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RESEARCH ARTICLE

EFFECT OF INCLUSIVE TEACHING ACTIVITIES IN CLASSROOMS ON STUDENTS' COMPETENCIES IN MATHEMATICS IN PUBLIC SECONDARY SCHOOLS OF RWANDA

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ABSTRACT

The study aimed to investigate the impact of inclusive teaching activities on students' mathematical competencies in public secondary schools in Muhanga District, Rwanda. The study aimed to assess the types of inclusive teaching used by teachers, evaluate their effects on mathematical skills, and identify their influence on student competencies. A sample of 188 respondents, including 20 teachers and 161 students from four schools, was selected using purposeful and random sampling techniques. Employing a descriptive research design, both quantitative and qualitative methods were utilized, with data analyzed via SPSS version 21. Findings revealed that a majority of respondents endorsed various inclusive practices: 80.6% supported empathetic practical activities, 84.2% favored technological inclusivity, and 83.9% agreed on the use of learner-centered approaches. The study concluded that these activities significantly enhance problem-solving, critical thinking, and motivation among students. Specifically, there was a positive association between empathetic practical activities and improved problem-solving, while learner-centered strategies correlated with enhanced logical reasoning and creativity. The study recommends that the government ensure schools have the necessary resources for implementing inclusive teaching and that MINEDUC evaluate these strategies. Future research should explore the effects of inclusive teaching on student motivation and engagement.

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INTRODUCTION

Inclusive education has a vital impact on enriching learners' accomplishment and collaboration in diverse classrooms; hence, educators are pleading to design inclusive teaching practices that promote equity in the learning process for all students to upkeep academic achievement and student engagement in mathematics subject. The aim is to facilitate all students in the same classroom due to their capabilities and backgrounds, hence, they learn to the best of their abilities and ultimately return to mainstream class. [1] specified that Inclusive schools need to build curricula that take into account unique student characteristics as well as the benefits for all students. That is why, [2] suggested that it may be more useful to consider how existing successful inclusive education practices can be identified and scaled up. All over the world, education systems are serving more student populations in classrooms. However, teachers of mathematics progressively encounter earnest issues related to students with varied backgrounds, experiences, strengths and weaknesses [3]. This is why educators are advised to ponder on possible difficulties that students might face and they organize instruction strategies that will enhance competences by allowing the needs of all students in the classroom (Gin, Guerrero, Cooper and Brownell, 2020). The education system needs to include all students, welcome and support them to learn regardless of who they are or what their abilities or needs are [1]. This includes all children at all levels having access to appropriate teaching and curriculum, as well as school buildings, classrooms and play areas. Salamanca's Declaration covers all groups of students facing problems in school because of diversity [3]. The declaration concerns all students with their ability to interact in normal learning experiences within the ordinary school system, regardless of their specific needs, gender, race, culture and social-economic context. The Salamanca statement further highlights the principles behind Inclusion concerning the placement of all children in regular school systems and the importance of enabling the school systems to include all children regardless of individual differences. However, insufficient knowledge and expertise to support inclusive teaching in classrooms is still challenging consistent with previous research. Teachers can adopt core values and competencies to support all learners, such as collaboration, valuing diversity, and engaging in professional development [4] (Ramberg & Watkins, 2020). Empowering teachers with the knowledge and skills to implement inclusive activities is crucial for maximizing both academic and social well-being outcomes for children and young people ([5], . However, many teachers face challenges in promoting inclusion, particularly in mathematics. For instance, South Korea and Japan have low percentages of teachers adapting their methods to address cultural diversity and reduce ethnic stereotypes [4]. While teachers in Finland and Japan generally express positive attitudes towards inclusion, they also voice concerns about their ability to effectively implement inclusive practices due to a lack of confidence [6]. This highlights a strong correlation between teachers' adaptability in mathematics instruction and the reduction of ethnic stereotypes in the classroom, underscoring the need for ongoing support and professional development in inclusive education. In the United States, inclusive teaching activities are vital for students' learning and development. According to Salend (2015)[7], inclusive classrooms address diverse needs by focusing on students' strengths and challenges, with Universal Design for Learning (UDL) facilitating a flexible environment that removes barriers and promotes engagement, particularly in mathematics. Educators are encouraged to employ varied teaching methods, technologies, assessments, and teamwork to help all learners acquire essential competencies,

