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## To Analyze the Influence of Socio-Economic Factors on Access to And Utilization of Digital Tools in Primary Classrooms

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### Abstract

This thesis explores the role of digital resources in education, particularly focusing on their potential to enhance English language competency among primary school students from low-income families who face significant barriers in accessing extracurricular learning opportunities. The study investigates the effectiveness of technology-based interventions, specifically through blended learning approaches, in improving writing skills for these students. By analyzing demographic data and conducting experiments in two schools, the research reveals that students who participated in the experimental groups exhibited a notable increase in post-test scores, demonstrating a wider median and interquartile range compared to their peers in control groups. This indicates that the integration of digital tools and innovative teaching methods, such as the station rotation model, can provide substantial support to low-income students, helping them navigate the unique challenges they encounter in the classroom and ultimately enhancing their educational outcomes.

**Keywords:** Socio-Economic, Digital, Primary, Classrooms and Content

### Introduction

Digital resources in education encompass a wide array of technological tools, online platforms, and digital materials used to improve and ease the process of learning. Learning management systems, online libraries, multimedia presentations, interactive software, and instructional websites are all examples of such resources. These approaches provide a variety of dynamic and engaging ways to convey information, engage students, and help them improve their skills. They are a great addition to conventional teaching methods. The importance of digital resources in today's educational settings is immense. They make it possible to distribute instructional information across a wide range of disciplines and skill levels in a way that is accessible, flexible, and scalable. A wide variety of learning styles may be accommodated by digital resources, such as interactive simulations, virtual classrooms, and personalized learning modules. Furthermore, they enhance the educational experience by encouraging student

cooperation and allowing teachers to personalize lessons to each student's requirements. In addition, students are better equipped to meet the challenges of a technology-driven world that is always changing thanks to digital resources.

These skills are essential for success in today's workforce: digital literacy, critical thinking, problem-solving, and information fluency. By incorporating digital technologies into the classroom, we can help kids develop the skills they'll need to succeed in today's globally interdependent world and encourage them to continue learning throughout their lives. Equal access to these digital resources is still a major issue, even if they have a lot of promise. A major obstacle to providing equitable opportunity for all students is the digital gap, which is frequently fuelled by socioeconomic inequities. It is crucial to address inequities and improve inclusion within educational systems by understanding the influence of socioeconomic variables on access to digital resources in education. Inequitable distribution and access to ICT among various groups,

mainly due to socioeconomic inequality, is what the digital divide encompasses.

It draws a divide between the privileged and the disadvantaged in terms of digital resources, including computer access, internet connection, and technology proficiency. Disparities in educational, economic, and social possibilities are worsened by this split, which reflects preexisting socioeconomic stratifications within communities. When it comes to education, the digital divide has a major effect on how and what students learn. Students' ability to use digital resources for learning is greatly affected by socioeconomic characteristics such as their income, degree of education, place of residence, and cultural background. Computers, fast internet, and a variety of instructional software or online platforms are more often available to higher-income families, giving their children greater learning options. On the other side, low-income families and those living in neglected communities often lack access to these resources, which puts them at a severe disadvantage when it comes to the quality and accessibility of their education.

The digital divide has been the subject of much study in the field of education, yet there are still many unanswered questions. The majority of research has ignored post-pandemic equity concerns in favour of examining the efficacy of online education and student mobility. Further, studies addressing the digital gap at the university level are few, and those addressing the first two tiers of the split have received little attention. In addition, current research often fails to account for the role that socioeconomic position, gender, and urban/rural status play in exacerbating the digital gap. Lastly, studies investigating the theoretical bases of the digital divide are few.

### Literature Review

Arisanti, Rica. (2025) <sup>[1]</sup>. Improving student learning outcomes via the emphasis of this is the integration of technology in education literature-based research. Incorporating research from other fields, the study demonstrates how technology resources like augmented reality, multimedia apps, and e-learning platforms boost critical thinking, engagement, and cognitive growth. The efficacy of digital technology's incorporation is contingent upon variables including infrastructure, classroom design, and teacher skill, despite the fact that it provides significant advantages. According to the research, the best way to maximize learning results is to utilize technology strategically, with the students in mind, and in a way that is relevant to their environment.

