The Skilled Student: Linking Social, Emotional, and Behavioral Skills to Engagement and Student Outcomes in Secondary School Students

Gerardo Pellegrino[a], Barbara Carretti[a], Christopher M. Napolitano[b], Christopher J. Soto[c], Chiara Meneghetti[a], Tommaso Feraco[a]

[a]*Department of General Psychology, University of Padova*

[b]*Department of Educational Psychology, University of Illinois at Urbana-Champaign*

[c]*Colby College*

*Corresponding author: Gerardo Pellegrino, via Venezia 8, Padova, Italy, gerardo.pellegrino@phd.unipd.it

Author note

Gerardo Pellegrino: https://orcid.org/0000-0001-7032-9774

Barbara Carretti: https://orcid.org/0000-0001-5147-7544

Christopher M. Napolitano: https://orcid.org/0000-0001-8626-2914

Christopher J. Soto: https://orcid.org/0000-0002-2875-8919

Chiara Meneghetti: https://orcid.org/0000-0002-4232-4244

Tommaso Feraco: https://orcid.org/0000-0002-8920-5330

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Abstract

Social, emotional, and behavioral (SEB) skills are malleable competencies that can be developed through life experiences. The recent SEB skills framework (Soto et al., 2021) identifies five skills domains (self-management, innovation, social engagement, cooperation, and emotional resilience) associated with students' achievement and well-being. However, the mechanisms by which SEB skills support students at school remain unclear. In the present research, we integrate research on SEB skills and student engagement, hypothesizing that SEB skills can be considered as individual antecedents of student engagement, a multidimensional construct encompassing four dimensions (affective, behavioral, cognitive, and agentic). A sample of 1642 high school students (Mage = 15.68; SDage = 1.47; 913 girls) completed measures assessing SEB skills, student engagement, and student outcomes (achievement, school satisfaction, life satisfaction, and school burnout). The results of a path analysis confirmed that self-management and social engagement skills domains are significantly associated with student outcomes, through the mediation of global student engagement. Further specific patterns of associations between the five SEB skills domains and the four dimensions of student engagement were also found. Our study emphasizes the value of integrating research on individual factors associated with student success and well-being into broader theoretical frameworks. This approach can enhance our understanding of how to support students throughout their educational journey.

Keywords: soft skills; 21st-century skills; life skills; student engagement; academic achievement.

Introduction

A classic topic in psychology is the study of individual differences associated with students' achievement and satisfaction with school (Jovanović, 2019; Kriegbaum et al., 2018). Among these individual factors, increasing recent attention has been given to social, emotional, and behavioral (SEB) skills, conceptualized as non-technical and malleable competencies that regulate emotions, behavior, and cognition and sustain an individual's well-being and success (Pellegrino & Hilton, 2012; Robles, 2012). SEB skills are associated with many student outcomes, including psychological well-being, quality of relationships with peers and family, school grades, and pro-social behaviors (Soto et al., 2021, 2022b).

As academic tasks and social contexts become increasingly complex, analyzing only study-related individual factors (e.g. student engagement, self-regulated learning, academic self-efficacy) is insufficient to explain academic results and satisfaction at school. Therefore, considering general personal skills can help to understand variability in student outcomes and well-being. These skills are indeed fundamental during students' academic journey. For example, students need to manage schedules independently and plan their study routines with increasing autonomy (Mega et al., 2014). They also need to develop their social skills as the quality of their relationships with peers and teachers has an impact on their learning experience (Wang & Eccles, 2013).

Our study combines the new SEB skills framework (Soto et al., 2021, 2022b) with research on student engagement (Salmela-Aro et al., 2022; Wang et al., 2019) to better understand how SEB skills and student engagement work together to promote student outcomes (i.e., academic achievement, school and life satisfaction, and academic burnout).

Social, Emotional, and Behavioral skills

Social, emotional, and behavioral (SEB) skills are considered core competencies that promote an individual's well-being and success (Napolitano et al., 2021). They have also

been called *21st-century skills* (Pellegrino & Hilton, 2012), as they include all the non-technical competencies that every student needs to develop and improve to be successful in different fields of life, from education to work.

