KMAN PUBLISHING INSTITUTE
Journal Website

Article history:
Received 13 March 2025
Revised 06 June 2025
Accepted 11 June 2025
Published online 01 July 2025

Psychological Research in Individuals with Exceptional Needs

Volume 3, Issue 3, pp 1-9

PRIEN
Psychological Research in Individuals with Exceptional Needs

E-ISSN: 3060-6713

Teacher–Student Interaction Quality and Academic Motivation in Neurodivergent Learners: The Mediating Role of Social Relatedness

Vladimir. Pelc[1], Marit. Erves[2], Aleksander. Ternar[2*]

[1] University of Primorska, Faculty of Education, Slovenia
[2] Faculty of Education, University of Maribor, Maribor, Slovenia

*** Corresponding author email address**: Ternar@um.si

A r t i c l e I n f o

Article type:
Original Research

How to cite this article:
Pelc, V., Erves, M., & Ternar, A. (2025). Teacher–Student Interaction Quality and Academic Motivation in Neurodivergent Learners: The Mediating Role of Social Relatedness. *Psychological Research in Individuals with Exceptional Needs, 3*(3), 1-9.
https://doi.org/10.61838/kman.prien.3.3.4

A B S T R A C T

This study aimed to investigate the effect of teacher–student interaction quality on academic motivation in neurodivergent learners, with social relatedness examined as a mediating variable. A descriptive correlational design was employed using a sample of 403 neurodivergent secondary school students in Slovenia, selected based on Krejcie and Morgan's sampling table. Standardized instruments were used to assess teacher–student interaction quality, social relatedness, and academic motivation, all measured on 7-point Likert scales. Data were analyzed using Pearson correlation in SPSS-27 to explore bivariate associations and Structural Equation Modeling (SEM) in AMOS-21 to test the hypothesized mediating model. Model fit was evaluated using multiple indices, including χ^2/df, GFI, AGFI, CFI, TLI, and RMSEA. The results indicated significant positive correlations among all variables: teacher–student interaction quality was positively correlated with social relatedness ($r = .61$, $p < .001$) and academic motivation ($r = .55$, $p < .001$), while social relatedness was strongly correlated with academic motivation ($r = .67$, $p < .001$). The SEM analysis showed an acceptable model fit (χ^2/df = 2.35, CFI = 0.97, RMSEA = 0.057). Teacher–student interaction quality had significant direct effects on both social relatedness ($\beta = .61$, $p < .001$) and academic motivation ($\beta = .26$, $p < .001$). Social relatedness significantly predicted academic motivation ($\beta = .58$, $p < .001$), and also mediated the relationship between teacher–student interaction and academic motivation (indirect $\beta = .35$, $p < .001$), confirming a partial mediation model. The findings underscore the critical role of social relatedness in explaining how supportive teacher–student interactions enhance academic motivation among neurodivergent learners. Educational interventions that strengthen relational dynamics in inclusive classrooms may foster higher motivation and academic engagement in this population.

Keywords: *Teacher–student interaction, social relatedness, academic motivation, neurodivergent learners*

1. Introduction

In recent years, there has been increasing scholarly and practical interest in identifying the psychological and relational variables that foster academic motivation in neurodivergent learners—students with atypical cognitive, emotional, or behavioral functioning who require tailored educational approaches. Among the most critical constructs in this domain are teacher–student interaction quality, social relatedness, and intrinsic academic motivation, which are all theoretically grounded in Self-Determination Theory (SDT). SDT posits that satisfaction of basic psychological needs—namely autonomy, competence, and relatedness—is foundational to optimal learning and motivation. Among these, relatedness has emerged as a particularly vital yet complex factor in understanding how neurodivergent students engage in academic settings (Murray et al., 2020; Ratelle et al., 2021).

Academic motivation, particularly intrinsic and identified motivation, is a key determinant of student success, persistence, and well-being across educational contexts. However, neurodivergent learners often face heightened risks of academic disengagement due to cognitive load, socioemotional challenges, and lower access to tailored support (Selimi et al., 2023). Thus, understanding how motivational processes operate for these students is not only of theoretical importance but also a social and educational necessity. Research increasingly highlights the importance of supportive teacher–student interactions in facilitating motivational resources in this population (Garwood, 2022; Gucciardi et al., 2020). However, the pathways through which such interactions translate into motivation remain underexplored, especially the mediating role of social relatedness in inclusive educational contexts.