ensuring that content-based mathematics is both evidence-based and reflective of individual student abilities [7]. However, implementing inclusive practices remains challenging, often grounded more in theory than in reality. In Africa, initiatives like Education for All and the Salamanca Statement, supported by NGOs, aim to promote inclusive education. Yet, in 2018, over one-fifth of the continent's 400 million children were still out of school. National governments are working to enhance inclusive learning policies and provide teacher training to bridge this theory-practice gap. Countries like Cameroon, Nigeria, Senegal, Sierra Leone, and Uganda are developing inclusive education frameworks, yet educators recognize that more work is needed for successful implementation. To address these challenges, enhancing teachers' ability to support the unique needs of every student considering factors like learning difficulties, social class, gender, language, and background is essential, as inclusive education is crucial for a holistic educational experience [8]. In Rwanda, the Ministry of Education is actively promoting inclusive teaching across all subjects, particularly in mathematics, as a key component of STEM education to enhance socio-economic development. The Ministry's fundamental aim is to stabilize education within the Rwandan socio-cultural context, encapsulated in the concept of "Uburezibudaheza," or "non-exclusionary" education [9]. However, challenges persist, as not all students have access to quality education, and many teachers struggle to effectively implement competence-based curricula that emphasize learner-centered approaches. To address this, educators must be equipped to manage inclusive teaching activities in the classroom. The Ministry asserts that for students to become competent, they must be taught both basic and generic skills [10]. Consequently, creating conducive environments is crucial to ensure an inclusive teaching workforce that effectively supports students in acquiring necessary competencies. The impact of inclusive teaching activities on students' mathematical competencies in public secondary schools in Rwanda is vital and should be prioritized.

MATERIALS AND METHODS

Research Design*:* The main purpose of this research was to find out the effects of inclusive teaching activities in the classroom on student competences in mathematics in public secondary schools in Rwanda. In this study, there were two main research strategies: qualitative and quantitative which determined the effects between independent and dependent variables. To gather data for this study, a questionnaire and interview guide of the descriptive research survey were employed. Descriptive research is the act of gathering data from people who make up a population to establish the present state of the subject according to the investigation of one or more variables [11]. This is due to the simple reason that it allows for the collecting of knowledge on opinions of individuals, beliefs, habits, or any number of educational issues. Descriptive research, according to [12], has to do with determining who, what, the reason why where, and how of anything.

Participants: This investigation focused on participants from public secondary schools in Muhanga District, specifically including students, teachers, the Dean of Studies, and head teachers. The district consists of 11 public secondary schools, with a total of 231 teachers, 11 head teachers, and 1,457 students ([13] Statistics, 2022). Three sectors Mushishiro, Muhanga, and Nyamabuye were selected, leading to a target population of 357 participants. The sample size was determined to be 188 participants, calculated using the Yamane formula. The selection process utilized both purposive and simple random sampling methods. Purposive sampling targeted head teachers and the Dean of Studies to ensure the inclusion of individuals who could provide in-depth insights into the research questions. In contrast, simple random sampling was employed for teachers and students, giving every individual in the population an equal chance of selection. This dual approach ensured a representative sample while capturing valuable perspectives from key informants in the educational context.

Instruments: The study utilized a combination of questionnaires and guided interviews to gather essential information. The researcher designed questionnaires for both teachers and students, which included demographic data such as sex, age, and academic qualifications, alongside questions regarding the impact of inclusive teaching activities on students' competencies in mathematics. Participants comprised students, teachers, the Dean of Studies (DOS), and the Head Teacher (HT) from four schools. In addition to questionnaires, the study employed guided interview guidelines, featuring a list of topics to be addressed during the interview process. Unlike structured questionnaires, these guidelines allowed for a more flexible discussion, fostering opportunities for deeper insights. This approach was chosen for its reliability and validity in exploring specialized systems and processes. The guided interviews specifically targeted the DOS and HT, enabling the researcher to gain a comprehensive understanding of the systems influencing inclusive teaching activities and their effect on student competencies among Rwandan students.

