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Soft Skills and Academic Performance of Secondary School Students in Mathematics: A Relationship Study

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Abstract
This research examined the correlation between the soft skills of secondary school students and their Mathematics performance in Bayelsa State. Soft skills like communication, teamwork, self-discipline, flexibility, and problem-solving are becoming widely acknowledged as necessary for the academic performance of students. The design used in the study was correlational, and the sample size was 1,096 senior secondary school students (SS 1 and 2) who were randomly selected using a stratified random sampling method from Bayelsa State public and private secondary schools. Data were collected using the Soft Skills Assessment Questionnaire (SSAQ)—a 15-item instrument rated on a 4-point Likert scale—and students' end-of-term Mathematics grades. The SSAQ was found to be highly reliable with a Cronbach's alpha of 0.77. Descriptive statistics and Pearson product-moment correlation were employed to test the data. The results revealed that the majority of students had moderate soft skills and Mathematics performance; a strong positive correlation was found between soft skills and Mathematics performance ($r = 0.76$, $p = 0.00$), suggesting that students with higher soft skills tend to perform better in Mathematics. The study concludes that soft skills are a significant predictor of mathematical success and recommends the inclusion of structured soft skills training in the senior secondary school curriculum to enhance students' academic outcomes.

Keywords: Soft Skills, Performance, Mathematics, Secondary School, Students

Introduction

In academia, academic accomplishment is at times considered to be solely a matter of one's command over technical ability or hard skills. However, success as a high-flying professional needs more than proficiency - there is always a factor of uncertainty. While hard skills are certainly extremely critical to attain academic accomplishment, driving forces are actually soft skills. Soft skills consist of a broad set of intrapersonal and interpersonal skills that are in great demand both in academic and professional environments. They are the fuel for successful teams, effective leaders, and adept problem-solvers. Yusuf (2024) defined soft skills as individual traits that influence one's ability to interact with others. It is a term commonly attached to a person's combination of personality traits, social norms, personal habits, sociability, and leadership qualities. This combination of character traits determines the manner in which a person deals with other individuals and/or groups surrounding them. Soft skills are personal qualities that typify an individual's ability to handle others. Vasanthakumari (2019) further stated that soft skills comprise interpersonal skills, social competencies, communication skills, personality traits, attitudes, professional attributes, and social and emotional intelligence that enable individuals to navigate their environs, collaborate smoothly, perform at high levels, and achieve their intended results in conjunction with hard skills.

Many studies and reports on the country indicate that the development of soft skills among Nigerian secondary school learners remains low, particularly in critical thinking, problem-solving, communication, and flexibility. According to the World Bank (2020) report, fewer than 30% of Nigerian secondary school learners demonstrate mastery of the interpersonal and teamwork skills essential for academic and job performance. Similarly, a Nigerian national survey by the Nigerian Economic Summit Group (NESG, 2022) also reported that over 65% of employers perceive an acute scarcity in school leavers' soft skills, particularly in communication, time management, and teamwork. Furthermore, UNICEF Nigeria (2021) recorded that the application of the curriculum in secondary schools in Nigeria still focuses on rote memorization and exam preparation at the expense of very little room for the organized development of soft skills. Similarly, Akinnaso (2023) further posits that the absence of a national

policy on integrating soft skills has led to uneven exposure to non-cognitive skills learning, particularly in public schools. These findings align with those of Adebayo and Alabi (2021), who found that 22% of Nigerian secondary school students had satisfactory communication and interpersonal skills, whereas the rest had little experience practicing collaboration and leadership in schools.

Soft skills associated with student achievement in academics encompass, but not limited to: teamwork, confidence, empathy, self-management, perceptions about academic issues, classroom and school relations, team spirit, certain communication and problem-solving skills, attitudes toward teachers and the classroom environment, and teamwork. Researchers and academics have developed a strong association and connection between such soft skills and success in academic areas, especially in Mathematics and related subjects. These non-cognitive skills enable cognitive skills, allowing for a greater understanding and use of mathematical concepts. According to a study by the OECD (2015), the development of soft skills has a direct influence on a person's career success, and these skills have a strong link to student achievement in school. In addition, findings by Schleicher (2018) indicate that these kinds of non-cognitive abilities are crucial for student learning since they shape character traits, which affect motivation and academic success.