Empirical studies have consistently found that warm, structured, and responsive teacher–student interactions are positively associated with students' academic motivation and psychological well-being (Gucciardi et al., 2020; Keller, 2020). These interactions foster a sense of trust, autonomy, and inclusion that are particularly crucial for neurodivergent learners who may experience social exclusion or misunderstanding in mainstream classrooms (Kaplan et al., 2022). For example, teachers who show emotional attunement and provide consistent behavioral support help reduce classroom anxiety, which in turn strengthens students' motivational orientations. Positive teacher–student relationships have also been shown to buffer the effects of executive functioning difficulties and behavioral challenges common in neurodivergent youth (Norder et al., 2025).

Central to these relationships is the construct of social relatedness, which reflects a student's perception of being connected to others in the learning environment. When students feel emotionally and socially accepted, they are more likely to engage in learning activities with vigor and persistence (Cheng & Lau, 2022; Datu & Noltemeyer, 2024). Social relatedness also contributes to psychological safety, which is essential for neurodivergent students whose previous experiences of rejection or miscommunication may impair classroom participation (Anne & Grimminger, 2025). Relatedness does not only arise from teacher–student interactions, but also from peer dynamics and school culture; yet the teacher's role is foundational, as educators shape the affective climate of the classroom and establish the norms of social inclusion (Escandell & Chu, 2021; Garwood, 2022).

The importance of relatedness is magnified in the context of inclusive education, where neurodivergent students are integrated into mainstream classrooms. While inclusion aims to promote equity and participation, it also introduces challenges such as social marginalization, reduced access to differentiated instruction, and misaligned teacher expectations (Pentecost et al., 2018). Under these circumstances, the quality of teacher–student interactions can either mitigate or exacerbate motivational vulnerabilities. For example, Ganotice et al. (2024) found that students' motivation and engagement in collaborative learning contexts were significantly predicted by peer and teacher relatedness, especially when interprofessional tasks were involved (Ganotice et al., 2024). Similarly, the extent to which students perceive their teachers as relationally supportive mediates the influence of classroom structure on academic outcomes (Sieber et al., 2022).

Social relatedness has also been investigated as a mediating variable in various motivational models. For instance, studies indicate that perceived relatedness mediates the relationship between teacher behaviors and student engagement, particularly among populations with learning differences (Gråstén et al., 2019; Núñez-Regueiro & Wang, 2025). When relatedness needs are unmet, students may experience motivational deficits such as amotivation or extrinsic motivation, which undermines academic persistence and increases dropout risk (Raižienė et al., 2017). Conversely, when relatedness is supported—whether through empathetic teaching, inclusive activities, or authentic peer connections—students report greater task

E-ISSN: 3060-6713

interest, self-regulation, and academic resilience (Datu & Noltemeyer, 2024; Ganotice et al., 2024).

Furthermore, the dynamic interaction between teacher support and relatedness may differ in important ways for neurodivergent learners. For example, some students on the autism spectrum may require more explicit relational scaffolding and communication cues to experience social connection, while students with ADHD may benefit from predictable feedback and encouragement (Anne & Grimminger, 2025; Norder et al., 2025). These differences underscore the need for nuanced models that include mediators such as social relatedness to explain how interaction quality translates into academic motivation across diverse neurodevelopmental profiles.

Recent contributions to the literature suggest that cultural, technological, and environmental factors also shape the experience of relatedness and its impact on motivation. For instance, digital learning environments and social media have emerged as both facilitators and inhibitors of social connection. While virtual platforms may offer alternative avenues for engagement and expression among neurodivergent students, they also risk increasing social isolation if relational quality is not fostered (Cheng & Lau, 2022; Zhou et al., 2021). Silva (2021) further demonstrated that social media motives driven by relatedness needs predicted behavioral engagement patterns, suggesting that relatedness is a trans-contextual factor influencing motivation beyond the classroom (Silva, 2021). In addition, Zeng and Xia (2024) modeled students' continuous intention to use educational AI tools and found that social presence and perceived connectedness significantly contributed to technology adoption in learning (Zeng & Xia, 2024).

Cross-cultural studies have also illustrated how relatedness and interaction quality are interpreted differently across educational systems. For example, Min and Shapii (2025) explored how foreign students in China navigate relatedness through social media and resilience strategies, highlighting how cultural norms shape relational expectations and motivational outcomes (Min & Shapii, 2025). Similarly, Kaplan et al. (2022) emphasized the role of minority status in shaping students' perceptions of relatedness in Israeli teacher education institutions, suggesting that background variables interact with classroom dynamics to influence academic engagement (Kaplan et al., 2022).

