|Research Article|

Quality Teaching: Relationship between Increased Enrollment of Students and Teaching Efficacy

Dr. Ijaz Hussain
Assistant Professor, Department of Education, Ghazi University, Dera Ghazi Khan, Punjab, Pakistan Ijhussain@gudge.edu.pk, ijazhussainchou@gmail.com
Dr. Masood Ahmad
Assistant Professor, Department of Educational Training, The Islamia University of Bahawalpur, Punjab, Pakistan masood.ahmad@iub.edu.pk
Muhammad Aqeel
M. Phil. Scholar, Department of Education, Ghazi University, Dera Ghazi Khan.
aqeelalyani5@gmail.com
Dr. Muhammad Irfan Malik
Lecturer, Department of Education, The Islamia University of Bahawalpur, Bahawalnagar Campus, mirfan.malik@iub.edu.pk

Abstract

The current study sought to determine the relationship of increased enrollment of the students and teaching efficacy. The study employed the descriptive survey research design. The study was delimited to public sector primary schools of tehsil Dera Ghazi Khan. Purposive sampling technique was used. 317 sample size (233 teachers and 84 head teachers) working in public sector primary school in tehsil Dera Ghazi Khan were selected. Questionnaire was used as tools for data collection. Data was analyzed using statistical techniques, t–test, correlational and regression analysis. The results of data analysis were presented using frequency distribution and the t-test, Pearson correlation and regression. Strong negative correlation -.703 was found. No statistical significant difference was found in the perception teachers and head teachers. The study recognized that high enrolment trends in schools led to overworking the staff members, inadequate teaching facilities, poor infrastructure of school and ultimately affects the teaching efficacy. The increased enrolment impacted to a great extent on the quality of teaching in public primary schools. Based on the findings of the study. It is recommended that the government should take necessary measures in providing facilities that match the pupils' enrolment to ensure quality education at public sector primary schools.

Keywords- Quality Teaching, Increased Enrollment of Students and Teaching Efficacy

Introduction

The correlation between the quality of education and the balance between resources invested and the outcomes achieved is evident. In the context of education, "output" signifies the discernible growth or development in students directly attributable to specific educational experiences (Eryilmaz & Deveci, 2022).

It is crucial to recognize that primary education serves as the cornerstone of an individual's academic journey (Maala, 2022). To ensure a successful academic trajectory, it is imperative to establish a strong educational foundation at the primary level. The caliber of teaching experiences plays a pivotal role in determining students' educational achievements and their future prospects. An influential factor in shaping the quality of education is the enrollment rate, which reflects the number of students enrolled in a school. The enrollment rate in primary schools holds a significant role in molding the quality of education and the overall outcomes of the educational system.

In Pakistan, the government has instituted a policy of providing free and compulsory education to all children between the ages of 5 and 16, as stipulated in Article 25 A, Part-II, Chapter 1 of the constitution. While this policy has led to an increase in enrollment, it has also been implicated in the subpar performance of students in public primary schools (Maala, 2022). The rise in enrollment has not been accompanied by a commensurate increase in essential resources. The number of teachers often falls short of the student population, preventing personalized attention. Additionally, teachers struggle to regularly assess homework due to these constraints. In many instances, there is a shortage of classrooms, resulting in students and teachers conducting classes outdoors, which hampers the acquisition of a quality education.

Literature Review

The primary area of focus has revolved around examining whether reducing class sizes results in improved academic outcomes for students. The magnitude of these effects has sparked significant debates, as elucidated in various reviews by Anderson (2000), Biddle and Berliner (2002), Blatchford and Mortimore (1994), Blatchford, Goldstein, and Mortimore (1998), Blatchford, Russell, and Brown (2009), Ehrenberg, Brewer, Gamoran, and Willms (2001), Finn, Pannozzo, and Achilles (2003), Galton (1998), Grissmer (1999), Hattie (2005), and Wilson (2006). Notably, in several East Asian regions and cities such as Shanghai (mainland China), Hong Kong, Macau, Taiwan, Korea, and Japan, the implementation of "small class teaching" initiatives has garnered attention.

While controversies persist, some consensus has begun to emerge, drawing from both experimental studies (Finn and Achilles, 1999) and observational inquiries (Blatchford, Bassett, Goldstein, and Martin, 2003). Generally, it is acknowledged that smaller class sizes yield positive impacts on students' academic performance, especially when implemented early in students' school careers, typically with the youngest learners.