Despite the growing importance attributed to SEB skills for people's success (Feraco et al., 2022; Robles, 2012), a significant challenge in research on skills and competencies lies in the multitude of theoretical frameworks proposed (Bhagra & Sharma, 2018), each emphasizing distinct skill sets and employing varied measurement tools (Abrahams et al., 2019). Soto and colleagues (2021, 2022b) have recently proposed an integrative theoretical framework to structure research on SEB skills, and a new measure for that framework, the Behavioral, Emotional, and Social Skills Inventory (BESSI). They define SEB skills as people's capacities to maintain social relationships, regulate emotions, manage goal-directed behaviors, and learn from experience (Napolitano et al., 2021; Soto et al., 2022b). In examining various SEB skills taxonomies, the authors identified several skills that are common across frameworks and could be related to the Big Five personality traits (McCrae & Costa, 1989). In particular, the authors have identified five major SEB skill domains (Soto et al., 2021, 2022a):

- Self-management skills (related to the Big Five trait of conscientiousness) include the abilities to effectively achieve goals and complete tasks.
- Innovation skills (related to openness) include the abilities to engage with novel ideas and experiences.
- Social engagement skills (related to extraversion) include the abilities to actively engage with other people.
- Cooperation skills (related to agreeableness) include the abilities to maintain positive social relationships.

- Emotional-resilience skills (related to neuroticism) include the abilities to regulate emotions and moods.

While there are similarities to personality traits, SEB skills are distinct from them: traits represent how a person tends to think, feel, and behave across situations, whereas SEB skills represent how a person is capable of thinking, feeling, and behaving when they want or need to do so (Soto et al., 2022b). For instance, an introverted student may prefer to study independently. However, if assigned to group work, they may still be able to interact constructively with other group members. Conversely, an extroverted student may be very sociable but lack the communication skills necessary to participate effectively in a group setting.

SEB skills as personal antecedents of student engagement and educational outcomes

Although initial studies have found an association between SEB skills and student outcomes (e.g., academic achievement, social relationships, life satisfaction, and psychological well-being; Soto et al., 2022b), the potential mediating effect of other study-related factors has not been investigated. Previous research using different theoretical frameworks has shown that skills can be related to several study-related factors (e.g. motivation, learning strategies, learning emotions) and through them influence personal and educational outcomes (Casali & Meneghetti, 2023; Feraco et al., 2022a).

Among study-related factors, student engagement is considered to be one of the most important (Salmela-Aro et al., 2022; Wang et al., 2019), but its relationship with SEB skills and its potential role as a mediating factor with student outcomes has been little explored (Soto et al., 2022b). Student engagement is a complex construct encompassing multiple dimensions of involvement in school and commitment to learning (Appleton et al., 2008). It is strongly associated with various educational outcomes, for example, grades (Lei et al.,

2018), school and life satisfaction (Lewis et al., 2011), relationships with peers and teachers (Reyes et al., 2012), and burnout symptoms (Fiorilli et al., 2017).

Student engagement includes three main components: affective-emotional engagement (i.e., affective reactions attributed to school activities), behavioral engagement (i.e., participation, persistence, and effort in school activities), and cognitive engagement (i.e., use of learning strategies and self-regulated learning; Fredricks et al., 2004; Lam et al., 2014). A proposed fourth dimension is agentic engagement, which refers to the process by which students proactively create, enhance, and personalize the conditions under which they learn (Mameli & Passini, 2019; Reeve, 2013).

Student engagement can be conceptualized as a pathway or process through which sociocultural and personal factors shape learning outcomes (Skinner & Raine, 2022; Wang et al., 2019). SEB skills can play a critical role in this process. Given the growing complexity of academic and social demands, children and adolescents must acquire and develop the skills to recognize and manage their emotions, form healthy relationships, and set realistic and positive goals (Oberle et al., 2016; Wang et al., 2019). These skills may be particularly relevant in the school context, in which students are required to manage various commitments and tasks, interact with peers and teachers, cope with stress and difficulties, and engage with novel experiences and individuals (Napolitano et al., 2021; Santos et al., 2023). Therefore, students with greater levels of SEB skills may be better prepared to navigate the demands of academic life, and this may increase their sense of engagement and motivation. For instance, students who demonstrate high emotional resilience may respond more constructively to academic setbacks, thereby sustaining a more optimistic attitude toward school and study. Similarly, students who exhibit higher social skills may interact more easily with peers and teachers, leading to higher levels of agentic engagement. In other words, students who

possess greater SEB skills may exhibit higher levels of engagement, which could have a beneficial cascading effect on student outcomes.

The Collaborative for Academic, Social, and Emotional Learning (CASEL; Payton et al., 2000) framework represents an early attempt to explore the link between social and emotional skills and student engagement. A recent review (Santos et al., 2023) has confirmed that CASEL competencies (e.g., social competence and self-control), are positively related to engagement. However, there is significant variability in the specific competencies and assessment methods used in these studies (Martinez-Yarza et al., 2023). This inconsistency underscores the need for a more robust conceptual and empirical framework to improve the reliability and validity of these findings.

