ABSTRACT
This correlational study determined the relationship between the technology leadership competencies of 254 head teachers (headmasters/headmistresses) and ICT integration in the 254 Model Primary Schools in Rivers State. Four objectives with corresponding research questions and hypotheses guided the study. Two instruments were developed for the study namely, Head teachers’ Technology Leadership Competencies Questionnaire and ICT Integration Questionnaire. These instruments were validated by experts in Measurement and Evaluation and Educational Management. A Cronbach’s alpha reliability coefficient of 0.74 was obtained for head teachers’ technology leadership competencies and 0.88 for ICT integration. Data were analyzed using Pearson Product Moment Correlation Coefficient. The findings of the study revealed that head teachers’ articulated vision statements and staff development competencies, have significant relationship with ICT integration in the model primary schools in Rivers State. On the other hand, Head teachers’ planning competencies and infrastructure support competencies have no significant relationship with ICT integration. The study concluded that head teachers’ technology leadership competencies are needed for effective ICT integration in model primary schools in Rivers State. It was recommended that both the Rivers State government and head teachers should articulate clear vision statements about ICT integration. Frequent staff development workshops should be organized to expose the head teachers to Technology Leadership competencies. Funds should be provided to head teachers by government to maintain available ICT facilities and sustain ICT integration in Model Primary Schools.

Keywords: Head teachers, Technology leadership, Competencies and ICT Integration

INTRODUCTION
Technology leadership competencies is the application of leadership skills necessary for school administrators to assist their schools use Information and Communication Technology (ICT) in teaching and learning (Chang, Chin, Hsu, 2008). Yee (2000) defined technology leadership as the ability of Head teachers to manifest technology knowledge, skills and behaviours required for ICT integration in schools. Yee noted that with the influx of current technologies and the availability of computers in schools, head teachers need to prepare themselves to take up the role of technology leaders so as to prepare teachers and students for the future. ICT integration is the incorporation of technology resources into the daily routines and management of schools (National Center for Educational Statistics, 2003). ICT is a tool which can store, manipulate and, retrieve information, and when integrated into teaching has the ability to engage pupils in instructional activities, increase their ability to learn, help them solve difficult problems and improve their cognitive skills (Newby, Stepich, Lehah & Russell, 2011).

Haddad and Draxler (2018) identified five levels of ICT use in education, namely; presentation, demonstrations, drill and practice, communication and collaboration. For presentation, ICTs such as overhead projectors, television, and smart boards when used in teaching promote pupils’ understanding of complex concepts (Trucano, 2005). Teachers can teach difficult topics like stages of
seed germination and geographical phenomena such as volcanic eruption by using videos, which help to bring them to life and make such topics more interesting.

Yildirim (2007) conducted a study to find out the current utilization of ICT by teachers in Turkish basic education schools. Yildirim developed a scale to measure the extent of computer use in schools. The scale covered areas such as using ICT to create handouts, assignment, creating test, grading, evaluation, drill and practice, tutorials and internet search. The study found that teachers use ICT mainly for creating assignment and giving test to pupils. ICT has come to improve the process of instruction in schools; it is therefore the duty of head teachers to model the effective use of ICT for teachers to imitate. Studies have shown that for ICT to be integrated in schools, the role of the head teachers need to change to that of technology leaders (Chang, 2003; Wilmore & Betz, 2000).

Chang, (2003) identified five dimensions of technology leadership namely vision, planning and management; staff development and training, technology and infrastructure support; evaluation, research and assessment of staff; interpersonal and communication skills. According to Chang the aforementioned skills are the head teachers’ core areas in dealing with teaching, learning and administrative operations that involve ICT in schools. They noted that these dimensions or competencies “were drawn from the empirical literatures in principals’ leadership in general and their effectiveness as technology leaders” (Chang, 2012. P. 330). Chang also identified vision as the foundation of technology leadership which gives direction and guidance to teachers for ICT to succeed. It involves the process of defining a mission statement that shows the strategies that will bring about the achievement of pre-determined ICT goals (Niekerk & Molly, 2000). Planning is the process of articulating a formulated vision. It is the various steps that will be taken to carry out the goals of ICT in the school. It also entails the leaders’ assessment of the current state of ICT integration in the school and the ability to make informed decisions through his observations. The technology plans provide a blueprint to the sequence of events the school hopes to achieve. It also outlines how ICT facilities, personnel and funds will be managed.