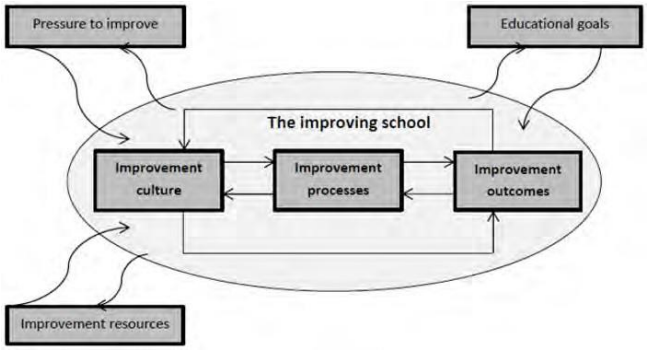

Figure 1. Efficient institutional amelioration related to congested classrooms (Creemers, 2008, p. 7).

Nonetheless, there is a growing recognition, shared not only by critics of class size reduction, that a deeper understanding of the effects of class size necessitates an exploration of classroom dynamics and processes. This includes an examination of teacher-student interactions and student behavior to gain insights into classroom environments and their effectiveness.

Enrollment rates exert a direct influence on student-teacher ratios, and it is widely believed that smaller student-teacher ratios promote more effective teaching and learning (Mbofana, & Banda, 2022). Overcrowded classrooms resulting from high enrollment often lead to reduced individualized attention, diminished student engagement, and difficulties in delivering effective instruction. Such conditions hinder the overall teaching experience and impede educational outcomes. Furthermore, a negative correlation has been identified between student-teacher ratios and students' performance in studies like "Pupil-Teacher Ratio and Its Impact on Academic Performance in Public Primary Schools in Central Division, Machakos County, Kenya" by Waita, Mulei, Mueni, Mutune, and Kalai (2016). This negative correlation implies that performance improves as the student-teacher ratio decreases, and vice versa. In smaller classes, students tend to perform better, classroom management is more achievable, and students participate more actively (Okechukwu and Oboshi, 2021).

In addition to student-teacher ratios, the availability and adequacy of resources and infrastructure are crucial factors influenced by enrollment. Buildings, classrooms, and educational infrastructure are fundamental components of school teaching environments. There is strong evidence to suggest that high-quality infrastructure leads to improved teaching instruction, better student performance, and reduced dropout rates, among other benefits (Teixeira, Amoroso & Gresham, 2017). An increase in enrollment without corresponding improvements in infrastructure can result in inadequate teaching

environments. A scarcity of classrooms, limited teaching materials, and restricted access to technology have a detrimental impact on the quality of education.

Enrollment rates also have a significant bearing on the quality of teaching. As enrollment numbers rise, so does the demand for qualified and skilled teachers. Research conducted by Khan (2011) indicated that effective teaching becomes challenging in overcrowded classes, leading to issues related to instruction, discipline, physical resources, and evaluation. Jan, et. al., (2016) further found that higher enrollment negatively affects teacher-student interactions and instructional quality due to overwhelmed educators. Furthermore, enrollment rates can influence parental engagement in students' education. Walsh (2010), in a study on parental involvement titled "Is Parental Involvement Lower in Larger Schools (Economics of Education Review)," revealed that increased enrollment often leads to decreased parental involvement due to limited resources and time constraints. This decline in parental engagement can adversely affect students' academic achievement and overall educational experience.

Quality education is closely linked to educational resources, which are typically categorized into four main types: human, material, physical, and financial resources. These resources play a central role in the educational process, facilitating teachers' efforts and enhancing students' teaching, thereby contributing to the achievement of educational goals and objectives (Bilgin, Ertem, & Gök, (2005). Hope, (2015) acknowledges that the educational system requires specific activities, materials, and prerequisites, which are currently insufficient, necessitating provisions at all educational levels to fulfill educational goals. The curriculum's inherent nature assumes the availability of infrastructure, laboratories, workshops, classrooms, equipment, physical amenities, and teaching aids to ensure the successful implementation of the program.

The importance of quality education often influences parental decisions regarding sending their children to school and impacts their attendance patterns. Recent research from various African nations demonstrates that cognitive skill development is pivotal in determining earnings, surpassing the mere length of schooling (UNESCO, 2005). Assessing educational quality across different countries can be accomplished through globally comparable data on academic performance and test scores, often serving as indicators of educational excellence. Noteworthy international assessments such as the Third International Mathematics and Science Study, Progress in International Literacy Study, and Programme for International Assessment focus on cognitive accomplishments, primarily in

developed countries, with some representation from middle-income developing nations (UNESCO, 2005).

