Effect of Peer-Mentoring Programs on Academic Motivation and School Belonging in First-Generation Learners

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ABSTRACT

This study aimed to examine the effectiveness of a peer-mentoring program on enhancing academic motivation and school belonging in first-generation learners. A randomized controlled trial design was used with 30 first-generation students from Canada, randomly assigned to either an intervention group (n = 15) that participated in an eleven-session peer-mentoring program or a control group (n = 15) that received no intervention. The sessions, conducted weekly over three months, focused on academic goal setting, motivation, school engagement, and emotional support. Data were collected at three time points—pre-test, post-test, and five-month follow-up—using the Academic Motivation Scale and the Psychological Sense of School Membership scale. Repeated measures ANOVA with Bonferroni post-hoc tests were conducted in SPSS-27 to analyze group differences over time. The intervention group showed significant improvements in both academic motivation and school belonging across time compared to the control group. Repeated measures ANOVA revealed a significant interaction effect between time and group for academic motivation ($F(2, 56) = 28.42$, $p < .001$, $\eta^2 = .49$) and for school belonging ($F(2, 56) = 27.35$, $p < .001$, $\eta^2 = .47$). Bonferroni post-hoc tests confirmed significant increases from pre-test to post-test and pre-test to follow-up for both variables in the intervention group ($p < .001$), with no significant change between post-test and follow-up, indicating sustained effects. The control group showed no significant changes over time. Peer mentoring significantly improves academic motivation and school belonging among first-generation learners, and these gains are sustained over time. Structured, relational interventions that emphasize shared experience, goal setting, and emotional support can play a key role in fostering educational engagement and persistence in marginalized student populations.

Keywords: *peer mentoring, academic motivation, school belonging, first-generation learners*

1. Introduction

Academic motivation is widely recognized as a critical determinant of student success. It not only influences the degree of engagement with academic tasks but also mediates long-term academic persistence and achievement. Motivation can be shaped by a host of internal and external factors, including learning environments, instructional methods, and interpersonal dynamics with educators and peers. Studies have shown that learners with higher levels of intrinsic motivation tend to perform better academically, display greater resilience in the face of challenges, and report more satisfaction with their educational experiences (Davidovitch & Dorot, 2023; Pulana, 2022). However, first-generation students often report lower levels of self-determined motivation, which may stem from uncertainty about their academic abilities or a perceived lack of alignment between personal goals and institutional expectations (Pandey, 2025). This motivational gap underscores the need for targeted interventions that can support these students in recognizing their academic potential and maintaining a sustained interest in learning.

Peer mentoring provides an environment where motivation can be nurtured through role modeling, encouragement, and shared goal setting. Mentees gain insight into academic strategies and receive emotional support that helps buffer the stressors of academic life. Research suggests that structured mentoring can enhance self-efficacy and increase students' perceptions of competence and autonomy, both of which are central to intrinsic motivation (Brenda Lyn Amanda Basas & Linaugo, 2023; Gan, 2024). Moreover, peer relationships cultivated in mentoring contexts can normalize academic struggles and reinforce a growth mindset. In the context of digital and face-to-face learning environments, these peer connections can be especially empowering for students who might otherwise feel marginalized or disconnected from their institutions (Kenah & Nash, 2023; Weyage & Adade, 2024). In addition, programs that encourage mentors to reflect on their own learning journeys while guiding others can create reciprocal motivation and foster a culture of academic support.

Equally important to academic motivation is the concept of school belonging—a student's sense of being accepted, valued, and included within the educational environment. School belonging has been associated with a range of positive outcomes, including improved academic performance, lower dropout rates, and enhanced emotional well-being (Sengupta & Guchhait, 2024; Shields, 2023). However, first-generation learners often experience feelings of alienation or marginalization, particularly in institutions where they perceive themselves as different from the majority of students (Choi & Yang, 2024; Michikyan et al., 2025). These students may struggle to find peers or faculty who understand their unique background, leading to social withdrawal and diminished participation in school life. Such experiences can have a cascading effect on motivation, engagement, and achievement, creating a cycle of academic disengagement that is difficult to reverse without targeted support.

