

## Article

# Determinants of Academic Achievement in Special Education Environments

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**Abstract:** This study examines how teacher expertise and training influence the academic performance of students with special needs, focusing on specialized knowledge, skills in special education, and collaborative practices. The findings show that teachers have strong expertise in special education, receiving high ratings across various areas, particularly in understanding and applying appropriate assessment methods for students with disabilities. Teachers were also positively evaluated for using evidence-based practices and individualized instructional strategies, reflecting their solid knowledge and practical skills in supporting students with special needs. Moreover, their communication and collaboration abilities were rated highly, indicating effective partnerships with special education staff, parents, and general education teachers. Despite these positive evaluations, an analysis of students' academic performance in English, Mathematics, and Science showed only satisfactory outcomes, with average grades of approximately 85 in Mathematics and Science. No significant relationship was found between teacher expertise, professional development, and collaboration and students' academic performance in these subjects, as statistical analysis revealed low r-values and non-significant p-values ( $p > 0.05$ ). This suggests that while teachers possess the necessary skills and knowledge, other factors may have a more substantial influence on student performance.

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**Keywords:** Special Education, Academic performance, English, Mathematics, Science performance

## Introduction

Special education environments are designed to support Special education is a critical component of the educational system, designed to meet the unique needs of students with disabilities (Mason-Williams et al., 2020). These programs provide tailored instruction and resources to ensure that every student has the opportunity to succeed academically, socially, and emotionally (Collins et al., 2022). The importance of special education lies in its ability to promote inclusivity and equal opportunities for all students, regardless of their individual



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challenges (Smith, 2020). The significance of special education extends beyond academic achievement. It plays a crucial role in the social and emotional development of students with disabilities. Fostering an inclusive environment, special education helps these students build self-esteem, social skills, and a sense of belonging, which are essential for their overall well-being (Gargiulo & Bouck, 2020). Moreover, inclusive educational settings where special education students learn alongside their peers without disabilities promote mutual understanding and respect, contributing to a more inclusive society (Hornby, 2021). Supporting special education is essential for creating an equitable learning environment. Allocating sufficient resources, training educators, and developing comprehensive policies, schools can better address the diverse needs of their students. Effective support for special education leads to improved academic outcomes, higher graduation rates, and greater overall well-being for students with disabilities (Johnson & Brown, 2021). Effective support for special education has a profound impact on students' academic outcomes. Students support who receive appropriate support are more likely to achieve higher academic performance, stay engaged in school, and graduate. For instance, individualized instruction and support can help bridge learning gaps and promote mastery of essential skills. Studies have shown that students with disabilities who receive tailored support are more likely to experience academic success and personal growth (Samuels, 2019).

Special education faces several challenges, including the need for adequate health support, the implementation of individualized education programs (IEPs), and ensuring teachers possess the necessary expertise. Health support services are crucial for managing medical conditions that may impact learning. The effectiveness of IEPs depends on their quality and the extent to which they are customized to meet individual needs. Moreover, teachers' expertise and ongoing professional development are vital for delivering high-quality special education (Davis & Wilson, 2019). Another, one key area of focus has been the effectiveness of different instructional strategies. Research has shown that evidence-based instructional methods, such as direct instruction, peer tutoring, and differentiated instruction, can significantly improve learning outcomes for students with disabilities. For instance, direct instruction, which involves structured and explicit teaching, has been found to be particularly effective for students with learning disabilities, leading to improvements in reading and mathematics skills (Vaughn et al., 2020).

The connection between appropriate support and student academic performance in special education settings is well-documented. When students receive tailored instruction, adequate resources, and personalized attention through IEPs, their academic achievements improve significantly. Furthermore, schools that foster a supportive and inclusive environment enable students with disabilities

to thrive academically and socially, leading to better long-term outcomes (Martinez & Perez, 2023). For instance, attention through small class sizes and individualized support is another crucial factor. Smaller class sizes allow for more one-on-one interaction between students and teachers, enabling more personalized instruction. This individualized attention helps address specific learning needs and challenges, leading to better academic performance. A study by Blatchford et al. (2019) demonstrated that students in smaller classes made more significant academic gains, particularly those with special educational needs.