The current study builds on these findings by proposing and testing a mediational model in which teacher–student interaction quality predicts academic motivation, both directly and indirectly through social relatedness, in a sample of neurodivergent adolescents in Slovenia.

2. Methods and Materials

2.1. Study Design and Participants

This research employed a descriptive correlational design to examine the relationships between teacher–student interaction quality, social relatedness, and academic motivation in neurodivergent learners. The target population included secondary school students with neurodevelopmental conditions (e.g., ADHD, autism spectrum disorder, specific learning disorders) enrolled in inclusive classrooms across Slovenia. A total of 403 participants were selected using simple random sampling, with the sample size determined based on Krejcie and Morgan's (1970) sample size determination table for a finite population. Inclusion criteria required students to have an official diagnosis of a neurodevelopmental condition, be enrolled in a general education setting, and provide informed consent.

2.2. Measures

To assess academic motivation as the dependent variable, the study employed the Academic Motivation Scale (AMS) developed by Vallerand et al. (1992). The AMS is grounded in self-determination theory and measures different types of academic motivation across seven subscales: intrinsic motivation to know, intrinsic motivation toward accomplishment, intrinsic motivation to experience stimulation, identified regulation, introjected regulation, external regulation, and amotivation. The scale comprises 28 items rated on a 7-point Likert scale ranging from 1 ("Does not correspond at all") to 7 ("Corresponds exactly"). Higher scores on the intrinsic and identified regulation subscales indicate stronger self-determined motivation. Numerous studies have confirmed the AMS's strong psychometric properties, including internal consistency coefficients (Cronbach's alpha ranging from 0.62 to 0.86 across subscales) and construct validity across both general and special populations, including neurodivergent learners.

To evaluate the quality of teacher–student interaction, the study utilized the Student–Teacher Relationship Scale (STRS) developed by Pianta (2001). This 28-item scale assesses the teacher's perception of their relationship with a student across three subscales: Closeness (e.g., warmth and open communication), Conflict (e.g., friction and

E-ISSN: 3060-6713

negativity), and Dependency (e.g., over-reliance on the teacher). Items are rated on a 5-point Likert scale from 1 ("Definitely does not apply") to 5 ("Definitely applies"). The STRS is widely used in educational and developmental research and has demonstrated good internal consistency (α = 0.72–0.89), test-retest reliability, and validity across diverse student groups, including those with neurodevelopmental differences such as ADHD and autism spectrum disorders.

To measure the mediating variable of social relatedness, the study employed the Social Relatedness Subscale from the Basic Psychological Need Satisfaction in Relationships Scale (La Guardia, Ryan, Couchman, & Deci, 2000). This subscale contains 8 items that specifically assess the extent to which individuals feel connected, understood, and supported in close relational contexts such as the classroom. Responses are recorded on a 7-point Likert scale ranging from 1 ("Not at all true") to 7 ("Very true"). The subscale has shown excellent internal consistency (α > 0.85) and strong construct validity in previous research, including studies involving adolescents and neurodivergent populations. Its alignment with self-determination theory makes it particularly suitable for capturing the role of social relatedness in motivation processes.

2.3. Data Analysis

Data analysis was conducted using SPSS version 27 and AMOS version 21. Initially, descriptive statistics (mean, standard deviation, frequency, and percentage) were computed to describe the demographic variables and study constructs. The Pearson correlation coefficient was used to assess the bivariate relationships between the dependent variable (academic motivation) and the independent variables (teacher–student interaction quality and social relatedness). To test the hypothesized mediation model, Structural Equation Modeling (SEM) was employed using AMOS. Model fit was evaluated based on multiple indices, including the chi-square/degrees of freedom (χ^2/df), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). A significance level of $p < .05$ was considered for all inferential analyses.

3. Findings and Results

Of the 403 participants, 213 (52.85%) were male and 190 (47.15%) were female. The average age of the students was 14.62 years (SD = 1.21), ranging from 12 to 17 years. In terms of neurodevelopmental diagnoses, 176 students (43.67%) had been diagnosed with ADHD, 124 (30.77%) with autism spectrum disorder, and 103 (25.56%) with specific learning disorders. Regarding educational placement, 315 students (78.16%) were enrolled in mainstream classrooms with support services, while 88 (21.84%) were in inclusive education settings with partial integration. Additionally, 284 participants (70.47%) reported receiving supplementary tutoring or educational counseling.