The SEB skills framework offers the advantage of integrating skills and competencies from different theoretical models, including those related to CASEL competencies, within a robust assessment framework (Napolitano et al., 2021). It also effectively distinguishes between personality traits and SEB skills, demonstrating excellent psychometric properties across languages and contexts (Feraco et al., 2024; Lechner et al., 2022; Postigo et al., 2024).

Rationale of the study and hypotheses

The present study employs the theoretical framework of SEB skills (Soto et al., 2021, 2022b) and student engagement (Salmela-Aro et al., 2022; Wang et al., 2019), to examine the relations between SEB skills, student engagement, and student outcomes in a sample of high school students. Four student outcomes were considered: academic achievement (i.e., school grades), satisfaction with school (i.e., overall contentment with one's educational experience), school burnout (i.e., exhaustion, cynicism, and reduced effectiveness resulting from prolonged stress and dissatisfaction with school-related activities), and life satisfaction (i.e., overall contentment with one's life conditions). These outcomes are indicators of student success and well-being within the educational context, and they have already shown

associations with both SEB skills (Feraco et al., 2022; Soto et al., 2022b) and student engagement (Fiorilli et al., 2017; Wang et al., 2019).

As a primary aim, we tested whether SEB skills are associated with these four student outcomes through the mediation of global student engagement (encompassing the four dimensions of affective, behavioral, cognitive, and agentic engagement; Mameli & Passini, 2017). We expected SEB skills, and specifically the self-management, social engagement, and emotional resilience domains, to be antecedents of global student engagement, and to have both direct and indirect associations with student outcomes (Feraco et al., 2022; Santos et al., 2023; Soto et al., 2022b; Wang et al., 2019). The overall tested model is represented in Figure 1, while specific hypothesized effects are presented in Table 1. Based on the literature, for cooperation skills, no significant direct or mediated associations were expected with student outcomes (Soto et al., 2022b). For innovation skills, some studies found a positive association between the ability to think creatively and be open to new experiences and study outcomes (Gajda et al., 2017), while others found negative (Casali et al., 2024) or non-significant (Soto et al., 2022b) associations. For this reason, we further explored the relation of innovation skills with student engagement and outcomes.

Finally, as an additional aim, we investigated relations between the five SEB skills domains and the four student engagement dimensions (i.e., affective, behavioral, cognitive, and agentic). Considering the multidimensionality of engagement could help us understand the specific mechanisms through which SEB skills influence students' learning processes (Lam et al., 2014). As no previous studies have focused on these relations, these results should be considered exploratory.

Method

Participants

Power analysis

To ensure sample size adequacy, a power analysis was conducted via simulation before data collection. Data were simulated each time (10,000 iterations per sample size) from a matrix of correlations between all the variables considered. The *r* values ranged between .20 and .30 based on our literature review. The power to obtain significant indirect effects for all our predicted mediated associations (see the *Rationale of the study and hypothesis* section) ranged between .85 and 1 depending on the specific effects with 1500 participants.

Sample

A total of 1787 students from 4 high schools in different Italian regions voluntarily participated in the study. Because gender was added as an independent variable, 28 participants were excluded from the analysis because they reported a gender other than boy or girl. Data were screened for careless responding using the *careless* package (Yentes & Wilhelm, 2023), and two different criteria were applied (Curran, 2016; Goldammer et al., 2020): long-string analysis (long sequences of identical responses to the items) and psychometric antonyms (within-person correlation across item pairs with strong negative correlation [$r > -.50$]). Following this procedure, 145 students were excluded.

The final sample consisted of 1642 students (729 boys) with a mean age of 15 years and 6 months (SD = 1.47 years). 497 students were enrolled in the first year of high school, 430 in the second year, 326 in the third year, 197 in the fourth year, and 220 in the final fifth year.

Materials

Participants completed some introductory demographic questions about age, gender, grade, and type of school. For all self-reported measures, responses were given on five-point Likert scales for the sake of readability. The reliability of the questionnaires in our sample

was assessed with Cronbach's α and McDonald's ω (see Table 2) using the *semTools* package (Jorgensen et al., 2022).

Social, Emotional, and Behavioral skills

The BESSI-45 (Feraco et al., 2024; Sewell et al., 2024) measures participants' SEB skills with 9 items for each SEB skills domain (i.e., self-management, social engagement, cooperation, emotional resilience, and innovation skills). Participants report how well they can perform the behavior, thought, or feeling described in each item (e.g., "Plan out my time", "Lead a group of people").

Student engagement

The Student Engagement Scale (Lam et al., 2014; Mameli & Passini, 2017) investigates affective, behavioral, and cognitive dimensions of student engagement with 33 items (e.g., "I am very interested with learning").

