

**TEACHERS' DIGITAL LITERACY AND STUDENTS' LEARNING SATISFACTION IN  
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State University, Port Harcourt, Rivers State, Nigeria, [omodu.morgan@ust.edu.ng](mailto:omodu.morgan@ust.edu.ng)****Abstract**

*This study investigated teachers' digital literacy and students' learning satisfaction in secondary schools in Rivers State. Four research questions were answered and four hypotheses tested in the study. The study adopted correlation survey design. The population of the study comprised all the 6, 893 public secondary school teachers in Rivers State while 378 teachers were sampled for the study through simple random sampling technique. There were two questionnaires named "Teachers Digital Literacy Questionnaire" (TDLQ) and "Students Learning Satisfaction Questionnaire" (SLSQ) with 15 and 10 questionnaire items respectively used to collect data on the independent and dependent variables of the study respectively. The questionnaires were validated by two Educational Management lecturers at the Ignatius Ajuru University of Education, Port Harcourt Rivers State while the reliability indices of the TDLQ and SLSQ were 0.82 and 0.87 respectively using Cronbach alpha statistics. Out of the 378 copies of the questionnaire administered, 362 copies representing 95.8% were properly filled and retrieved. Research questions one to three were answered using simple regression analysis while research question four was answered using multiple regression analysis. Similarly, hypotheses one to three were tested using t-test associated with simple regression while hypotheses four was tested using one-way analysis of variance at 0.05 level of significance. The result of the study indicated that teachers digital content creation, digital communication and collaboration as well as digital safety and security competencies had low, moderate and low relationship of  $r= 0.301$ ,  $0.594$  and  $0.340$  with the students learning satisfaction. The digital literacy of the teachers also had a moderate relationship of  $r=0.624$  with the learning satisfaction of the students but all of these competencies were significant at 0.05 level of significance. This implies that the teachers are only moderately digitally literate as reflected in the learning satisfaction of the students. The study recommended the need for digital training for the teachers on how to use emerging technologies to improve on their general educational service delivery in these schools.*

**Keywords:** *Digital Literacy, Students Learning Satisfaction, Teacher, School, Technology*

**Introduction**

The education system unlike what obtains in the past has moved from the traditional method of teaching and learning to the application of digital technology in the execution of all educational administration activities ranging from student, teacher and financial management to the management of even physical facilities in school. In line with these changes, the expectation and needs of students from the teaching process is gradually shifting from the use of traditional method of instruction to the use of digital technologies in the engagement of students in and outside the classroom. The level at which students are satisfied these days with the learning process that takes place in the classroom is determined by how well their learning needs are met and this is optimally so when such needs are met using these emerging technologies which often fascinates them.

It has been pointed out by researchers such as Zhao and Khu as cited in Lin et al., (2018:850) that "learning engagement is related to students' learning outcomes, learning satisfactions, school identity, and future development" and in today's blended learning environment, digital literacy of the teacher cannot be jettisoned (Tang & Chaw, 2016) as this is required in satisfying the needs of the students. Teachers who are digitally literate are more likely to be able to engage their students in more meaningful teaching and learning and are

also most likely to improve on students learning satisfaction. In the worlds of Greene et al., (2014), to be digitally literate is not about merely being able to search and manage information online but also include the ability to be able to scrutinize and integrate digital information in the areas of usage. This means that the digitally literate teacher must be able to search, create, protect, communicate and even collaborate with other technology users using available technologies in this digital age and this is required to be able to enhance students learning satisfaction for their overall educational development.

### **Statement of the Problem**

The world is today referred to as a global village but the effects of technological advancement is only slightly felt across the different sectors of the economy especially in developing economies and this includes the education sector. The world today relies heavily on technology because of its efficiency and effectiveness in the delivery of services and the education system in Nigeria is expected to benefit from this advancement but unfortunately, it appears teachers in most of the schools are not competent enough to appropriate the benefits of these technologies. Students who are supposed to benefit from the competence of their teachers in the use of digital technology have not been able to compete with their colleagues in other countries that are technology complaint and the several of these students are unable to deploy technology in meeting their educational needs because of their teachers' lack of capacity. The study therefore intends to interrogate how the teachers' digital literacy relate to students learning satisfaction in secondary schools in Rivers State.

