

Implementation of Itinerant Classrooms as an Educational Strategy for Pedagogical Knowledge Recovery in Basic Education Students

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Abstract

The global COVID-19 pandemic resulted in academic setbacks due to the loss of learning, the effects of which began to become evident during the progressive return to in-person classes, highlighting the need to work on re-education processes. This study examines the effectiveness of itinerant classrooms in facilitating learning recovery among Basic Education students following the impact of the COVID-19 pandemic. A pedagogical support intervention was implemented for 304 students across educational institutions nationwide. A quasi-experimental design with a quantitative approach was employed, utilizing pre-test and post-test assessments to evaluate mathematics performance. The results demonstrated a significant improvement in student grades after the intervention, with the complete elimination of scores in the lower range. These findings underscore the effectiveness of itinerant classrooms as a mobile educational strategy that addresses the needs of students in marginalized communities. The research highlights the importance of an inclusive approach to pedagogical recovery, promoting collaboration among educators, psychologists, and families to comprehensively address academic underachievement.

Keywords: *Educational Environment, Learning, Classroom, Learning Difficulty, Recovery.*

Introduction

Furthermore, the COVID-19 pandemic transformed the global educational landscape, with society as a whole having to adapt to new strategies and a "new normal," which undoubtedly impacted teaching and learning processes, as well as the use of educational technologies that facilitated access to education (Shen et al., 2022; Gutiérrez-González et al., 2023). In these circumstances, Cooper et al. (2021) educational system: first, efforts at the school level, such as intensive tutoring, teacher collaboration, and rotational scheduling; second, establishing partnerships with community organizations to provide comprehensive support to the most marginalized communities; and third, promoting parental involvement through practical advice and messages sent via text to help parents support student learning.

The article, "Exploring How Ontario Teachers Adapted to Home Learning Initiatives During COVID-19: Combining Technological and Pedagogical Expertise in a Time of Increasing Inequalities," examines the response to school closures due to the pandemic, during which home learning initiatives were implemented. These initiatives focused on four main themes: increasing disparities in equity, ineffective communication of educational policies, factors influencing the success of emergency remote teaching—encompassing both technological and pedagogical aspects—and the impacts on academic performance and socio-emotional/mental health (Cooper et al., 2021).

Dolorier Zapata et al. (2022) in their article "*Feedback as a Strategy for Systematizing Good Practices in Pre-service Teachers*," highlight that the use of feedback has a positive impact, as strategies aimed at enhancing the pedagogical practice process have shown favorable results. The main objective of pedagogical recovery is to foster intellectual development in students and eliminate detrimental academic habits. For this reason, comprehensive programs that incorporate psychological and pedagogical elements are crucial, wherein children actively participate, and their well-being is promoted. Collaboration between psychologists,

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psychotherapists, and parents plays a critical role, as it facilitates knowledge acquisition and stimulates cognitive development.

The aforementioned feedback strategies bring us closer to the concept of itinerant classrooms, understood as spaces located in unconventional places yet serving the purpose of educational activities (Ballesteros Senties et al., 2021). Additionally, it is essential to recognize that itinerant classrooms, as their name suggests, are mobile educational spaces that move across different locations to provide education to students who lack access to conventional schools or require academic reinforcement (Ministerio de Educación Formación Profesional y Deportes de España, 2023).

Itinerant classrooms face challenges but also offer multiple benefits. It is important to highlight that they bring education to marginalized communities and promote inclusion by adapting to the specific needs of students (Ramiro-Sánchez et al., 2013). Itinerant classrooms provide educational support to students who cannot attend traditional schools for various reasons, offering opportunities for children and young people from vulnerable sectors (Ministerio de Educación Formación Profesional y Deportes de España, 2023).

In the context of Basic Education, itinerant classrooms function as mobile educational spaces characterized by their ability to reach areas where primary and secondary education is needed but not accessible due to various factors (Ministerio de Educación Formación Profesional y Deportes de España, 2023). Additionally, programs are designed to support students who have encountered difficulties throughout their academic journey, offering personalized attention to those with academic delays, with the aim of recovering lost instructional time, improving learning outcomes, and reducing absenteeism. This work is conducted directly with the target population, providing individualized support to students with academic setbacks.