The Agentic Engagement Scale (AES; Mameli & Passini, 2017; Reeve & Tseng, 2011) assesses a fourth dimension of engagement (i.e., agentic engagement) with five items (e.g., "I tell the teacher what I like and what I don't like").

The mean of the items on each subscale was used as a global score on the corresponding dimension, while a global score of student engagement was computed by averaging all item scores (Mameli & Passini, 2017).

Life satisfaction

The Satisfaction With Life Scale (SWLS), (Di Fabio & Gori, 2016; Diener et al., 1985) assesses individuals' overall life satisfaction with five items (e.g., "The conditions of my life are excellent.").

School satisfaction

The Students' Life Satisfaction Scale – Short Form, School subscale (Huebner et al., 2012; Zappulla et al., 2013) assesses students' satisfaction with school life with 5 items (e.g., "I enjoy being at school").

School burnout

The School Burnout Inventory (SBI; Fiorilli et al., 2014; Salmela-Aro et al., 2009) investigates three dimensions of students' burnout with 9 items: exhaustion from school-related work, cynicism toward the meaning of school, and feelings of inadequacy toward school tasks.

Fluid intelligence

Two tasks from the Cattell Test-Scale 2a (Cattell, 1940; Troche et al., 2019) were used to assess fluid intelligence. First, in the Series subtest, participants have to correctly complete a sequence of images (15 items, 4 minutes). Second, in the Classifications subtest, students were required to find the image that differed from the others in a series of five (15 items, 4 minutes). Correct answers scored one point, while zero points were awarded in case of wrong or missing answers. Split-half correlation (r = .75) and Kuder–Richardson Formula 20 (r_{tt} = .84) show adequate reliability for the total score in our sample.

Academic achievement

In the Italian school system, students receive grades on a 10-point scale where 6 represents a passing grade. Students were asked to self-report their grades obtained at the end of the previous school year in five core subjects: Italian, Mathematics, English, Science, and History. Correlations between grades ranged between r = .55 and r = .69. For the analysis, all grades were averaged into a single score, which serves as a measure of overall achievement.

Procedure

The researchers contacted school principals via email, provided explanations of the study's aims and procedures, and invited them to participate in the study. Consent forms were

distributed to the parents, or the students over the age of 18, who signed them before data collection.

The data were collected during school hours in the presence of the researcher. Demographic information was collected at the beginning, while the questionnaires were presented in randomized order across participants. The Cattell test was always administered at the end. Other questionnaires were also administered, which were not used for the present study. All instruments took approximately 20-30 minutes to complete. All questionnaires and the Cattell Test were administered using the Qualtrics platform. Researchers delivered the Qualtrics link, read the instructions, and followed the students through the process. Data were collected in the first weeks of the school year (end of September – beginning of November 2023).

Data analysis

Data and analysis code are available at https://osf.io/ebhcy/?view_only=a7f18c8488574cef8af1686963b9b5ec.

All analyses were run using *lavaan* (Rosseel, 2012) and *semTools* (Jorgensen et al., 2022) packages in R (R Core Team, 2023). Table 2 shows descriptive statistics and internal consistency for all the variables, which were then standardized for subsequent analysis. Correlations between all variables are reported in Supplemental Table S1.

For the first part of the study, a path analysis model was fitted, specifying all hypothesized relations between the observed variables (i.e., SEB skills domains, global student engagement, school, and life satisfaction, academic achievement, school burnout, and fluid intelligence). Because the use of all four dimensions of engagement would have resulted in the estimation of approximately 80 mediated parameters, we used the total student engagement score (global student engagement), which is consistent with the second-order model of engagement (Lam et al., 2014; Mameli & Passini, 2017). We estimated:

- The direct effects of self-management, innovation, cooperation, social engagement, and emotional resilience skills on global student engagement, school and life satisfaction, academic achievement, and school burnout;
- The direct effects of global student engagement on school and life satisfaction, academic achievement, and school burnout.

All the indirect effects were also calculated, focusing on the hypothesized mediated effects (see *Rationale of the study and hypotheses* section). To control for potential demographic differences (Feraco & Meneghetti, 2023), age and gender were added as predictors of global student engagement, school and life satisfaction, academic achievement, and school burnout. Dummy variables representing the four schools involved in the study were incorporated into the analysis to account for potential differences related to the schools themselves. Fluid intelligence was also added as a predictor of academic achievement.