### **Purpose of the Study**

The purpose of the study was to investigate teachers' digital literacy and students' learning satisfaction in secondary schools in Rivers State. In specific terms, the objectives of the study were to:

1. determine the relationship between teachers' digital content creation and students' learning satisfaction in secondary schools in Rivers State
2. examine the relationship between teachers' digital communication and collaboration and students' learning satisfaction in secondary schools in Rivers State
3. ascertain the relationship between teachers' digital safety and security and students' learning satisfaction in secondary schools in Rivers State
4. describe the relationship between teachers' digital literacy and students' learning satisfaction in secondary schools in Rivers State

### **Research Questions**

The following research questions were answered in the study:

1. What is the relationship between teachers' digital content creation and students' learning satisfaction in secondary schools in Rivers State?
2. What is the relationship between teachers' digital communication and collaboration and students' learning satisfaction in secondary schools in Rivers State?
3. What is the relationship between teachers' digital safety and security and students' learning satisfaction in secondary schools in Rivers State?
4. What is the relationship between teachers' digital literacy and students' learning satisfaction in secondary schools in Rivers State?

### **Hypotheses**

The following hypotheses were tested at 0.05 level of significance;

1. Teachers' digital content creation is not significantly related to students' learning satisfaction in secondary schools in Rivers State
2. Teachers' digital communication and collaboration is not significantly related to students' learning satisfaction in secondary schools in Rivers State
3. Teachers' digital safety and security is not significantly related to students' learning satisfaction in secondary schools in Rivers State
4. Teachers' digital literacy is not significantly related to students' learning satisfaction in secondary schools in Rivers State

## Literature Review

### Digital Literacy

The concept of digital literacy is one that has evolved over the years as a result of the advancement in the technological space. This is because someone who was digitally literate in the 18<sup>th</sup> century may not be considered as being so in this present age when technology has advanced. Similarly, scholars in education have also defined digital literacy from their own different perspective and in this regard, Mercuri and Ramos (2014) pointed out that digital literacy refers to the ability to use media platforms for different classroom activities differently from how it was traditionally done. However, in a clearer term, Law et al., (2018) opined that digital literacy is the ability to access, use and communicate relevant information to other people as well as communicate with them using digital devices. Spire and Bartlett as cited in Forutanian (2021:26) stated that “digital literacy involves locating and consuming digital content, creating digital content, communicating digital content and engaging in critical evaluation”. On the other hand, Hague and Payton (2010:19) state that there are certain indicators that determine if one is digitally literate and this includes the act of “creativity, critical thinking and evaluation, cultural and social understanding, collaboration, finding and selecting information, effective communication, e-safety, and functional skills” and it is only when an individual is effective in all of these activities that he or she can be classified as being digitally literate.

### Students Learning Satisfaction

In a common parlance, students learning satisfaction can be defined as how contented a learner is with all the activities that makes up the learning process and this ranges from the quality of instruction, teacher quality, classroom setting among other factors. Lo (2010) pointed out that student satisfaction in learning is the subjective perceptions, on the part of the student on how well a learning environment supports academic success from his or her perspective. In a related manner, Eom et al., as cited in Gray and DiLoreto (2016) the quality of the course structure, instructor feedback, self-motivation, learning style, interaction, and instructor facilitation are significant determinants of a student satisfaction. Students learning satisfaction therefore refers to the level of contentment that is derived by a student from all the activities and people that make up the learning process and contributes to the attainment of the learner’s educational expectations either in terms of academic performance or otherwise.

