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Didactic activities among elementary school students in mathematics: urban vs rural schools in Indonesia

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ABSTRACT. This research analyzes the differences in didactical activities in mathematics learning in elementary schools between urban and rural environments, using a mixed method approach. Participants involved teachers and fifth grade students from 10 schools (5 urban and 5 rural), with a total of 325 students. Data collection methods include classroom observations, interviews with teachers, and analysis of mathematics learning outcomes. In urban environments, with access to sophisticated technology, activities that prioritize discipline and class resistance are found to dominate, apply group assignments and technology, but tend to be individualistic. Meanwhile, in rural environments, activities focus more on the use of traditional methods and local resources, integrating students' daily experiences and the natural environment, which encourages interest and collaboration in the classroom. Statistical analysis using the Mann-Whitney U Test revealed significant differences in mathematics learning outcomes, with urban students tending to have higher scores than rural students. These findings underscore disparities in educational quality and access to resources, emphasizing the need for policy interventions to reduce educational disparities, including more equitable allocation of resources, increasing access to technology, and strengthening teaching methods that are adaptive and responsive to student needs.

Keywords: didactic; elementary students; rural; urban.

Atividades didáticas entre alunos do ensino fundamental em matemática: escolas urbanas versus escolas rurais na Indonésia

RESUMO. Esta pesquisa analisa as diferenças nas atividades didáticas de aprendizagem de matemática nas escolas de ensino fundamental entre ambientes urbanos e rurais, utilizando uma abordagem de método misto. Os participantes envolveram professores e alunos do 5º ano de 10 escolas (5 urbanas e 5 rurais), num total de 325 alunos. Os métodos de recolha de dados incluem observações em sala de aula, entrevistas com professores e análise dos resultados da aprendizagem da matemática. Em ambientes urbanos, com acesso a tecnologia sofisticada, as atividades que priorizam a disciplina e a resistência de classe são dominantes, aplicam tarefas de grupo e tecnologia, mas tendem a ser individualistas. Entretanto, em ambientes rurais, as atividades centram-se mais na utilização de métodos tradicionais e recursos locais, integrando as experiências quotidianas dos alunos e o ambiente natural, o que estimula o interesse e a colaboração na sala de aula. A análise estatística utilizando o Teste U de Mann-Whitney revelou diferenças significativas nos resultados de aprendizagem da matemática, com os estudantes urbanos a tenderem a obter pontuações mais elevadas do que os estudantes rurais. Estas conclusões sublinham as disparidades na qualidade educacional e no acesso aos recursos, enfatizando a necessidade de intervenções políticas para reduzir as disparidades educacionais, incluindo uma alocação mais equitativa de recursos, aumentando o acesso à tecnologia e fortalecendo métodos de ensino que sejam adaptáveis e respondam às necessidades dos alunos.

Palavras chave: didático; alunos do ensino fundamental; rural; urbano.

Actividades didácticas en matemáticas entre estudiantes de primaria: escuelas urbanas versus escuelas rurales en Indonesia

RESUMEN. Esta investigación analiza las diferencias en las actividades didácticas en el aprendizaje de matemáticas en escuelas primarias entre entornos urbanos y rurales, utilizando un enfoque de métodos mixtos. Participaron docentes y estudiantes de quinto grado de 10 escuelas (5 urbanas y 5 rurales), con un total de 325 estudiantes. Los métodos de recopilación de datos incluyen observaciones en el aula, entrevistas con profesores y análisis de los resultados del aprendizaje de matemáticas. En entornos urbanos,

con acceso a tecnología sofisticada, predominan las actividades que priorizan la disciplina y la resistencia de clase, aplican tareas grupales y tecnología, pero tienden a ser individualistas. Mientras, en los entornos rurales las actividades se centran más en el uso de métodos tradicionales y recursos locales, integrando las experiencias cotidianas de los estudiantes y el entorno natural, lo que fomenta el interés y la colaboración en el aula. El análisis estadístico utilizando la prueba U de Mann-Whitney reveló diferencias significativas en los resultados del aprendizaje de matemáticas, y los estudiantes urbanos tienden a obtener puntuaciones más altas que los estudiantes rurales. Estos hallazgos subrayan las disparidades en la calidad de la educación y el acceso a los recursos, enfatizando la necesidad de intervenciones políticas para reducir las disparidades educativas, incluida una asignación más equitativa de los recursos, un mayor acceso a la tecnología y el fortalecimiento de métodos de enseñanza que se adapten y respondan a las necesidades de los estudiantes.

Palavras clave: didáctico; estudiantes de primaria; rural; urbano.