Table 1

Means and Standard Deviations of Study Variables (N = 403)

Variable	Mean (M)	Standard Deviation (SD)
Teacher–Student Interaction Quality	4.87	0.63
Social Relatedness	5.12	0.58
Academic Motivation	5.34	0.61

The descriptive statistics in Table 1 indicate that students reported relatively high scores on all three variables. The mean score for academic motivation was the highest (M = 5.34, SD = 0.61), followed by social relatedness (M = 5.12, SD = 0.58), and teacher–student interaction quality (M = 4.87, SD = 0.63). The relatively low standard deviations across variables suggest a moderate degree of variability in students' perceptions.

Before conducting the main analyses, the assumptions for parametric tests and SEM were examined and confirmed. Normality was assessed through skewness and kurtosis values, which ranged between -0.88 and +0.91 for all variables, indicating acceptable limits. Linearity and homoscedasticity were confirmed using scatterplots, and no significant deviations were observed. The Pearson correlation matrix indicated no multicollinearity, with all correlation coefficients below 0.80. Variance Inflation Factor (VIF) values ranged from 1.21 to 1.67, further supporting the absence of multicollinearity. The Mahalanobis distance was used to detect multivariate outliers, resulting in the exclusion of 7 cases with critical χ^2 values exceeding the threshold ($\chi^2 > 16.27$, df = 3, $p < .001$).

E-ISSN: 3060-6713

After cleaning, the final dataset of 403 participants met all assumptions for SEM and correlational analyses.

Table 2

Pearson Correlation Matrix Between Main Study Variables (N = 403)

Variable	1	2	3
1. Teacher–Student Interaction Quality	—		
2. Social Relatedness	.61** (p < .001)	—	
3. Academic Motivation	.55** (p < .001)	.67** (p < .001)	—

As shown in Table 2, teacher–student interaction quality was positively and significantly correlated with both social relatedness (r = .61, p < .001) and academic motivation (r = .55, p < .001). Social relatedness was also strongly correlated with academic motivation (r = .67, p < .001). These results support the inclusion of all variables in the subsequent mediation analysis using Structural Equation Modeling.

Table 3

Fit Indices of the Structural Model

Fit Index	Value	Recommended Threshold
Chi-Square (χ^2)	112.78	—
Degrees of Freedom (df)	48	—
χ^2/df	2.35	< 3.00
GFI	0.94	≥ 0.90
AGFI	0.91	≥ 0.90
CFI	0.97	≥ 0.95
TLI	0.96	≥ 0.95
RMSEA	0.057	≤ 0.08

Table 3 indicates that the hypothesized structural model demonstrated an acceptable to excellent fit with the data. The χ^2/df ratio was 2.35, below the recommended cutoff of 3.00. Other indices such as GFI (0.94), AGFI (0.91), CFI (0.97), and TLI (0.96) met or exceeded acceptable thresholds. The RMSEA value of 0.057 indicates a good approximate fit. These fit indices collectively support the adequacy of the proposed mediation model.