It is assumed that children and adolescents from low socioeconomic backgrounds and rural areas were more significantly affected by learning loss, and the goal is to identify the academic difficulties these students faced after the pandemic, intervene, and assess the pedagogical recovery of knowledge.

Literature Review

One of the strategies considered to control the spread of the coronavirus was the reduction of social contact. This measure has had both psychological and academic impacts on students worldwide, leading to observable changes in the emotional state of children and adolescents, who experienced confusion and anxiety (Ravens-Sieberer et al., 2023). The lockdown marked a significant shift in the lives of children and adolescents (Orgilés et al., 2021); the closure of schools disrupted their academic routines and social spaces. Doucet et al. (as cited in Cooper et al., 2021); Madaus et al. (2022) note that many countries, in response to the emergency, opted for remote learning, swiftly changing strategies to maintain school cycles "regularly" without the need for in-person attendance.

In addition, children and adolescents were thrust into emotional difficulties, living in circumstances incongruent with their developmental needs, hindering the exploration of various aspects of identity formation and their ability to cope with daily challenges, particularly in the school setting (Mann & Mann, 2021; Ravens-Sieberer et al., 2021; Ravens-Sieberer et al., 2022). Furthermore, Betthäuser, Bach-Mortensen, and Engzell (as cited in Asadullah & Tham, 2023) suggest that this interruption of in-school education likely exacerbated pre-existing issues, contributing to a learning crisis.

Ko et al. (2023) Ko et al. (2023) investigated how the threat of the pandemic affected students' learning behavior in various ways, particularly in terms of learning loss concerning quantity, pattern, and pace—what they referred to as the tripartite aspect of learning behavior. Elliot Major et al. (as cited in Asadullah & Tham, 2023) argue that even in high-income countries, learning losses were recorded due to reduced school hours. Educational institutions had to adopt online learning models, which significantly impacted students from communities with inadequate technological infrastructure, limited access to devices, and restricted internet connectivity (Vijayan, 2021).

Undoubtedly, the shift to remote learning led to significant setbacks in education, particularly in poorer countries where school closures were prolonged and the use of technology was limited (Alejo et al., 2023; Lichand & Doria, 2024); This situation substantially increased absenteeism and even led to dropouts (Miranda & Baum, 2024; Promsron et al., 2024). In response to these challenges, educators have made considerable efforts to provide quality education and ensure that learning outcomes are met (Vijayan, 2021). All of this posed a major challenge for teachers delivering instruction electronically (Alenezi, 2024). As a result, learning losses have disproportionately affected the most vulnerable, exacerbating the pre-existing learning crisis (Angrist et al., 2021).

Given the explanations above, it is evident that the pandemic triggered what the United Nations Children's Fund (UNICEF) termed "the greatest disruption of schooling in the history of the world" (Miranda & Baum, 2024). Consequently, educational technologies played a pivotal role in facilitating learning during the pandemic and continue to do so in its aftermath (Ko et al., 2023).

In 2021, in-person classes began to resume progressively worldwide, even in the countries most affected by the pandemic, and educational systems faced the challenge of addressing significant learning losses (Lichand & Doria, 2024). Reforms and programs were implemented to address the immediate recovery of learning (Angrist et al., 2021); requiring a multifaceted approach aimed at improving teaching quality and access to learning resources, while overcoming social and economic barriers in education (Tapia et al., 2023); These programs emerged as an alternative for learning recovery and raised expectations within schools regarding academic progress (Nikolaidis et al., 2024).

