DIGITALIZATION IN EDUCATION SYSTEM AND MANAGEMENT OF PRIMARY EDUCATION IN RIVERS STATE

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Abstract

This study investigated digitization in education system and management of primary education in Rivers State. The study focused on public primary schools in Rivers State. Three objectives, research questions and hypotheses guided the study. The study used an inferential statistic with survey research design. A self-designed questionnaire titled "Digitization in Education System and Management of Primary Education Questionnaire" was used to collect information for the study. The population of this study was 8,082 which comprises of all 994 head teachers and 7,088 teachers in public primary schools in Rivers State. The sample size of 432 (32 headteachers and 400 teachers) was selected using multi-stage sampling technique. All the 432 copies of the instrument sent out were all retrieved and used for the study's analysis. The instrument was face and content validated by 4 lecturers from the Departments of Educational Management and Measurement and Evaluation, Faculty of Education, Rivers State University. Test-retest method was used to test the reliability of the items and a reliability of 0.88 was obtained. The data collected were analyzed using mean and standard deviation while Chi-square ($\times^2$) was used to test the formulated null hypotheses. All hypotheses were tested at the 0.05 level of significance. The result revealed that there was significant relationship between student-cantered learning, teacher-student ratio and management of primary education in Rivers State. The result also revealed that there is no significant relationship between digital literacy and management of primary education in Rivers State. It was recommended that, tailored plans to cater for individual students' needs and interest should be developed, primary school administrators should maintain a teacher-student ratio of 1:20 or lower to ensure personalized attention, and a state digital literacy program should be established for students, teachers, and administrators.

Keywords: *digitization, management, primary education, student-centered learning, teacher-student ratio, and digital literacy*

Introduction

Primary Education is defined as the years of compulsory schooling experienced by a child between the ages of six and eleven (or higher). It has been compared to a foundation upon which one's future learning can be built. Therefore, the first stage is fundamental to the complete structure. Primary education among others aims to permanently affect literacy, numeracy, and effective communication skills; establish a firm groundwork for scientific and reflective thinking; shape the child's character and develop a sound attitude and morals (FRN, 2014). A modern primary education system uses technology to impart knowledge in the digitalize world. In today's digital age, technology has transformed various aspects of our lives, and the education sector is no exception. The integration of technology in primary education has brought about a significant shift in the way students acquire knowledge, develop skills, and interact with their peers and teachers.

Digitalization in education system refers to the combination of innovative technology and digital tools into educational frameworks, enhancing their overall management. It has the potential to transform the education system, making it more inclusive, accessible, and effective. Hartong (2016) opined that digitalization in education allows for personalized learning experiences tailored to individual students' needs and abilities. The digitalization of the education system presents an opportunity to cultivate a cognitive resource-based approach

in learners, enhancing their skills, fostering lifelong learning, and promoting continuous education and transformed the way students learn, teachers teach, and administrators manage educational institutions. It has democratized knowledge, making education a collaborative and self-directed pursuit.

Falasteen (2018) described digitization in education as the process of turning traditional methods of teaching such as paper document, sounds and more to a digital format that can be understood by pupils or students toward the achievement of educational goals and objectives. In the view of Cloonan and Sanett (2005) digitizing is the central way of making digital representations of geographical features, storing images, creating of electronic charts by digitizing traditional paper documents, graphs, or images. Digitalization has also changed the way educational institutions are managed, with administrative tasks becoming more efficient and data-driven decision-making becoming the norm. In primary education, digitalization has enabled personalized learning, enhanced student engagement, and improved assessment and feedback methods. Digital tools and resources have also enabled teachers to develop innovative pedagogical approaches, making learning more fun, interactive, and effective. With the advent of innovative tools, learning has transformed from a traditional academic approach to an engaging and interactive experience, leveraging student-centered learning. Digitization in this study refers to student-centered learning, teacher-student ratio and digital training employed towards the realization of effective management of primary education.