Despite the progress in special education, several research gaps remain. These include the quality of Individualized Education Programs (IEPs), teacher expertise and training, school resources, classroom environment, and health and well-being. More research is needed to understand how to provide effective teacher training to provide quality education to special education students. Addressing these gaps is crucial for advancing the field of special education and improving student outcomes. Future research should focus on developing evidence-based practices to improve IEP quality, investigating the most effective teacher training programs, and identifying the best ways to allocate school resources. Additionally, studies should examine how different classroom environments impact student learning and how to integrate health and well-being support into special education programs.

### **Methodology**

This study utilized a descriptive research method to explore the factors influencing the academic performance of students at Ormoc City SPED Integrated School, part of the Ormoc City Division. A structured questionnaire was employed, adapted from the works of Gargiulo & Bouck (2020), Yell et al. (2013), Vaughn et al. (2020), Ainscow & Sandill (2010), Loreman (2017), and Glanz et al. (2015). These sources were selected to address important themes such as individualized education programs, teacher expertise and training, school resources, classroom management, and student health and well-being. Data was gathered by distributing questionnaires to students' parents, ensuring anonymity and confidentiality. Responses were measured using a 5-point Likert scale, ranging from "strongly agree" to "strongly disagree," to evaluate the influence of these factors. Statistical software was used for data analysis, with a significance level of 0.05 applied to examine the relationship between the identified factors and students' academic performance. The research framework followed the INPUT-PROCESS-OUTPUT (IPO) model, focusing on inputs (influential factors), processes (data collection and analysis), and outputs (findings and an intervention plan). The results laid the groundwork for designing an intervention plan aimed at fostering a globally competitive environment in the special education context.

## Results and Discussion

Table 1. Specialized knowledge and Skills

Specialized Knowledge and Skills	Mean	VD
The teacher demonstrates a thorough understanding of special education laws and regulations.	3.83	A
The teacher is knowledgeable about various disabilities and their educational implications.	3.63	A
The teacher effectively implements individualized instructional strategies for students with special needs.	3.80	A
The teacher uses evidence-based practices in special education.	3.87	A
The teacher understands and applies appropriate assessment methods for students with disabilities.	3.93	A
Grand Mean	3.81	A

The data in the table evaluates the extent of specialized knowledge and skills among teachers in relation to their expertise and training, particularly in special education. All the items assessed received mean scores within the "Agree" (A) category, indicating a general consensus that teachers possess adequate knowledge and skills in these areas. The highest mean score of 3.93 was given to the teachers' understanding and application of appropriate assessment methods for students with disabilities, suggesting that this is a particular strength. The use of evidence-based practices in special education also received a relatively high score of 3.87, reflecting confidence in the teachers' ability to apply proven methods. Meanwhile, knowledge about various disabilities and their educational implications received the lowest mean score of 3.63, indicating this area may need further development. The overall grand mean of 3.81 suggests that, while teachers are generally well-prepared and knowledgeable, there is still room for improvement, particularly in deepening their understanding of disabilities and the specific laws and regulations governing special education.

Table 2. Quality of Instructional Strategies

Professional Development and Continuous Learning Quality of Instructional Strategies	Mean	VD
The teacher regularly participates in special education training and workshops.	3.73	A
The teacher seeks out and engages in professional development opportunities.	3.47	A
The teacher stays current with new research and practices in special education.	3.70	A
The teacher applies new knowledge and skills from professional development to their teaching	3.90	A
The teacher collaborates with colleagues to share and learn best practices in special education.	3.90	A
Grand Mean	3.74	A

The mean scores for all items fall within the "Agree" (A) category, indicating a general positive attitude towards professional

development among the teachers. The highest mean scores, both at 3.90, were awarded to the teachers' application of new knowledge and skills from professional development and their collaboration with colleagues to share and learn best practices. These scores suggest that teachers are proactive in integrating what they learn into their teaching practices and value collaborative learning. However, the lowest mean score of 3.47, which pertains to seeking out and engaging in professional development opportunities, indicates that there may be some reluctance or challenges in actively pursuing these opportunities. The other areas, such as regular participation in special education training and staying current with new research, received scores around 3.70, reflecting a generally positive but slightly less enthusiastic engagement in ongoing learning. Overall, the grand mean of 3.74 reflects a solid commitment to professional development and continuous learning among the teachers, though it also highlights areas where further encouragement or support might enhance their proactive engagement with professional development opportunities.