Parents and guardians face challenges in meeting the demands of students with low academic performance and must be concerned with providing them adequate support. Beyond society's general interest in offering these students the resources necessary to develop the skills required for academic and subsequent professional success (Berlinski et al., 2023; Mohamad et al., 2024). the resources currently utilized provide individualized and isolated support, separate from general teaching, while still adhering to educational policy objectives (Niemi & Laaksonen, 2020); This specifically involves adopting approaches that promote the equitable treatment of all students (López-Marí et al., 2021).

In employing the aforementioned strategies, it is crucial to understand that inclusive education is a process aimed at identifying and eliminating obstacles that hinder the performance of all students, with particular attention to those at risk of marginalization or underachievement. Inclusive education consistently promotes equality, accessibility, and the defense of the right to education for all (García-Prieto et al., 2021). Furthermore, it fosters a significant transformation in the educational system to address student diversity, ensuring equal opportunities and removing barriers to inclusion (Rojas et al., 2024); However, it is important to note that adopting this approach is challenging, as Parrilla (as cited in en Rojas et al., 2024) explains, because it requires comprehensive reform, and often, only isolated changes occur that fail to achieve deep restructuring.

According to Echeita and Ainscow, Pérez-Jorge, and Leal (as cited in Vera et al., 2024) addressing the specific educational support needs of students involves accommodating those who experience developmental disruptions that may hinder their access, participation, or learning, either temporarily or permanently, and to varying degrees. These disruptions may occur at a specific point in their schooling or throughout it. Addressing these needs requires providing targeted supports to help students achieve learning objectives. Additionally, it is essential to identify the type of specific educational support each student requires in order to offer assistance that meets those needs. Finally, it is important to recognize that these spaces within educational centers are sometimes referred to as specialized classrooms or special education classrooms (as cited in Gudiño et al., 2022).

Considering the aforementioned, this study presents the results of an intervention carried out in itinerant classrooms, whose approach involves working individually or in small groups, where the teacher aims to strengthen learning in an innovative way by applying specific methodologies tailored to a program designed specifically to meet individual needs and adapt to each student's requirements.

Methods

Research Design

This study is classified as applied research, as it provides information and insights about the analyzed population through an intervention involving pedagogical support for learning recovery. It is framed within the positivist paradigm and follows a quantitative approach. The study is cross-sectional, as the evaluation was conducted at a specific point in time. It employs a quasi-experimental design, utilizing a pre-test and post-test within the same group of participants. The quantitative approach is used to collect and analyze data based on numerical and statistical measurements to establish relationships between the examined variables. The study was conducted in multiple educational institutions at the national level, with a representative sample. This research adheres to an action-research methodology, developed from educational practice.

Participants

The study sample comprised 304 Basic Education students from various educational institutions across Ecuador, with representation nationwide. A convenience sampling method was employed, with inclusion criteria including students who had experienced learning losses and whose guardians provided informed consent. The ethical principles of the Declaration of Helsinki were adhered to, ensuring confidentiality, autonomy, and respect. The sole exclusion criterion was a lack of willingness to participate. Data on the sociodemographic variables are presented in Table 1.

Table 1. Sociodemographic Data of Participants

– Variable	– Category	N	%
– Age	– 4-6	62	20.39
	– 7-9	98	32.24
	– 10-12	125	41.12
	– 13-15	19	6.25
– Gender	– Male	195	64.14
	– Female	109	35.86
– Ethnicity	– Afro-Ecuadorian	11	3.62
	– White	2	0.66
	– Indigenous	24	7.89
	– Mestizo	267	87.83
– School Year	– 1st-3 rd	104	34.21
	– 4th-6 th	92	30.26
	– 7th-9 th	108	35.53
– Type of Educational Institution	– Public	231	75.99
	– Semi-public (Fiscomisional)	34	11.18
	– Private	39	12.83
– Region	– Amazon	36	11.84
	– Coast	175	57.57
	– Highlands	93	30.59
– Area	– Rural	98	32.24
	– Urban	206	67.76
– Disability	– No	294	96.71
	– Yes	10	3.29

Instruments

In this research, standardized mathematics tests were used at various levels, incorporating the criteria and competencies established by the Ministry of Education:

Counting: counting sequence

Numeration: ability to count.