Data Analysis and Procedures: Data analysis is essential for transforming raw information into meaningful insights that facilitate interpretation and comprehension[13]. This process involves classifying responses into categories, known as coding, which helps convert unprocessed data into relevant information. Ensuring data quality is critical, as it guarantees the acquisition of reliable information that accurately reflects the research context. In this study, data were analyzed using descriptive statistics aligned with the research subjects and objectives. This approach included the computation of means and standard deviations. The analysis was conducted using SPSS version 21, logical analysis, and Microsoft Excel 2016, employing tables, charts, and graphs to present findings clearly. Qualitative data analysis often involves iterative processes, where data collection and analysis occur simultaneously. In this investigation, data were systematically edited, tabulated, and coded to facilitate thorough analysis. This comprehensive approach ensured that the findings were robust and meaningful, providing valuable insights into the research questions.

Limitations: The study faced several limitations related to methodology and analysis, particularly concerning the quantity and diversity of respondents. The qualitative nature of the study required a deep understanding of participants' perspectives on inclusive teaching activities. Some school administrators were hesitant to discuss these practices freely, fearing blame for inadequacies, which prompted the researcher to employ multiple instruments, such as questionnaires and interviews, to capture genuine opinions. Additionally, respondent subjectivity posed a challenge, as it could skew the findings. To mitigate this, the researcher implemented strategies to reduce bias during data collection. Language barriers also emerged, as not all participants were proficient in English. To address this, the researcher provided interpretation in Kinyarwanda, facilitating better understanding of the questions.

RESULTS AND DISCUSSION

The Inclusive Teaching Activities Used by Teachers in Mathematics in Public Secondary Schools: The following table indicates the perception of the mathematics teachers on the inclusive teaching activities used in mathematics that affect the students' competences. According to the table above, results indicated that teachers (80.6%) agree or strongly agree that empathetic practical activities are highly effective in assisting all students with diverse abilities in mathematics. This indicates a strong consensus among educators regarding the value of using this approach. Another result indicated that technological inclusive activities are still valued by a substantial proportion (84.2%) of teachers who agreed or strongly agreed, this suggests that technology has the potential to play a significant role in inclusive mathematics education. The data strongly supports the use of manipulatives and visual aids in mathematics classrooms with 74.2% of teachers expressing strong agreement on their effectiveness; it is evident that these resources are considered

Table 1. Answers from Mathematics Instructors on the Inclusive Teaching Activities Used by Teachers in Mathematics in Public Secondary Schools

	Strongly disagree		Disagree		Neutral		Agree		Strongly Agree				
	N	%	N	%	N	%	N	%	N	%	Total	Mean	Sdv
Empathetic practical activitieshelps teachers assist all students with different abilities in learning to complete their tasks successfully in mathematics.	1	3.2%	0	0.0%	2	6.5%	11	35.5%	17	54.8%	31	4.39	.882
TechnologicalInclusive activities helps me to motivate every student according to their difficulties in learning mathematics.	0	0.0%	1	3.2%	4	12.9%	7	22.6%	19	61.3%	31	4.42	.848
Supportive manipulatives and visual aids help me to increase every student's engagement and become more familiar with mathematics subjects.	1	3.2%	4	12.9%	3	9.7%	8	25.8%	15	48.4%	31	4.03	.197
Varied learner-centered activities in teaching and learning helps teachers to motivate every student to perform given tasks due to their strengths and weaknesses.	2	6.5%	1	3.2%	2	6.5%	7	22.6%	19	61.3%	31	4.29	.160
Iconsider student learning styles when planning teaching activities to support students learning with their best in mathematics classrooms	2	6.5%	3	9.7%	2	6.5%	10	32.3%	14	45.2%	31	4.00	.238

Source: Primary data, 2024

Table 2. Answers from Mathematics Instructors on the Mathematical competences Due to Inclusive Teaching