### Digital Literacy and Learning Satisfaction

Research has shown that technology is spreading at a faster rate than the extent at which it is being deployed for use and this is not far from the fact that technology users including teachers are yet to build the digital capacity to maximize the benefits of existing technology for meeting their own needs and the needs of the students and the school as a whole. Technology is influencing the way people interact, explore and utilize other resources within their environment so that they can maximize utility from these resources. Aligning with this perspective, Shopova (2014:26) stated that “the Internet and new media communication technologies with their interactive and increasingly individualized digital services change people’s habits and behaviour by building new value models and vital cues”. This shows that the growth of technology does not only bring about changes in products but also people and processes thereby enabling users to derive utility or satisfaction from its usage.

Students learning satisfaction can be enhanced when their instructors or teachers are digitally competent. According to Pham and Nguyen (2022:32) a digitally literate individual is expected to develop in six dimensions which includes “professional engagement, digital sources and resources, teaching and learning, assessment within assessment strategies, empowering learners and facilitating learners’ digital competence”. When a teacher is able to develop these capabilities, it becomes easy for the teacher to develop himself or herself and assist the learner to learn meaningfully and satisfactorily. There are several digital activities that can make teaching and learning fun-filled and appealing to learners but this can only be optimized if the teacher is digitally literate. Digitally literate teachers according to Rodríguez-García et al., (2022) are able to interact through digital technologies, share information through digital technologies, engage and collaborate among others. Teachers who are able to do this will no doubt awaken all the learning interest of the students and also assist the students to utilize these technological experiences to further their educational expectations.

and overall educational development. Carretero et al., (2017) a digitally literate individual will show competence and skills in the establishment and communication of essential information to other people within a digital environment and this is what is required to add value to students and make them educationally satisfied. Similarly, Gomez-Oriuela et al., (2021) noted that digitally literate individuals develop complexities that enable them interact and this helps students to develop both communicative and social skills while the competencies of sharing and collaborating using digital technology makes it easy for students to engage in deeper learning. All of these contribute to the cognitive, affective and psychomotive development of the students making it easy for their educational needs to be satisfied. Carretero et al., (2017) further mentioned that when teachers develop the required digital literacy, the various domains of the learner are not only developed but students are able to better understand the instructional process and also acquire more insight on the teaching and learning process and this is required to get the attention of students in a contemporary classroom in today's digital world.

Part of the expectations of students from their teachers is that the teacher should be able to create learning experiences using digital platforms that will meet the expectation of students. Teachers' ability to engage in digital content creation will expose the students to new learning experiences both in audio and video format and will also enable the learner to be able to make more meaning from all of the activities taking place in the classroom. Digital content creation makes it easy for the teacher to also be able to carry out simulation activities that will impact more on the students making it easy for them to carry out interdependent learning activities based on the pattern that has been created for them. The digitally literate teacher will also be able to communicate and collaborate with the students making access, sharing and retrieving of information easy and less time consuming which is part of what students look out for in a digital era where students want to be able to find, share and store relevant information using available technological devices at their disposal. The ability to secure the information of students in a digital system where privacy of learner information is top priority is also part of the expectations of students for sustained learning satisfaction. Digital safety also means that the teacher should be able to use these digital technologies professionally such that it does not pose any health challenge to the teacher and students as Ovcharuk and Ivaniuk (2021) noted in their study that 22.1% of respondents pointed out that they are aware that the use of digital technologies has health implications and only a digitally literate teacher can avoid these effects for the overall satisfaction of the learner. Teachers' digital literacy is therefore essential in today's technology driven classroom so as to enhance and sustain the learning satisfaction of students.

### **Empirical Studies**

Several researchers have attempted to investigate how digital literacy affects different aspects of education. Wordu et al., (2021) in their study on digital literacy and teachers job performance in Universities in Rivers State, Nigeria adopted a correlation survey design and collected data using questionnaire correlation from 2,644 teaching staff in the three public universities in Rivers State out of which 347 teaching staff were sampled through stratified random sampling. The findings of their study showed that digital communication, digital safety and digital creativity were severely related with teachers' job performance in universities in Rivers State at low, high and moderately positive levels respectively with values of  $r=0.305$ ,  $r=0.614$  and  $r=0.479$  respectively.