Understanding of the number system: number reading and writing, number comparison, base-10 recognition.

Logical operations: numerical series.

Operations: addition, subtraction, and multiplication.

Size estimation: comparing dot patterns (determining where there are more) and numerical comparison (space, perception, and time).

The purpose of applying these instruments was to evaluate students' knowledge in relation to these criteria.

To ensure the validity of the instruments, several types of validity were assessed, including content validity, criterion validity, construct validity, and expert validation. The validation process was carried out through evaluations by subject matter specialists, who confirmed that each instrument was appropriate and demonstrated clarity in wording, internal coherence, and suitability of language for the students' level.

Study Procedure

The parents of the selected students were invited to discuss the pedagogical recovery project. Informed consent was then obtained, and data was collected to characterize the students.

For the initial (diagnostic) evaluation, individual meetings were held to communicate the instructions for developing the evaluation instrument. After applying and grading the instrument, the difficulties each student faced were identified, with the aim of designing an action plan to address the areas where their mathematical knowledge needed to be strengthened.

The research process revealed several key mathematical challenges, such as a limited understanding of equality properties, multiplication of arithmetic expressions, and multiplication tables. Insufficient knowledge was also detected in solving additions and subtractions of homogeneous fractions, as well as in divisions. Other challenges included placing decimal numbers on the positional chart and recognizing different types of angles.

Once these needs were identified, learning strategies were designed to align with Ecuador's educational curriculum. The strategies focused on strengthening basic math skills by applying techniques such as number decomposition, solving contextualized problems, and using physical objects to understand divisions. Efforts were also made to improve the understanding of homogeneous fractions, decimal placement, and angle recognition.

Finally, the teachers planned personalized learning activities for each student, which were validated with the parents before implementation. The sessions, held three times a week over eight weeks, concluded with a final evaluation that allowed for measuring the progress made and drafting a comparative report on the results.

Data Collection and Statistical Analysis

The data collected was processed using SPSS software, version 24.0. Given that the study involves scalar, ordinal, and nominal variables, a normality test and Levene's test for equality of variances were conducted to assess homoscedasticity. Based on the results of these tests, it was determined that applying a non-parametric statistical method would be appropriate, specifically the Wilcoxon signed-rank test, to make inferences. This approach aimed to gather relevant information about the recovery of Basic Education students to measure the impact of the intervention conducted in Itinerant Classrooms.

Results

The normality test indicates that the variables age and the grades before and after the evaluation do not meet the normality criterion, which requires the use of a non-parametric test for analysis. The Wilcoxon signed-rank test Z statistic is -14.995, and the two-tailed asymptotic significance is <0.001. This suggests that there is a significant difference between the final and initial grades,

allowing the null hypothesis to be rejected with a high level of confidence. Table 2 details the results of a pre-test and post-test, divided into various groups by age, gender, ethnicity, school year, type of institution, region, zone, and disability. In all groups, a significant improvement ($p < 0.001$) is observed in the post-test results, with a notable increase in the upper range (8.0-10) and a decrease in the lower and middle ranges. For example, in the 4-6 year age group, the percentage in the upper range increased from 9.7% to 88.7%, and in the male gender group, the upper range rose from 6.7% to 73.3%.

Table 2. Summary of Results Divided by Variables.