Parveen, Dr *et al.* (2024) <sup>[2]</sup>. Technology has revolutionized our lives, transforming our lifestyle in several aspects. Thanks to contemporary innovations, once difficult and crucial activities are now a breeze to do. Technology has had a significant influence on education. Guaranteeing accessible and equitable education for everyone is an essential element of the United Nations' Sustainable Development Goals 2030 Agenda, which places a strong emphasis on excellent education. There has been a paradigm change in the system driven by the COVID-19 pandemic, which has further entrenched the use of digital technology in education and made them key instruments for accomplishing this aim. These days, digital tools may do

more than just pass along information; they can also act as guides, teachers, and graders. Thanks to software and other technological improvements, students no longer need to rely on pen and paper to complete their assignments and presentations.

Rafiq, Shahid *et al.* (2024) <sup>[3]</sup>. The objective of this project is to investigate how private institutions in Lahore, Pakistan, are using digital technologies and online learning platforms to enhance their pupils' academic achievement. The research aims to uncover the main obstacles and difficulties encountered by both students and teachers when attempting to incorporate modern technologies, with an emphasis on the effects on student engagement, motivation, and scholarly success. The research used a quantitative methodology and a multistage sampling procedure to choose 350 students for the sample. A survey questionnaire with Likert scales was used to gather data, which was then analyzed using regression analysis. Student involvement, motivation, and academic achievement are all markedly improved by digital technologies, according to the results. But there are obstacles that make it hard to use effectively, such as technical issues, a lack of resources, and inadequate training.

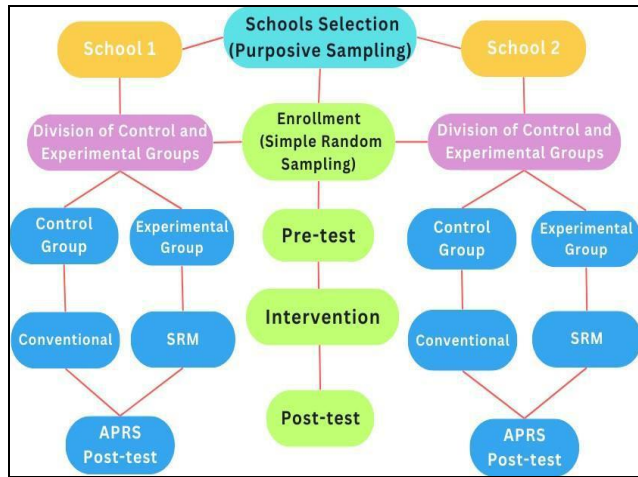
Osmani, Sonila *et al.* (2024) <sup>[4]</sup>. More and more schools are using digital tools in the classroom, which might revolutionize the way students learn and the way teachers do their jobs. This research looks at how digital tools have changed classroom instruction and student achievement in Albanian schools. Using a mixed-methods strategy, this research looked at the pros, cons, and overall effectiveness of digital technologies in classrooms. With an emphasis on developing countries, this research conducts a thorough literature review to investigate current trends and future challenges surrounding the implementation of digital technology in educational settings. As a developing nation working to strengthen its educational system, Albania has unique socio-economic and infrastructure challenges, which are highlighted in this article. Numerical data was given via survey answers from a varied group of 10 educational institutions in Durres, Albania. In order to have a good grasp of the experiences and viewpoints of students of various ages, questionnaires were administered as part of the quantitative data gathering process. Digital technology significantly boosts student engagement and academic performance, according to the data.

Oskarita, Elsa *et al.* (2024) <sup>[5]</sup>. The effect of technological resources on group projects undertaken by high school pupils is the focus of this research. We look at how different educational applications and online platforms encourage collaboration, communication, and problem-solving abilities. A total of 300 students from five different schools were surveyed and/or interviewed for this study. Students' levels of engagement, critical thinking, and peer interaction all increased significantly after using digital tools for collaboration, according to the results. Researchers found that students learned more effectively when they used digital tools in class.