Model fit was evaluated with four different fit indices: The Comparative Fit Index (CFI), the Tucker Lewis Index (TLI), the Standardized Root Mean Square Residual (SRMR), and the Root Mean Square Error of Approximation (RMSEA). We judged model fit according to the following criteria (Hu & Bentler, 1999): CFI and TLI > .90 ("adequate") or >.95 ("good"); SRMR and RMSEA < .06 ("good") or < .10 ("adequate"). We calculated the R^2 to estimate the variability of the endogenous variables explained by the model.

As an additional, exploratory aim, we ran multivariate regression models to assess the effect of the five SEB skills domains on the four dimensions of engagement. Age, gender, and schools (dummy variables) were added as covariates.

We used a significance threshold of $p < .001$ to account for multiple analyses performed in the study. To facilitate the interpretation of results, we considered direct effects with coefficients lower than |.10| negligible.

Results

Path analysis: direct effects

The model displayed adequate fit indices: CFI = 1.00; TLI = .94; SRMR = .01; RMSEA = .05. Overall, the model explained 42% of the variance for global student engagement, 46% for school satisfaction, 34% for life satisfaction, 30% for burnout, and 22% for achievement. All direct associations between SEB skills and student outcomes are reported in Table 3. The complete results of the path analysis are reported in Supplemental Table S2.

Our findings show that:

- Self-management skills are directly associated with academic achievement and life satisfaction;

- Social engagement skills are directly associated with life satisfaction. However, the direct association with school satisfaction was negligible;

- Emotional resilience skills are directly associated with school satisfaction, life satisfaction, and school burnout.

Furthermore, cooperation skills are negatively associated with academic achievement, and innovation skills are negatively associated with life satisfaction.

Path analysis: mediated effects

Complete results are reported in Table 4. Our findings show that as hypothesized:

- Self-management skills are indirectly associated with school achievement, life satisfaction, school satisfaction, and school burnout;

- Social engagement skills are indirectly associated with life satisfaction, school satisfaction, and school burnout;

However, contrary to expectations, emotional resilience skills were not indirectly associated with life satisfaction, school satisfaction, and school burnout.

Cooperation skills showed no significant mediated associations with student outcomes. Innovation skills were indirectly associated with school achievement, life satisfaction, school satisfaction, and school burnout, through the mediation of global student engagement.

Multivariate regression analysis

Regression coefficients of SEB skills on student outcomes are reported in Table 5. Complete results are provided in Supplemental Table S3. Our results showed that:

- Affective engagement was significantly associated with self-management, innovation, and emotional resilience skills,
- Behavioral engagement was significantly associated with self-management skills;
- Cognitive engagement was significantly associated with self-management, innovation, and social engagement skills;
- Agentic engagement was significantly associated with self-management and social engagement skills.

Discussion

The present research combined the recent SEB skills framework (Napolitano et al., 2021; Soto et al., 2022a) with the broader literature on student engagement (Lam et al., 2014; Wang et al., 2019). We investigated the mediated effect of the five SEB skills domains through student engagement on four student outcomes (i.e., academic achievement, satisfaction, burnout, and life satisfaction). Furthermore, as student engagement is a multidimensional construct (Lam et al., 2014; Reeve, 2013), we explored the relations between four specific dimensions of engagement and SEB skills.

SEB skills, global student engagement, and student outcomes

Our results supported our hypothesized model: SEB skills showed both direct and indirect relations with student outcomes.

As predicted, self-management skills were positively associated with life satisfaction and academic achievement. Furthermore, they were indirectly associated with all four student outcomes through the mediation of global engagement. Self-management skills include fundamental competencies for a successful academic journey. By setting clear goals and maintaining consistency, students gain direction and purpose, which increases their engagement in learning activities (Urdan & Kaplan, 2020). The capacity to organize study routines, prioritize assignments, and integrate extracurricular activities provides students with a sense of control over their academic responsibilities, perhaps making their academic workload feel more manageable (García-Ros et al., 2023; Mega et al., 2014).

Concerning social engagement skills, our results confirmed that these skills are positively associated with school and life satisfaction, and negatively associated with school burnout, through the mediation of global engagement. Moreover, these skills were directly associated with life satisfaction. As school is often considered a "social environment for learning" (Boocock, 1973), these skills might shape engagement by buttressing children's positive relationships with teachers, parents, and peers (Wang et al., 2019). It is possible to hypothesize that students who perceive themselves as more competent in engaging with teachers and peers also feel more engaged in school activities (Payton et al., 2000; Santos et al., 2023), and this positive engagement can have a beneficial impact on their achievement and satisfaction. However, social engagement skills are critical not only in school but also in other contexts (e.g., family, peer group, sports), and this may account for the strong association with life satisfaction (Segrin & Taylor, 2007).