Variable		Pre-Test			Post-Test			p-value
		Lower Limit (0-3.9)	Middle Range (4.0-7.9)	Upper Limit (8.0-10)	Lower Limit (0-3.9)	Middle Range (4.0-7.9)	Upper Limit (8.0-10)	
Age Group	4-6	11.3%	79.0%	9.7%	0.0%	11.3%	88.7%	<0.001
	7-9	10.2%	82.7%	7.1%	0.0%	4.1%	95.9%	<0.001
	10-12	23.2%	72.8%	4.0%	0.0%	40.0%	60.0%	<0.001
	13-15	26.3%	73.7%	0.0%	0.0%	63.2%	36.8%	<0.001
Gender	Male	15.9%	77.4%	6.7%	0.0%	26.7%	73.3%	<0.001
	Female	18.3%	77.1%	4.6%	0.0%	19.3%	80.7%	<0.001
Ethnicity	Afro-Ecuadorian	72.7%	27.3%	0.0%	0.0%	18.2%	81.8%	<0.001
	White	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%	<0.001
	Indigenous	0.0%	79.2%	20.8%	0.0%	4.2%	95.8%	<0.001
	Mestizo	16.1%	79.0%	4.9%	0.0%	26.2%	73.8%	<0.001
School Year	1st-3rd	8.7%	79.8%	11.5%	0.0%	7.7%	92.3%	<0.001
	4th-6th	12.0%	87.0%	1.1%	0.0%	16.3%	83.7%	<0.001
	7th-9th	28.7%	66.7%	4.6%	0.0%	46.3%	53.7%	<0.001
Type of Institution	Public	12.1%	82.3%	5.6%	0.0%	25.1%	74.9%	<0.001
	Semi-public	58.8%	32.4%	8.8%	0.0%	35.3%	64.7%	<0.001
	Private	7.7%	87.2%	5.1%	0.0%	7.7%	92.3%	<0.001
Region	Amazon	0.0%	75.0%	25.0%	0.0%	0.0%	100.0%	<0.001
	Cost	20.6%	76.0%	3.4%	0.0%	24.6%	75.4%	<0.001
	Highlands	16.1%	80.6%	3.2%	0.0%	32.3%	67.7%	<0.001
Zone	Rural	6.1%	87.8%	6.1%	0.0%	8.2%	91.8%	<0.001
	Urban	21.8%	72.3%	5.8%	0.0%	31.6%	68.4%	<0.001
Disability	No	17.3%	77.2%	5.4%	0.0%	24.1%	75.9%	<0.001
	Yes	0.0%	80.0%	20.0%	0.0%	20.0%	80.0%	<0.001

When analyzing the correlation between the variables, a significant negative relationship was observed between age and the level of improvement (difference between post-test and pre-test results). The Spearman correlation coefficient was -0.173, indicating that as age increases, improvement tends to decrease slightly. The two-tailed significance of 0.002 confirms that this relationship is statistically significant at the 0.01 level, reinforcing the robustness of the finding. Given that these values are based on a total of 304 observations, there is strong statistical support for the analysis.

The results obtained from the analysis of the variables gender, disability, and zone of residence reveal important differences in the improvement observed among the participants. While males show a slightly higher average rank than females, the Mann-Whitney U test does not show significant differences, suggesting that gender does not play a relevant role in improvement. Similarly, the disability variable does not seem to significantly influence the results, as participants with and without disabilities show similar improvements.

However, according to Table 3, the variable zone of residence yields a notable result. Participants from urban areas show significantly greater improvement compared to those living in rural areas. This difference could be related to a variety of contextual factors, such as access to better educational resources, technologies, or infrastructure in urban areas, which may potentially favor the implementation and monitoring of the intervention.

Table 3. Average Improvement Ranks by Gender, Disability, And Zone of Residence.

Variable	Category	N	Average rank	Z	p-value
Género	Male	195	154.29	-0.477	0.633
	Female	109	149.29		
Disability	Yes	10	148.65	-0.141	0.888
	No	294	152.63		
Zone	Rural	98	129.30	-3.185	0.001
	Urban	206	163.54		

The ANOVA analysis in Table 4 shows a significant difference between ethnic groups in terms of improvement, with an F-value of 13.196 and a significance of $p < 0.001$. This means that at least one ethnic group has significantly different improvement from the others. Tukey's comparisons reveal that Afro-Ecuadorians have significantly greater improvement than Indigenous individuals (mean difference = 3.80, $p < 0.001$) and Mestizos (mean difference = 2.83, $p < 0.001$). There is also a significant difference between Indigenous and Mestizos, although this difference is smaller (mean difference = 0.97, $p = 0.035$).