	Strongly disagree		Disagree		Neutral		Agree		Strongly Agree			
	N	%	N	%	N	%	N	%	N	%	Mean	Sdv
The use of empathetic practical activities facilitates me to support the learners to discover new knowledge in daily learning of mathematics	1	3.2%	3	9.7%	1	3.2%	11	35.5%	15	48.4%	4.16	.598
The use of varied learner centered activities facilitates me to support the learners to improve their levels of understanding and differentiate mathematics concepts	3	9.7%	3	9.7%	4	12.9%	7	22.6%	14	45.2%	3.84	.369
Individual learning styles facilitate me to improve the learner's ability to solve mathematical complex problems	0	0.0%	2	6.5%	3	9.7%	7	22.6%	19	61.3%	4.39	.919
Technological Inclusive activities assist me in assisting the learners in presentation and to apply mathematics concepts in daily life	2	6.5%	1	3.2%	5	16.1%	3	9.7%	20	64.5%	4.29	.230

Source: Primary data, 2024

Table 3. Answers from Mathematics Instructors on the Influences of Inclusive Teaching Activities on Student's Competencies in Mathematics

	Strongly disagree		Disagree		Neutral		Agree		Strongly agree			
	N	%	N	%	N	%	N	%	N	%	Mean	Sdv
Technological Inclusive activities helps me facilitate and encourage the learners to improve creativity and innovation in mathematics subjects.	2	6.5%	1	3.2%	4	12.9%	13	41.9%	11	35.5%	3.97	.110
The use of manipulatives and visual aids in teaching and learning facilitates me in improving students' lifelong learning.	1	3.2%	3	9.7%	5	16.1%	2	6.5%	20	64.5%	4.19	.221
Varied learner-centered activities in mathematics help me tostudent's problem-solving skills in mathematics subjects.	2	6.5%	2	6.5%	3	9.7%	11	35.5%	13	41.9%	4.00	.183
Using practical activities helps me to support students to improve their creativity and innovation.	4	12.9%	3	9.7%	6	19.4%	4	12.9%	14	45.2%	3.68	.469
Using Individual learning styles facilitates me in improving students' logic and critical thinking in mathematics.	0	0.0%	3	9.7%	4	12.9%	5	16.1%	19	61.3%	4.42	.339

Source: Primary data, 2024

essential tools for enhancing student understanding. Findings indicated that learner-centred activities are widely embraced and used by teachers; with 83.9%, expressing agreed or strongly agreed, this indicates a shift towards more student-centered pedagogy in mathematics education. The importance of considering student-learning styles in mathematics classrooms is evident in the data, with 77.4% of teachers agreeing or strongly agreeing with this practice, this suggests a growing awareness among teachers of the need to differentiate instruction to meet the diverse needs of students. The findings highlight a strong inclination among teachers towards inclusive teaching activities usage in mathematics. [14] found that to incorporate several inclusive activities through using cooperation, technology and hands-on based activities into the course delivery uplift concept understanding and engagement of the students, both in class and on examinations. [15] found that inclusive teaching activities must be carried out by identifying students' readiness, considering their learning preferences, accepting each student for who they are, and using alternative methods of informing them through using practical exercises and learner-centered approaches.

Mathematical Competences Due to Inclusive Teaching: The following table indicates the perception of the mathematics teacherson the mathematical competencesdue to inclusive teaching in public secondary schools. The Table above shows the responses given by teachers of mathematics. The result shows that a strong majority (83.9%) of respondents agreed that using empathetic practical activities helps them support students in discovering new knowledge during daily math lessons.The result showed that a strong majority (87.1%) of respondents agreed that the use of varied learner-centered activities fosters a deeper understanding of math concepts and facilitates differentiation for students, this indicates a shift towards more student-active and inclusive classrooms. Another result showed a strong majority (83.9%) of respondents agreed on the importance of addressing individual learning styles for improving the learner's ability to solve mathematical complex problems. Finally, the results indicated that the majority (87.1%) of respondents agreed that technological inclusive activities assist students in presentation and applying math concepts to real-world situations. In addition, results indicated that students build upon foundational arithmetic skills to develop abstract reasoning through algebra, spatial understanding through geometry, and data interpretation through statistics. As Geary (2014) found that the systems that emphasize conceptual understanding tend to place less importance on procedural fluency, with deficits in arithmetic fact retrieval not being taken seriously[16]. [17] (2015) concluded that every school must adopt teachers who are capable of meeting the needs of every student from diverse backgrounds to support student gain basic competences by foster knowledge discovery, conceptual understanding, problem-solving skills communication skills and critical thinking.