Our results did not confirm the expected mediated relation between emotional resilience skills and student outcomes through global engagement. However, emotional resilience skills show a positive direct association with school and life satisfaction, and a negative relation with burnout, as previous literature has also shown (Soto et al., 2022b).

A negative correlation was observed between cooperation skills and academic performance. Students who report higher levels of cooperation skills may also display higher levels of distraction and sociability compared to their peers (Richardson et al., 2012). This may have a detrimental effect on their ability to focus on their study goals. However, cooperation skills may support student outcomes through other mechanisms. For example, students with strong cooperation skills may develop more positive relationships with their peers (Soto et al., 2022b), and this could potentially lead to increased student engagement (Lan, 2023). More research is required to understand the role that cooperation skills might play in student success and well-being.

Finally, the relationship between innovation skills and student outcomes showed that the former is positively associated with all student outcomes through the mediation of global student engagement. Although there are mixed results in the literature (Casali et al., 2024; Gajda et al., 2017; Soto et al., 2022b), we could speculate that students with higher innovation skills are more motivated and interested in learning new things and may experience the challenges and difficulties that come with learning as opportunities for personal growth and fulfillment (Bakker et al., 2015; Komarraju & Karau, 2005). However, the relationship between innovation skills and life satisfaction is negative when direct, but positive when mediated. Other external factors may influence this relationship, such as the environment, which can provide individuals with opportunities and resources to engage in creative behaviors (Benedek, 2024). Individuals with higher innovation skills may experience lower life satisfaction due to constraints in expressing their skills, but engagement in school activities could mediate this effect, particularly in environments that support creativity and provide diverse experiences (Davies et al., 2013). Further research is necessary to fully understand these associations.

SEB skills and student engagement dimensions

Our results indicate that self-management skills were significantly associated with all dimensions of academic engagement, confirming the core role of these skills in school engagement and learning processes (Soto et al., 2022b).

However, the other SEB skills domains showed significant relations only with specific facets of engagement. For instance, students who reported higher levels of emotional resilience skills also reported higher affective engagement: these skills may help students in maintaining a positive attitude toward school and see learning challenges as opportunities for personal growth, but may be less important for other facets of engagement (Mega et al., 2014; Wang et al., 2019).

Social engagement skills were positively linked with agentic and cognitive engagement. Students with higher levels of social competence tend to express their opinions and ideas more effectively, enabling them to change and improve their learning environment (Mameli & Passini, 2019). Furthermore, these students may benefit from the assistance of teachers and their peers in identifying effective learning strategies and in requesting aid when they are experiencing difficulties (Broadbent & Poon, 2015; Richardson et al., 2012).

Finally, students with higher self-reported innovation skills indicated higher affective and cognitive engagement. Perhaps these students are more interested in learning new things and expanding their knowledge, while at the same time having the skills to handle new information and connect the different concepts they learn (Soto et al., 2022a).

Implications for research and practice

Our findings are consistent with previous theorizations suggesting that skills and competencies are important personal antecedents of engagement (Wang et al., 2019). As the literature on SEB skills and student engagement is large and varied (Napolitano et al., 2021; Skinner & Raine, 2022), combining well-defined theoretical frameworks could enable us to synthesize and better understand the interplay between these constructs.

Furthermore, our study revealed that SEB skills exhibit distinctive patterns of relations with the four dimensions of engagement. This could be relevant not only for future research but also for intervention and training. For example, if social engagement skills are more closely linked with agentic engagement than with other dimensions, then agentic engagement could be used as a measure of the transfer effects of social engagement training or as a means of integrating social engagement training into interventions aimed at fostering agentic engagement (Reeve et al., 2022).

From a practical perspective, understanding the mechanisms by which SEB skills contribute to student educational outcomes is of great relevance to practitioners. This knowledge can inform the selection and implementation of interventions to enhance student development. By fostering SEB skills, educators can better equip students for future academic and professional endeavors (Feraco et al., 2022). Consequently, promoting these skills serves a dual purpose: supporting students throughout their educational journey and increasing their prospects for future success.

Strengths, limitations, and future directions

The present study has notable theoretical strengths. It integrates two robust frameworks – SEB skills and student engagement – with empirical evidence strongly supporting the relationship between these two constructs. Additionally, our results are generalizable across a wider range of students by involving secondary school students from different grades.

Despite the above-mentioned strengths, there are some limitations to consider. First, its cross-sectional nature did not allow us to make any causal inferences about the direction of the relationships assessed. Future studies could adopt a longitudinal approach to test whether SEB skills prospectively predict changes in students' achievement and well-being during the school year. Additionally, new studies could adopt an experimental design to test

the possible effects of training aimed at specific SEB skills on student engagement and other outcomes.