As reported by Perez (2008), the number of public primary schools in the nation has steadily increased, rising from 14,864 in 1990 to 18,901 in 2001/2, marking a notable 27.2% surge. This growth has placed significant pressure on educational resources, teacher availability, gender equality, and student involvement in extracurricular activities. Additionally, Perez's observations indicate that the proportion of female enrollment also experienced an uptick during the same timeframe, reaching 49.3%, indicating the successful achievement of gender parity in enrollment across public primary schools at the national level.

Baluch & Shahid, (2008) conducted a research project in Pakistan to investigate the factors influencing enrollment in primary education, focusing on the case of district Lahore. The study collected primary data from a total of 3320 households, with 2520 households situated in urban areas and 800 households in rural regions. The study identified several factors that positively and significantly contributed to overall enrollment of children in primary schools, including family size, property ownership, education-related expenses, literacy rates, and dependency ratios. Interestingly, the study revealed that proximity to schools did not significantly hinder school attendance.

In a related context, Makari, Mutsotso & Masibo, (2019) emphasized that the qualifications of teachers and the availability of appropriate facilities played a pivotal role in evaluating the academic achievements of secondary school students. Consequently, the presence of adequate facilities within schools directly influenced the academic performance of students. Numerous studies investigating the factors contributing to poor performance in KCSE examinations have consistently pointed to increased enrollment, which subsequently leads to insufficient teaching and learning resources, as a crucial variable (Gikunda, 2016).

Shah and Inamullah (2012) discovered through their research that excessively crowded classrooms can directly hinder teachers' teaching experiences. These conditions not only adversely affect students' academic performance but also pose challenges for teachers, including issues related to discipline, behavioral problems, deteriorating health, and reduced student performance. Furthermore, overcrowded classrooms place considerable stress on teachers and contribute to an increase in student drop-out rates.

Carlson, Kacmar & Williams (2000) found a challenging situation to maintain a high standard of education when a substantial number of students are squeezed into classrooms

with limited space. This issue was notably evident in schools like Unidad Divina in Florida, Santiago, and Taltas' Escuela Hogar, where classrooms designed to accommodate a maximum of 35 children were accommodating more than 40 students. The cramped seating arrangements created obstacles for students to effectively participate in productive activities or move comfortably.

In a separate study by Ijaiya in 1999, a weak positive correlation was identified between the viewpoints of teachers and students. The findings indicated that overcrowded conditions had a detrimental impact on both the quality and efficiency of teaching and learning processes, presenting significant obstacles to the attainment of educational goals. To address these challenges, the study recommended a prioritized focus on constructing additional school buildings and procuring more furniture across all educational levels.

Statement of the Problem

The government's implementation of free education for children aged 5 to 16 led to a notable rise in student enrollment across various educational levels, particularly within public primary schools. However, it has frequently been observed that this surge in enrollment is often associated with lower academic performance among pupils, as noted by Mwirigi and Mutha in 2015. The present study aims to investigate the connection between the increased enrollment of students and their overall teaching effectiveness.

Research Objective and Hypothesis

This study had a singular research goal: to assess the association between student enrollment and teaching outcomes.

Null Hypothesis (Ho): There is no statistically significant correlation between increased enrollment and teachers' teaching effectiveness.

Alternative Hypothesis (H1): There exists a statistically significant correlation between increased enrollment and teachers' teaching effectiveness.

Methodology

This study examines the relationship of enrollment and quality teaching by highlighting the significance of adequate enrollment and its effects. The study was descriptive in nature. The target population was District Dera Ghazi Khan. District Dera Ghazi Khan is located in the Punjab province of Pakistan. There are four Tehsils (Dera Ghazi Khan, Kot Chutta, Taunsa and Koh e Sulman). The study was delimited to Tehsil Dera Ghazi Khan. In tehsil Dera Ghazi Khan there were 1795 primary school teachers working. 317 teachers (233 teachers

and 84 head teachers) were selected as appropriate sample size for 1795 primary school teachers (Rubenstein, 2012). Purposive sampling technique was used for this study. Self-developed questionnaire was used as the research tool for data collection. The research tool was validated by peer review and Cronbach alpha. The crown batch alpha value was .873 which is good for descriptive research (George and Mallery 2003). Descriptive and inferential statistics was used for data analysis.

Results and Discussions

Table 1: ***Gender Wise Participants***

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	157	49.5	49.5	49.5
	Female	160	50.5	50.5	100.0
	Total	317	100.0	100.0	

Table 1 showed that there were 157 male and 160 female respondents. Almost equal number of respondents were selected for data collection.