Perception of Mathematics Instructors on how inclusive Teaching Activities Influence Student's Competencies in Mathematics: The table above shows the findings that indicate correlation between inclusive teaching activities and enhanced student competencies in mathematics. The results show a substantial majority of teachers (77.4%) reported that technological inclusive activities significantly contribute to students' creativity and innovation, this suggests that technology can serve as a powerful tool for differentiation and engagement, providing diverse learning opportunities for all students. Furthermore, the overwhelming support (80.6%) for manipulatives and visual aids underscores their importance in facilitating long-term learning, these concrete learning tools cater to various learning styles, making abstract concepts more accessible to a wider range of students. Results indicated positive perception of learner-centered activities (77.4%) aligns with inclusive teaching principles, as these approaches prioritize student engagement and autonomy. Other results indicated that practical activities garnered support from a majority of teachers (61.3%), but the impact on creativity and innovation was perceived with slightly less certainty. Nevertheless, practical activities offer opportunities for hands-on learning and problem-solving, which are essential components of inclusive education. Results indicated the strong agreement (77.4%) of teachers on the importance of addressing individual learning styles highlights the significance of tailoring instruction to meet diverse student needs, this indicates that by accommodating different learning styles, teachers can create a more inclusive and equitable learning environment. As a result, the findings consistently demonstrate the positive influence of inclusive teaching activities on students' mathematical competencies. These practices enhance engagement, understanding, critical thinking, and overall student success. The result in this study is within the literature, where Yuval et al., (2018) stated that evaluation for the use of inclusive activities in mathematics exert a valuable and positive effect on students' adjustment and educational performance [14]. Cumming & Rose (2021), concluded that the use of inclusive teaching practices reduces students' stress related to their course workload [18].

Perception of Students on the Effect of Inclusive Teaching Activities on the Student's Competencies in Mathematics: Results from the table above indicate the results compelling evidence of the positive impact of inclusive teaching activities on student learning experiences in mathematics. A substantial majority of students (98.6%) agree or strongly agree that the technological inclusive activities significantly enhances their understanding and application of mathematical concepts. This finding underscores the potential of technology to create more engaging and accessible learning environments for all students. The results indicated that teacher support emerges as a critical factor in student success, with a resounding (81.6%) of students expressing satisfaction with the assistance provided by their teachers. This highlights the importance of supportive and responsive teaching in fostering a positive learning climate, particularly for students who may face challenges. Findings indicated (79.6%) of students present an opportunity for further exploration when they participate in cooperative learning. Results indicated the use of practical activities, manipulatives and visual aids garnered strong support from students, with (85%)and (83%) agreement rates, respectively, these findings emphasize the value of hands-on learning experiences and concrete representations in making mathematics more accessible and engaging. The data supports the implementation of inclusive teaching practices to optimize student learning in mathematics. Cumming & Rose (2021) and Seok et al., (2018) found that the use of inclusive teaching activities enhances student understanding, exploration, engagement and participation [18]. Excellent results for all children indicate the significance of inclusive teaching activities in the classroom [19].

The Statistical Package for Social Sciences on the Influences of Inclusive Teaching Activities on Student's Competencies in Mathematics: The study investigated the influence of inclusive teaching activities on students' competencies in Mathematics. The tables below shows the correlation between the independent and dependent variables as well as regression analysis.

The data in the table above reveal significant associations among the research variables. For problem-solving skills, there is a strong link to empathetic practical activities in math ($r = .796^{**}$, $p = 0.000$) and moderate correlations with varied learner-centered activities ($r = .272^{**}$, $p = 0.000$), technological inclusive activities ($r = .211^{**}$, $p = 0.005$), individual learning styles ($r = .367^{**}$, $p = 0.000$), and supportive manipulatives and visual aids ($r = .205^{**}$, $p = 0.06$). In terms of logic and critical thinking, significant associations are found with empathetic practical activities ($r = .736^{**}$, $p = 0.000$) and varied learner-centered activities ($r = .197^{**}$, $p = 0.008$), while the association with technological inclusive activities is weaker ($r = .182^{**}$, $p = 0.015$). Significant links are also noted with individual learning styles ($r = .254^{**}$, $p = 0.001$) and supportive manipulatives and visual aids ($r = .357^{**}$, $p = 0.000$). For lifelong learning, significant relationships exist with empathetic practical activities ($r = .770^{**}$, $p = 0.000$), varied learner-centered activities ($r = .243^{**}$, $p = 0.001$), individual learning styles ($r = .224^{**}$, $p = 0.002$), and supportive manipulatives and visual aids ($r = .339^{**}$, $p = 0.000$), while the association with technological inclusive activities is insignificant ($r = .118$, $p = 0.116$).