Student-centered learning involves students taking ownership of their learning, with teachers acting as facilitators rather than lecturers. Student-centered learning has revolutionized primary education, shifting the focus from teacher-directed instruction to student-led exploration and discovery. According to Wiggins and McTighe (2005), Ladson-Billings (2006) and Darling-Hammond (2006) effective management for implementing student-centered learning encourage inquiry-based learning and project-based assessments, foster a collaborative and inclusive environment that promotes student autonomy and provide professional development opportunities to help teachers transition from traditional teaching methods to student-centered learning.

The teacher-student ratio is a critical factor in the management of primary education, as it impacts the quality of education and student outcomes, teaching quality and school effectiveness. Finn, Gerber and Achilles (2009) opined that optimal teacher-student ratio is associated with better student outcomes, including improved academic achievement and social development. The International Labour Organization (ILO,2018) recommends a teacher-student ratio of 1:20 for primary education. Barnett, Freda and Booren (2017) and Tomlinson, Brighton and Moon (2003) are of the view that a lower teacher-student ratio allows for more individualized attention, improved classroom management, and increase teacher morale and also enables teachers to better differentiate instruction, leading to improved student engagement and academic performance.

Digital literacy is a vital skill in today's technology-driven world, and its importance in primary education cannot be overstated. Krumsvik (2014) defined digital literacy as the ability to effectively, and critically navigate, evaluate, and create digital content. Digital literacy is essential for teaching and learning in primary education, and its impact on education, school leaders can make informed decisions to create technology-rich learning environments that prepare students for the digital age (Froehlich, 2018). Digitalization has the potential to revolutionize the management of primary education, making it more efficient, effective, and accessible.

Management according to Abdullahi (2018) can be seen as the process of planning, coordinating, controlling, monitoring, supervising, directing, and evaluating results to realize predetermined goals of organization. Management of education is the process of making resources available and maximum utilization of the resources to achieve stated organizational goals and objectives (Segun, 2010). The primary educational system is the foundation of every child's educational journey, and its effective management is crucial for providing high-quality education. Effective management of primary education in the digital age requires a comprehensive understanding of the interplay between technology, pedagogy, and administration. Therefore,

school leaders and administrators must navigate the complexities of digitalization to create a conducive learning environment, ensure efficient resource allocation, and promote data-driven decision-making.

Statement of the Problem

The COVID-19 pandemic accelerated the adoption of digital technologies in education, making it and essential part of the learning process. Despite the potential benefits of digitalization in primary education, many schools in Rivers State face significant challenges in harnessing technology to improve teaching and learning. The lack of adequate infrastructure limited digital literacy among teachers, inadequate digital content is hindering the effective integration of technology in primary education. As a result, many students are missing out on opportunities to develop essential skills for digital age, and schools are struggling to provide high-quality education that prepares students for success in the 21st century. Therefore, it is essential to investigate digitalization in education system and management of primary education in Rivers State. The following objectives have been formulated to:

1. Ascertain the extent of student-centered learning and management of primary education in Rivers State.
2. Assess the extent of teacher-student ratio and management of primary education in Rivers State.
3. Examine the extent of digital literacy and management of primary education in Rivers State.

The following research questions were posed for the study. They are:

1. To what extent is student-centered learning and management of primary education in Rivers State?
2. To what extent is teacher-student ratio learning and management of primary education in Rivers State?
3. To what extent is digital literacy learning and management of primary education in Rivers State?

Hypotheses

Three hypotheses were formulated for this study:

1. There is no significant relationship from the responses of the respondents between the extent of studentcentered learning and management of primary education in Rivers State.
2. There is no significant relationship from the responses of the respondents between the extent of teacherstudent ratio and management of primary education in Rivers State.
3. There is no significant relationship from the responses of the respondents between the extent of digital literacy and management of primary education in Rivers State.