Similarly, Pratolo and Solikhati (2021) investigated teachers' attitude toward digital literacy in EFL classroom. Four objective guided the study while qualitative research method was adopted. Semi-structured interview as well as observation were used to gather data which was analyzed using thematic analysis. Two EFL teachers at a junior high school in Temanggung, Central Java, Indonesia were sampled for the study and the result of the study indicated that the teachers used computer and smartphone to search for digital information and also showed positive attitudes in the use of digital literacy for EFL teaching. On the other hand, Li and Yu (2022) conducted a related study on teachers' satisfaction, role, and digital literacy during the COVID-19 pandemic. The study adopted a systematic literature review. There were 21 studies which were used for the study after intensive searches. There were five research questions regarding teachers' professional role, satisfaction, digital literacy, higher educational practice, and sustainable education that

guided the study and it was revealed in the findings of the study that teachers' professional roles changed complicatedly. The study also showed that teachers were assigned more tasks during the online teaching process which created a decline in teachers' satisfaction.

Lo (2010) investigated how student satisfaction factors affect perceived learning. Respondents of the study were students in two sections of a general education course offered at a research university in spring 2009 in the study area and 22 elements in the learning environment were explored after being grouped into 3 satisfaction factors related to the roles of student, instructor, and policy. Findings of the study indicated that all of these satisfaction factors were associated with higher rates of perceived learning, measured via students' expectations of academic success.

Rodríguez-García et al., (2022) also conducted a study on communicating and collaborating with others through digital competence. The study engaged non-experimental quantitative research and questionnaire was used for gathering of data. There were 698 pre-service teachers in Andalusia (Spain) who were sampled for the study. Result of the study showed that teacher trainees had an intermediate level in terms of their abilities to communicate and collaborate with other people through digital technologies. The study also showed significant differences regarding the teachers' gender, which implied that gender can still be considered a limitation in the use of ICTs.

The study by Tomczyk (2019) focused on what do teachers know about digital safety. The study was conducted using a competency test and diagnostic survey. The study was conducted among 421 lower-secondary school teachers covering three grades for children aged 12/13 to 15/16 within the country. Result of the study showed that the teachers had different levels of digital literacy. The teachers of technical subjects (including ICT) obtained the best results, whereas natural science teachers scored the lowest. Age was also not a determinant of ICT expertise while a low level of digital literacy and safety skills prevailed in the group of teachers who had recently began their career in education (trainees). Aguirre et al., (2022) also conducted a study on online learning experiences and satisfaction of students on the transition to remote learning which showed that the quality of learning, technology, and learning issues strongly impacted on students' satisfaction as the students are more concerned about the service received than the materials available. These studies expose the fact that a lot still needs to be done in the process of deploying technology appropriately for educational purposes as a result of differences in age, level of education, experiences among other factors and all of these determines the benefits that can be derived from this process.

### **Methodology**

The study adopted correlation survey design while the population consisted of all the 6, 893 teachers in the public senior secondary schools in Rivers State out of which 378 teachers were sampled for the study using simple random sampling technique. The sample size of the study was estimated using the Taro Yamane minimum sample size determination formula. Two questionnaires namely "Teachers Digital Literacy Questionnaire" (TDLQ) with 15 questionnaire items were used to collect data on the independent variables of the study while a second questionnaire tagged "Students Learning Satisfaction Questionnaire" (SLSQ) with 10 questionnaire items was used to gather data on the dependent variables of the study. The questionnaires were responded to on a four point modified Likert scale of Strongly Agree (SA) Agree(A), Disagree (D) and Strongly Disagree (SD) with weighted scores of 4, 3, 2 and 1. The questionnaires were validated by two Educational Management lecturers at the Ignatius Ajuru University of Education, Port Harcourt Rivers State. The reliability of the TDLQ and SLSQ was estimated using the Cronbach alpha statistic and the average coefficient were 0.82 and 0.87 for both questionnaires respectively. Out of the 378 copies of the questionnaire administered, there were 362 copies which were properly filled and retrieved indicating a 95.8% retrieval rate. Research questions one to three were answered using simple regression analysis while research question four was answered using multiple regression analysis. Similarly, hypotheses one to three were tested using t-test associated with simple regression while hypotheses four was tested using one-way analysis of variance at 0.05 level of significance.