Table 2: ***Work Related Data Analysis***

Your role in school					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Teacher	233	73.5	73.5	73.5
	Head Teacher	84	26.5	26.5	100.0
	Total	317	100.0	100.0	

Table 2 showed that there were 233 teachers and 84 head teachers participated in the data collection. Total number of respondents were 317.

Table 3: ***Class Enrollment***

Classes are Overcrowded					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	279	88.0	88.0	88.0
	No	38	12.0	12.0	100.0
	Total	317	100.0	100.0	100.0

Table 3 showed that vast majority of the respondents (88%) were found agreed that their classes were overcrowded whereas only 12% respondents opined that their classes were not overcrowded.

Table 4: *Class Management Problems*

Techers face problem for classroom management in overcrowded school.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	42	13.2	13.2	13.2
	Strongly Agree	257	81.1	81.1	94.3
	Neutral	13	4.1	4.1	98.4
	Strongly Disagree	5	1.6	1.6	100.0
	Total	317	100.0	100.0	100.0

Table 4 showed that vast majority of the respondents (94.3%) were found agreed with the statement that teacher faced problems for class management in overcrowded schools. Whereas only 1.6% respondents were found disagreed with the statement. however, 4.1% respondents were neutral.

Table 5: Students' Sitting Problem

Students face sitting problem in overcrowded school					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	43	13.6	13.6	13.6
	Strongly Agree	261	82.3	82.3	95.9
	Neutral	6	1.9	1.9	97.8
	Strongly Disagree	7	2.2	2.2	100.0
	Total	317	100.0	100.0	100.0

Table 5 showed that vast majority of the respondents (93.9%) were found agreed with the statement that students face sitting problem in overcrowded school. Whereas only 2.2% respondents were found disagreed with the statement. However, 1.9% respondents were neutral with the statement.

Table 6: Syllabus Completion

Teachers face problems to cover syllabus in time in overcrowded school.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	46	14.5	14.5	14.5
	Strongly Agree	218	68.8	68.8	83.3
	Neutral	32	10.1	10.1	93.4
	Disagree	21	6.6	6.6	6.6

	Total	317	100.0	100.0	100.0

Table 6 showed that vast majority of respondents (83.3%) were found agreed with the statement that the teachers faced problems in completion of syllabus in time. Whereas, only 6.6% respondents were found disagreed with the statement. However, 10.1% respondents were found neutral.

Table 7: Level of Individual Attention

Individual attention is affected in large class					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	46	14.5	14.5	14.5
	Strongly Agree	239	75.4	75.4	89.9
	Neutral	13	4.1	4.1	94.0
	Disagree	19	6.0	6.0	100.0
	Total	317	100.0	100.0	100.0

Table 7 showed that majority of the respondents (89.9%) agreed with the statement that teachers' individual attention to students is affected in large classes. Whereas only 6% respondents were found disagreed with the statement. However, 4.1% respondents were neutral.

Tale 8: Student teachers Relationship

Student teachers' relationship is affected in overcrowded class					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	50	15.8	15.8	15.8
	Strongly Agree	198	62.5	62.5	78.2
	Neutral	35	11.0	11.0	89.3
	Disagree	34	10.7	10.7	100.0
	Total	317	100.0	100.0	100.0

Table 8 showed that majority of the respondents (78.2%) agreed with the research statement that student teachers' relationship is affected in overcrowded class. Whereas, 10.7% respondents were found disagreed. However, 11% respondents were found neutral with the statement.

Table 9: Parents teachers Interaction

Parents teachers interaction is affected in overcrowded class					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	53	16.7	16.7	16.7
	Strongly Agree	189	59.6	59.6	76.3
	Neutral	27	8.5	8.5	84.9
	Disagree	28	8.8	8.8	93.7

	Strongly Disagree	20	6.3	6.3	100.0
	Total	317	100.0	100.0	100.0

Table 9 showed that majority of the respondents (76.3%) agreed with the research statement that parent teachers' interaction is affected in overcrowded class. Whereas, 15.1% respondents were found disagreed with the statement. However, 8.5% respondents were neutral.

Table 10: *t*-test

				t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Efficacy	Equal variances assumed	.018	.893	-.341	315	.734	-.02323	.06818	-.15739	.11092

Table 10 shows P>0.05 which means that there is no statistical difference in the perception of teachers and head teachers about increased enrollment of students and teaching efficacy.