Table 4. ANOVA and Multiple Comparisons (Tukey) to Determine Improvement By Ethnicity.

Comparison (I-J)	Sum of squares	DF	Mean square	F	Sig.	Mean difference (I-J)	Standard error	Sig.	95% Confidence interval
Between groups	110.896	3	36.965	13.196	<0.001	Afro-Ecuadorian - Indigenous	3.803*	0.609	<0.001
Within groups	840.392	300	2.801			Afro-Ecuadorian - Mestizo	2.833*	0.515	<0.001
Total	951.288	303				Indigenous - Mestizo	0.969*	0.357	0.035

* The mean difference is significant at the 0.05 level.

Table 5 shows the mean improvements by ethnic group. Afro-Ecuadorians have the highest improvement (5.6364), while the Indigenous group has the lowest improvement (1.8333). These results show that the differences between the groups are important, but the unequal sample sizes must be considered when interpreting the data.

Table 5. Tukey Harmonic Mean to Determine Improvement by Ethnicity.

Ethnicity	N	Mean improvement
Indigenous	24	1.833
Mestizo	267	2.803
White	2	3.165
Afro-Ecuadorian	11	5.636

The ANOVA analysis in Table 6 shows a significant difference in improvement between different types of educational institutions ($F = 11.651$, $p < 0.001$). This indicates that the type of educational institution has a significant impact on improvement. Tukey's multiple comparisons reveal that students from public institutions show significantly lower improvements than those from semi-private institutions (mean difference = -1.36 , $p < 0.001$) and private institutions (mean difference = -0.80 , $p = 0.020$). No significant difference is observed between students from semi-private and private institutions ($p = 0.345$).

Table 6. ANOVA and Multiple Comparisons (Tukey) to Determine Improvement by Type of Institution..

Comparison (I-J)	Sum of squares	DF	Mean square	F	Sig.	Mean difference (I-J)	Standard error	Sig.	95% Confidence interval
Between groups	68.351	2	34.175	11.651	0	Public - Semi-private	-1.362*	0.315	0
Within groups	882.937	301	2.933			Public - Private	-0.802*	0.300	0.020
Total	951.288	303				Semi-private - Private	0.560	0.402	0.345

* The mean difference is significant at the 0.05 level.

Table 7 shows the mean improvements by type of educational institution. Students from semi-private institutions have the highest improvement (3.94), followed by those from private institutions (3.38) and public institutions (2.58). These results indicate that students from public institutions show significantly lower improvements compared to other types of institutions, while semi-private institutions show the best results.

Table 7. Media Armónica De Tukey Para Determinar La Mejora Según El Tipo De Institución.

Type of educational institution	N	Mean improvement
Public	231	2.576
Private	39	3.378

Semi-private	34	3.938
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Discussion

In the study by (Ko et al., 2023), it was evident that the pandemic exacerbated educational inequalities, disproportionately affecting students from low socioeconomic backgrounds—an observation clearly reflected in this study. The most vulnerable students, particularly those in rural areas, faced additional barriers due to a lack of access to technological devices and the internet. This aligns with the context of itinerant classrooms, where direct and specialized support is provided to students who, for various reasons, cannot regularly attend traditional schools. Unlike the predominant technological approach during the pandemic, Ramiro-Sánchez et al. (2013) argue that itinerant classrooms have the potential to overcome technological barriers by offering education in environments adapted to the needs of the most marginalized students, which was undoubtedly the nature of the intervention in this study.

The implementation of itinerant classrooms as an educational strategy for learning recovery in Basic Education has proven effective, particularly in vulnerable contexts where students face limited access to formal education. This model facilitates targeted interventions by adapting pedagogical content to the specific needs of students. Evidence of its effectiveness is demonstrated by significant improvements in students' academic performance, as reflected in the increase in their grades and the elimination of those in the lower range (0–3.9). A notable example is the support models applied in Andalusia, described in previous research, where efforts focused on therapeutic, collaborative/individual, consultative/resource-based, and curricular aspects (García-Prieto et al., 2021). Moreover, this type of intervention aligns with international approaches to post-pandemic learning recovery, which integrate technological and pedagogical strategies to address the educational inequalities exacerbated by school closures (Cooper et al., 2021).