Clear communication is an essential soft skill that enables students to speak briefly, engage actively in class debate, and clarify when required. Critical thinking, however, entails sifting through vital information, balancing merits and demerits, and reasoning logically. These two are among the required soft skills for academic achievement. With the rapid speed of research and communication, it is increasingly crucial for students to analyze knowledge and form beliefs based on reason. Critical thinking and problem-solving skills allow students to analyze compound problems, analyze data, and form innovative solutions. Schneider and Preckel (2017) conducted a meta-analysis that discovers that students with effective critical thinking skills perform well academically in all subjects, from Mathematics to science to the humanities. Furthermore, possessing the ability to adapt to new challenges and to rework parts of problems is also highly correlated with academic resilience, which is a trait of perseverance and success in the face of adversity.

Moreover, emotional intelligence, such as self-awareness, self-regulation, empathy, and social skills—is crucial to academic achievement and overall wellness. Research indicates that students with higher emotional intelligence are better at managing stress, building positive relationships with peers and adults and with teachers, and succeeding over academic challenges (Brackett & Rivers, 2019). By promoting emotional intelligence through social-emotional learning and reflection strategies, schools can create supportive environments for student well-being and success. Empirical research, however, reports conflicting degrees of development in soft skills among Mathematics secondary school students. Abdullahi and Salihu (2022) investigated the integration of soft skills into teaching Mathematics in Nigeria's secondary schools, and concluded that students possessed minimal skills in rational thinking and teamwork when operating in groups, but their communication and self-discipline skills remained deficient. The study noted the elements of traditional teacher-centered learning practices and the lack of concern with active learning settings.

Likewise, Okafor and Obiora (2021) implemented a study in Anambra State, Nigeria, to evaluate students' critical thinking ability as well as collaboration potential when solving Mathematics problems. The findings indicated that merely 38% of the students were capable of productive engagement in group work or offering rational explanations of their solutions. The authors opined that soft skills are usually neglected in Mathematics classes owing to the predominance of procedural teaching and lack of time. In a mixed-methods study by Shukor et al. (2023) in Malaysia, the researchers conducted an investigation on secondary students' soft skills from the context of Mathematics Project-Based Learning (PBL). The research indicated significant development in the communication, creativity, and critical thinking abilities of students when Mathematics was imparted through collaborative and inquiry-based project works. Students from underperforming schools, however, exhibited less improvement and indicated an imbalance in access to effective teaching methods. Bello and Musa (2021) investigated the contribution of emotional intelligence and problem-solving to the improvement of the performance of secondary school pupils in northern Nigeria in Mathematics. Their research indicated that students who had greater emotional control and social competence performed better in word problem solving and the application of Mathematics to real-life contexts, where the value of incorporating emotional and interpersonal skills into the curriculum is highlighted.

Moreover, the OECD (2022) identified in its Mathematics Framework for PISA 2022 that across the globe, Mathematics learning increasingly includes the building of soft skills such as persistence, adaptability, and collaboration. Nevertheless, regional disparities persist, with students from poorer economic background

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describing significantly lower use of soft skills in mathematics activities. Hashim and Osman (2025) discovered the correlation between soft skills (communication skills, critical thinking, problem-solving skills, teamwork, creativity, and emotional well-being) and academic achievement among students in science. In this study, a structural equation model was used to analyze the path coefficient, which established a significant correlation between soft skills and academic performance among students. Narita and Nur (2024) utilized qualitative as well as quantitative approaches to research approaches to improve the academic performance of students at border areas, to emphasize the significance of improving soft skills and being socially engaged. The study revealed that it is not just a question of possessing academic ability to achieve high-level achievement. Communication, collaboration, and self-discipline skills and involvement in various community activities contribute significantly to the academic performance of students. Students who develop soft skills and engage in community activities witness an amazing change in their performance.