Table 11: Correlation

Correlations between overcrowded school and Efficacy			
		My school is overcrowded	Efficacy
My school is overcrowded	Pearson Correlation	1	-.703
	Sig. (2-tailed)		.000
	N	317	317
Efficacy	Pearson Correlation	-.703	1
	Sig. (2-tailed)	.000	
	N	317	317

Table 11 showed that the correlation between overcrowded school and teachers' teaching efficacy is -.703 which is significant at p<.001. The null hypothesis is rejected and it is concluded that there is strong negative correlation between overcrowded school and teachers' teaching efficacy. It means when school enrollment is increased the teachers' teaching efficacy is decreased.

Table 12: Regression Analysis

Model Summary[b]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.703[a]	.494	.492	.38135
a. Predictors: (Constant), My school is overcrowded				
b. Dependent Variable: Efficacy				

Table 12 shows R square .494 which means 49.4% students learning efficacy is affected due to overcrowded school.

Table 13: ANOVA

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	44.639	1	44.639	306.948	.000[b]
	Residual	45.810	315	.145		
	Total	90.448	316			
a. Dependent Variable: Efficacy						
b. Predictors: (Constant), My school is overcrowded						

Table 13 shows ANOVA F=306.948 and P<0.001.which indicates that significant relationship between overcrowded school and students learning efficacy.

Table 14: Coefficient

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	3.352	.077		43.595	.000	3.201	3.503
	school is overcrowded	-1.155	.066	-.703	-17.520	.000	-1.285	-1.026
a. Dependent Variable: Efficacy								

Table 14 clearly shows that Beta value is -.703 which means that dependent variable (Efficacy) is affected -.703 by changing the one unit in independent variable (overcrowded school). Negative sign shows the inverse relation.

Conclusion

The study showed that the increasing student enrollment had negative effect on the teachers' teaching efficacy. Strong negative correlation (.703) Which means that by increasing the students' enrollment the leaning efficacy of students negatively affected. It was found that

overcrowded classes contributed to Poor classroom management, Poor teaching quality. Students' behavior development and parent teachers' interaction were negatively affected in overcrowded school. Teachers and head teachers' perceptions about increased enrollments of students and teachers' teaching efficacy were same. No statistical difference was found in teachers and head teachers' perceptions. The Beta coefficient and R square were respectively (β -.703) (R square =.494).

Recommendation

Based on the findings of the study the following recommendations have been made: The government needs to

- Develop policies to govern enrolment ratios.
- More schools should be opened to balance the teacher students' ratio in schools.
- Ensure both human and material resources for the quality of teaching in public sector schools.

References

Anderson, J. R. (2000). *Learning and memory: An integrated approach*. John Wiley & Sons Inc.

Baluch, M. U. H., & Shahid, S. (2008). Determinants of enrollment in primary education: a case study of district Lahore. *Pakistan Economic and Social Review*, 161-200.

Biddle, B., & Berliner, D. C. (2002). Unequal school. *Educational Leadership*, *59*(8), 48-59.

Bilgin, A., Ertem, B., & Gök, Y. (2005). Synthesis and characterization of new metal-free and metallophthalocyanines containing spherical or cylindrical macrotricyclic moieties. *Polyhedron*, *24*(10), 1117-1124.

Bindé, J., & Matsuura, K. (2005). Towards knowledge societies: UNESCO world report. *UNESCO reference works series. Paris: UNESCO. Retrieved March*, *9*(2010), 220.

Blatchford, P., & Mortimore, P. (1994). The issue of class size for young children in schools: what can we learn from research?. *Oxford review of education*, *20*(4), 411-428.

Blatchford, P., Bassett, P., Brown, P., Martin, C., Russell, A., & Webster, R. (2009). Research brief: Deployment and impact of support staff project.

Blatchford, P., Bassett, P., Goldstein, H., & Martin, C. (2003). Are class size differences related to pupils' educational progress and classroom processes? findings from the institute of education class size study of children aged 5–7 years. *British Educational Research Journal*, *29*(5), 709-730.

Blatchford, P., Goldstein, H., & Mortimore, P. (1998). Research on class size effects: A critique of methods and a way forward. *International Journal of Educational Research*, *29*(8), 691-710.

Carlson, D. S., Kacmar, K. M., & Williams, L. J. (2000). Construction and initial validation of a multidimensional measure of work–family conflict. *Journal of Vocational behavior*, *56*(2), 249-276.