### Research Methodology

Prior to commencing demographic information, the study's main experiment of participants from schools 1 and 2 was gathered and evaluated to validate their appropriateness

according to socio-economic background criteria. Figure 1. shows the screening method that was used to divide the children into the experimental and control groups. The instructors from each class administered a pre-test to both the control and experimental groups. Students 1 and 2 in the control group and the experimental group were both given the pre-test prior to beginning the intervention sessions. Subjects in the control and experimental groups were both given the instructional methods after the pre-test was given. In Figure 1, we can see the study's approved design laid out in a flow diagram,



**Fig 1:** Flowchart depicting the research design

**Data Analysis**

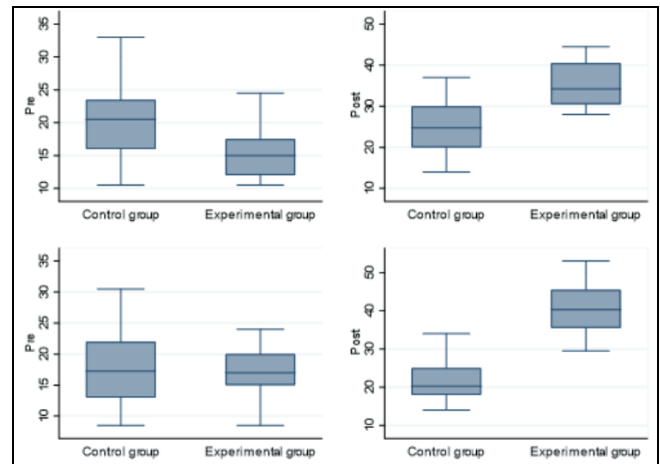
The data set was analyzed to find the median and interquartile range, and the resulting p-value was used for the purpose of assessing the information's relevance. The box plot quartile range is useful for interpreting the mean and standard deviation values. The data set was then treated as quantitative discrete. Table 1. below displays the interquartile and median ranges that were derived from the study.

**Table 1:** Comparing the groups of both the schools for Median and IQR

Schools	Groups	Tests	Median	IQR
School 1	CG 1	Pre-test	20.5	16-23.5
	EG 1	Pre-test	15	12-17.5
	CG 1	Post-test	24.75	20-30
	EG 2	Post-test	34.25	30.5-40.5
School 2	CG 2	Pre-test	17.25	13-22
	EG 2	Pre-test	17	15-20
	CG 2	Post-test	20.25	18-25
	EG 2	Post-test	40.25	35.5-45.5

At the midpoint, the experimental groups' post-test scores had a significantly wider median and interquartile range (IQR), offering a substantial variation, compared to the

control groups in both schools. Figure 2. shows the data from Table 1 visually as a box plot.



**Fig 2:** Representing the Box Plot marks for Pre and post-test time Points of all the groups in both School 1 and 2

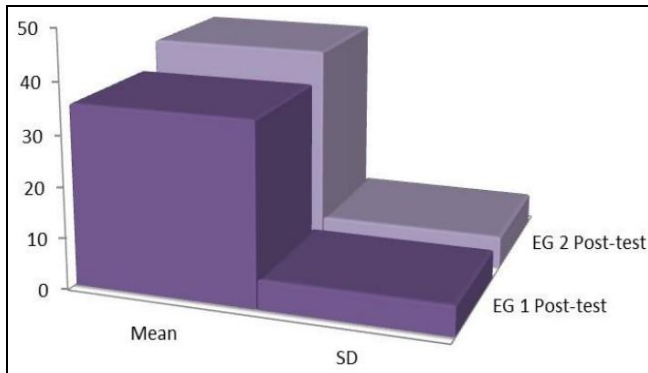
There is a small disparity between school 1 and school 2 in terms of socio-economic background, parents' education level, occupation, and study assistance from parents, among other factors, as discussed in the previous chapters pertaining to the educational institutions and study participants. On the other hand, school 2 students are somewhat ahead of school 1 students in terms of advancement. Two or three computers and a laptop for the instructor are available at School 2, which was chosen for the research. Alternatively, apart from the researcher's own gadgets and those borrowed for the study, School 1 does not have any technical assistance.