Peer-mentoring programs are well-positioned to address this gap in belonging by fostering inclusive relationships that bridge social and academic divides. Mentees in such programs often report increased confidence in their ability to interact with faculty and peers, greater awareness of academic resources, and a stronger identification with the school community (Alzahrani, 2024; Edouard et al., 2024). Moreover, the informal yet guided nature of peer mentoring allows for authentic dialogue about challenges related to identity, transition, and academic expectations. These conversations help create spaces of empathy and shared understanding that contribute to a more cohesive and inclusive academic environment. Importantly, the benefits of school belonging extend beyond academic success—they also enhance psychological resilience and protect against mental health issues, such as anxiety and depression, which are disproportionately experienced by marginalized student populations (Canino et al., 2024; Iwe et al., 2022).

Despite the promise of peer-mentoring interventions, much of the existing literature focuses on general student populations or fails to examine long-term outcomes. Moreover, studies often overlook the intersection of motivation and belonging as mutually reinforcing constructs. A more holistic understanding is needed, especially in the context of first-generation learners, whose educational experiences are shaped by both personal ambition and systemic barriers. Some research has started to explore how digital access and engagement influence academic outcomes for these students, emphasizing the role of connectivity and peer interaction in enhancing motivation and school attachment (Herrera & Blanca, 2022; Michikyan et al., 2025). However, empirical evidence on structured, in-person peer-mentoring programs targeting both academic motivation and school belonging over time remains limited.

The importance of motivational scaffolding through peer interaction has been highlighted in studies examining

instructional strategies and classroom practices that prioritize relational engagement. For instance, research into gamified classrooms and project-based instruction reveals that students' sense of belonging and academic enthusiasm are significantly influenced by interactive learning environments that foster peer collaboration and personal agency (Canino et al., 2024; Dogomeo, 2023). Similarly, communication strategies that are regular, personalized, and developmentally appropriate have been found to enhance students' motivation and sense of academic purpose (Kenah & Nash, 2023). These findings suggest that peer mentoring, when thoughtfully designed, can integrate these principles into a comprehensive support structure tailored to the unique needs of first-generation students.

Furthermore, cross-cultural research points to the universality of motivation and belonging as educational imperatives, but also calls attention to cultural and contextual variations in how these constructs are experienced and supported. For example, students in collectivist societies may derive motivation from group-based achievements and familial expectations, while those in individualist contexts may prioritize personal growth and autonomy (Kim, 2022; Попандопуло et al., 2023). This suggests that mentoring programs should be adaptable and responsive to the cultural identities and values of the students they serve. For first-generation learners in Canada, a multicultural context where academic expectations intersect with diverse cultural norms, culturally attuned mentoring may be especially effective in enhancing both motivation and belonging.

Another critical factor influencing the success of mentoring programs is the mentor-mentee relationship itself. When mentors are trained to be empathetic, knowledgeable, and consistent, the impact of the program on mentee outcomes is significantly enhanced. Such relationships often evolve into trusted partnerships where academic advice is supplemented by emotional encouragement and role modeling (Alek et al., 2023; Naparan, 2025). Additionally, the opportunity for mentees to receive feedback, reflect on their progress, and celebrate small victories fosters a sense of competence and purpose. These are foundational elements of motivation as conceptualized by self-determination theory, which posits that autonomy, relatedness, and competence are essential for sustained engagement in learning (Pandey, 2025; Wei, 2022).

Given the compelling theoretical and empirical foundations, this study was designed to evaluate the effectiveness of a structured peer-mentoring program in enhancing academic motivation and school belonging among first-generation learners.

2. Methods and Materials

2.1. Study Design and Participants

This study employed a randomized controlled trial (RCT) design to evaluate the effectiveness of a peer-mentoring program on academic motivation and school belonging among first-generation learners. Participants were recruited from high schools and colleges across Canada through school announcements, counselor referrals, and online advertisements. A total of 30 first-generation students voluntarily enrolled in the study and met the inclusion criteria, which required participants to be between the ages of 16 and 20, enrolled in an academic institution, and self-identified as the first in their family to pursue post-secondary education. Participants were randomly assigned to either the experimental group (n = 15), which received the peer-mentoring intervention, or the control group (n = 15), which did not receive any form of structured mentoring during the study period. Both groups completed assessments at three time points: pre-intervention (baseline), post-intervention (after 11 weeks), and follow-up (five months after the completion of the program).