**Results****Answer to Research Questions**

**Research Question One:** What is the relationship between teachers' digital content creation and students' learning satisfaction in secondary schools in Rivers State?

**Table 1: Simple regression analysis on the relationship between teachers' digital content creation and students' learning satisfaction in secondary schools in Rivers State**

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Remarks
1	.301 <sup>a</sup>	.091	.088	3.91359	Low but positive relationship

a. Predictors: (Constant), TeachersDigitalContentCreation

Table 1 showed that at a value of  $r=0.301$ , there existed a low but positive relationship between the teachers' digital content creation abilities and students learning satisfaction and the value of  $r^2$  of 0.091 implied that 9.1% of students learning satisfaction is accounted for by the teachers' digital content creation competence while the remaining 90.9% of students learning satisfaction is accounted for by other factors aside the teachers digital content creation abilities.

**Research Question Two:** What is the relationship between teachers' digital communication and collaboration and students' learning satisfaction in secondary schools in Rivers State?

**Table 2: Simple regression analysis on the relationship between teachers' digital communication and collaboration and students' learning satisfaction in secondary schools in Rivers State**

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Remarks
1	.594 <sup>a</sup>	.353	.351	3.56843	Moderate but positive relationship

a. Predictors: (Constant), TeachersDigitalCommunicationandCollaboration

Table 2 revealed that at a value of  $r=0.594$ , there was a moderate and positive relationship between the teachers' digital communication and collaboration competence and students learning satisfaction and the value of  $r^2$  of 0.353 meant that 35.3% of students learning satisfaction was as a result of the teachers' digital communication and communication abilities while the remaining 64.7% of students learning satisfaction is accounted for by other factors aside the teachers digital communication and collaboration skills.

**Research Question Three:** What is the relationship between teachers' digital safety and security and students' learning satisfaction in secondary schools in Rivers State?

**Table 3: Simple regression analysis on the relationship between teachers' digital safety and security and students' learning satisfaction in secondary schools in Rivers State**

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Remarks
1	.340 <sup>a</sup>	.116	.113	3.85991	Low but positive relationship

a. Predictors: (Constant), TeachersDigitalSafetyandSecurity

Table 3 indicated that at a value of  $r=0.340$ , there existed a low but positive relationship between the teachers' digital safety and security abilities and students learning satisfaction and the value of  $r^2$  of 0.116 implied that 11.6% of students learning satisfaction is accounted for by the teachers' digital safety and

security competence while the remaining 88.4% of students learning satisfaction is accounted for by other external factors.

**Research Question Four:** What is the relationship between teachers' digital literacy and students' learning satisfaction in secondary schools in Rivers State?

**Table 4: Multiple regression analysis on the relationship between teachers' digital literacy and students' learning satisfaction in secondary schools in Rivers State**

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Remarks
1	.624 <sup>a</sup>	.389	.383	3.50470	Moderate and positive relationship

a. Predictors: (Constant), TeachersDigitalCommunicationandCollaboration, TeachersDigitalContentCreation, TeachersDigitalSafetyandSecurity

Table 4 pointed out that at a value of  $r=0.624$ , there existed a moderate and positive relationship between the teachers' digital literacy and students learning satisfaction and the value of  $r^2$  of 0.389 implied that 38.9.1% of students learning satisfaction is accounted for by the teachers' digital literacy while the remaining 61.1% of students learning satisfaction is accounted for by some other factors which are not related to the teachers' digital literacy.