Table 3. Communication and Collaboration

Communication and Collaboration	Mean	VD
The teacher effectively collaborates with special education staff and other professionals.	3.83	A
The teacher communicates regularly and effectively with parents about their child's progress.	3.73	A
The teacher works well with general education teachers to support inclusion.	3.70	A
The teacher participates actively in IEP meetings and contributes valuable input.	3.87	A
The teacher builds positive relationships with students and their families.	3.73	A
Grand Mean	3.77	A

The data in the table evaluates the extent of teachers' effectiveness in communication and collaboration, particularly in the context of supporting students with special needs. All the items scored within the "Agree" (A) range, reflecting a positive overall assessment of the teachers' abilities in these areas. The highest mean score of 3.87 was given to the teacher's active participation in Individualized Education Program (IEP) meetings and their contribution of valuable input, suggesting strong involvement in the formal planning and review processes for students with special needs. The teacher's ability to collaborate effectively with special education staff and other professionals received a mean score of 3.83, indicating a strong capacity for teamwork in a multidisciplinary context. Scores for communication with parents and relationship-building with students and their families, both at 3.73, indicate solid, though not outstanding, effectiveness in these critical areas of student support. Collaboration with general education teachers to support inclusion was rated slightly lower, with a mean score of 3.70, suggesting that while teachers are

generally supportive of inclusive practices, there may be some room for improvement in this area. The grand mean of 3.77 reflects a consistent, positive assessment of teachers' communication and collaboration skills, with particular strengths in participating in IEP meetings and collaborating with special education staff, though some areas, such as inclusion support and parent communication, could benefit from further development.

Table 4. Learners Academic Performance

Subject	Grade	VD
English	82.78	Satisfactory
Mathematics	85.85	Very Satisfactory
Science	85.88	Very Satisfactory

The data in the table outlines the academic performance of learners across three subjects: English, Mathematics, and Science. The grades indicate varying levels of achievement, with English receiving a grade of 82.78, which is classified as "Satisfactory." This suggests that while students are meeting basic expectations in English, there may be room for improvement. In contrast, both Mathematics and Science received higher grades, 85.85 and 85.88 respectively, both classified as "Very Satisfactory." These scores indicate that learners are performing well in these subjects, exceeding basic expectations and demonstrating a stronger grasp of the material. Overall, the data suggests that learners are performing adequately in English and excelling in Mathematics and Science, highlighting these areas as particular strengths in their academic performance.

Table 5. Significant Relationship Between the Extent of Clarity and Specificity of Goals to English Performance

Constructs	r-value	t-value	P value	Remarks	Decision
Special Education Knowledge and Skills	0.0677	0.359	0.7220.722	Not Significant	Do not reject
Professional Development and Continuous Learning	-0.218	-1.183	0.247	Not significant	Do not reject
Collaboration and Communication	-0.130	-0.692	0.495	Not significant	Do not reject

The data in the table analyzes the potential relationships between three influential factors special education knowledge and skills, professional development and continuous learning, and collaboration and communication and students' academic performance in English. The findings indicate that none of these factors exhibit a statistically significant relationship with English performance. For Special Education Knowledge and Skills, the r-value is 0.0677 with a t-value of 0.359 and a P-value of 0.722, suggesting a very weak and statistically



insignificant correlation with English performance. The factor of Professional Development and Continuous Learning has a slightly negative r-value of -0.218, a t-value of -1.183, and a P-value of 0.247, indicating that there is no significant impact of this factor on English performance. Similarly, Collaboration and Communication shows an r-value of -0.130, a t-value of -0.692, and a P-value of 0.495, also suggesting no significant correlation. In all cases, the P-values are above the standard significance threshold of 0.05, leading to the conclusion that these factors do not significantly influence English performance in this sample. This implies that other variables, not included in this analysis, might be more critical in affecting students' performance in English.

Table 6. Significant Relationship Between the extent of Quality of Instructional strategies to Mathematics

Constructs	r-value	t-value	P value	Remarks	Decision
Special Education Knowledge and Skills	-0.0870	-0.462	0.648	Not Significant	Do not reject
Professional Development and Continuous Learning	-0.295	-1.636	0.113	Not significant	Do not reject
Collaboration and Communication	-0.207	-1.117	0.273	Not significant	Do not reject

