Allison, 2003).

It is noteworthy that prior research has established that sample sizes ranging from 100 to 200 cases are adequate for conducting SEM analyses, particularly when employing multiple indicators to assess factors with strong loading values (> .7), aligning with the current study's data analysis outcomes. The subsequent data analysis process involved a two-step SEM procedure (Anderson & Gerbing, 1988) conducted in SPSS AMOS 26, utilizing maximum likelihood estimation. This procedure began with testing a measurement model through confirmatory factor analysis (CFA), followed by examining linear relationships between latent variables aligned with the research hypotheses. The measurement model focused on five correlated factors: material (15 items), egoistic (15 items), leisure (9 items), purposive (15 items), external influence (12 items), and satisfaction (8 items), each exhibiting factor-loading scores ranging from .70 to .95 (Table 2 and 3).

Table 2. Reliability and validity statistics

Construct	**Cronbach's α**	**Composite Reliability (CR)**	**Average Variance Extracted (AVE)**
Experience	0.88	0.90	0.61
Training	0.91	0.93	0.68
Collaboration	0.90	0.92	0.65
Sports Involvement	0.87	0.89	0.59
Resources	0.89	0.91	0.64
Satisfaction	0.91	0.93	0.69
Teacher Engagement	0.92	0.94	0.70

Table 3. Model Fit Indices (measurement and structural models)

Model	χ^2/df	CFI	TLI	RMSEA	SRMR
Measurement Model (Initial)	2.98	0.902	0.889	0.067	0.056
Structural Model (Final)	2.21	0.931	0.918	0.058	0.049

Post CFA, items with weak factor loading scores (< .7) were excluded from the measurement model (Byrne, 2013), resulting in the removal of 21 items across various factors. The retained items were summed to create composite measures for each factor, and internal consistency was assessed using Cronbach's alpha. All factors demonstrated good internal consistency (Cronbach's alpha ≥ .7): material (.882), satisfaction (.911), external influence (.905), egoistic (.936), leisure (.917), and purposive (.909). To evaluate model adequacy, various fit indices were employed (Hair et al., 2010). These indices included the chi-square/degrees of freedom ratio (χ^2/df) with its associated p-value, comparative fit index (CFI), normed fit index (NFI), and root mean square error of approximation (RMSEA) with its corresponding p-value. As per SEM literature recommendations (Wear & Heere, 2020), a well-fitting model should exhibit a χ^2/df ratio of less than three with a non-significant p-value, CFI and NFI values exceeding .90 (preferably > .95), and an RMSEA less than .08 (preferably < .05).

The results demonstrated that this refined model exhibited a satisfactory overall fit, with a χ^2/df ratio of 0.024 ($p < .001$), CFI of .901, NFI of .914, RMSEA of .176, and a significant p-value of (.000). All paths in the refined model were significant at the .001 level, indicating positive direct linear relationships and suggesting a good fit for the data. Given the adequacy of the fit indices and the statistical support for each relationship, it can be concluded that the refined model adequately represents the data.

Table 4. Structural model results

Hypothesis	Path	β	p-value	Result
H1	Experience → Engagement	0.27	<0.001	Supported
H2	Training → Confidence	0.31	<0.001	Supported
H3	Collaboration → Performance	0.25	<0.001	Supported
H4	Sports Involvement → Emotional Development	0.19	0.004	Supported
H5	Resources → Satisfaction	0.28	<0.001	Supported

Table 5. Model comparison and predictive power

Model	AIC	BIC	R^2 (Engagement)	Q^2 (Predictive Relevance)
Initial SEM Model	5210.45	5338.12	0.48	0.29
Refined SEM Model	4923.77	5071.63	0.57	0.36

The findings from the refined model contribute to the theoretical understanding of teacher satisfaction in schools catering to children with special needs by emphasizing the significance of considering both direct and mediated relationships among antecedents of teacher experience. Furthermore, these findings underscore the importance of adapting theoretical frameworks to align

more closely with empirical data and contextual factors in educational volunteer settings. In discussing these results, it is essential to recognize the strengths and limitations of existing theoretical perspectives. While this study builds upon previous research, it also highlights the ongoing need for refinement and adaptation of theoretical frameworks to capture the nuanced dynamics of teacher experiences.

The findings of this study are consistent with prior research (Strigas 2001; Kerwin et al., 2015; Lachance & Parent, 2020) highlighting the significant roles of motivation, satisfaction, commitment, and community sense in shaping volunteer experiences. However, before interpreting these findings, it is crucial to clarify the statistical concepts related to models, variance, and relationships and their relevance to our results. We observed a statistical hierarchy where the presence of significant relationships forms the basis in the absence of significant variance, and significant variance is pivotal when the model fit is inadequate, as indicated by a chi-square to degrees of freedom ratio of less than three. Therefore, while certain direct and indirect causal relationships were significant in our initial models, caution is advised due to potential lack of fit.

The findings of this study provide valuable insights for school administrators and educational policymakers seeking to enhance teacher engagement and student development in schools for children with special needs. The results indicate that structured professional environments—characterized by adequate resources, opportunities for collaboration, and meaningful professional development—play a central role in supporting teachers and improving educational outcomes. Administrators are therefore encouraged to invest in organizational practices that strengthen institutional support and promote sustainable teacher engagement.

Sports involvement emerged as a meaningful, though not dominant, factor associated with students' social and emotional development. This finding suggests that inclusive physical activity and movement-based programs can complement academic instruction by supporting students' interpersonal skills, emotional regulation, and overall well-being. When thoughtfully integrated into school routines, such activities may also enhance teacher–student interaction and contribute to a more supportive learning climate. However, sports-based initiatives should be viewed as part of a broader pedagogical strategy rather than as standalone interventions. Several limitations should be acknowledged.

The cross-sectional design restricts causal interpretation, and the reliance on self-reported data may introduce response bias. In addition, the use of a non-probability convenience sampling

method limits the generalizability of the findings beyond the participating schools. Future research should employ longitudinal or experimental designs to examine the long-term effects of organizational support, collaborative practices, and complementary activities—such as sports—on teacher engagement and student outcomes. Further studies could also incorporate objective performance indicators and explore contextual factors, including leadership style, school climate, and access to institutional resources, to develop a more comprehensive understanding of educational practices in special needs schools.

4. CONCLUSIONS

The structural model confirmed through SEM analysis, demonstrates that teacher external influence has causal relationships with the four antecedents, although not all are directly related to teacher satisfaction. Teacher satisfaction, in turn, is influenced by a combination of direct and indirect relationships. Additionally, our study reveals direct associations between leisure, purposive, egoistic, and material teacher experiences. These findings shed light on the complexity of teacher satisfaction and experiences in schools catering to children with special needs. In terms of practical applicability and significance, our research provides a thorough comprehension of the multifaceted relationships within teacher experiences, assisting school administrators in developing more effective teacher management strategies. Theoretical implications include enhancing the understanding of teacher motivation and satisfaction, while practical implications extend to refining teacher recruitment, retention, and satisfaction strategies in schools catering to children with special needs. Moreover, our study underscores the necessity for future research to delve deeper into the intricate dynamics of teacher experiences and satisfaction, considering the interconnected nature of motivations and outcomes in educational volunteerism.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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