Methodology

The study used inferential statistics with descriptive survey design. The study was carried out in Rivers State, Nigeria. The study focused on public primary schools in Rivers State. The population of the study 8,082. This comprises of all 994 head teachers and 7,088 teachers in public primary schools in Rivers State. The sample size was 432 respondents made up of 32 headteachers and 400 teachers. The multi-stage sampling technique was adopted in arriving at the sample size. Data for this study were collected by means of questionnaire developed by the researcher and titled "Digitization in Education System and Management of Primary Education Questionnaire" (DESMPEQ). The DESMPEQ has two sections "A" and "B". Section A sought information on the personal background of the respondents, and it contained 3 items. Section B sought information on the view of the respondents regarding the topic of which was as follows: Very High Extent (VHE = 4points), High Extent

(HE = 3 points), Low Extent (LE = 2points) and No Extent (No = 1 point). The mean of each item was interpreted in relation to the normal value assigned to the instrument with their real limits as follows; VHE =3.50-4.00, HE= 2.50-3.49, LE=1.50-2.49 and NE=0.50-1.49. The researcher and three research assistants trained by the researcher distributed 432 copies of questionnaire to the respondents, with accompanying letters of appeal. All the 432 copies of the instrument sent out were all retrieved and used for the study's analysis. The initial copy of the questionnaire was face and content validated by 4 lecturers from the Departments of Educational Management and Measurement and Evaluation, Faculty of Education, Rivers State University. Test-retest method was used to test the reliability of the items and a reliability of 0.88 was obtained. Mean and standard deviation was used to analyze the research questions while Chi-square ($\times^2$) was used to test the hypotheses. The formulated null hypotheses were rejected when the observed Chi-square ($\times^2$) value is greater than or equal to the table value and accepted when the observed Chi-square ($\times^2$) is less than the table value.

Results

Research Question 1: What is the extent of student-centered learning and management of primary education in Rivers State?

Table 1: Student-Centered Learning and Management of Primary Education in Rivers State

S/No.	Items	VHE	HE	LE	NE	— X	SD	Remark
1	Student-centered learning encourages active engagement with digital resources, promoting deeper understanding and retention.	192	131	90	19	3.36	0.92	HE
2	Student-centered learning with digital technologies can connect academic	201	159	60	12	3.27	0.80	HE
	concepts to real-world applications and scenarios							
3	Student-centered learning with digital technologies helps students develop essential skills like critical thinking, problem-solving, and creativity	250	125	50	7	3.43	0.75	HE
4	Digitalized learning environments can accommodate different learning styles such as visual, auditory, or kinesthetic learning	190	145	89	8	3.20	0.82	HE
5	Digital tools and resources can facilitate student autonomy, allowing them to explore and learn at their own pace	232	178	20	2	3.84	0.71	VHE
	Grand Mean/SD					**3.42**	**0.80**	**HE**

Source: Research Data, 2024

As shown in Table 1, the overall mean for the extent of respondents on student-centered learning is 3.42 and 0.80 respectively. This could be interpreted that the respondents' responses on the extent of student-centered learning and management of primary education was to a high extent. This revealed that respondents agreed that student-centered learning enhance effective management of primary education in Rivers State.

Research Question 2: To what extent is teacher-student ratio and management of primary education in Rivers State?

Table 2: Teacher-Student Ratio and Management of Primary Education in Rivers State

S/No.	Items	VHE	HE	LE	NE	— X	SD	Remark
6	A lower teacher-student ratio allows for more personalized attention, which is essential for effective digital learning	240	160	30	2	3.47	0.65	HE
7	A lower teacher-student ratio enables teachers to better integrate digital tools into their teaching practices	250	150	27	5	3.49	0.62	HE
8	With a lower teacher-student ratio, teachers can more easily monitor students' progress in digital learning activities, identify areas where students need extra support, and adjust their teaching strategies accordingly	195	191	32	14	3.31	0.75	HE
9	A lower teacher-student ratio facilitates more effective collaboration and feedback between teachers and students	205	193	33	1	3.39	0.63	HE
10	With a lower teacher-student ratio, teachers can provide individualized support and guidance, ensuring that students effectively use digital resources	198	200	31	3	3.37	0.65	HE
	Grand Mean/SD					**3.41**	**0.66**	**HE**

Source: Research Data, 2024

Research question 2 is about teacher-student ratio as shown in Table 2, the grand mean for the respondents on teacher-student ratio is 3.41 and SD of 0.66. This could be inferred that the respondents agreed that the extent of teacher-student ratio and management of primary education is to a high extent. The analysis for each teacherstudent ratio items indicated the following means 3.47, 3.49. 3.31, 3.39 and 3.37 for items 6-10 and SD of 0.65, 0.62, 0.75, 0.63 and 0.65.