Table 4

Path Coefficients for Direct, Indirect, and Total Effects Between Variables

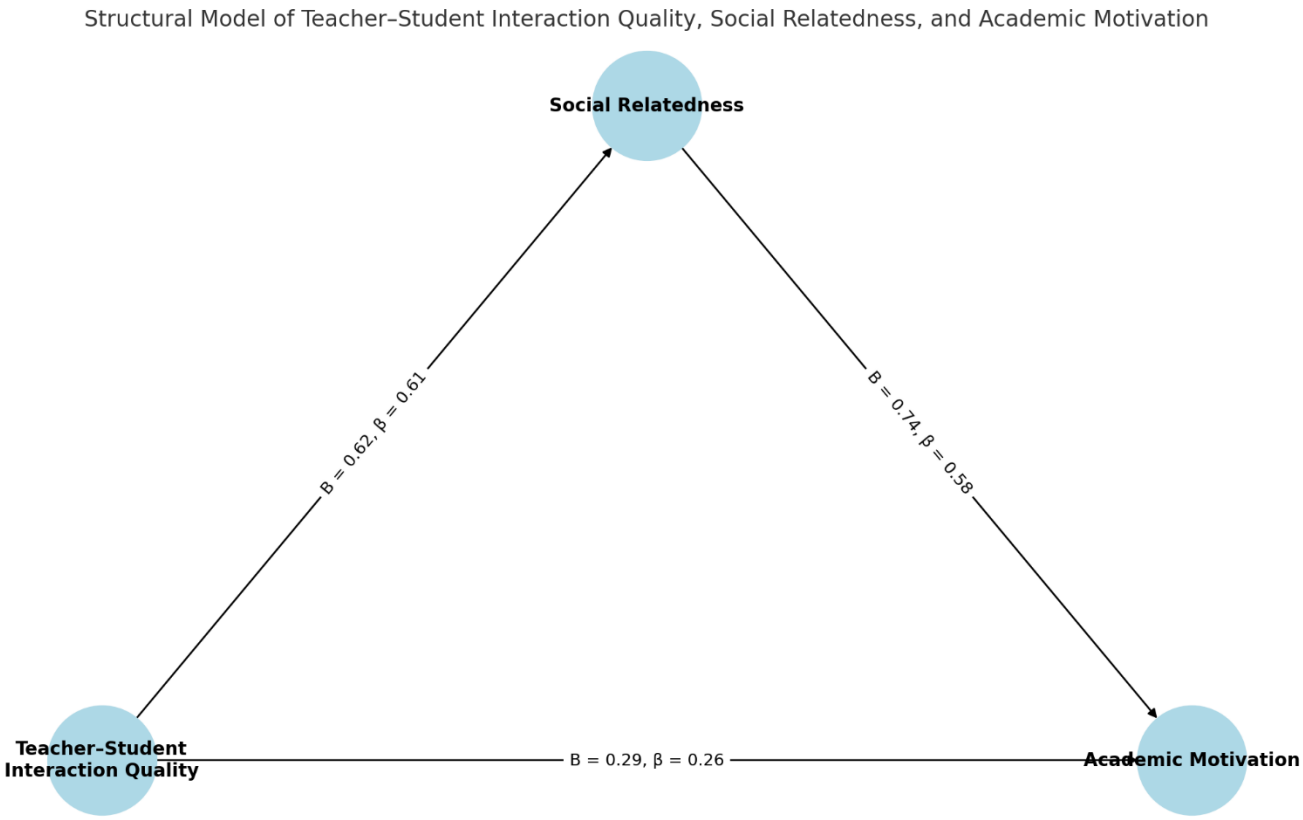
Path	b	S.E.	β	p
Teacher–Student Interaction → Social Relatedness	0.62	0.05	.61	< .001
Social Relatedness → Academic Motivation	0.74	0.06	.58	< .001
Teacher–Student Interaction → Academic Motivation (Direct)	0.29	0.07	.26	< .001
Teacher–Student Interaction → Academic Motivation (Indirect)	0.46	0.05	.35	< .001
Teacher–Student Interaction → Academic Motivation (Total)	0.75	0.08	.61	< .001

As illustrated in Table 4, teacher–student interaction quality had a significant direct effect on social relatedness (b = 0.62, β = .61, p < .001), and social relatedness significantly predicted academic motivation (b = 0.74, β = .58, p < .001). The direct path from teacher–student interaction to academic motivation was also significant (b = 0.29, β = .26, p < .001), and the indirect path mediated by social relatedness was substantial (b = 0.46, β = .35, p < .001). The total effect (direct + indirect) of teacher–student interaction on academic motivation was strong (b = 0.75, β = .61, p < .001), confirming the partial mediation model.

E-ISSN: 3060-6713

Figure 1

Structural Model of The Study



4. Discussion and Conclusion

The present study investigated the predictive role of teacher–student interaction quality on academic motivation among neurodivergent learners, with social relatedness examined as a mediating variable. The findings from correlational analyses revealed significant positive relationships among all three variables. Teacher–student interaction quality demonstrated a strong positive correlation with both social relatedness and academic motivation. Furthermore, social relatedness was found to positively predict academic motivation, providing initial support for the mediating model. The results of the Structural Equation Model (SEM) confirmed the hypothesized mediational pathway, indicating that social relatedness partially mediates the relationship between teacher–student interaction quality and academic motivation. This finding highlights the centrality of relational factors in sustaining motivation in neurodivergent students and supports the theoretical propositions of Self-Determination Theory.

These findings reinforce the growing body of literature emphasizing the foundational role of high-quality teacher–student interactions in fostering motivational outcomes in diverse student populations. Consistent with previous research, this study affirms that students who perceive their interactions with teachers as warm, structured, and emotionally attuned tend to experience greater academic motivation (Garwood, 2022; Gucciardi et al., 2020). For neurodivergent learners—who often face cognitive, social, or behavioral challenges in inclusive settings—teacher responsiveness may serve as a compensatory mechanism that buffers against feelings of exclusion or incompetence. Teachers who engage in emotionally supportive and structured interactions help create an environment where neurodivergent students can thrive academically and socially, echoing findings from similar inclusive education contexts (Kaplan et al., 2022; Norder et al., 2025).