#### Test of Hypotheses

**Hypothesis One:** Teachers' digital content creation is not significantly related to students' learning satisfaction in secondary schools in Rivers State

**Table 5: t-test associated with simple regression on the significance of the relationship between teachers' digital content creation and students' learning satisfaction in secondary schools in Rivers State**

Coefficients <sup>a</sup>							
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Decision
		B	Std. Error	Beta			
1	(Constant)	20.915	1.484		14.093	.000	Significant
	TeachersDigitalContentCreation	.531	.088	.301	5.999	.000	

a. Dependent Variable: StudentsLearningSatisfaction

In table 5, the significance value of 0.000 which is less than the p-value of 0.05 aligns with the value of t-cal. of 5.999 to indicate that there existed a significant relationship between teachers' digital content creation and students' learning satisfaction in secondary schools in Rivers State

**Hypothesis Two:** Teachers' digital communication and collaboration is not significantly related to students' learning satisfaction in secondary schools in Rivers State

**Table 6: t-test associated with simple regression on the significance of the relationship between teachers' digital communication and collaboration and students' learning satisfaction in secondary schools in Rivers State**

Coefficients <sup>a</sup>							
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Decision
		B	Std. Error	Beta			
1	(Constant)	16.612	1.231		13.495	.000	Significant
	TeachersDigitalCommunicationandCollaboration	.843	.078	.494	10.784	.000	

a. Dependent Variable: StudentsLearningSatisfaction

In table 6, the significance value of 0.000 which is less than the p-value of 0.05 aligns with the value of t-cal. of 10.784 to indicate that there existed a significant relationship between teachers' digital communication and collaboration and students' learning satisfaction in secondary schools in Rivers State.

**Hypothesis Three:** Teachers' digital safety and security is not significantly related to students' learning satisfaction in secondary schools in Rivers State

**Table 7: t-test associated with simple regression on the significance of the relationship between teachers' digital safety and security and students' learning satisfaction in secondary schools in Rivers State**

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Decision
		B	Std. Error	Beta			
Model 1	(Constant)	20.064	1.424		14.094	.000	Significant
	TeachersDigitalSafetyandSecurity	.606	.088	.340	6.861	.000	

a. Dependent Variable: StudentsLearningSatisfaction

In table 7, the significance value of 0.000 which is less than the p-value of 0.05 aligns with the value of t-cal. of 6.861 to indicate that there existed a significant relationship between teachers' digital safety and security and students' learning satisfaction in secondary schools in Rivers State

**Hypothesis Four:** Teachers' digital literacy is not significantly related to students' learning satisfaction in secondary schools in Rivers State

**Table 8: One-way analysis of variance on the significance of the relationship between teachers' digital literacy and students' learning satisfaction in secondary schools in Rivers State**

		ANOVA <sup>a</sup>					Decision
Model		Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	1667.710	3	555.903	45.258	.000 <sup>b</sup>	Significant
	Residual	4397.298	358	12.283			
	Total	6065.008	361				

a. Dependent Variable: StudentsLearningSatisfaction

b. Predictors: (Constant), TeachersDigitalCommunicationandCollaboration, TeachersDigitalContentCreation, TeachersDigitalSafetyandSecurity

In table 8, the significance value of 0.000 which is less than the p-value of 0.05 aligns with the value of f-cal. of 45.258 to indicate that there existed a significant relationship between teachers' digital literacy and students' learning satisfaction in secondary schools in Rivers State.

### Discussion of Findings

The result of the data collected and analyzed from the responses of the teachers showed that a low but positive relationship existed between teachers' digital content creation and students learning satisfaction and that this relationship was significant at 0.05 level of significance. This result suggests that the teachers are not doing so much in terms of using available technologies to create learning experiences that the students will appreciate. This result was given support by the research carried out by Aguirre et al., (2022) which indicated that the quality of learning, technology, and learning issues have great impact on students' satisfaction as the students are more concerned about the service received than the materials available. This implies that students are more attached to the services and the value that the teacher is able to create from the technology available in the school and not necessary the provision of emerging technology in the classroom and this is what promotes the satisfaction of the students. Unfortunately, the study by Tomczyk (2019) revealed that teachers had different levels of digital literacy with those in technical subjects getting the best outcomes, whereas natural science teachers scored the lowest. This means that the specialization of the teachers' had an influence on the digital literacy of the teachers including their ability to create digital contents and this calls for the need for adequate training in order to make positive influence on the education system and improve on students learning satisfaction.