Research Question 3: What is the extent of digital literacy and management of primary education in Rivers State?

Table 3: Digital Literacy and Management of Primary Education in Rivers State

S/No.	Items	VHE	HE	LE	NE	- X	SD	Remark

11	Digitally literate teachers effectively integrate digital resources and tools into their teaching practices, enhancing the learning experience	213	189	25	5	3.41	0.66	HE
12	Teachers with high digital literacy are more likely to use digital technologies confidently and creatively, promoting a positive learning environment	222	172	32	6	3.41	0.69	HE
13	Digitally literate teachers are better equipped to participate in online professional development opportunities, staying updated on best practices and new technologies	194	199	30	9	3.31	0.70	HE
14	Digitally literate students understand how to navigate digital environments safely and responsibly, essential for online learning and collaboration	212	201	16	3	3.44	0.60	HE
15	Digitally literate students can harness digital tools to express their creativity, enhancing their learning experience and developing essential skills for the digital age	203	191	34	4	3.37	0.66	HE
	Grand Mean/SD					**3.39**	**0.66**	**HE**

Source: Research Data, 2024

Table 3 which is about digital literacy showed a grand mean of 3.39 and SD of 0.66 for the respondents on digital literacy. This means that the respondents agreed that digital literacy and management of primary education is to a high in Rivers State. The analysis for each digital literacy items indicated the following means 3.41, 3.41. 3.31, 3.44 and 3.37 for items 11-15 and SD of 0.66, 0.69, 0.70, 0.60 and 0.66.

Hypothesis 1: There is no significant relationship from the responses of the respondents between the extent of student-centered learning and management of primary education in Rivers State.

Table 4: Chi-square ($\times^2$) Test of the Relationship Between Student-Centered Learning and Management of Primary Education in Rivers State

Table 4(a): Contingency Table

Items	**VHE**	**HE**	**LE**	**NE**	**Total**
1	192 (213)	131(147.6)	90 (61.8)	19 (9.6)	432
2	201 (213)	159 (147.6)	60 (61.8)	12 (9.6)	432
3	250 (213)	125 (147.6)	50 (61.8)	7 (9.6)	432

4	190 (213)	145 (147.6)	89 (61.8)	8 (9.6)	432
5	232 (213)	178 (147.6)	20 (61.8)	2 (9.6)	432
Total	**1065**	**738**	**309**	**48**	**2160**

Source: Research Data, 2024

Table 4(b): Chi-square (×²) Observed and Expected Table

O	**e**	**O-e**	**O-e**	**(O-e)²/e**	**×² - cal.**	**×² crit.**	**Decision**
192	213	-12	441	2.07			
131	147.6	-16.6	275.56	1.87			
90	61.8	28.2	795.24	12.87			
19	9.6	9.4	88.36	9.20			
201	213	-12	144	0.68			
159	147.6	11.4	35.81	0.24			
60	61.8	-1.8	3.24	0.05			
12	9.6	2.4	5.76	0.6			
250	213	37	1.37	0.01			
125	147.6	-22.6	510.76	3.46	91.29	21.03	Rejected
50	61.8	-11.8	139.24	2.53			
7	9.6	-2.6	6.76	0.70			
190	213	-23	529	2.48			
145	147.6	-2.6	6.76	0.05			
89	61.8	27.2	739.84	11.97			
8	9.6	-1.6	2.56	0.27			
232	213	19	361	1.69			
178	147.6	30.4	924.16	6.26			
20	61.8	-41.8	1747.24	28.27			
2	9.6	-7.6	57.76	6.02			
				91.29			

Source: Research Data, 2024

The analysis shows that the calculated value of $\times^2$ is greater than the critical value of $\times^2$ at 91.29 and 21.03 respectively with a degree of freedom of 12. The researcher rejected the null hypothesis in favour of the alternate hypothesis. Based on the hypothesis testing, the researcher concludes that there is significant relationship from the responses of the respondents between the extent of student-centered learning and management of primary education in Rivers State.

Hypothesis 2: There is no significant relationship from the responses of the respondents between the extent of teacher-student ratio and management of primary education in Rivers State.