Another study by Kamarul (2017) found a positive relationship between generic skills and students' academic achievement. Similarly, the study by Kamaruddin et al. (2020) found a strong relationship between soft skills and academic achievement. Feraco et al. (2024) investigated how six soft skills (adaptability, curiosity, initiative, leadership, perseverance, and social awareness) interact with these self-regulated learning strategies, academic motivation, emotional success, and fluid reasoning skills to determine students' performance in standardized math activities. Data were gathered from 551 Italian students aged between 11 and 18 years through classroom written exercises and questionnaires. Path analysis results show that cognitive reasoning skills, negative success feelings, and academic motivation are the exclusive skills with a direct relationship to mathematics performance. Soft skills bear a curved association with mathematics performance, which is shaped by negative success feelings and academic motivation (not by positive success feelings or self-regulated learning strategies). These findings emphasize the increasing recognition of the significance of soft skills and project them into mathematical achievement, possibly involving new psychoeducational treatment to improve students' achievement in this field.

Casali and Meneghetti (2023) tested a model in which five soft skills (i.e., epistemic curiosity, creativity, critical thinking, perseverance, and social awareness) were assumed as personal characteristics influencing performance and general distress through the mediation of four educational variables (i.e., achievement emotions, self-regulated learning strategies, motivational beliefs, and study resilience). Six hundred and six (606) Italian university students participated in the research and completed self-report questionnaires evaluating soft skills, study-related factor, and general distress indices; academic performance was assessed based on their grades. The results revealed that all four study-related factors significantly mediated the soft skills and academic performance relationship, whereas achievement emotions and study resilience were the sole significant mediators in the soft skills and general distress relationship. Obafemi et al. (2023) investigated the correlation between self-efficacy—a soft skills component and students' performance in mathematics. The results indicated a positive relationship between the self-efficacy of students and academic performance, implying that an increase in the confidence of students in their mathematical capability can result in improved academic performance.

Nur and Noorhayati (2017) studied the correlation between academic performance and soft skills, and found significant correlation among three dimensions of soft skills: communication skills, teamwork skills, and analytical thinking and problem-solving skills with students' academic performance. Thus, it can be expected that as students enhance their soft skills like communication, teamwork, and analytical thinking and problem-solving skills, academic performance is enhanced. Choudhary (2022) evaluated the soft skills of undergraduate students in Agriculture, and found that the overall participants demonstrated an average level of competency in the skills. Shajimon and Joseph (2018) investigated the relationship between soft skills and achievement among senior secondary students using the employment of a descriptive research design. A random sampling method, which is stratified, was used to sample 400 senior secondary students who were chosen from six senior secondary schools in Kottayam district. The researcher employed a specially designed scale to measure soft skills among the students of higher secondary education. Students' scores on the latest test were utilized for assessing academic performance. The research found that most high-achieving students exhibit general interpersonal skills, have a moderate degree of educational achievement, and there is a strong relationship between academic performance and soft skills

Statement of the Problem

Cognitive ability has always been the main determinant of student performance in learning and teaching Mathematics. Recent research suggests, however, that non-cognitive skills in this instance, soft skills such as communication, critical thinking, flexibility, and emotional intelligence etc., are just as important to academic success. The growing evidence notwithstanding, integration and assessment of soft skills within the mathematics

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programme are under-explored and sporadically applied. Feraco et al. (2022) developed an integrated model linking soft skills to academic performance and life satisfaction of students. The findings revealed that there is a positive relationship of soft skills with motivation, self-directed learning, and success-related positive attitudes, which collectively enhance academic performance. Importantly, the research highlighted that while soft skills do not directly contribute to grades, they exert a strong indirect influence on grades via these mediating variables.