In this study, students with learning losses from various Basic Education institutions across the nation were selected to participate in an eight-week learning recovery process, yielding promising results. Prior to the intervention, 17.56% of students had grades in the lower range (0–3.9), 75.33% were in the mid-range (4.0–7.9), and only 7.10% had grades in the upper range (8.0–10). After the intervention, the results shifted significantly: 0.0% of students remained in the lower range, 21.41% achieved mid-range grades, and 78.59% were in the upper range. This process is similar to a previous study in which eligible children left regular classes to work with a tutor for 40 minutes, three times a week, resulting in an improvement in literacy skills by one-third of a standard deviation for underperforming students (Berlinski et al., 2023).

The model applied in the itinerant classrooms is similar to other recovery programs implemented globally, such as the one described by Berlinski et al. (2023), which also demonstrated a significant improvement in students' literacy skills following intensive tutoring. Learning recovery, as highlighted in this study, requires a comprehensive approach involving both educators and the community. According to Dolorier Zapata et al. (2022), pedagogical feedback is crucial for improving teaching practices and fostering students' intellectual development—an element that was key to the success of the itinerant classroom intervention. In terms of implementation, itinerant classrooms face several challenges, including logistical mobility and the adequacy of pedagogical resources. However, they also offer unique benefits, such as the ability to bring education closer to communities facing geographical or socioeconomic barriers, thereby promoting more equitable access to education.

The results of the Wilcoxon signed-rank test revealed a significant difference between the grades before and after the intervention ($Z = -14.995$, $p < 0.001$). This demonstrates a notable improvement in the participants' performance after the evaluation, allowing the null hypothesis to be rejected. Additionally, a slight negative correlation was observed between age and improvement, suggesting that younger students improved more than older ones. The intervention in these classrooms aims not only to recover lost learning but also to reduce school absenteeism and prevent dropout rates—an issue highlighted by Miranda & Baum

(2024) as one of the most concerning effects of the pandemic on the global education system (Niemi & Laaksonen, 2020).

Finally, studies such as that of Niemi & Laaksonen (2020) suggest that inclusive educational programs should be accompanied by broader structural reforms, rather than relying solely on isolated interventions. While itinerant classrooms offer a viable short-term solution, the development of more comprehensive and sustainable educational policies is essential to addressing educational inequalities in the long term. Although the results obtained in this study are encouraging, it is important to acknowledge certain limitations. First, the study focused on a relatively small and homogeneous sample of students. Future research should include a larger and more diverse sample to assess whether the observed effects are consistent across different educational and socioeconomic contexts. Additionally, further research is needed to investigate the long-term impact of itinerant classrooms on students' academic and socio-emotional development, as the intervention lasted only eight weeks, and it is unclear whether the effects will be sustained over time.

Conclusions

The pedagogical intervention in Itinerant Classrooms proved highly effective in facilitating learning recovery among Basic Education students, as evidenced by the elimination of academic lag in 100% of cases and a significant improvement in the performance of 78.59% of students. This underscores the importance of targeted educational approaches and personalized support, particularly in vulnerable contexts, to ensure inclusive and quality education. An important limitation of this research was the diversity of the sample, which made it difficult to generalize the results. Based on the findings, future research could investigate the impact of intervention strategies in a broader context. This may include exploring how these strategies work across different regions, educational systems, or among students with varying backgrounds, in order to enhance the scalability and effectiveness of the interventions. An important limitation of this research was the diversity of the sample, which made it difficult to generalize the results. Based on the findings, future research could investigate the impact of intervention strategies in a broader context. This may include exploring how these strategies work across different regions, educational systems, or among students with varying backgrounds, in order to enhance the scalability and effectiveness of the interventions.

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