Table 4. Perception of Students on the Effect of Inclusive Teaching Activities on the Student's Competencies in Mathematics

	Strongly disagree		Disagree		Neutral		Agree		Strongly agree			
	N	%	N	%	N	%	N	%	N	%	Mean	Sdv
Technological Inclusive activities such as computers and projectors encourages me daily to understand mathematics concepts and apply mathematics in real-life situations.	0	0.0%	2	1.4%	0	0.0%	52	35.4%	93	63.3%	4.61	.568
My teacher helps me to handle difficulties in learning, and thisassists me in solving mathematics problems better and that motivates me in daily learning of mathematics	0	0.0%	8	5.4%	16	10.9%	3	2.0%	120	81.6%	4.60	.889
Engaging through cooperative or group activities helps me to improve logic and critical thinking in learning mathematics	5	3.4%	13	8.8%	11	7.5%	55	37.4%	63	42.9%	4.07	1.080
The use of practical activities in the classroom assisted me in understanding and acquiring competencies for long time in mathematics	1	0.7%	7	4.8%	14	9.5%	29	19.7%	96	65.3%	4.44	900
The use of supportive manipulatives and visual aids facilitates me to recognize mathematics concepts	6	4.1%	11	7.5%	13	8.8%	37	25.2%	80	54.4%	4.18	1.129
The use of practical exercises in mathematics helped me to increase my level of creativity and innovation in daily life situations	9	6.1%	6	4.1%	10	6.8%	17	11.6%	105	71.4%	4.38	1.167

Source: Primary data, 2024

Table 5. Correlation Analysis Between the Inclusive Teaching Activities and Students' Competencies in Mathematics in Public Secondary Schools in Rwanda a Case of the Muhanga District

		Empathetic practical activities	Varied learner-centered activities	Technological Inclusive activities	Individual learning styles	Use of supportive manipulatives and visual aids	Problem-solving skills	Logic and critical thinking	long-life learning	Improved creativity and innovation in mathematics
Empathetic practical activities	Pearson Correlation	1	.317**	.163*	.115**	.197**	.796**	.736**	.770**	. .215**
	Sig. (2-tailed)		.000	.029	.005	.008	.000	.000	.000	.000
	N	178	178	178	178	178	178	178	178	178
Varied learner-centered activities	Pearson Correlation	.317**	1	.596**	.591**	.263**	.272**	.197**	.243**	.317**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.008	.001	.000
	N	178	178	178	178	178	178	178	178	178
Technological Inclusive activities	Pearson Correlation	.163**	.596**	1	.495**	.156*	.211**	.182*	.118**	.163*
	Sig. (2-tailed)	.029	.000		.000	.037	.005	.015	.116	.029
	N	178	178	178	178	178	178	178	178	178
Individual learning styles	Pearson Correlation	.115**	.591**	.495**	1	.217**	.367**	.254**	.224**	.115**
	Sig. (2-tailed)	.125	.000	.000		.003	.000	.001	.002	.125
	N	178	178	178	178	178	178	178	178	178
Use of supportive manipulatives and visual aids	Pearson Correlation	.197**	.263**	.156*	.217**	1	.205**	.357**	.339**	.197**
	Sig. (2-tailed)	.008	.000	.037	.003		.006	.000	.000	.008
	N	178	178	178	178	178	178	178	178	178
Problem-solving skills	Pearson Correlation	.796**	.272**	.211**	.367**	.205**	1	.766**	.700**	.796**
	Sig. (2-tailed)	.000	.000	.005	.000	.006		.000	.000	.000
	N	178	178	178	178	178	178	178	178	178
Logic and critical thinking	Pearson Correlation	.736**	.197**	.182*	.254**	.357**	.766**	1	.795**	.736**
	Sig. (2-tailed)	.000	.008	.015	.001	.000	.000		.000	.000
	N	178	178	178	178	178	178	178	178	178
Improved long-life learning	Pearson Correlation	.770**	.243**	.118**	.224**	.339**	.700**	.795**	1	.770**
	Sig. (2-tailed)	.000	.001	.116	.002	.000	.000	.000		.000
	N	178	178	178	178	178	178	178	178	178
Improved creativity and innovation in mathematics	Pearson Correlation	.215**	.317**	.163*	.115**	.197**	.796**	. 736**	.770**	1
	Sig. (2-tailed)	.000	.000	029	.005	.008	. 000	.000	. 000	
	N	178	178	178	178	178	178	178	178	178