To gain insights into how factors such as socio-economic background, available technological devices, school, teachers' and parents' support, and school were impacted on students' post-test performance, a general the findings of the school 2 experimental group were compared with those of School 1 via analysis.

According to Table 2 mean and standard deviation figures, the experimental students from School 2 outperformed their counterparts from School 1 when it came to improving their writing abilities. Referring to their academic achievement and classroom observations, respectively, the findings part of the next chapter provides a comprehensive conclusion on the underlying pattern of the data.

**Table 2:** Tabulation of Mean and SD of Schools 1 and 2 Highlighting the Experimental Groups of Both Schools.

School	Groups	Mean	SD	t-value	p-value	S/NS
School 1	CG 1	24.58	5.84	-5.4504	<0.001	S
	EG 1	35.5	6.22			
School 2	CG 2	21.94	5.8	-9.3459	<0.001	S
	EG 2	40.61	6.18			



**Fig 3:** Graphical Representation Comparing the Mean and SD of the Experimental Groups in Schools 1 and 2

The results from the second school's experiment were far better than those from the first when looking at the standard deviation and mean values. The disparity in the higher values suggests that the experimental group from School 2 had superior writing ability development compared to the other groups. Results from a statistical analysis using the Mean, SD, Median, and IQR range show that both experimental groups in Schools 1 and 2 are statistically significant. This proves, statistically speaking, that pupils whose groups participated in the station rotation approach had superior writing abilities compared to the control group, who received traditional instruction.

To compare the two schools' a two-tailed t-test to compare the effects of the experimental groups and determine whether there was a statistically significant difference. Table 3 displays the p-value for the two-tailed t-test.

**Table 3:** Results of the Two-tailed t-test of School 1 vs. School 2 Experimental Groups.

School 1 vs School 2	Control Groups(p-value)	Experimental Groups (p-value)
Pre-test	0.129	0.197
Post-test	0.436	0.012

Table 3 shows that the experimental groups' post-test results are statistically significant, with values obtained that are less than 0.05. This proves that the results are quite trustworthy and legitimate. The p-value for this two-tailed t-test is 0.012 on the post-tests given to students in the experimental groups at schools 1 and 2 suggests that, whether combined or maintained separately, the data set does not disprove the significant performance of the experimental groups at either school.

Based on the results of these tests, we may conclude This means that H02, the alternative hypothesis, is true and H0, the null hypothesis, is not; this proves that the experimental groups from schools 1 and 2 performed significantly differently. To determine the magnitude of the effect between the two groups that participated in the study (control and experimental) of students, Cohen's d size is calculated alongside the t-test findings. Cohen's d is a statistical metric that measures the dissimilarity between the means of two groups. A value of 0 shows no difference between the groups, whereas bigger values imply larger differences; it is a standardized effect size that may vary from 0 to infinity. An effect size of 0.2 is considered modest, 0.5 is considered medium, and an effect size of 0.8

or above is considered significant when interpreting Cohen's d. In order to determine whether the study's findings are practically significant, the average and variability of the experimental and control groups from both schools, when computed using Cohen's d calculation, must be 0.8 or higher. This indicates a greater effect size. School 1 has a much greater impact size (1.81 between control and experimental groups 1) than the other groups. Additionally, school 2 has a much bigger impact size compared to the control and experimental groups, as seen by its effect size of 3.11. The study's second dependent variable assesses how pupils' performance in the classroom was affected by the station rotation approach at Schools 1 and 2.

The APRS is modified to gather the data needed to analyze the academic performance of pupils. After experts during validation removed two items (Q1 and Q3) that were unrelated to the research, the 19-item scale was utilized for data collection and analysis. The remaining 17 questions were carefully selected. The question numbers were same in the amended scale to provide clarity and for future replication in other courses using the same 19 items. The Mean and SD estimates are based on the scores on the 19-item Likert scale, which is an interval measure. With the exception of question 14, all of the questions from 12 to 19 are scored in reverse, suggesting that the groups with the lowest scores are really doing better than the other groups.

Table 4 displays the findings from the t-test performed on the data collected from School 1 for both groups in order to ascertain the p-value.