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Introduction

The didactic activities in mathematics learning for elementary school students are designed to enrich their understanding of mathematical concepts through enjoyable and interactive approaches (Rasmussen & Schmidt, 2022). Students participate in mathematical games such as number puzzles, math bingo, or board games aimed at honing their counting skills, understanding of geometry, and problem-solving abilities. Through activities like these, mathematics becomes a lively and engaging subject, steering them away from rigid and theoretical learning. For instance, in learning fractions, students might participate in activities such as dividing cakes or pizzas, where they attempt to split these items into equal parts. Although achieving equal divisions in a practical sense may not be feasible as one piece might slightly differ in size from another the activity still provides a valuable and concrete visual model for understanding the concept of fractions. This hands-on approach not only helps students engage with the idea of partitioning but also highlights the inherent challenge of exact division, fostering a more nuanced understanding of fractional parts and equality.

Moreover, teachers frequently incorporate concrete teaching aids, such as blocks, tangrams, or abacuses, to illustrate foundational mathematical concepts, such as addition, subtraction, multiplication, and fractions. For example, an abacus is often used to visually demonstrate addition and subtraction by moving beads to represent numerical values, aiding students in understanding place value and number relationships. Tangrams, on the other hand, can help students explore concepts related to geometry, such as shape composition, area, and symmetry. Through such tools, students gain a hands-on experience that reinforces abstract mathematical ideas, making learning more engaging and accessible (Dikkartin & Akar, 2018). These manipulative activities are highly effective in teaching students about shapes, sizes, patterns, and numbers. Students are also encouraged to create math journals, where they draw or write about their experiences in learning mathematics, reflecting on challenges faced and strategies used to solve problems (Sadovsky & Sessa, 2005). Thus, didactic activities in mathematics not only enhance academic abilities but also foster curiosity, independence, and confidence in students when facing mathematical challenges.

The difference in didactic activities carried out by elementary school students in mathematics learning between schools in urban and rural areas is often evident in the resources and approaches employed (Bourg, 2021). In urban schools, didactic activities may be more diverse and incorporate cutting-edge technology. Students may have access to digital devices enabling them to engage in interactive math games or use educational apps designed to deepen their understanding of mathematics (Hake, 2007). These schools may also possess more resources such as advanced manipulative kits or math laboratories, allowing students to learn through complex experiments and hands-on projects. On the other hand, village schools may rely more on traditional methods and resources due to limited access to technology and materials. However, this does not diminish the richness and effectiveness of mathematics learning (Ennis & Chen, 1995; Lee & Chen, 2010). Often, didactic activities in rural areas are integrated with the natural environment and daily life, such as using natural materials to learn about shapes and sizes or engaging in transactions at a small market for arithmetic practice (Loucaides et al., 2004). These limitations often drive innovation by utilizing local resources and making lessons relevant to students' lives, promoting a deeper and more practical

understanding of mathematics (Li & Ranieri, 2013). These differences reflect the adaptation of teaching methods to the context and available resources, while still maintaining the goal of enriching students' understanding and skills in mathematics.

Research findings on didactic activities in mathematics learning often indicate that the integration of non-formal or didactic activities has a positive impact on students' understanding of concepts, attitudes toward mathematics, and problem-solving abilities (Delacour, 2016; Spreitzer et al., 2022). Studies generally find that when students engage in practical, contextual, and enjoyable mathematical activities such as games, problem-based projects, or explorations with teaching aids, they tend to develop a deeper understanding of mathematical content and can apply these concepts in real-life situations (Ahmed et al., 2020). These activities also help students cultivate a positive attitude toward mathematics by demonstrating its utility and the joy inherent in the subject, which, in turn, can reduce math anxiety and boost confidence. Furthermore, research frequently underscores the crucial role of teachers in designing and implementing didactic activities (Ferretti et al., 2018; Li & Ranieri, 2013). Effective teachers who integrate didactic activities into their mathematics instruction often employ student-centered approaches, allowing for independent exploration and adapting activities to the needs and interests of their classes (Amans-Passaga & Verscheure, 2020). However, research also acknowledges challenges in implementation, such as a lack of time, resources, or professional support, highlighting the need for ongoing professional development and better resources for teachers (Brousseau, 2002).

In previous research, the investigation did not explore effective forms of didactic activities for mathematics learning in the classroom. In this study, the researcher will focus on investigating the forms of didactic activities in elementary schools. The study will compare the effectiveness of didactic activities in urban and rural elementary schools. Urban elementary schools tend to utilize technologies such as Augmented Reality, Virtual Reality, and the like as tools for students' didactic activities. In contrast, rural elementary schools tend to rely on hands-on games for didactic activities in school. The integration of didactic activities such as math games, practical exploration, and problem-based projects can help deepen students' understanding of mathematical concepts. This is because these activities allow students to see and experience the application of mathematical concepts in real or semi-real contexts, making the material more relevant and easily understood. Based on the previous exposition, several research questions are formulated, including:

1. What are the forms of didactic activities in urban elementary schools?
2. What are the forms of didactic activities in rural elementary schools?
3. How does student learning outcomes compare after participating in didactic activities in urban and rural elementary schools?