Another limitation of our study is that we used only self-report measures. Future studies might use multi-informant assessment (e.g., collecting information from students, parents, and teachers) and add behavioral tasks (e.g., for a more objective assessment of SEB skills) to make the results more generalizable (Abrahams et al., 2019).

Finally, more research is required to understand how SEB skills interact with other external and individual factors, such as school climate, relationships with teachers, parents, and peers, and self-regulated learning processes (Feraco et al., 2022; Grazia & Molinari, 2023). For example, it is possible that students with higher levels of SEB skills only achieve better results when their learning environment is supportive (Salmela-Aro et al., 2022). Future research should investigate variations in the promotion of SEB skills and school climate at the school level to provide more detailed insights and enhance the generalizability of the findings.

Conclusions

This study represents a first step toward integrating the SEB skills model into broader theoretical frameworks of student engagement. Our findings suggest that SEB skills are robustly linked with student engagement. Furthermore, they are associated with relevant student outcomes both directly and indirectly, through the mediation of student engagement. Expanding this line of research can help practitioners understand how to promote social, emotional, and behavioral skills and, through them, student achievement and well-being.

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Table 1

Hypothesized direct and mediated effects between SEB skills and student outcomes.

Direct effects			Based on
Self-management	→ Life Satisfaction	+	Soto et al., 2022b; Yoon et al., 2024
	→ Achievement	+	
Social Engagement	→ School Satisfaction	+	Payton et al., 2000; Soto et al., 2022b
	→ Life Satisfaction	+	
Emotional Resilience	→ School Satisfaction	+	Salmela-Aro et al., 2022; Soto et al., 2022b
	→ Life Satisfaction	+	
	→ School Burnout	−	
Mediated effects			
Self-management	→ Engagement → School Satisfaction	+	Mega et al., 2014; Soto et al., 2022b; Urdan & Kaplan, 2020; Yoon et al., 2024
	→ Engagement → Life Satisfaction	+	
	→ Engagement → School Burnout	−	
	→ Engagement → Achievement	+	
Social Engagement	→ Engagement → School Satisfaction	+	Napolitano et al., 2021; Wang et al., 2019
	→ Engagement → Life Satisfaction	+	
	→ Engagement → School Burnout	−	
Emotional Resilience	→ Engagement → School Satisfaction	+	Feraco et al., 2022a; Soto et al., 2022b
	→ Engagement → Life Satisfaction	+	
	→ Engagement → School Burnout	−	

Table 2

Psychometric Properties of All Study Variables.

	M	*SD*	Skewness	Kurtosis	α	ω
Age	15.68	1.47	.46	2.12	–	–
Achievement	7.84	1.11	.16	2.33	–	–
Self-management	3.41	.59	− .07	2.93	.78	.78
Innovation	3.17	.56	.21	2.97	.71	.77
Cooperation	3.52	.54	− .04	2.80	.73	.77
Social Engagement	3.12	.66	− .04	2.90	.80	.84
Emotional Resilience	2.89	.74	.11	2.73	.84	.87
Affective Eng.	3.41	.70	− .43	3.40	.78	.84
Behavioral Eng.	3.53	.62	− .38	3.17	.85	.87
Cognitive Eng.	3.50	.67	− .16	2.85	.88	.89
Agentic Eng.	3.14	.87	− .32	2.89	.85	.87
Global Eng.	3.44	.54	− .20	3.18	.93	.94
School Satisfaction	2.95	.72	.22	3.19	.83	.84
Life Satisfaction	3.16	.81	− .21	2.72	.83	.83
School Burnout	3.00	.88	.03	2.44	.86	.88
Fluid Intelligence	17.79	5.54	− .76	3.32	–	–

Note. Eng. = Engagement; α = Cronbach's alpha; ω = McDonald's omega.

Table 3

Results of the Path Analysis: direct effects of SEB skills and engagement on student outcomes.