Creemers, B. (2008). *Effective school improvement-Ingredients for success, organisational effectiveness and improvementin education*. Buckingham: Open University Press.

Ehrenberg, R. G., Brewer, D. J., Gamoran, A., & Willms, J. D. (2001). Class size and student achievement. *Psychological science in the public interest*, *2*(1), 1-30.

Eryilmaz, Ö., & Deveci, H. (2022). The Effect of Child-to-Child Teaching Approach on Students'level of Social Responsibility in Social Studies. *International Online Journal of Primary Education*, *11*(1), 90-108.

Finn, J. D., & Achilles, C. M. (1999). Tennessee's class size study: Findings, implications, misconceptions. *Educational evaluation and policy analysis*, *21*(2), 97-109.

Finn, J. D., Pannozzo, G. M., & Achilles, C. M. (2003). The "why's" of class size: Student behavior in small classes. *Review of educational research*, *73*(3), 321-368.

Galton, D. J. (1998). Greek theories on eugenics. *Journal of medical ethics*, *24*(4), 263-267.

George, D., & Mallery, M. (2003). Using SPSS for Windows step by step: a simple guide and reference.

Gikunda, M. G. (2016). *Factors influencing teacher performance in the implementation of geography curriculum in public secondary schools in Imenti South Sub County, Meru County Kenya* (Doctoral dissertation, University Of Nairobi).

Grissmer, D. (1999). Conclusion: Class size effects: Assessing the evidence, its policy implications, and future research agenda. *Educational evaluation and policy analysis*, *21*(2), 231-248.

Hattie, J. (2005). The paradox of reducing class size and improving learning outcomes. *International journal of educational research*, *43*(6), 387-425.

Hope, K. R. (2015). Bringing in the future in Kenya: Beyond the 2010 Constitution. *Insight on Africa*, *7*(2), 91-107.

Ijaiya, Y. (1999). Effects of over-crowded classrooms on teacher-students interactions. *Ilorin Journal of Education*, *19*, 1-11.

Jan, S. R., Ullah, F., Ali, H., & Khan, F. (2016). Enhanced and effective learning through mobile learning an insight into students perception of mobile learning at university level. *International Journal of Scientific Research in Science, Engineering and Technology (IJSRSET), Print ISSN*, *2395*, 1990.

Khan, I. A. (2011). Learning difficulties in English: Diagnosis and pedagogy in Saudi Arabia. *Educational Research*, *2*(7), 1248-1257.

Maala, A. (2022). *Factors Contributing to Low Performance in Teaching Reading Comprehension in English Among Grade Eight Pupils in Selected Secondary Schools of Lusaka District* (Doctoral Dissertation, The University of Zambia).

Makari, P., Mutsotso, S. N., & Masibo, E. (2019). Use of Conventional Teaching Resources in Secondary Schools in Bungoma County, Kenya. *basic education*, *9*(22).

Mbofana, A., & Banda, S. (2022). The effects of class size on the delivery of quality mathematics learning in secondary schools.

Okechukwu, J. N., & Oboshi, B. C. (2021). Influence of Overcrowded Classroom on Pupils'Academic Achievement in Public Primary Schools in Idemili South Local Government Area of Anambra State, Nigeria. *Journal of Educational Research & Development*, *4*(2).

Pérez-Lombard, L., Ortiz, J., & Pout, C. (2008). A review on buildings energy consumption information. *Energy and buildings*, *40*(3), 394-398.

Rubenstein, L. D., Siegle, D., Reis, S. M., Mccoach, D. B., & Burton, M. G. (2012). A complex quest: The development and research of underachievement interventions for gifted students. *Psychology in the Schools*, *49*(7), 678-694

Shah, J., & Inamullah, M. (2012). The impact of overcrowded classroom on the academic performance of the students at secondary level. *International Journal of Research in Commerce, Economics and Management*, *2*(6), 141-153.

Teixeira, J., Amoroso, J., & Gresham, J. (2017). Why education infrastructure matters for learning. *World Bank Blogs, on October*, *3*.

Waita, K. J., Mulei, K. O., Mueni, K. B., Mutune, M. J., & Kalai, J. (2016). Pupil-teacher ratio and its impact on academic performance in public primary schools in Central Division, Machakos County, Kenya. *European Journal of Education Studies*.

Walsh, G. (2010). Biopharmaceutical benchmarks 2010. *Nature biotechnology*, *28*(9), 917-924.

Wilson, C. (2006). Learning phonology with substantive bias: An experimental and computational study of velar palatalization. *Cognitive science*, *30*(5), 945-982.