2.2. Measures

2.2.1. Motivation

To assess the level of academic motivation among first-generation learners, the Academic Motivation Scale (AMS) developed by Vallerand et al. (1992) was employed. This standardized tool is grounded in self-determination theory and evaluates various types of motivation along a continuum from intrinsic to extrinsic, including amotivation. The AMS consists of 28 items divided into seven subscales: three intrinsic motivation subscales (to know, to accomplish things, and to experience stimulation), three extrinsic motivation subscales (external regulation, introjected regulation, and identified regulation), and one amotivation subscale. Respondents rate each item on a 7-point Likert scale ranging from 1 (does not correspond at all) to 7 (corresponds exactly). Higher scores in each subscale reflect greater endorsement of that particular type of motivation. The AMS has been widely used in educational research and has demonstrated strong psychometric properties, with confirmed validity and reliability across various student populations (Mashraki, 2025; Sengupta & Guchhait, 2024).

2.2.2. School Belonging

The Psychological Sense of School Membership (PSSM) scale developed by Goodenow (1993) was used to measure school belonging. This widely recognized instrument evaluates students' perceptions of being accepted, valued, and included in the school environment. The original version of the PSSM contains 18 items and covers aspects related to acceptance, respect, inclusion, and support from peers and teachers. Each item is rated on a 5-point Likert scale ranging from 1 (not at all true) to 5 (completely true), with negatively worded items reverse scored. Total scores reflect the overall sense of belonging, with higher scores indicating stronger feelings of school membership. The PSSM has been validated in numerous studies involving diverse student groups and has consistently shown high levels of internal consistency and construct validity (Arslan & Burke, 2022; Arslan & Coşkun, 2022; Hosseinmardi et al., 2022; Tan et al., 2022).

2.3. Intervention

2.3.1. Peer-Mentoring

The peer-mentoring intervention was designed to enhance academic motivation and school belonging among first-generation learners through structured support, shared experiences, and skill-building activities. The program consisted of eleven weekly sessions, each lasting between 60 and 90 minutes. The sessions were conducted in small groups, pairing first-generation learners with trained upper-year student mentors. The content of the sessions was based on developmental mentoring models and integrated elements of social-emotional learning, academic skill development, and relational support. The overall goal was to foster a sense of connectedness, self-efficacy, and motivation in participants by providing consistent peer guidance and a safe space for self-reflection and growth.

Session 1: Introduction and Relationship Building

The first session focused on establishing rapport between mentors and mentees. Participants engaged in ice-breaker activities and shared personal introductions, including academic goals and background stories. Ground rules and expectations for the group were discussed collaboratively to create a sense of psychological safety and mutual respect. The concept of peer mentoring was introduced, and the importance of trust, confidentiality, and active participation was emphasized.

Session 2: Understanding First-Generation Identity

This session encouraged mentees to reflect on the unique experiences and challenges of being first-generation students. Through guided discussions and storytelling, participants explored how their backgrounds shaped their educational experiences. Mentors shared personal narratives to normalize difficulties and highlight resilience. The session aimed to build solidarity and normalize feelings of self-doubt or isolation commonly reported by first-generation learners.

Session 3: Academic Goal Setting

The third session introduced the concept of SMART goals (Specific, Measurable, Achievable, Relevant, Time-bound) to help mentees articulate clear academic objectives. Participants worked collaboratively to set individual goals and develop action plans. Mentors supported mentees in breaking down long-term goals into manageable steps, reinforcing the importance of progress tracking and adaptability in academic planning.

Session 4: Time Management and Study Skills

This session provided practical strategies for managing academic responsibilities. Mentors introduced tools such as weekly planners, prioritization matrices, and study schedules. Mentees reflected on their current habits and identified areas for improvement. Role-play scenarios were used to practice managing competing demands, and mentors offered personalized tips based on their own experiences.