Method

Research design

The researcher employs a mixed-method approach to address the formulated research questions (Creswell, 2014). A qualitative approach is utilized to explore the forms of didactic activities in both urban and rural elementary schools. Subsequently, the researcher compares the effectiveness of didactic activities occurring in urban and rural elementary schools. The mixed-method research procedure employed in this study combines qualitative and quantitative approaches to provide a nuanced and multifaceted perspective on the research problem. This study utilizes a sequential exploratory design, where qualitative data collection and analysis are conducted initially to explore themes and insights. These findings subsequently inform the quantitative phase, in which statistical analyses are applied to assess the relationships identified.

Importantly, statistical analyses are not limited to numerical interpretation but are contextualized qualitatively to ensure a meaningful integration of results. The qualitative insights guide the interpretation of statistical outcomes, allowing for a more comprehensive synthesis during the final integration phase. This approach ensures that both qualitative and quantitative insights are not only separately analysed but also interwoven to achieve a richer, well-rounded conclusion.

Participants

The participants in this research are teachers and fifth-grade students from 5 urban elementary schools and 5 rural elementary schools. Fifth-grade students are chosen because they are deemed capable of engaging

in didactic activities that require abstract thinking and more complex problem-solving. The criteria for selecting urban and rural elementary schools can be found in Table 1.

Table 1. Criteria for Urban and Rural Elementary Schools.

Criteria	Urban Elementary School	Rural Elementary School
Infrastructure and Facilities	More modern and comprehensive. Facilities like computer laboratories, extensive libraries, sports fields.	Simple, with limited facilities. May lack complete laboratories and libraries.
Accessibility	Easily accessible with public transportation.	Scattered and may be difficult to access, limited transportation.
Education Quality	Teachers with higher qualifications, more training, diverse curriculum.	Teachers may have limited access to resources and training, more standardized curriculum.
Student Population	Larger number of students, diverse backgrounds.	Smaller number of students, more homogenous backgrounds.

Source: Ennis and Chen (1995).

This research involves a total of 10 schools with diverse profiles, including both urban and rural settings, allowing for a comparison of varying educational contexts. Specifically, 10 teachers and 325 students participate, with the researcher conducting observations and interviews with all teachers to collect comprehensive information on the types of didactic activities conducted in their classrooms. The selection process included schools with differing characteristics, as some urban schools also experience challenges often associated with rural settings, such as limited resources and larger class sizes. By comparing learning outcomes across these contexts, this study aims to identify which didactic approaches are more effective for mathematics learning in both urban and rural elementary schools. This comprehensive approach provides insights into shared challenges and distinctive factors affecting educational outcomes, contributing to a more nuanced understanding of mathematics education across diverse environments.

Instrument and Data Collection

In this research, the researcher employs three research instruments: observation sheets, interview guidelines, and documentation of students' learning outcomes in the subject of mathematics at the elementary school level. The observation process takes place over four sessions. The Observation Sheet used by the researcher is adapted from Pleşan (2021), which outlines the aspects of the observation sheet for classroom learning activities, as seen in Table 2.

Table 2. Indicators for observation instrument of didactic activities of students in class.

No	Dimension	Indicator
1	Interest in class activities	Attends class with enthusiasm
		Actively participates in class activities
		Demonstrates active involvement in assigned tasks
		Willing to come forward for class presentations
2	Discipline in class activities	Timely arrival to class
		Brings necessary tools for assigned activities
		Neat appearance of students
		Follows class activities with effective and efficient use of time
3	Resistance to class activities	Sits calmly in class
		Listens attentively to teacher instructions
		Responds well to the teacher
		Uses learning resources effectively
		Focuses on completing tasks
4	Social Aspects with classmates	Communicates with classmates during task completion
		Collaborates ideas with classmates
		Follows group rules well

Source: Pleşan (2021).

For the interview guideline instrument, the researcher develops questions based on observations from the observation sheet already conducted. The interview is conducted to confirm the findings on the observation sheet of didactic activities performed by students in class. Afterward, the researcher utilizes documents of students' mathematics learning outcomes to assess the effectiveness of the didactic activities that occurred in the classroom.

Data analysis

In this research, data analysis is processed using the Interactive Model proposed by Hair et al. (2019), where the researcher integrates qualitative and quantitative approaches comprehensively. In the first stage, data collection utilizes observation sheets and interview guidelines to obtain qualitative data. Subsequently, students' mathematics learning outcome documents are used to obtain quantitative data. The second stage involves data condensation through a selective process that includes selection, focus, simplification, summarization, and data transformation. Relevant data to the research questions are retained and coded based on specific themes. The systematic organization of data enables a more in-depth and focused analysis. The third stage involves presenting data in the form of tables or structured narratives, highlighting key findings based on the research questions. This stage allows the researcher to visualize the relationships between various data elements and facilitates interpretation. The fourth stage entails drawing conclusions based on the condensed and presented data. Conclusions are developed through an interpretative process involving categorization, synthesis, and theorization of findings to address the research questions.