In teaching Mathematics, it is crucial that educators understand soft skills abstractly. A study in Zambia by Busaka, Umugiraneza and Kitta (2022), examined the knowledge of soft skills among secondary school Mathematics teachers and how they are integrated into their teaching. The findings indicated that the majority of teachers lacked adequate understanding and knowledge of soft skills and their integration into teaching. This is where the professional development schemes to equip the teachers with tools to incorporate the soft skills in the mathematics syllabus are needed. Furthermore, the effect of the teachers' soft skills on the academic performance of students has been examined. A baseline study in District Mardan by Shah et al. (2024), revealed that teachers' self-discipline skills, problem-solving skills, interpersonal skills, and self-motivation significantly affect the academic success of students. The study indicated that educational leaders value the development of these skills among teachers in order to enhance student performance. In spite of all this, there is still a great disparity in systematized inclusion and assessment of soft skills in Mathematics instruction. Teachers lack the tools to incorporate these skills into their classrooms yet, nor is there a consensus on sound evaluative practices. Bridging these is critical if teachers are to deliver a learning environment that promotes the growth of cognitive and non-cognitive abilities. Accordingly, the present research will study the relationship between soft skills and Mathematics performance among students. By studying the relationship, the research aims to make inferences about how the inclusion of soft skills can enhance mathematical understanding and performance, and hence guide teaching approaches and policies.

Research Questions

The following research questions guided the study:

1. What is the level of soft skills among secondary school students?
2. What is the level of Mathematics performance among secondary school students?
3. Is there a significant relationship between students' soft skills and their Mathematics performance?

Hypothesis

The following hypothesis was tested at 0.05 significant level:

1. There is no significant relationship between secondary school students' soft skills and their Mathematics performance.

Material and Methods

The study utilized a correlational research design, which suits the study of the relationship between two naturally occurring variables: soft skills (independent variable) and **Mathematics** performance (dependent variable). Correlational research does not involve manipulation of the variables but rather tries to determine the direction and magnitude of relationships between the variables (Creswell & Creswell, 2018). The study covered all the Senior Secondary School I and II (SSS I and SSS II) pupils in public and private secondary schools in three Local Government Areas (LGAs) of Bayelsa State: Yenagoa, Sagbama, and Ekeremor. They were purposively chosen to access geographic and demographic diversity. Yenagoa represents the urban center with relatively better-provided schools, Sagbama for a rural setting with infrastructural shortages, and Ekeremor for a semi-urban environment, which is situated between the two extremes. This assignment made the results as representative as possible. 1,096 students were drawn through the use of a stratified random sampling technique, capturing gender, school type (public/private), and educational level (SSS I/II). At every level, there was simple random sampling to select participants proportionally. Two main instruments were used for data collection: (a) Soft Skills Assessment Questionnaire (SSAQ)- SSAQ was developed in order to measure students' self-assessment of their soft skills in five dimensions: Communication (3 items), Teamwork/Cooperation (3 items), Self-discipline (3 items), Adaptability/Flexibility (3 items), Problem-solving (3 items). The instrument consisted of 15 items rated on a 4-point Likert type scale ranging from Strongly Disagree (1) to Strongly Agree (4). SSAQ total scores range from 15 to 60, and levels of soft skills are: Low: 15–29, Moderate: 30–44, High: 45–60. SSAQ was based on established models of soft skills by Kyllonen (2013) and the OECD (2019) and was reviewed for face and content validity by three educational psychologists and measurement experts. Revisions were made based on expert reviews to improve clarity and applicability to context, as per expert reviews.

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(b) Mathematics Performance in School- Mathematics performance was measured by students' end-of-term Mathematics test scores in the academic year 2024/2025. Directly provided from school records, the scores reflect students' overall mastery of Mathematics. Use of standardized institution scores provided an objective and consistent measure across schools. The pilot involved 30 students from an outside secondary school and was employed to assess the clarity, consistency, and reliability of the instruments. Despite being small, the pilot was adequate because pilot studies in educational research tend to range from 10 to 30 participants (van Teijlingen & Hundley, 2001). The participants were representative in terms of gender and school type. The SSAQ had a Cronbach's alpha of 0.77, indicative of good internal consistency. The data for performance in Mathematics had a Cronbach's alpha of 0.78, which confirmed it to be reliable for correlational purposes. Permission was initially obtained from responsible school authorities prior to data collection. The instruments were administered by the research assistants and researcher during normal school hours. Participants were made aware of the purpose of the study, assured confidentiality and anonymity, and instructed to answer truthfully. The questionnaire was filled in by themselves while under supervision to avoid response bias. Ethical clearance was sought and obtained from the appropriate institutional committee. All procedures conformed to ethical standards for research among human subjects. Student involvement was voluntary, and permission of parents or institution was sought wherever necessary. No personal identification information were collected to preserve confidentiality and data protection. Data were calculated using SPSS version 25. Descriptive measures like mean and standard deviation were used to describe levels of soft skills and Mathematics performance for students. Pearson Product-Moment Correlation Coefficient (r) was used to examine the direction and magnitude of the relationship between soft skills and Mathematics performance. All statistical tests had a 0.05 level of significance applied to them.