A central contribution of this study is its empirical validation of social relatedness as a mediating mechanism linking interaction quality to motivation. The mediating effect of relatedness aligns with numerous theoretical and

E-ISSN: 3060-6713

empirical studies emphasizing the psychological importance of feeling connected to others in educational settings (Datu & Noltemeyer, 2024; Ratelle et al., 2021). Relatedness facilitates motivational development by fostering emotional security, trust, and belonging—conditions that are particularly critical for neurodivergent learners who often report relational difficulties and heightened social anxiety. When students feel understood and accepted by their teachers, they are more likely to internalize academic values and goals, resulting in more self-determined forms of motivation (Cheng & Lau, 2022; Núñez-Regueiro & Wang, 2025).

The findings also contribute to a broader understanding of the educational ecology of neurodivergent learners, emphasizing that supportive interactions are not merely dyadic but embedded in larger social processes. Several studies have shown that relatedness—whether with peers or teachers—acts as a conduit through which broader motivational climates exert their influence (Escandell & Chu, 2021; Ganotice et al., 2024). For example, peer-relatedness in group-based learning has been found to significantly enhance both engagement and sustained interest in school tasks (Anne & Grimminger, 2025). Similarly, teacher-relatedness has been associated with reductions in maladaptive behaviors and increases in goal-directed learning, especially when students perceive their autonomy and emotional needs to be respected (Gråstén et al., 2019; Kaplan et al., 2022). The current study extends this work by demonstrating that social relatedness is not just an outcome of good teaching but also an active process that facilitates internal motivational dynamics.

The role of relatedness becomes even more crucial in light of recent shifts in educational delivery and classroom diversity. For instance, remote and hybrid learning models introduced during the COVID-19 pandemic disrupted traditional forms of relational engagement, heightening the importance of intentional efforts to maintain social bonds (Murray et al., 2020; Sieber et al., 2022). In such contexts, teacher behaviors that foster connection—through feedback, empathy, and structure—become even more predictive of motivation and well-being. This supports the idea that relatedness is not merely context-dependent but a basic psychological need that must be consistently nurtured, regardless of instructional modality or student profile (Xiang et al., 2017; Zhou et al., 2021).

Moreover, cultural and contextual variables may shape how relatedness is experienced and how it influences motivational outcomes. The current study, situated in Slovenia, contributes to the limited but growing body of cross-cultural research on relatedness in non-Western or underrepresented educational settings. For example, recent work by Min and Shapii (2025) showed that the way foreign students in China experience social connection via digital platforms influences their academic resilience, illustrating that relatedness is interpreted differently across cultural and technological contexts (Min & Shapii, 2025). Similarly, Kaplan et al. (2022) found that minority and majority status within the classroom affects perceptions of teacher support and inclusion, reinforcing the need to consider background variables in motivational models (Kaplan et al., 2022).

The findings also resonate with studies emphasizing that neurodivergent learners may require differentiated relational scaffolding to experience meaningful relatedness. Students with autism, ADHD, or learning disabilities often encounter difficulties in interpreting social cues or managing peer relationships. Teachers, therefore, play an especially pivotal role in initiating and sustaining relational experiences that are accessible and affirming (Anne & Grimminger, 2025; Norder et al., 2025). In this regard, teacher–student interaction quality serves not only as a predictor of academic outcomes but as a relational gateway to experiencing connectedness and belonging—both of which are essential for neurodivergent learners' motivational development.

This study further supports calls for a holistic and humanizing approach to special education, where relational and emotional factors are integrated into academic planning and pedagogical practice. Educators are encouraged to view motivation not as a fixed trait but as a dynamic construct influenced by relational cues, emotional safety, and classroom climate. This approach aligns with the work of Pentecost et al. (2018), who argue for a humanized pedagogy that centers the student's social and emotional world as a key component of academic engagement (Pentecost et al., 2018). In inclusive settings, fostering relatedness through intentional teacher behaviors may thus serve as a leverage point for reducing motivational disparities between neurotypical and neurodivergent students.

Despite its contributions, the present study is not without limitations. First, the cross-sectional design limits causal inferences regarding the directionality of the relationships between variables. While SEM provides a robust framework for testing mediation, longitudinal data are needed to confirm the temporal sequencing of teacher interaction quality, relatedness, and academic motivation. Second, the study relied exclusively on self-report measures, which may be subject to social desirability or perceptual bias, especially

E-ISSN: 3060-6713

among neurodivergent adolescents who may interpret social cues differently. Third, while the sample was drawn from a national population of Slovenian students, cultural factors specific to this context may limit the generalizability of the findings to other educational systems. Additionally, diagnostic subgroups were not analyzed separately, preventing exploration of possible differences in mediation patterns between students with ADHD, autism, or learning disabilities.