Staff development is also another variable of technology leadership which is intended to develop and improve skills for present and future roles in ICT integration. It is also learning activities acquired by staff to equip them to use ICT in the school (Tech. in School, 2007). Staff development includes coaching, individualized instructions and observation of ICT integration in practice. The head teachers should be involved in staff development as to develop competencies in the use of the tools and become models of ICT. Technology infrastructural support is another competency needed by school administrators for effective ICT integration, it is defined as the action taken by head teachers to provide teachers with appropriate ICT facilities, and support when needed (Anderson & Dexter, 2000). Availability and access to ICT provide avenue to develop competence in the use of ICT tools. Research shows that schools with high level of ICT integration had higher pupils’ laptop ratio and adequate levels of support (Educational Research, 2008). Anderson & Dexter, (2000) noted that it is the head teachers’ role to provide technology infrastructural support in the school. According to them money spent on technology infrastructure was a factor influencing ICT integration.

**Statement of problem**

In 2008 to 2017, the Rivers State Government establishing 254 model primary schools across the State (Rivers State Universal Basic Education, 2017) and equipped each with ICT facilities. It is one thing to equip a school with ICT facilities and another issue to ensure effective integration of those facilities into teaching and learning. Studies have shown the importance of head teachers’ technology leadership competencies to effective use of ICT (Chang, 2012; Wilmore & Betz, 2000). According to Chang (2012) they apply different strategies such as identification and articulation of technology vision, planning for ICT use, staff development and provision of resources to implement ICT use in schools. It is doubtful if head teachers in model primary schools in Rivers State have the requisite technology leadership competencies to integrate ICT into our primary schools. Hence this study sets to determine the relationship between head teachers’ technology leadership and ICT integration in model primary schools in Rivers State.
Purpose of the study
The main purpose of the study is to determine the relationship between head teachers technology leadership competencies and ICT integration in model primary schools in Rivers State. Specifically the study intends to determine the:

1. Relationship between head teachers’ articulated vision and ICT integration in model primary schools in Rivers State
2. Relationship between head teachers’ planning competencies and ICT integration in model primary schools in Rivers State.
3. Relationship between head teachers’ staff development competencies and ICT integration in model primary schools in Rivers State.
4. Relationship between head teachers’ technology infrastructure competencies and ICT integration in model primary schools in Rivers State.

Research Questions
The study was guided by the following research questions:

1. What is the relationship between head teachers’ well-articulated vision statement and ICT integration in model primary schools in Rivers State?
2. What is the relationship between head teachers’ planning competencies and ICT integration in model primary schools in Rivers State?
3. What is the relationship between head teachers’ staff development competencies and ICT integration in model primary schools in Rivers State?
4. What is the relationship between head teachers’ technology infrastructure competencies and ICT integration in model primary schools in Rivers State?

Hypothesis
The following null hypothesis were formulated and tested in this study:

H₀₁: There is no significant relationship between head teachers’ competencies in articulating vision statement and ICT integration in model primary schools in River State.
H₀₂: There is no significant relationship between head teachers’ planning competencies and ICT integration in model primary schools in River State.
H₀₃: There is no significant relationship between head teachers’ staff development competencies and ICT integration in model primary schools in River State.
H₀₄: There is no significant relationship between head teachers’ technology infrastructure competencies and ICT integration in model primary schools in River State.

METHODOLOGY
The study adopted a correlational design. The population consisted of 254 head teachers in model primary schools in Rivers State. Census technique was used to select the whole population for the study. Two instruments were used in this study, a self-developed questionnaire titled Technology Leadership Competencies Questionnaire (HTLQ). The second instrument was on the integration of ICT in the classrooms by teachers. This instrument was adapted from Centre for the Study of Learning (CSLP). The instrument was titled ICT Integration Questionnaire (ICTIQ) and consist of 19 descriptive items. The responses were based on a four point Likert Scale of Very High Extent (VHE-4); High Extent (HE-3); Low Extent (LE-2); Very Low Extent (VLE-1). The head teachers responded to both instruments. Reliability of the instruments was tested using Cronbach’s Alpha Coefficient. A reliability coefficient of 0.74 was obtained for head teachers’ technology leadership competencies and 0.88 for ICT integration. This coefficient obtained indicates that the instruments were reliable. A total of 254 questionnaires were administered but only 246 head teachers responded to the survey instruments. Data were analyzed using correlation analysis through the application of Statistical Packages for Social Sciences (SPSS).
RESULTS

Research Question 1: What is the relationship between head teachers well-articulated vision statement and ICT integration in model primary schools in Rivers State?