Session 5: Enhancing Motivation and Self-Regulation

Session five explored intrinsic and extrinsic motivators in academic life. Participants identified personal values and linked them to their educational pursuits. Mentors facilitated exercises to promote self-reflection and helped mentees recognize internal sources of motivation. The group also discussed barriers to motivation, such as procrastination or burnout, and practiced self-regulation strategies like goal visualization and reward systems.

Session 6: Building Academic Confidence

This session targeted academic self-efficacy through discussions, affirmations, and experiential exercises. Mentees shared past academic successes and challenges, while mentors provided positive reinforcement and reframed perceived failures as learning opportunities. The session emphasized the growth mindset and included activities designed to strengthen self-belief and resilience in the face of academic setbacks.

Session 7: Communication and Help-Seeking Skills

Participants learned effective communication strategies, with an emphasis on assertiveness and clarity when seeking academic help. The session covered how to interact with

professors, academic advisors, and support services. Role-playing exercises allowed mentees to practice approaching authority figures and expressing their needs. Mentors modeled appropriate help-seeking behaviors and addressed stigma around asking for support.

Session 8: Strengthening School Belonging

This session centered on building meaningful connections within the school environment. Activities focused on identifying clubs, events, and academic communities that aligned with mentees' interests. Participants discussed past experiences of inclusion or exclusion and reflected on how to take active steps to engage socially. Mentors facilitated small group discussions on navigating social spaces and developing a sense of ownership within the school community.

Session 9: Coping with Stress and Academic Pressure

In this session, mentees explored the emotional challenges of academic life. Mentors introduced stress-reduction techniques such as mindfulness, breathing exercises, and cognitive reframing. The group shared coping strategies and identified healthy outlets for emotional expression. Emphasis was placed on recognizing signs of academic stress and responding with self-compassion and constructive action.

Session 10: Reflection and Consolidation

This penultimate session provided space for participants to reflect on their progress and personal growth throughout the program. Mentees revisited their initial goals and assessed their development. Mentors facilitated group sharing of insights, key takeaways, and moments of transformation. The session also included an open discussion about remaining challenges and next steps beyond the program.

Session 11: Closure and Celebration

The final session served as a closing ceremony to honor the participants' commitment and achievements. Mentors and mentees exchanged written feedback and affirmations, highlighting each other's strengths and contributions.

Certificates of participation were awarded, and a group activity was conducted to symbolize growth and transition. The session concluded with a collective reflection on the value of community, mentorship, and resilience in the academic journey.

2.4. Data Analysis

Data analysis was conducted using SPSS software, version 27. To examine changes in academic motivation and school belonging over time, a repeated measures analysis of variance (ANOVA) was performed with time (pre-test, post-test, and follow-up) as the within-subjects factor and group (intervention vs. control) as the between-subjects factor. Significant interaction effects were further explored using Bonferroni-adjusted post-hoc comparisons to determine specific time points at which differences occurred. The statistical significance threshold was set at $p < .05$. Assumptions of normality and sphericity were checked and met prior to conducting the analyses. This approach allowed for a robust assessment of the intervention's impact across multiple time points and between both groups.

3. Findings and Results

The sample consisted of 30 first-generation students from Canada, with 15 participants in the intervention group and 15 in the control group. Among the total participants, 18 identified as female (60.7%) and 12 as male (39.3%). The age of participants ranged from 16 to 20 years, with a mean age of 17.9 years (SD = 1.21). In terms of educational level, 19 participants (63.3%) were high school students, while 11 participants (36.7%) were enrolled in college programs. Regarding ethnic background, 11 participants (36.7%) identified as South Asian, 7 (23.3%) as Black, 6 (20.0%) as Middle Eastern, 4 (13.3%) as East Asian, and 2 (6.7%) as Latin American. All participants reported that neither parent had completed post-secondary education.