Future research should employ longitudinal and multi-informant designs to validate and expand upon the findings presented here. Longitudinal studies could explore how teacher–student interaction quality and relatedness evolve over time and influence motivational trajectories across school years. Incorporating teacher ratings, observational data, or peer reports would enhance the validity of the findings and provide a more comprehensive understanding of relational dynamics. Moreover, future work could explore subgroup analyses to determine whether the pathways differ based on specific neurodevelopmental diagnoses, gender, or age. Experimental studies that manipulate relatedness-supportive strategies could also provide causal evidence for intervention efficacy. Finally, exploring digital or hybrid learning contexts—especially in light of increasing educational technologization—would yield valuable insights into how relatedness and interaction quality function in nontraditional classrooms.

Educators and school leaders should prioritize the development of relationally supportive environments for neurodivergent students. Professional development programs should equip teachers with strategies to foster emotional attunement, individualized support, and structured feedback—hallmarks of high-quality interaction. Creating consistent opportunities for student voice, emotional check-ins, and inclusive classroom rituals can promote social relatedness and, by extension, academic motivation. Schools should also invest in mentoring and peer-support systems that help neurodivergent learners build connections beyond the teacher–student dyad. At the policy level, embedding relational goals into individualized education plans (IEPs) and inclusive teaching standards could institutionalize a relational approach to motivation. Ultimately, cultivating social relatedness should be seen not as an ancillary concern but as a core component of educational equity for neurodivergent youth.

Authors' Contributions

Authors contributed equally to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

Acknowledgments

We would like to express our gratitude to all individuals helped us to do the project.

Declaration of Interest

The authors report no conflict of interest.

Funding

According to the authors, this article has no financial support.

Ethics Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

References

Anne, G. M. d. B., & Grimminger, E. (2025). Received and Perceived Peer Acceptance in Relation to Enjoyment, Social Competence, and Physical Activity in Primary School Physical Education and the Role of Peer-Relatedness Need Satisfaction. *Journal of Teaching in Physical Education*, 1-11. https://doi.org/10.1123/jtpe.2024-0230

Cheng, C., & Lau, Y.-C. (2022). Social Media Addiction During COVID-19-Mandated Physical Distancing: Relatedness Needs as Motives. *International journal of environmental research and public health*, *19*(8), 4621. https://doi.org/10.3390/ijerph19084621

Datu, J. A. D., & Noltemeyer, A. (2024). Sense of Relatedness and Science Engagement Among Filipino High School Students. *Psychology in the Schools*, *61*(8), 3410-3420. https://doi.org/10.1002/pits.23224

Escandell, S., & Chu, T. L. (2021). Implementing Relatedness-Supportive Teaching Strategies to Promote Learning in the College Classroom. *Teaching of Psychology*, *50*(4), 441-447. https://doi.org/10.1177/00986283211046873

Ganotice, F. A., Mendoza, N. B., John Ian Wilzon, T. D., Shen, X., Lee, J. C., Chan, E., Luk, P., Manio, M. M., He, Q., Khoo, U. S., Lam, M. P. S., Chan, S. C. S., Chow, A. Y. M., Wang, N., & Tipoe, G. L. (2024). Students' Motivation and Engagement in Interprofessional Education: The Mediating Role of Peer

E-ISSN: 3060-6713

Relatedness. *Medical Education Online*, *29*(1). https://doi.org/10.1080/10872981.2024.2430593

Garwood, J. D. (2022). Character Education to Improve Students' Sense of Relatedness: Preliminary Findings From the Positivity Project. *International Journal of Education*, *14*(2), 36. https://doi.org/10.5296/ije.v14i2.19981

Gråstén, A., Yli-Piipari, S., Huhtiniemi, M., Salin, K., Seppälä, S., Lahti, J., Hakonen, H., & Jaakkola, T. (2019). Predicting Accelerometer-Based Physical Activity in Physical Education and Total Physical Activity: The Self-Determination Theory Approach. *Journal of Human Sport and Exercise*, *14*(4). https://doi.org/10.14198/jhse.2019.144.05

Gucciardi, D. F., Weixian, J. C., Gibson, W., Ntoumanis, N., & Ng, L. (2020). Motivational Climate in the Classroom. *European Journal of Psychological Assessment*, *36*(2), 324-335. https://doi.org/10.1027/1015-5759/a000524