Exogenous variable		Endogenous variable	β	SE	z	p	Lower 95% CI	Upper 95% CI
Engagement	→	School Satisfaction	.63	.02	29.90	< .001	.59	.67
	→	Life Satisfaction	.18	.03	7.02	< .001	.13	.23
	→	Burnout	−.29	.03	−1.96	< .001	−.34	−.24
	→	Achievement	.28	.03	1.01	< .001	.23	.34
Self−management	→	Engagement	.37	.02	17.46	< .001	.33	.41
	→	School Satisfaction	.03	.02	1.21	.23	−.02	.07
	→	Life Satisfaction	.12	.03	4.67	< .001	.07	.17
	→	Burnout	−.09	.03	−3.35	< .01	−.14	−.04
	→	Achievement	.16	.03	5.81	< .001	.11	.22
Innovation	→	Engagement	.21	.02	9.64	< .001	.17	.25
	→	School Satisfaction	−.03	.02	−1.24	.22	−.07	.02
	→	Life Satisfaction	−.11	.02	−4.61	< .001	−.16	−.06
	→	Burnout	.06	.02	2.33	.02	.01	.11
	→	Achievement	.07	.03	2.52	.01	.02	.12
Social Engagement	→	Engagement	.16	.02	7.02	< .001	.11	.20
	→	School Satisfaction	−.07	.02	−3.19	< .01	−.12	−.03
	→	Life Satisfaction	.25	.02	1.39	< .001	.20	.30
	→	Burnout	−.01	.03	−.39	.69	−.06	.04
	→	Achievement	−.03	.03	−.94	.35	−.08	.03
Cooperation	→	Engagement	.05	.02	2.05	.04	.00	.09
	→	School Satisfaction	.04	.02	1.70	.09	−.01	.08
	→	Life Satisfaction	−.05	.02	−2.18	.03	−.10	−.01
	→	Burnout	.09	.03	3.49	< .001	.04	.14
	→	Achievement	−.10	.03	−3.69	< .001	−.15	−.05
Emotional Resilience	→	Engagement	.03	.02	1.28	.20	−.02	.08
	→	School Satisfaction	.10	.02	4.18	< .001	.05	.14
	→	Life Satisfaction	.29	.02	11.97	< .001	.25	.34
	→	Burnout	−.29	.03	−11.35	< .001	−.34	−.24
	→	Achievement	−.04	.03	−1.44	.15	−.09	.01

Note. β = standardized coefficient; SE = standard error; CI = confidence interval. Complete results of the path analysis are reported in Table S2 (Supplementary materials).

Table 4

Results of the Path Analysis: mediated effects.

Exogenous variable	Mediator		Endogenous variable	β	SE	z	*p*	Lower 95% CI	Upper 95% CI
Self − management	→ Engagement	→	School Satisfaction	.23	.02	14.90	< .001	.20	.26
		→	Life Satisfaction	.07	.01	6.49	< .001	.05	.09
		→	Burnout	−.11	.01	−9.22	< .001	−.13	−.09
		→	Achievement	.10	.01	8.65	< .001	.08	.13
Innovation	→ Engagement	→	School Satisfaction	.13	.01	9.10	< .001	.10	.16
		→	Life Satisfaction	.04	.01	5.65	< .001	.03	.05
		→	Burnout	−.06	.01	−7.19	< .001	−.08	−.04
		→	Achievement	.06	.01	6.93	< .001	.04	.08
Social engagement	→ Engagement	→	School Satisfaction	.10	.01	6.78	< .001	.07	.13
		→	Life Satisfaction	.03	.01	4.96	< .001	.02	.04
		→	Burnout	−.05	.01	−5.89	< .001	−.06	−.03
		→	Achievement	.04	.01	5.72	< .001	.03	.06
Cooperation	→ Engagement	→	School Satisfaction	.03	.01	2.04	.04	.00	.06
		→	Life Satisfaction	.01	.00	1.96	.05	.00	.02
		→	Burnout	−.01	.01	−2.01	.04	−.03	.00
		→	Achievement	.01	.01	2.00	.05	.00	.03
Emotional Resilience	→ Engagement	→	School Satisfaction	.02	.01	1.28	.20	−.01	.05
		→	Life Satisfaction	.01	.00	1.26	.21	.00	.01
		→	Burnout	−.01	.01	−1.27	.20	−.02	.00
		→	Achievement	.01	.01	1.27	.21	.00	.02

Note. β = standardized coefficient; SE = standard error; CI = confidence interval.

Table 5

Results of the Multivariate Regression Analysis. Standardized coefficients (β) of SEB skills on dimensions of engagement are reported.

	Dimensions of Engagement			
	Affective	Behavioral	Cognitive	Agentic
Self-management	**.26***	**.47***	**.24***	**.11***
Innovation	**.15***	.09*	**.29***	.08
Social Engagement	.06	.05	**.11***	**.37***
Cooperation	.03	.07	.05	-.04
Emotional Resilience	**.12***	-.02	-.02	.04
R^2	.25	.37	.28	.23

Note. * $p < .001$. Complete results are reported in Table S3 (Supplementary materials)

Figure 1

Representation of the fitted path analysis (direct relations between SEB skills and student outcomes are not represented).