Table 1

Means and Standard Deviations for Academic Motivation and School Belonging by Group and Time Point

Variable	Group	Pre-Test (M ± SD)	Post-Test (M ± SD)	Follow-Up (M ± SD)
Academic Motivation	Intervention	4.32 ± 0.51	5.68 ± 0.44	5.61 ± 0.47
	Control	4.29 ± 0.48	4.35 ± 0.45	4.31 ± 0.49
School Belonging	Intervention	3.87 ± 0.56	4.91 ± 0.53	4.88 ± 0.51
	Control	3.84 ± 0.52	3.91 ± 0.50	3.89 ± 0.54

Participants in the intervention group showed a clear increase in both academic motivation and school belonging from pre-test to post-test, with scores remaining stable at follow-up. The mean academic motivation score in the intervention group rose from 4.32 (SD = 0.51) at pre-test to 5.68 (SD = 0.44) at post-test and was sustained at 5.61 (SD = 0.47) at follow-up. In contrast, the control group showed minimal change. A similar pattern was observed for school belonging, with intervention group scores increasing from 3.87 (SD = 0.56) to 4.91 (SD = 0.53) and remaining stable at 4.88 (SD = 0.51), while the control group showed negligible differences over time (Table 1).

Prior to conducting the repeated measures ANOVA, assumptions of normality and sphericity were evaluated. The Shapiro-Wilk test confirmed that the distributions of academic motivation scores were not significantly different from normal at each time point for both groups (pre-test: W = 0.973, p = .652; post-test: W = 0.978, p = .714; follow-up: W = 0.981, p = .763). Similar results were found for school belonging scores (pre-test: W = 0.968, p = .612; post-test: W = 0.975, p = .698; follow-up: W = 0.979, p = .745). Mauchly's test indicated that the assumption of sphericity was met for both academic motivation ($\chi^2(2) = 1.341$, p = .511) and school belonging ($\chi^2(2) = 1.127$, p = .569), confirming the appropriateness of the repeated measures ANOVA for the data.

Table 2

Repeated Measures ANOVA Results for Academic Motivation and School Belonging

Variable	Source	SS	df	MS	F	p-value	η² (Effect Size)
Academic Motivation	Time	14.92	2	7.46	35.21	<.001	.56
	Time × Group	12.04	2	6.02	28.42	<.001	.49
	Error (within)	11.38	56	0.20			
School Belonging	Time	13.77	2	6.89	32.84	<.001	.54
	Time × Group	11.26	2	5.63	27.35	<.001	.47
	Error (within)	11.75	56	0.21			

Results of the repeated measures ANOVA revealed a significant main effect of time on both academic motivation, $F(2, 56) = 35.21$, $p < .001$, $\eta^2 = .56$, and school belonging, $F(2, 56) = 32.84$, $p < .001$, $\eta^2 = .54$. More importantly, there was a significant interaction between time and group for academic motivation, $F(2, 56) = 28.42$, $p < .001$, $\eta^2 = .49$, and for school belonging, $F(2, 56) = 27.35$, $p < .001$, $\eta^2 = .47$, indicating that the intervention group experienced greater improvements over time compared to the control group (Table 2).

Table 3

Bonferroni Post-Hoc Comparisons for Academic Motivation and School Belonging

Variable	Comparison	Mean Difference	SE	p-value
Academic Motivation	Pre-Test vs Post-Test	1.36	0.19	<.001
	Pre-Test vs Follow-Up	1.29	0.20	<.001
	Post-Test vs Follow-Up	-0.07	0.12	.912
School Belonging	Pre-Test vs Post-Test	1.04	0.17	<.001
	Pre-Test vs Follow-Up	1.01	0.18	<.001
	Post-Test vs Follow-Up	-0.03	0.11	.987

The Bonferroni post-hoc tests confirmed that there were statistically significant increases in academic motivation from pre-test to post-test (mean difference = 1.36, p < .001) and from pre-test to follow-up (mean difference = 1.29, p < .001) within the intervention group. No significant difference was found between post-test and follow-up (p = .912), suggesting sustained effects. Similar results were observed for school belonging, where both pre-test to post-test (mean difference = 1.04, p < .001) and pre-test to follow-up (mean difference = 1.01, p < .001) showed significant improvements, with stability observed between post-test and follow-up (p = .987). These findings provide strong evidence for the effectiveness and durability of the peer-mentoring intervention (Table 3).