Kaplan, H., Najjar, Z., Kalnisky, E., & Keinan, A. (2022). The Challenge of Diversity in Teacher Education Institutions in Israel: Students' Sense of Relatedness and Perceptions Regarding Being a Minority or Majority. *Journal of Diversity in Higher Education*, *15*(4), 493-504. https://doi.org/10.1037/dhe0000288

Keller, H. (2020). Culture and Social Development. https://doi.org/10.1093/acrefore/9780190236557.013.592

Min, X., & Shapii, A. (2025). Exploring the Cross-Cultural Communication Challenges of Foreign Students in China: The Mediating Effects of Social Media Interaction and Psychological Resilience. *Frontiers in psychology*, *16*. https://doi.org/10.3389/fpsyg.2025.1560298

Murray, C., Heinz, M., Munday, I., Keane, E., Flynn, N., Connolly, C., Hall, T., & MacRuairc, G. (2020). Reconceptualising Relatedness in Education in 'Distanced' Times. *European Journal of Teacher Education*, *43*(4), 488-502. https://doi.org/10.1080/02619768.2020.1806820

Norder, W., Boer, A. d., & Minnaert, A. (2025). Peer Relations and Motivation in Special Secondary Education: Experiences of Adolescents With Social, Emotional and Behavioural Difficulties. *British Journal of Educational Psychology*. https://doi.org/10.1111/bjep.12773

Núñez-Regueiro, F., & Wang, M. T. (2025). Adolescent Well-Being and School Engagement as a Function of Teacher and Peer Relatedness: The More (Relatedness) Is Not Always the Merrier. *Journal of Educational Psychology*, *117*(3), 466-484. https://doi.org/10.1037/edu0000910

Pentecost, M., Gerber, B., Wainwright, M., & Cousins, T. (2018). Critical Orientations for Humanising Health Sciences Education in South Africa. *Medical Humanities*, *44*(4), 221-229. https://doi.org/10.1136/medhum-2018-011472

Raižienė, S., Gabrialavičiūtė, I., Garckija, R., & Kalesinskas, L. (2017). Teacher's Provided Feedback and Students' Dropout Intentions: The Role of Basic Psychological Needs. *Pedagogika*, *128*(4), 97-113. https://doi.org/10.15823/p.2017.57

Ratelle, C. F., Duchesne, S., Litalien, D., & Plamondon, A. (2021). The Role of Mothers in Supporting Adaptation in School: A Psychological Needs Perspective. *Journal of Educational Psychology*, *113*(1), 197-212. https://doi.org/10.1037/edu0000455

Selimi, R., Llullaku, N., Helm, P. v. d., Geert Jan, J. M. S., & Roest, J. (2023). Academic Motivation of Incarcerated Juveniles From the Perspective of Self-Determination Theory: A Multiple Case Study in Kosovo Context. *International journal of offender therapy and comparative criminology*, *69*(8), 1101-1116. https://doi.org/10.1177/0306624x231198805

Sieber, V., Köhler, C., Christ, A. A., Helbling, J., & Praetorius, A. K. (2022). The Role of Relatedness in the Motivation and Vitality of University Students in Online Classes During Social Distancing. *Frontiers in psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.702323

Silva, S. K. D. U. D. (2021). Motives of Social Media Usage on Building Consumer Behavioural Engagement. *Proceedings of International Conference on Business Management*, *17*. https://doi.org/10.31357/icbm.v17.5160

Xiang, P., Ağbuğa, B., Liu, J., & McBride, R. E. (2017). Relatedness Need Satisfaction, Intrinsic Motivation, and Engagement in Secondary School Physical Education. *Journal of Teaching in Physical Education*, *36*(3), 340-352. https://doi.org/10.1123/jtpe.2017-0034

Zeng, J., & Xia, L. (2024). Modeling the Continuous Intention to Use Generative AI as an Educational Tool for EFL Learners Among Vocational College Students in Guangzhou, China. *Journal of Innovation and Development*, *8*(2), 18-27. https://doi.org/10.54097/d1c3my56

Zhou, X., Chai, C. S., Jong, M. S., & Xiong, X. B. (2021). Does Relatedness Matter for Online Self-Regulated Learning to Promote Perceived Learning Gains and Satisfaction? *The Asia-Pacific Education Researcher*, *30*(3), 205-215. https://doi.org/10.1007/s40299-021-00579-5

E-ISSN: 3060-6713