In the study, there was a moderate and positive relationship between the teachers' digital communication and collaboration competence and students learning satisfaction with the teachers' digital communication and communication abilities predicting 35.3% of students learning satisfaction and this contribution was significant at 0.05 level of significance. The study showed that the teachers engaged slightly more in digital communication and collaboration than the other aspects of their digital literacy determinants. This agrees with the result of the study by Pratolo and Solikhati (2021) which indicated that the teachers in the study used computer and smartphone to search for digital information and also showed positive attitudes in the use of digital literacy for teaching. The easy access to these basic digital tools and their ease of usage may explain why they use this technology for carrying out their educational services which impacts on their students by extension. Similarly, since this aspect of digitalization has direct impact on the duties of the teacher by making it easy for them to access and use information for their teaching, this may explain why they engage more in this aspect of digital literacy and this no doubt affects the learning satisfaction of their students moderately. However, the teachers must diversify their digital focus as Li and Yu (2022) indicated in the findings of their study that teachers who were assigned more tasks during the online teaching process had a decline in their satisfaction and this shows the need for the teachers to engage in other aspect of digitalization and also support their activities with other support resources as this will help to enhance the learning satisfaction of the students they teach.

The study equally showed that teachers' digital safety and security abilities had a low and positive relationship with students learning satisfaction and 11.6% of students learning satisfaction was predicted by the teachers' digital safety and security competence which was also significant at 0.05 level of significance. The digital safety and security of the teachers was a low determinant of the students learning satisfaction and this suggests that the teachers are unable to protect the students in the course of using the digital platforms at their disposal and this may account for why the relationship was low. This is because the regular use of digital tools comes with health challenges and the security of information is also an important part of the safety and security process. If the students are unable to see from the practices of the teacher that their health and information are safe and secured, their satisfaction from this process may be below expectation. In a related study, Rodríguez-García et al., (2022) found that the teachers' gender can still be considered a limitation in the use of ICTs and this implies that there are also personal factors that may play a role in the digital literacy of teachers and school administrators must give this the needed attention in order to promote the students learning satisfaction.

Generally, the entire domains of the teachers' digital literacy measured (content creation, communication and collaboration as well as safety and security) had a moderate and positive relationship with the students learning satisfaction and predicted 38.9.1% of the students learning satisfaction. This result simply points to the fact that the teachers' digital literacy is still at its development stage although the relationship is significant. This finding agrees with the outcome of a similar study carried out by Wordu et al., (2021) which showed that digital communication, digital safety and digital creativity were related with teachers' job performance in universities in Rivers State at low, high and moderately positive levels respectively with values of  $r=0.305$ ,  $r=0.614$  and  $r=0.479$  respectively. These findings point to the fact that there is need to improve on the digital literacy of teachers across all levels of education in order to improve on overall educational outcomes. Study by Lo (2010) indicated that all of these satisfaction factors were associated with higher rates of perceived learning, measured via students' expectations of academic success and as such until when teachers are able to develop the required level of digital literacy, students learning satisfaction and overall educational outcomes may still remain at an average level across all levels of education.

### **Conclusion**

The study concluded based on its findings that teachers' digital communication and collaboration had the moderate effect on students learning satisfaction while digital content creation and safety as well as security had low positive relationship on students learning satisfaction. There was a significant relationship between the dimensions of teachers' digital literacy investigated and students learning satisfaction in the secondary schools in Rivers State.

### Recommendations

The following were recommendations made based on the findings of the study:

1. School administrators should ensure that all teachers related activities in the school are executed over digital platforms as this will help to improve their digital literacy in the long run.
2. Teachers application of digital technology in the school should be adequately monitored in order to ensure digital safety and security of all school personnel in the process of pursuing the actualization of the goals and objectives of education in the school.
3. Adequate digital training should be provided for teachers and students on how to use these emerging technologies as this will help to improve on their digital literacy and promote the learning satisfaction of students as well as meet the educational need of other educational stakeholders in the school.

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