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed). Source: Primary data, 2024

*The data in the table above reveal significant associations among the research variables. For problem-solving skills, there is a strong link to empathetic practical activities in math (r = .796**, p = 0.000) and moderate correlations with varied learner-centered activities (r = .272**, p = 0.000), technological inclusive activities (r = .211**, p = 0.005), individual learning styles (r = .367**, p = 0.000), and supportive manipulatives and visual aids (r = .205**, p = 0.06).*

Finally, for creativity and innovation in mathematics, significant relationships are seen with empathetic practical activities (r = .215**, p = 0.000), varied learner-centered activities (r = .317**, p = 0.000), and technological inclusive activities (r = .163*, p = 0.029), as well as with individual learning styles (r = .115**, p = 0.005) and supportive manipulatives and visual aids (r = .197**, p = 0.008). These findings collectively suggest that these independent variables positively influence students' competencies in mathematics.

CONCLUSION

The investigation clarified the following closing statements based on the study findings described in the chapter and the comparison with previous empirical studies:

To answer the first aim and research question on assessing the inclusive teaching activities used by teachers in mathematics in public secondary schools, the study indicates that the findings of the current research reveal the thoseinclusive teaching activities are included within the use of empathetic practical activities, varied learner-centered activities, technological inclusive activities, use of supportive manipulates and visual aids, and individual learning styles. The second aim and research question on assessing mathematical competences due to inclusive teaching in public secondary schools, the research findings revealed that the of students' competences due to inclusive teaching activities in mathematics are problem-solving skills, conceptual understanding, presentation, technological literacy and communication skills. Finally, to address the third objective and research question for identifying the influences of inclusive teaching activities on students' competences in mathematics, the findings indicates that the inclusive teaching activities with in using empathetic practical activities, use of supportive manipulates and visual aids, individual learning styles, varied learner-centered activities, andtechnological inclusive activitieseffect the students 'competences in mathematics by problem-solving skills, logical and critical thinking, long life learning, and improving of creativity and innovation. In addition, the findings indicate positive significance since the p-value is smaller than 0.05.

Recommendations

Government: The government should ensure schools have adequate resources to implement inclusive teaching strategies. This includes funding for professional development, resource procurement, and the creation of inclusive learning environments. The government should offer comprehensive training programs to equip teachers with the knowledge and skills to implement inclusive teaching strategies effectively. These programs should focus on topics such as differentiated instruction, universal design for learning, and culturally responsive teaching.

MINEDUC: MINEDUC should offer technical support to schools in implementing inclusive teaching strategies. This includes providing guidance on curriculum development, assessment, and evaluation. Creating a network of schools that are committed to inclusive education can facilitate collaboration, resource sharing, and the dissemination of best practices. Regular monitoring and evaluation of the implementation of inclusive teaching practices can help identify areas for improvement and provide necessary support.

***Stakeholders**:* Collaborating with non-governmental organizations and education experts can provide schools with additional resources, expertise, and support. Stakeholders should advocate for policies that support inclusive education and address the needs of all students.

Teachers: Teachers should implement strategies such as differentiated instruction, universal design for learning, and cooperative learning to cater to the diverse needs of their students. Create a positive and inclusive classroom environment by welcoming and respectful classroom atmosphere is essential for fostering student engagement and success. Teachers should seek professional development opportunities to enhance their knowledge and skills in inclusive teaching. By staying up-to-date with the latest research and best practices, teachers can effectively implement inclusive strategies in their classrooms.

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