Data validity in this research is affirmed through a series of strategies (Heale & Twycross, 2015). Firstly, perseverance is enhanced with consistent and sustained observations. Secondly, triangulation of sources and techniques is employed to reinforce findings, combining various perspectives and methods to gain a more holistic picture. Thirdly, member checks are implemented, where participants are given the opportunity to review and confirm the accuracy of findings. Finally, peer debriefing is conducted to obtain critical perspectives and validate the interpretation of data, enhancing the credibility and transferability of the research.

Result

The observation results of the performance of 5 schools in the urban area and 5 schools in the rural area are based on the four specified evaluative dimensions. These dimensions may encompass aspects such as Interest in class activities, Discipline in class activities, Resistance to class activities, and Social Aspects with classmates. Scores for each dimension are adjusted to a scale of 1-5, with 1 indicating the lowest performance and 5 indicating the highest performance. The tabulated data results of the observation sheet scores for each dimension can be seen in the following discussion:

Urban Schools

Figure 1 shows that urban schools tend to excel in the discipline dimension and exhibit strong resistance in participating in class activities. However, students in urban schools score low on the social aspects with classmate's dimension. This indicates that students in urban schools are more individualistic in facing problems or assignments given by the teacher. To confirm these observation sheet results, the researcher conducted interviews with 5 teachers in urban schools, yielding the following main transcript data.

a. Interview with Teacher 1 (First Urban School):
   Interviewer: "How do you create an environment that supports discipline in the classroom?"
   Teacher 1: "We have clear and consistent rules. Additionally, we often use strategies such as group assignments to teach cooperation and discipline to students."
b. Interview with Teacher 2 (Second Urban School):
   Interviewer: "How do you address students' resistance to class activities?"
   Teacher 2: "We strive to make learning more engaging by utilizing technology and practical examples. This helps reduce students' resistance and makes them more involved."
c. Interview with Teacher 3 (Third Urban School):
   Interviewer: "How do you encourage social interaction among students in the class?"
   Teacher 3: "We use teaching methods that encourage group discussions and collaboration. We also organize extracurricular activities that involve students in positive social interactions."
d. Interview with Teacher 4 (Fourth Urban School):
   Interviewer: "What is your approach in teaching social aspects with classmates?"
   Teacher 4: "We give assignments and group projects that require cooperation and communication among students. This helps them develop social skills."
e. Interview with Teacher 5 (Fifth Urban School):
   Interviewer: "How do you address the challenge of students' individualism in facing assignments?"

Teacher 5: "We strive to create awareness of the importance of cooperation in learning. We also provide positive feedback on the results of students' collaboration".

Through interviews with these teachers, it can be observed that they employ various strategies, such as clear classroom rules, the use of technology, interactive teaching methods, and group assignments, to address student resistance and enhance social aspects with classmates. These efforts aim to create a more balanced educational environment in urban schools.

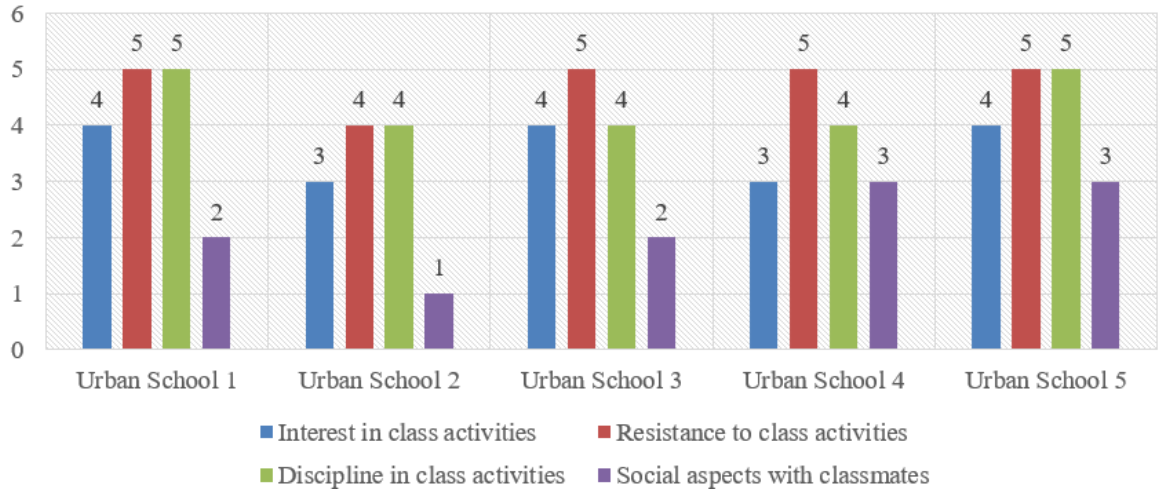

Figure 1. Observation Sheet Score Results for Urban Schools.
Source: Research Data.