Table 5: Chi-square ($\times^2$) Test of the Relationship Between Teacher-Student Ratio and Management of Primary Education in Rivers State

Table 5(a): Contingency Table

Items	VHE	HE	LE	NE	Total
1	240 (217.6)	160 (178.8)	30 (30.6)	2 (5)	432
2	250 (217.6)	150 (178.8)	27 (30.6)	5 (5)	432
3	195 (217.6)	191 (178.8)	32 (30.6)	14 (5)	432
4	205 (217.6)	193 (178.8)	33 (30.6)	1 (5)	432
5	198 (217.6)	200 (178.8)	31 (30.6)	3 (5)	432
Total	**1088**	**894**	**153**	**25**	**2160**

Source: Research Data, 2024

Table 5(b): Chi-square ($\times^2$) Observed and Expected Table

O	E	O-E	(O-E) ²	(O-E)²/E	Df	$\times^2$ - cal.	$\times^2$ crit.	Decision
240	217.6	22.4	501.76	2.31				
160	178.8	-18.8	353.44	1.98				
30	30.6	-0.6	0.36	0.01				
2	5	-3	9	1.8				
250	217.6	32.4	1049.76	4.82				
150	178.8	-28.8	829.44	4.64				
27	30.6	-3.6	12.96	0.43				
5	5	0	0	0				
195	217.6	-22.6	510.76	2.35				
191	178.8	12.2	148.84	0.83	12	45.77	21.03	Rejected

32	30.6	1.4	1.96	0.06				
14	5	9	81	16.2				
205	217.6	-12.6	158.76	0.73				
193	178.8	14.2	201.64	1.13				
33	30.6	2.4	5.76	0.19				
1	5	-4	16	3.2				
198	217.6	-19.6	384.16	1.77				
200	178.8	21.2	449.44	2.51				
31	30.6	0.4	0.16	0.01				
3	5	-2	4	0.8				
				45.77				

Source: Research Data, 2024

The analysis on Table 5b shows that the calculated value of $\times^2$ is greater than the critical value of $\times^2$ at 45.77 and 21.03 respectively with a degree of freedom of 12. The researcher rejected the null hypothesis in favour of the alternate hypothesis. Based on the hypothesis testing, the researcher concludes that there is significant relationship from the responses of the respondents between the extent of teacher-student ratio and management of primary education in Rivers State.

Hypothesis 3: There is no significant relationship from the responses of the respondents between the extent of digital literacy and management of primary education in Rivers State.

Table 6: Chi-square ($\times^2$) Test of the Relationship Between Digital Literacy and Management of Primary Education in Rivers State

Table 6(a): Contingency Table

Items	**VHE**	**HE**	**LE**	**NE**	**Total**
1	213	189	25	5	432
2	222	172	52	6	432
3	194	199	30	9	432
4	212	201	16	3	432
5	203	191	34	4	432
Total	**203**	**952**	**137**	**27**	**2160**

Source: Research Data, 2024

Table 6(b): Chi-square ($\times^2$) Observed and Expected Table

O	E	O-E	O-E	(O-E)²/E	Df	×² - cal.	×² crit.	Decision
213	208.8	4.2	17.64	0.08				
189	190.4	-1.4	1.96	0.01				
25	27.4	-2.4	5.76	0.21				
5	5.4	-0.4	0.16	0.03				
222	208.8	13.2	174.24	0.83				
172	190.4	-18.4	338.56	1.78				
32	27.4	4.6	21.16	0.77				
6	5.4	0.6	0.36	0.07				
194	208.8	-14.8	219.04	1.05				
199	190.4	8.6	73.96	0.39	12	16.43	21.03	Accepted
30	27.4	2.6	6.76	0.25				
9	5.4	3.6	12.96	2.4				
212	208.8	3.2	10.24	0.05				
201	190.4	10.6	112.36	0.59				
16	27.4	-11.4	129.96	4.74				
3	5.4	-2.4	5.76	1.07				
203	208.8	-5.8	33.64	0.16				
191	190.4	0.6	0.36	0.00				
34	27.4	6.6	43.56	1.59				
4	5.4	-1.4	1.96	0.36				
				16.43				

Source: Research Data, 2024

The analysis on Table 6b shows that the calculated value of ×² is less than the critical value of ×² at 16.43 and 21.03 respectively with a degree of freedom of 12. Therefore, the null hypothesis was accepted which states that there is no significant relationship from the responses of the respondents between the extent of digital literacy and management of primary education in Rivers State.