Results

Research Question One: What is the level of soft skills among secondary school students?

Table 1: The Level of Soft Skills among Secondary School Students

S/N	Soft Skill Statement	Mean	Standard Deviation	Decision
	Communication Skill:			
1	I express my ideas clearly during group work.	1.98	1.05	Average soft skill
2	I listen actively when others are speaking.	2.02	1.09	Average soft skill
3	I can explain how I solve mathematical problems to others.	1.85	0.94	Average soft skill
	Self-discipline Skill:			
1	I create a study timetable and follow it regularly.	1.99	1.05	Average soft skill
2	I complete my Mathematics assignments on time.	1.99	1.05	Average soft skill
3	I make good use of my time during Mathematics lessons.	1.87	0.99	Average soft skill
	Teamwork Skill			
1	I work well with classmates on group Mathematics tasks.	1.80	0.97	Average soft skill
2	I contribute actively in group activities.	1.70	0.85	Average soft skill
3	I respect others' opinions during group work.	1.75	0.91	Average soft skill
	Problem Solving Skill:			
1	I try different strategies when solving difficult problems.	1.86	1.01	Average soft skill
2	I do not give up easily when I encounter a tough Mathematics question.	1.68	0.84	Average soft skill
3	I apply logic when solving Mathematical problems.	1.74	0.90	Average soft skill
	Adaptability			
1	I quickly adjust to changes in Mathematics lesson plans.	1.72	0.91	Average soft skill
2	I can adapt to different teaching styles in Mathematics.	1.84	1.01	Average soft skill
3	I cope well with pressure during Mathematics tests.	1.72	0.86	Average soft skill
	Grand Mean	**1.83**	**0.96**	**Average soft skill**

Note: 2.5 and above = High soft skill; Average soft skill = 2.4 – 1.4; below 1.4 = low soft skill

From table 1, the researcher concludes that the means of soft skill scores are less than the criterion mean (1.83). Table1 shows that the grand mean is 1.83, less than the criterion mean of 2.5. This means that the majority of the secondary students have average soft skill.

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Research Question Two: What is the level of Mathematics performance among secondary school students?

Table 2: Distribution of Students' Mathematics Performance Levels

Level of Mathematics Performance	Range of scores	Number of Students	Percentage
High	70-100	26	2%
Average	40-69	181	17%
Low	0-39	889	81%

From table 2, the researcher observes that 2% of the students have high Mathematics performance, 17% students have average Mathematics performance, and 81% of the students possess low Mathematics performance. It reveals that majority of the senior secondary school students have average Mathematics performance level. The justification of performance ranges in Table 2 is based on the scale used by WAEC (2023), in which 70–100 is categorized as "High" because it includes excellent and very good performances- indicating mastery of mathematical content. 40–69 is considered "Average" because it encompasses marginal passes and credit grades — reflecting basic competence or moderate understanding. 0–39 is deemed "Low" because it falls below the passing threshold — representing inadequate understanding or failure in Mathematics.

Hypothesis One: There is no significant relationship between secondary school students' soft skills and their Mathematics performance.

Table 3: Relationship between Secondary School Students' Soft Skills and their Mathematics Performance

Variable	Number of Students	r-value	p-value (Sig. 2 tailed)
Soft Skill Mathematics Performance	1,096	0.76	0.00

$\alpha = 0.05$

Table 3 shows the relationship between soft skills of secondary school students and Mathematics performance. Table 3 shows that r-value of the correlation observed between soft skills and Mathematics performance was 0.76, showing positive relationship between soft skills and Mathematics performance. Table 3 shows that p-value (0.00) is less than the alpha value (0.05), this implies there is a significant relationship between the two variables. Therefore, the researcher concludes and infers that there is a strong relationship between soft skills among secondary school students and their Mathematics performance. As soft skills increase, Mathematics performance of the students also increases. There is an increase in the soft skills of the senior secondary students with an improvement in their Mathematics performance.