Rulal School

Figure 2 shows that rural schools have an advantage in the dimensions of interest and social aspects when conducting activities in the classroom. Students in rural schools demonstrate a more interested attitude in what will be done in class and are more cooperative with peers in a group when working on assignments given by the teacher. To reinforce this data, the transcript results of interviews with 5 teachers in rural schools are as follows:

a. Interview with Teacher 1 (First Rural School):
Interviewer: "How do you create interest among students in classroom activities at Rural School 1?"
Teacher 1: "We strive to make learning more engaging by incorporating practical and real elements into the lessons. We also provide examples that are relevant to the students' daily lives".

b. Interview with Teacher 2 (Second Rural School):
Interviewer: "How do you encourage cooperation among students in groups when working on assignments given by the teacher?"
Teacher 2: "We often assign group tasks that require cooperation and collaboration. We also provide space for students to discuss and share ideas during the learning process".

c. Interview with Teacher 3 (Third Rural School):
Interviewer: "What is your approach to teaching the social aspect with classmates?"
Teacher 3: "We understand the importance of developing social skills. Therefore, we provide opportunities for students to interact, discuss, and solve problems together in a supportive environment".

d. Interview with Teacher 4 (Fourth Rural School):
Interviewer: "How do you manage students' interest in classroom activities?"
Teacher 4: "We try to present relevant and engaging learning experiences using various resources available in the rural environment. We also listen to students' input about what interests them".

e. Interview with Teacher 5 (Fifth Rural School):
Interviewer: "How do you involve students in a more social learning process?"
Teacher 5: "We give students opportunities to discuss, debate, and collaborate on projects that emphasize cooperation. This helps them develop social skills and learn from their peers".

Through interviews with these teachers, they use various strategies to create student interest in classroom activities and enhance social aspects with peers in the rural school environment. These efforts aim to maximize students' potential in learning and collaboration.

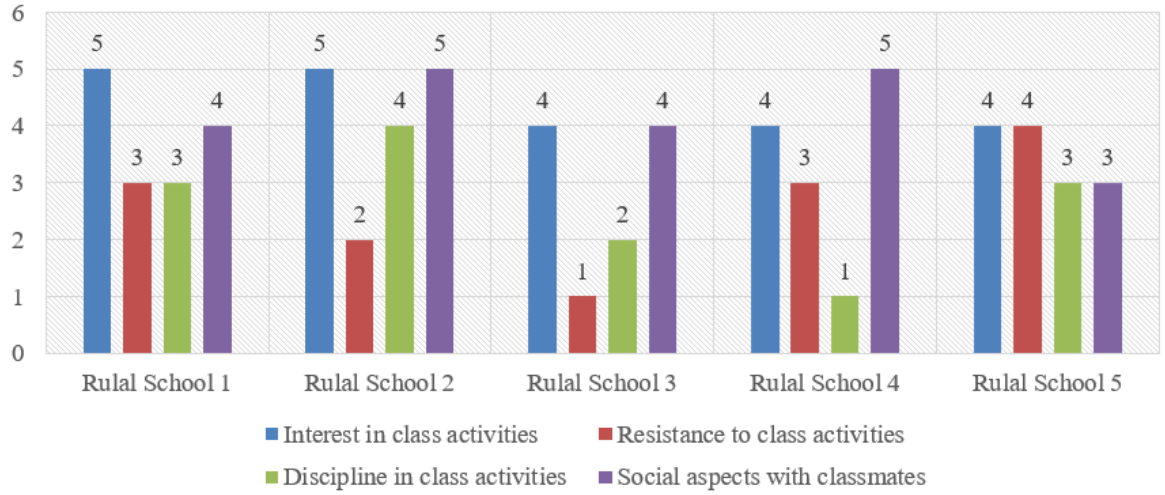

Figure 2. Results of Observation Sheet Scores for Rulal School.
Source: Research Data.

Mathematics Learning Outcomes of Students

To compare student learning outcome data over 4 sessions with didactic activities, the researcher conducted 4 statistical tests using SPSS, namely: (1) Descriptive Data Test, to calculate descriptive statistics such as mean, median, mode, standard deviation; (2) Normality Test to assess the distribution of values for each session; (3) Homogeneity Test to compare variances between urban and rural school groups; and (4) Comparative Test using Mann-Whitney U Test analysis, often used to compare two independent groups with non-normal distributions. A summary of the results of the statistical tests can be seen in Table 3.

Table 3. Results of Descriptive Data Test, Normality Test, Homogeneity Test, and Mann-Whitney U Test.

Session	Mean urban	Mean rulal	Normality urban (p)	Normality rulal (p)	Homogeneity (p)	Mann-Whitney U (p)
Session 1	85.22	78.55	0.038	0.036	0.161	0.015
Session 2	86.41	78.61	0.028	0.024	0.470	0.028
Session 3	86.60	78.39	0.019	0.043	0.410	0.010
Session 4	84.67	77.97	0.015	0.028	0.831	0.017

Source: SPSS Data.