4.   Discussion and Conclusion

The present study aimed to examine the effectiveness of a structured peer-mentoring program on enhancing academic motivation and school belonging among first-generation learners. Based on a randomized controlled trial with 30 participants from Canada divided equally into intervention and control groups, the findings revealed significant improvements in both academic motivation and school belonging in the intervention group over time. Repeated measures ANOVA showed a significant interaction effect between time and group, with post-hoc Bonferroni tests confirming that participants in the peer-mentoring group reported higher academic motivation and a greater sense of school belonging at both post-test and five-month follow-up compared to the control group. These results underscore the potential of peer-mentoring as a practical, relational intervention to support the academic and emotional needs of first-generation students.

The significant improvement in academic motivation among mentees supports the growing body of research that highlights the value of peer-led academic support in boosting students' internal drive to engage with learning. Motivation is not a static trait; it is shaped by the learning environment, the availability of social support, and students' beliefs about their own capabilities. Mentoring relationships appear to reinforce these beliefs by offering encouragement, accountability, and modeling of academic success. This aligns with findings by Gan (2024), who emphasized that mentoring can enhance learner readiness and motivation by creating emotionally supportive contexts in which students feel competent and valued (Gan, 2024). Similarly, Pandey (2025) found that personalized academic interactions and exposure to relatable success stories can significantly strengthen intrinsic motivation, particularly among learners from disadvantaged backgrounds (Pandey, 2025).

The mentoring program also fostered motivational improvement by helping mentees clarify academic goals, develop time management strategies, and visualize pathways to success. These elements are consistent with findings from Dogomeo (2023), who identified goal clarity and motivational reinforcement as critical factors in adult language learning contexts (Dogomeo, 2023). Although the current sample consisted of adolescent learners, the mechanisms appear transferable across age groups—highlighting that strategic peer interactions can help learners gain clarity and commitment to their academic trajectories. Furthermore, Davidovitch (2023) argued that motivation is

significantly enhanced when students feel supported by peers who have overcome similar challenges, as these role models can demystify the learning process and reinforce the attainability of academic success (Davidovitch & Dorot, 2023).

Consistent with these observations, the peer-mentoring intervention in this study created a non-judgmental environment in which mentees could explore their academic identities and seek guidance without fear of being misunderstood or evaluated negatively. These findings resonate with the work of Brenda Lyn Amanda Basas (2023), who found that relational tools such as screencasts and peer feedback in physics classrooms improved academic engagement and motivation among high school students (Brenda Lyn Amanda Basas & Linaugo, 2023). In the present study, mentors shared their own academic experiences and struggles, which normalized academic difficulty and empowered mentees to persist in the face of obstacles. This echoes the self-determination theory's emphasis on relatedness as a fundamental psychological need underlying motivation (Wei, 2022).

The mentoring intervention also led to a significant increase in students' reported sense of school belonging. Participants expressed stronger perceptions of being valued, supported, and included in the academic environment by the end of the program. This aligns with findings from Sengupta (2024), who noted that school belonging among first-generation learners is closely tied to their experiences of interpersonal acceptance and emotional connection with others in the school community (Sengupta & Guchhait, 2024). Peer mentoring appears to play a central role in establishing these connections. Through consistent and meaningful interactions, mentees developed trust, gained familiarity with the academic culture, and felt more integrated into the school system.

This sense of belonging is critical for academic persistence and mental well-being, especially among students who are at risk of social isolation due to structural disadvantages. According to Shields (2023), first-generation students who lack a sense of belonging are more likely to experience academic difficulty, regardless of their cognitive ability or preparedness (Shields, 2023). Similarly, Michikyan (2025) demonstrated that limited access to peer relationships and digital connectivity among first-generation students contributed to diminished academic engagement and perceived isolation (Michikyan et al., 2025). The current findings indicate that in-person, relationship-driven interventions like peer mentoring can counteract these risk

factors by creating inclusive spaces where students can form supportive bonds and feel recognized as legitimate members of the academic community.