Discussion

This study discovered that the majority of secondary school students have moderate soft skills. This means that although soft skills are being acknowledged as vital for educational and personal success, they have yet to be systematically taught or adequately marketed in a lot of learning institutions. The soft skills like communication, teamwork, self-discipline, adaptability, and self-control are not explicitly provided in the conventional academic curriculum, something that may be related to the fact that the students have moderate instead of high proficiency levels in these aspects. The mean proficiency in soft skills of the students indicates that, even though unstructured skill development and unstructured skill acquisition might take place through socialization and outside-classroom activities, there is no systematic and deliberate program for facilitating their full development (Heckman & Kautz, 2012). This is also indicative of the tendency in most education systems, particularly in developing countries, towards prioritizing standardized testing and cognitive skills over comprehensive education systems with non-cognitive skills (UNESCO, 2016). Part of the likely explanation for overall performance demonstrated is low appreciation by teachers and school officials for the contribution that soft skills can make towards improving academic performance, especially in areas such as mathematics. According to Conley (2015), learners can be deprived of support or guidance needed to grow such skills to their full potential without the deliberate teaching approaches and tests that focus on soft skills. The outcomes of this research agree with the conclusions of Choudhary (2022), and Shajimon and Joseph (2018), which revealed that the majority of students in higher education have average soft skill.

Additionally, the present study's findings indicated that the majority of senior secondary students possess an average level of mathematical proficiency. School success, particularly at higher secondary level, is determined by a complex combination of cognitive, emotional, socio-cultural, and educational determinants. An average level

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of performance indicates that although students are classified at basic education level, they might not receive suitable encouragement or assistance to reach higher excellence. Mathematics achievement is determined by a number of interconnected factors, such as cognitive ability, learning context, quality of teaching, quality of teachers, pupil motivation, and socio-economic status (Mullis et al., 2020). An average level of performance indicates that although students are gaining basic information, they are perhaps not being provided adequate instructional support to perform well at more advanced levels of mathematical thought. This aligns with findings from Trends in International Mathematics and Science Study (TIMSS) that indicate most students around the world realize moderate levels of performance, while fewer manage high levels of achievement (Mullis et al., 2020). Results of this study align with those of Shajimon and Joseph (2018), whose findings revealed that the majority of college students demonstrate an average level of academic attainment. Further, Okolie and Omeje (2018), in their research on Enugu State, Nigeria, examined students' performance in Mathematics and found overall unsatisfactory outcomes, which they attributed to inefficient teaching practices and lack of motivation in students. The findings indicate that students frequently fail to attain levels of proficiency required, specifically at higher secondary grades, where concepts become abstract in nature. A Nigerian national survey discovered that the reports of WAEC Chief Examiners (2020, 2021) persistently indicated high failure rates in Mathematics. These reports highlight frequent areas of difficulty like minimal comprehension of important concepts, inadequate practice, and issues with applying mathematical principles to solve problems.

The findings of the hypothesis indicated that there existed a high correlation between the secondary school students' soft skills and their Mathematics performance. Mathematics requires not just mental ability but also the ability to withstand hard problems, teamwork, and stress in studying. Students who are equipped with effective self-discipline and social skills are most likely to engage in active learning, seek assistance when needed, and maintain regular patterns of study—factors that promote mathematical performance (Conley, 2015; Kuh et al., 2008). This further supports the assertion that soft skills enhance the capacity of students to understand and apply mathematical concepts in theory and practice. The findings of this study are consistent with Hashim and Osman (2025), who established the relationship between science students' academic performance and soft skills (such as communication skills, critical thinking, problem-solving skills, teamwork, creativity, and emotional well-being) and demonstrated that there was a significant relationship between students' academic achievement and the soft skills.