Discussion of Findings

The result of research question one which is in Table 1 shows that student-centered learning and management of primary education in Rivers State is to a high extent with a grand mean of 3.42 and standard deviation of

0.80. This means that the respondents to a high extent agreed that student-centered learning encourages active engagement with digital resources, promotes deeper understanding and retention; studentcentered learning with digital technologies can connect academic concepts to real-world applications and scenarios; student-centered learning with digital technologies helps students develop essential skills like critical thinking, problem-solving, and creativity; digitalized learning environments can accommodate different learning styles such as visual, auditory, or kinesthetic learning and digital tools and resources can facilitate student autonomy, allowing them to explore and learn at their own pace. The corresponding hypothesis 1 which states that there is no significant relationship from the responses of the respondents between the extent of student-centered learning and management of primary education in Rivers State was rejected and the alternate hypothesis accepted. This finding is in line with the finding of Darling-Hammond (2006) that student-centered learning is effective on the primary school students because it encourage inquiry-based learning and projectbased assessments amongst them.

The findings of research question 2 as regards the extent of teacher-student ratio and management of primary education in Rivers State and a grand mean of 3.41 showed that the respondents to a high extent agreed to the following statements; that a lower teacher-student ratio allows for more personalized attention, which is essential for effective digital learning; a lower teacher-student ratio enables teachers to better integrate digital tools into their teaching practices; with a lower teacher-student ratio, teachers can more easily monitor students' progress in digital learning activities, identify areas where students need extra support, and adjust their teaching strategies accordingly; a lower teacher-student ratio facilitates more effective collaboration and feedback between teachers and students and with a lower teacher-student ratio, teachers can provide individualized support and guidance, ensuring that students effectively use digital resources. Hypothesis 2, with $\times^2$ value of 45.77 which is greater than the $\times^2$ critical value of 21.03 at 0.05 level of significance and degree of freedom of 12 was rejected and the alternate hypothesis accepted. The finding of this study was consistent with Barnett, Freda and Booren (2017) and Tomlinson, Brighton and Moon (2003) who are of the view that a lower teacherstudent ratio allows for more individualized attention, improved classroom management, and increase teacher morale and also enables teachers to better differentiate instruction, leading to improved student engagement and academic performance.

The finding of research question 3 which is on the extent of digital literacy and management of primary education in Rivers State shows that the respondents to a high extent agreed to the following statements, that digitally literate teachers effectively integrate digital resources and tools into their teaching practices, enhancing the learning experience ; teachers with high digital literacy are more likely to use digital technologies confidently and creatively, promoting a positive learning environment; digitally literate teachers are better equipped to participate in online professional development opportunities, staying updated on best practices and new technologies; digitally literate students understand how to navigate digital environments safely and responsibly, essential for online learning and collaboration; digitally literate students can harness digital tools to express their creativity, enhancing their learning experience and developing essential skills for the digital age. The corresponding hypothesis 3 which states that there is no significant relationship from the responses of the respondents between the extent of digital literacy and management of primary education in Rivers State was accepted and the alternate hypothesis rejected. The finding of this study resonates with Froehlich (2018) that digital literacy is crucial for teaching and learning in primary education, and impacts school leaders to make informed decisions which create technology-rich learning environments that prepare students for the digital age.

Conclusion

This paper conceptualized on the digitalization in education system and management of primary education in Rivers State. It discussed the topic using student-centered learning, teacher-student ratio, and digital training as indices of digitalization in primary education. The findings showed that there is a significant relationship between student-centered learning and teacher-student ratio and management of primary education. The study also showed no significant relationship between digital literacy and management of primary education.

Recommendations

Following the finding the following recommendations were made. They are:

1. Tailored plans to cater for individual students' needs and interest should be developed.

2. Primary school administrators should maintain a teacher-student ratio of 1:20 or lower to ensure personalized attention.

3. A state digital literacy program should be established for students, teachers, and administrators.

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