From Table 3, it is evident that the p-value from the Shapiro-Wilk Normality Test for urban/rural schools is less than 0.05. A value < 0.05 indicates a non-normal distribution. Additionally, the p-value from the Levene's Homogeneity Test shows that all values are > 0.05, thus, it can be concluded that the data from both groups are homogenous. Due to the non-normal distribution of the data, non-parametric comparative tests are used. This research employs the Mann-Whitney U Test to compare two independent groups with a non-normal distribution. Based on the statistical analysis conducted, including the Mann-Whitney U Test showing significant differences between the two groups in all sessions, it can be observed that the mean scores of students from Urban Schools tend to be higher compared to the mean scores of students from Rural Schools in each tested session. This is indicated by the consistently higher values in the 'Mean Urban' column compared to 'Mean Rural' in Table 3. Thus, based on the analyzed data, the learning outcomes of students from Urban Schools are statistically better compared to the learning outcomes of students from Rural Schools. This is measured by the scores in the tested sessions, where urban schools have higher average scores, and this difference is statistically significant.

Discussion

Didactic activities in urban schools

In examining didactic activities taking place in urban schools, findings indicate that there is an advantage in discipline, and a strong resistance to classroom activities. However, on the other hand, students tend to score low in the dimension of social interaction with classmates. Based on observations and interviews with teachers, the employed strategies include the emphasis on clear rules, the use of technology, and the

organization of activities that encourage collaboration and social interaction. These strategies, including the use of group assignments and discussions, are intended to overcome individualistic tendencies and strengthen students' social skills.

A striking contrast is observed between the high discipline tendency and low social interaction among urban school students (Cai et al., 2019). This reflects the complex dynamics in urban educational environments, which often emphasize achievement and discipline but may lack in facilitating balanced social development (Istikomah & Wahyuni, 2018). While students may excel in academic aspects and adherence to rules, there is a need to balance this with stronger social skills. Methods employed by teachers, such as group work and collaborative projects, offer a path to creating a more inclusive and supportive learning environment, where students can learn to interact and collaborate more effectively (Li & Ma, 2010).

The significance of these findings lies in a deeper understanding of how didactic activities in urban schools can be optimized to balance academic discipline needs and social development. Interviews with teachers provide insights into current practices and potential further development (Erdogan et al., 2014; Mainali, 2021). Strategies such as the use of technology and teaching methods that encourage collaboration not only address student resistance to classroom activities but also help overcome challenges of individualism by enhancing engagement and social skills (Tall & Razali, 1993). Based on research findings and interviews with urban school teachers, some forms of didactic activities in urban schools include:

1. Implementation of Clear and Consistent Rules: Urban schools emphasize discipline through the implementation of clear and consistent rules. This helps create a structured learning environment where students understand expectations and boundaries. With clear rules, students are more likely to follow class norms and focus on lessons.
2. Group Assignments: To teach cooperation and discipline, urban school teachers often use group assignment strategies. This not only encourages students to work together to achieve common goals but also helps them develop communication and interpersonal skills. Group assignments aim to reduce individualism and strengthen collaboration among students.
3. Utilization of Technology: To make learning more interesting and reduce resistance to classroom activities, urban schools leverage technology such as digital devices, educational apps, and online resources. This technology is used to present lesson materials in a more dynamic and interactive way, capturing students' interest and enhancing their engagement in the learning process.
4. Teaching Methods Encouraging Discussion and Collaboration: Urban school teachers use teaching methods that encourage group discussions and collaboration. This involves activities such as class discussions, case studies, and collaborative projects. These methods not only enhance students' understanding of the subject matter but also help them develop critical thinking skills and the ability to work effectively in teams.
5. Extracurricular Activities for Social Interaction: Urban schools also organize extracurricular activities that involve students in positive social interactions. These activities can include sports, clubs, music, arts, and various other activities that encourage students to interact and collaborate outside the classroom. This helps students develop their social skills and feel more integrated into the school community.

The comparison between urban and rural schools shows a significant contrast in learning outcomes, with urban schools generally excelling in discipline and academics (Ferretti et al., 2018; Hermawan et al., 2020). However, the approaches used to address social and collaborative aspects become crucial to ensure education not only focuses on cognitive aspects but also on the holistic growth of students (Kang & Kim, 2016). Integrating extracurricular activities, group projects, and open discussions can contribute to improved social interaction and better development of social skills. Thus, this research highlights the importance of creating a balance between academic discipline and social development in education (Gokel & Dagli, 2017). The diverse strategies used by teachers in urban schools, while effective in some respects, need continuous evaluation and improvement to support more comprehensive student growth. The implications of these findings underscore the importance of a holistic approach to education, ensuring that students are not only academically successful but also skilled in social interaction and prepared for future challenges.

Didactic activities in rural schools

In rural schools, didactic activities take on a unique form aimed at integrating students' daily lives with classroom learning. To enhance student interest in classroom activities, teachers at the First Rural School integrate practical and contextual elements into their teaching (Isnaniah & Imamuddin, 2020; Maulyda et al.,

2020). They use examples relevant to students' daily lives, making the material more relatable and engaging. This fosters greater curiosity and interest among students towards the subjects, as they can see the direct application of what they learn to their environment (Kanastren et al., 2023; Perbowo et al., 2019). To encourage cooperation and social interaction, teachers at the Second and Third Rural Schools assign group tasks and promote group discussions. Through this collaboration, students learn to collaborate, share ideas, and solve problems together (Sarama & Clements, 2009). This not only enhances their social skills but also cultivates a sense of community and collectiveness in learning. The social aspect is crucial in the rural school environment, where communal relationships and cooperation often form the center of daily life (Gorgorió & Planas, 2005).