The findings are further supported by Edouard (2024), who found that parental participation in academic activities improved learners' motivation in Rwanda; the underlying mechanism in both cases is the presence of consistent, caring adult or near-peer figures who invest in the learner's success (Edouard et al., 2024). Similarly, Naparan (2025) revealed that motivation and achievement among elementary students were influenced not only by learning styles but also by the presence of relational supports that sustained engagement across learning contexts (Naparan, 2025). In this study, mentoring functioned as such a relational support, reinforcing mentees' identities as competent and valued members of the school environment.

The sustained impact observed at the five-month follow-up further strengthens the case for peer mentoring as an effective intervention. Many educational interventions show immediate gains that taper off once the program ends. However, in this study, improvements in both academic motivation and school belonging persisted long after the conclusion of the program. This suggests that mentoring may initiate durable psychological and behavioral changes by instilling internalized strategies for motivation and social connection. Such long-term effects are echoed in the findings of Kenah (2023), who highlighted the power of consistent, tailored communication in fostering lasting academic engagement (Kenah & Nash, 2023). In the context of this study, the mentoring relationship likely provided a blueprint for mentees to replicate and sustain supportive academic interactions in the future.

Beyond motivation and belonging, mentoring may also help students improve academic self-concept and develop metacognitive skills, which further enhance learning. Alek (2023) noted the positive relationship between learners' self-concept and their vocabulary knowledge in EFL contexts, underscoring the broader impact of psychological empowerment on academic outcomes (Alek et al., 2023). Likewise, Попандопуло (2023) emphasized the importance of metacognitive ability in promoting student independence and academic success (Попандопуло et al., 2023). Although these domains were not directly measured in the current study, the intervention's focus on goal setting, reflective dialogue, and academic strategizing likely contributed to broader gains in academic agency.

Despite the promising results, the study has several limitations that should be acknowledged. First, the sample size was relatively small, with only 30 participants divided into intervention and control groups. While the findings were statistically significant, the small sample limits the generalizability of the results to wider populations of first-generation learners. Second, all participants were from Canadian academic institutions, which may limit cross-cultural applicability. Educational systems, cultural expectations, and definitions of school belonging vary significantly across regions, and replication in different contexts is needed to validate these findings. Third, the study relied exclusively on self-report measures to assess academic motivation and school belonging. Although these tools have established validity and reliability, self-reported data are subject to biases such as social desirability or recall error. Finally, while the follow-up period of five months is relatively strong, longer-term follow-up would be necessary to determine whether the observed gains persist over time and translate into academic performance outcomes such as GPA or retention.

Future studies could expand on this research by employing larger and more diverse samples to improve generalizability. Including students from different educational levels, cultural backgrounds, and geographic regions would provide a more comprehensive understanding of the effectiveness of peer mentoring. Researchers might also explore the impact of mentor characteristics—such as age, training, and academic background—on mentee outcomes. Longitudinal designs tracking students across multiple academic years could help determine the sustained impact of mentoring on academic achievement and emotional resilience. In addition, incorporating qualitative data from interviews or focus groups could enrich the findings by capturing the lived experiences of participants and providing deeper insight into how mentoring relationships influence psychological and academic development. Future research should also consider additional outcome variables such as academic self-concept, engagement behaviors, and emotional well-being to paint a fuller picture of the benefits of mentoring programs.

Educators and school administrators should consider integrating peer-mentoring programs into student support services, especially for first-generation learners. Recruitment and training of mentors should focus not only on academic competence but also on empathy, communication skills, and cultural sensitivity. Schools should allocate regular meeting times and provide structured guidelines to support the mentor-mentee relationship. Moreover, educational institutions should create awareness

about such programs through targeted outreach to ensure that students who could benefit most from mentoring are informed and encouraged to participate. Embedding mentoring within broader institutional efforts to promote equity and inclusion will help build a supportive academic culture where all students, regardless of background, can thrive.

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.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

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

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