**Table 4:** Summary of APRS for School 1

Question No.	School 1				p-value
	CG 2		EG 2		
	Mean	SD	Mean	SD	
Q2	2.28	0.83	4.67	0.49	<0.001
Q4	2.17	0.71	4.5	0.62	<0.001
Q5	1.89	0.76	4.56	0.62	<0.001
Q6	2	0.91	4.78	0.43	<0.001
Q7	2.11	0.9	5	0	<0.001
Q8	2.17	0.79	4.5	0.51	<0.001
Q9	1.94	0.80	2.83	0.62	0.002
Q10	2	0.69	3.56	1.04	<0.001
Q11	2.06	0.73	3.56	0.86	<0.001
Q14	1.72	0.67	2.67	0.84	<0.001
Q15	3.5	1.15	1.72	0.75	<0.001
Q16	2.56	0.78	1.06	0.24	<0.001
Q17	3.44	1.1	1.78	0.73	<0.001
Q18	3.83	0.86	1.33	0.49	<0.001
Q19	3.22	1.4	1.5	0.51	<0.001

In Table 4, we can see how the control and experimental groups from School 1 fared statistically. When looking at the experimental groups' academic achievement, the p-values for all the questions are significant. All of the research questions had p-values that were less than 0.05, indicating statistical significance. As the chapter progresses, the circumstances for each inquiry and the observations are described in detail.

Because of this, we can conclude that the study's We accept the alternative hypothesis (Ha3), which indicates that the experimental group of kids at School 1 fared better academically than the control group, and reject the null hypothesis (H03). After collecting, organizing, and

analyzing the APRS scores for school 2, we were able to find out the mean, standard deviation, and p-value. This allowed us to grasp the degree of importance for each question. According to Table 5, the two groups at School 2 had different outcomes.

In Table 5, we can see how the two groups from School 2 fared in terms of mean and standard deviation. All of the questions used to compare the experimental groups' academic performance had significant p-values. All seventeen questions included in the research had p-values lower than 0.05. Rejecting H03, the study's we discover, if we accept Ha3 as the alternative hypothesis and reject the null hypothesis.

**Table 5:** Summary of APRS for School 2

Question No.	School 2				p-value
	CG 1		EG 1		
	Mean	SD	Mean	SD	
Q2	1.67	0.69	4.28	0.83	<0.001
Q4	2	0.69	4.61	0.5	<0.001
Q5	2.11	1.28	4.67	0.69	<0.001
Q6	2.33	0.97	4.78	0.43	<0.001
Q7	2.78	1	5	0	<0.001
Q8	2	0.77	4.61	0.5	<0.001
Q9	2	0.77	2.72	0.5	<0.001
Q10	2.72	0.89	3.83	0.71	<0.001
Q11	2	0.77	3.67	0.97	<0.001
Q12	2.39	1.09	1.11	0.32	<0.001
Q13	2.78	0.88	1.5	0.51	<0.001
Q14	1.06	0.24	3.61	0.92	<0.001
Q15	4	0.84	1.33	0.49	<0.001
Q16	3.89	0.9	1	0	<0.001
Q17	3.83	0.86	1.44	0.62	<0.001
Q18	4.11	0.9	1.11	0.32	<0.001
Q19	4.22	0.65	1	0	<0.001

Students in School 2's the table clearly shows that the experimental group achieved statistically better results than the control group.

**Conclusion**

In conclusion, the research underscores the significance of employing innovative teaching strategies, such as the station rotation model, to foster the holistic development of primary school students, particularly those from low-income backgrounds who face distinct challenges in their educational journey. By integrating technology-based interventions and blended learning approaches, the study highlights a marked improvement in writing skills among these students, evidenced by substantial gains in post-test scores that reflect a broader median and interquartile range compared to their counterparts in control groups. This compelling evidence suggests that tailored educational methods not only address the academic needs of disadvantaged students but also contribute to their overall personal and social development, thereby equipping them with essential skills to navigate an increasingly competitive world. Ultimately, the findings advocate for the adoption of such effective teaching designs to enhance educational outcomes and bridge the achievement gap for students from diverse socioeconomic backgrounds.

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