In creating interest in classroom activities, teachers at the Fourth Rural School use various resources available in the village environment (Partanen, 2011). They listen to students' input on what interests them and try to present relevant and engaging learning experiences. This approach not only makes students more engaged but also gives them a sense of ownership over their learning process (Sulisworo & Permprayoon, 2018). Teachers at the Fifth Rural School focus on more social learning, facilitating discussions, debates, and collaborative projects that emphasize cooperation. This encourages students to actively participate, share knowledge, and learn from their peers. These activities are particularly effective in developing students' social and communication skills, which are crucial aspects of holistic education.

The significance of these findings lies in recognizing that in rural schools, didactic approaches that apply activities reflecting communal life and local social practices tend to be more effective. These strategies not only address geographical challenges and limited resources but also leverage the strengths of the village community (Cimen, 2014). Compared to urban schools that may focus more on discipline and academic achievement, rural schools tend to emphasize collaborative learning and social growth. Here are some forms of didactic activities frequently carried out in rural schools:

1. Practice and Reality-Based Learning: Teachers in rural schools often incorporate practical and real elements into teaching. They use examples relevant to students' daily lives, such as using the surrounding natural environment or communal activities as teaching materials. This makes students more interested and involved as the learned material is perceived as relevant and useful.
2. Group Assignments to Encourage Cooperation: To enhance cooperation among students, teachers assign group tasks. This allows students to work together, share ideas, and collectively take responsibility for the outcomes achieved. Through group work, students learn to communicate, collaborate, and appreciate the contributions of each group member.
3. Teaching Social Aspects Through Class Interaction: In teaching social aspects, teachers in rural schools provide broader opportunities for students to interact, discuss, and collaborate in solving tasks or problems. This may involve activities like class discussions, collaborative projects, or even extracurricular activities that promote cooperation and social understanding.
4. Managing Interest Using Local Resources: Teachers in rural schools manage student interest by utilizing resources available around them. They may use local materials, folklore, or even involve the community in the learning process. This approach helps make learning more interesting and meaningful for students.
5. Activities Emphasizing Cooperation and Social Learning: In rural schools, it is essential to involve students in activities that emphasize cooperation and social learning. Teachers may engage students in communal projects, group-based activities, or other events that demand cooperation and social interaction, thereby strengthening their social and collaborative skills.

Thus, rural schools, with their unique didactic strategies, offer a learning environment closely tied to communal life and local social practices. This not only results in a greater interest in classroom activities but also strengthens social aspects and cooperation among students. The comparison with urban schools shows that, despite differences in resources and focus, both environments can learn from each other in creating holistic and inclusive education. The research results show that rural school environments tend to have closer links with communal life and local social practices (Griffin et al., 2018). This creates an atmosphere where learning does not only occur in the classroom but is also integrated into people's daily lives. This has the potential to influence students' motivation and engagement in learning, as well as strengthening social aspects and cooperation between them. On the other hand, urban schools tend to have greater access to resources and may expose students to a greater diversity of cultures and global experiences (Canales et al., 2008).

However, while these differences may be clear, it is important to recognize that both school environments have unique strengths and potential. Rural schools, with a didactic approach that is closely linked to local wisdom, may be able to provide a more authentic and meaningful learning experience for their students (Vásquez & Alsina, 2015). On the other hand, urban schools may be better able to provide access to technology and modern learning support resources. Therefore, adopting an inclusive approach that combines the best elements of both school environments can be the most beneficial approach for improving the overall quality of education.

In this context, it is important for educational policy makers to consider diversity in educational contexts and design appropriate strategies to support both types of schools (Hudson & Schneuwly, 2007). A focus on inter-school collaboration, learning exchange between rural and urban schools, and developing policies that are responsive to the unique needs of each neighborhood can help create an education system that is more inclusive, sustainable, and oriented toward equitable outcomes for all students.

Comparison of student learning outcomes in urban and rural schools

The conducted study reveals a significant difference in the average scores between urban and rural school students, with urban students demonstrating better performance in each assessed meeting. This finding aligns consistently with existing research, indicating that factors such as access to resources, teaching quality, and educational infrastructure tend to be better in urban environments (Ennis & Chen, 1995; Loucaides et al., 2004). However, it is essential to note that these differences do not automatically reflect intrinsic student abilities but may rather mirror the quality and access to education they receive. The results of the statistical analysis using the Mann-Whitney U test provide robust evidence of this significant difference, but it is crucial to explore the underlying factors. Research has shown that these differences can be attributed to a complex range of factors, including variations in teaching quality, school facilities, parental support, and student motivation. One key factor that can influence differences in academic performance between students in the two environments is the quality of teaching. Urban schools tend to have access to quality teachers equipped with better teaching skills and experience compared to rural schools. This factor can provide a competitive advantage for urban students, as they receive better guidance and more structured learning (Kjellgren et al., 2024). Apart from that, access to technology and educational materials is also an important factor. Urban schools are generally equipped with the latest technology and more complete educational materials, allowing students to learn more effectively and interactively. On the other hand, rural schools often face limitations in this regard, which can hinder students' ability to access modern educational information and resources (Silva, 2016).