The data in the table examines the relationships between various influential factors special education knowledge and skills, professional development and continuous learning, and collaboration and communication and students' academic performance in Mathematics. The results indicate that none of these factors show a statistically significant relationship with Mathematics performance, as all P-values are well above the conventional significance threshold of 0.05. Special Education Knowledge and Skills: This factor has a negative r-value of -0.0870, with a t-value of -0.462 and a P-value of 0.648. This suggests a very weak and statistically insignificant negative correlation, indicating that the teacher's special education knowledge and skills do not have a meaningful impact on Mathematics performance in this sample. Professional Development and Continuous Learning: Although this factor shows a more substantial negative r-value of -0.295 and a t-value of -1.636, the P-value of 0.113 indicates that the relationship is still not statistically significant. This suggests that professional development activities, as currently implemented, do not have a significant effect on improving Mathematics performance. Collaboration and Communication: This factor has an r-value of -0.207, a t-value of -1.117, and a P-value of 0.273, indicating a weak and statistically insignificant negative correlation with Mathematics performance. This suggests that the extent of collaboration and communication does not significantly influence students' performance in Mathematics. In summary, the data

suggests that none of these factors' special education knowledge and skills, professional development, or collaboration and communication are significantly related to Mathematics performance in this context.

Table 7. Significant Relationship Between the extent of Quality of Instructional strategies to Science Performance

Constructs	r-value	t-value	P value	Remarks	Decision
Special Education Knowledge and Skills	0.0571	0.329	0.5120	Not Significant	Do not reject
Professional Development and Continuous Learning	-0.418	-1.883	0.2241	Not significant	Do not reject
Collaboration and Communication	-0.532	-0.192	0.4428	Not significant	Do not reject

The data in the table explores the relationships between three influential factors special education knowledge and skills, professional development and continuous learning, and collaboration and communication—and students' academic performance in Science. The findings indicate that none of these factors have a statistically significant relationship with Science performance, as all P-values are above the standard significance threshold of 0.05. **Special Education Knowledge and Skills:** This factor shows an r-value of 0.0571, a t-value of 0.329, and a P-value of 0.5120, indicating a very weak and statistically insignificant positive correlation with Science performance. This suggests that the level of special education knowledge and skills among teachers does not significantly impact Science outcomes. **Professional Development and Continuous Learning:** This factor has a more negative r-value of -0.418 and a t-value of -1.883, but the P-value of 0.2241 still indicates that the relationship is not statistically significant. This implies that the extent of professional development and continuous learning activities among teachers does not have a meaningful influence on students' Science performance in this context. **Collaboration and Communication:** This factor shows the most negative r-value of -0.532 with a t-value of -0.192, and a P-value of 0.4428, which again indicates no statistically significant relationship. This suggests that even though collaboration and communication are important, they do not appear to significantly affect Science performance in this sample.

## Discussion

The results indicate that teachers possess strong expertise and skills in special education, with all aspects of specialized knowledge and skills receiving a positive rating. The highest-rated area is the understanding and application of appropriate assessment methods for students with



disabilities. Similarly, the use of evidence-based practices and the effective implementation of individualized instructional strategies are also highly rated, reflecting the teachers' solid foundational knowledge and practical application in special education. Additionally, in the area of communication and collaboration, teachers were rated highly for their ability to collaborate effectively with special education staff, communicate with parents, and work with general education teachers. These findings suggest that the teachers are well-equipped with both the specialized knowledge and collaborative skills necessary to support the academic performance of students with special needs. The analysis of learners' academic performance across English, Mathematics, and Science indicates generally satisfactory to very satisfactory grades, with Mathematics and Science both scoring around 85. However, when examining the significant relationship between the extent of influential factors such as Special Education Knowledge and Skills, Professional Development and Continuous Learning, and Collaboration and Communication with academic performance in these subjects, the results show no significant relationships. The  $r$ -values for all constructs are low, and the  $p$ -values are well above the threshold for significance ( $p > 0.05$ ) across all subjects. This suggests that these factors, as measured in the study, do not have a statistically significant impact on the academic performance of learners in English, Mathematics, and Science, leading to the conclusion that other variables may be influencing student outcomes in these areas.

## Conclusion

The findings suggest that while teachers in special education possess strong expertise and skills, particularly in the areas of specialized knowledge, assessment methods, evidence-based practices, and collaboration, these factors do not appear to have a statistically significant direct impact on the academic performance of learners in English, Mathematics, and Science. This implies that other variables, possibly external to teacher expertise and training, may be playing a more significant role in influencing student outcomes. The lack of significant relationships between the measured teacher-related factors and student academic performance highlights the complexity of educational success and suggests the need for further research to identify and address these other influencing factors.

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