Nevertheless, a composite correlation coefficient, whilst informative, does not show the relative contribution of each of the five soft skill domains to academic achievement. It is therefore necessary to explore the potential contribution of each of the five domains investigated—communication, cooperation, self-discipline, adaptability, and problem-solving—to better understand the dynamics at play. Amongst the domains, self-discipline and problem-solving stand the greatest chance of contributing most towards the high correlation. Self-discipline is naturally associated with study routines like consistent study, work completion, and being on time—routines required for understanding mathematical functions. Such association has been supported by Duckworth and Seligman (2005), who found that even self-discipline may overshadow intelligence when it comes to predicting academic success. In settings like Bayelsa State, where social-economic diversions may dominate, the ability to regulate oneself and remain academically focused becomes a principal differentiating factor among students. In the same way, problem-solving aligns with the nature of mathematics as a subject requiring logical thinking, analysis, and critical thinking. The OECD (2019) points out that mathematical literacy's prime skill is problem-solving, especially in being prepared for complex, real-world tasks. In this case, students with superior problem-solving skills will have a high likelihood of success in mathematical tests, particularly those related to application and not just computation. Communication and interaction may even play an intermediate role in the relationship. Although individual written tests are most commonly employed to measure the performance of mathematics, the development of communication skills aids easier understanding of mathematical instructions, description of problem-solving methods, and peer-to-peer learning through group study. Adeyemo (2010) believes that students with improved interpersonal and communicative abilities benefit more from collaborative learning environments that can indirectly support the learning of mathematics. In addition, group work is enabled by cooperative skills, but their effect on standardized or summative assessment could be more oblique (Kayii & Okiridu, 2020).

The function of adaptability appears more nuanced. With an increasingly variable landscape of education—particularly with the growing integration of digital tools and hybrid learning platforms—adaptability serves to help students adapt to new learning settings, new question types, or technological upheaval. While its direct effect on traditional mathematics test-taking performance may be a second-order effect, its contribution to sustaining long-term academic engagement and resilience is more widely reported (World Economic Forum, 2023). Despite such findings, the study did not decompose the correlation coefficient across individual soft skills domains,

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rendering it challenging to assign quantitative weights to each contribution of a skill. Future research can use multiple regression analysis to separate each domain's strength of predictability and clarify how each soft skill makes distinct contributions to math performance. In general, the results support the assumption that soft skills, particularly those related to cognitive control and analytical thinking, are needed for mathematics achievement. It is especially crucial in disadvantaged educational regions like Bayelsa State, where achievement in academics is largely constrained by infrastructural and socio-economic factors, and internal student characteristics like discipline and problem-solving serve as compensatory measures.

Conclusion

The implications of this research have shown the obvious connection between the soft skills of students at the senior school level and their mathematics performance. The essential factors in determining the learning pattern and performance of mathematics students are becoming increasingly evident to be soft skills such as adaptability, communication, critical thinking, self-discipline, and teamwork. Cognitive skills are necessary, but appropriate use of non-cognitive skills greatly enhances academic performance. The study brings to focus that the acquisition of soft skills by students correlates with a lot more than an add-on to course teaching; it is a valuable means of improving educational performance. The schools that integrate training in soft skills as part of their pedagogical approaches are likely to deliver well-adjusted students who can perform well academically and socially.

Recommendations

Based on the findings, the following recommendations are made:

1. Educational decision-makers and mathematics curriculum designers must incorporate soft skills—i.e., critical thinking, self-discipline, collaboration, and communication—into mathematics teaching and learning processes to foster well-rounded academic development.
2. Mathematics teachers must go through targeted development and professional advancement to be able to recognize, develop, and assess students' soft skills in the math classroom. This will enable them to create classrooms that support both cognitive and non-cognitive skill development.
3. The education authorities need to remodel the existing mathematics programme to promote greater in-depth understanding, successful problem-solving and real-world application instead of simple recall and repetitive drills. Focusing on inquiry-based and student-centered instructional approaches has the potential to allow students to progress from mediocre to excellent levels of achievement.
4. Schools must encourage cooperative learning, peer mentoring, and manipulative mathematics activities to encourage teamwork, self-discipline, and problem-solving skills in students—skills that have shown a positive correlation with student achievement.

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