Furthermore, geographical, and infrastructural challenges also play an important role in influencing the academic performance of students in rural areas. Students in rural areas may be faced with long commutes to school, teaching staff shortages, and limited educational resources. These conditions can create physical and psychological barriers for students, which in turn can affect their motivation and academic performance (Canales et al., 2008; Cumbreras et al., 2014). Parental support is also a key factor influencing students' academic performance in both settings. Although not directly related to the school environment, the level of parental participation in their children's education can influence students' motivation and readiness to learn. Parents in urban environments tend to have more resources and access to support their children's education, while parents in rural areas may face challenges such as economic instability or a lack of understanding of the importance of education (Loucaides et al., 2004). In overcoming this disparity, a holistic and integrated approach is needed. Efforts to improve the quality of teaching, increase access to technology and educational resources, and strengthen the involvement of parents and local communities in rural areas are essential. Only with this comprehensive approach can we ensure that all students, regardless of their geographic background, have equal access to quality education.

The findings from this research carry significant implications for education policies. To narrow the gap between urban and rural schools, the government and education stakeholders need to allocate resources more effectively, develop teacher training programs, and improve school infrastructure in rural areas. Additionally, providing access to educational technology and digital learning resources can help rural students access learning materials equivalent to their urban counterparts. Although this research provides valuable insights into the differences in academic performance between urban and rural schools, there are acknowledged limitations. This study may not account for all socio-economic, cultural, or environmental factors influencing learning outcomes. It is advisable for educators to consider integrating insights from this research, alongside

other relevant studies, into their teaching practices. Rather than mandating these practices, we extend an invitation to educators to reflect on these findings and explore their potential application in enhancing instructional effectiveness. By doing so, educators may find valuable strategies that align with their own teaching goals and contexts, fostering continuous improvement in educational practices. This may include developing a curriculum that is more responsive to the needs of rural students, training teachers in innovative and inclusive teaching methods, and implementing learning approaches that leverage the strengths of the local community. By understanding these differences and taking proactive steps to address them, the education system can better offer a quality and inclusive learning experience for all students, regardless of where they attend school.

Conclusion

The research examining the differences in academic performance between urban and rural school students sheds light on the importance of varied didactic activities in both environments. In urban schools, didactic activities tend to focus on implementing clear rules, utilizing technology, and assigning group tasks aimed at enhancing discipline and reducing individualism. This contributes to higher average scores, indicating the effectiveness of these strategies in creating a structured and engaging learning environment. The research underscores a significant need to incorporate additional activities that foster social interaction and collaboration. This recommendation aligns with observed lower scores in the social dimension among students in urban schools, suggesting that more intentional strategies to enhance collaborative skills may be beneficial. Emphasizing these elements could not only strengthen students' social competencies but also address an important aspect of holistic education, ultimately contributing to more well-rounded learning outcomes. On the other hand, rural schools excel in didactic activities that enhance student interest and collaboration. Teachers employ methods that integrate students' life experiences, encourage group learning, and focus on developing social skills through more intensive classroom interactions.

This results in a cooperative and engaged learning environment, where students show greater interest and improved collaborative abilities. While the statistical data suggest that rural schools generally display lower average scores compared to their urban counterparts, it is crucial to understand the distinct types of mathematical understanding that each educational environment aims to cultivate. In rural contexts, the emphasis often extends beyond traditional academic metrics to include the development of students' social and collaborative skills. This approach not only enriches students' social experiences but also fosters a type of mathematical learning that integrates real-life problem-solving and teamwork. By focusing on social contexts and practical applications, rural education environments offer unique, long-term benefits that may enhance students' adaptability and collaborative competence skills essential in both academic and non-academic settings. Thus, while the academic content may differ, each setting provides valuable, contextually relevant knowledge that supports students' overall growth.

These findings emphasize the need for policy interventions aimed at reducing educational disparities through more equitable resource allocation, improved access to technology, and strengthening adaptive and responsive teaching methods. Furthermore, this research suggests the necessity for in-depth studies on socio-economic, cultural, and environmental factors influencing learning outcomes to inform effective intervention strategies. In achieving educational equity, stakeholders must adopt a holistic approach that not only focuses on resource improvement but also on pedagogical innovation and teacher capacity building, to support the full potential of every student, whether in urban or rural environments. Future research needs to delve deeper into how factors such as school climate, family backgrounds, and local policies can affect student learning outcomes. Moreover, longitudinal studies monitoring changes in student performance over time can provide a broader understanding of educational dynamics in different regions.

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