Table 1: Correlation Summary for Relationship between Vision Statement and ICT Integration in Model Primary Schools in Rivers State

<table>
<thead>
<tr>
<th>Correlations</th>
<th>ICT Integration</th>
<th>Vision Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICT Integration</td>
<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.022</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>246</td>
</tr>
<tr>
<td>Vision Statement</td>
<td>Pearson Correlation</td>
<td>.145*</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.022</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>246</td>
</tr>
</tbody>
</table>

*. Correlation is significant at the 0.05 level (2-tailed).

To answer the research question, results from Table 1 produced a correlation coefficient, ‘r’ of 0.145 between Head Teacher Vision Statement and ICT Integration in Model Primary Schools in Rivers State. This means that there is a weak but positive relationship between Head Teacher Vision Statement and ICT Integration in Model Primary Schools in Rivers State.

Hypothesis 1

There is no significant relationship between head teachers’ competencies in articulating vision statement and ICT integration in model primary schools in Rivers State.

To test the hypothesis, r of 0.145 with P (0.022) < 0.05 is significant. Thus, the null hypothesis of no significant relationship was rejected. This implies that there is a significant relationship between Head teachers’ Vision Statement and ICT Integration in Model Primary Schools in Rivers State.

Research Question 2: What is the relationship between head teachers’ planning competencies and ICT integration in model primary schools in Rivers State?

Table 2: Correlation Summary for Relationship between Planning Competencies and ICT Integration in Model Primary Schools in Rivers State

<table>
<thead>
<tr>
<th>Correlations</th>
<th>ICT_Integration</th>
<th>Planning Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICT Integration</td>
<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.073</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>246</td>
</tr>
<tr>
<td>Planning Competencies</td>
<td>Pearson Correlation</td>
<td>.257*</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.073</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>246</td>
</tr>
</tbody>
</table>

*. Correlation is significant at the 0.05 level (2-tailed).

Results from Table 2 produced a correlation coefficient, ‘r’ of 0.257 between Head teachers’ Planning Competencies and ICT Integration in Model Primary Schools in Rivers State. This means that there is a weak but positive relationship between Head teacher Planning Competencies and ICT Integration in Model Primary Schools in Rivers State.

Hypothesis 2

There is no significant relationship between head teachers’ planning competencies and ICT integration in model primary schools in Rivers State.

To test the hypothesis, r of 0.257 with P (0.073) > 0.05 is not significant. Thus, the null hypothesis of no significant relationship was accepted. This implies that there is no significant relationship between Head teachers’ Planning Competencies and ICT Integration in Model Primary Schools in Rivers State.
Research Question 3: What is the relationship between head teachers’ staff development competencies and ICT integration in model primary schools in Rivers State?

Table 3: Correlation Summary for Relationship between Head teachers’ Staff Development Competencies and ICT Integration in Model Primary Schools in Rivers State

<table>
<thead>
<tr>
<th>Correlations</th>
<th>ICT_Integration</th>
<th>Staff Dev_Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICT Integration</td>
<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.496</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>246</td>
</tr>
<tr>
<td>Staff Development Competencies</td>
<td>Pearson Correlation</td>
<td>.496*</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.044</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>246</td>
</tr>
</tbody>
</table>

*. Correlation is significant at the 0.05 level (2-tailed).

Results from Table 3 show a correlation coefficient, ‘r’ of 0.496 between head teachers’ staff development competencies and ICT integration in model primary schools in Rivers State. This means there is moderate positive relationship between head teachers’ staff development competencies and ICT integration in model primary schools in Rivers State.

Hypothesis 3

There is no significant relationship between head teachers’ staff development competencies and ICT integration in model primary schools in Rivers State.

To test the hypothesis, r of 0.496 with P (0.044) < 0.05 is significant. Thus, the null hypothesis of no significant relationship was rejected. This implies that there is a significant relationship between Head Teachers’ Staff Development Competencies and ICT Integration in Model Primary Schools in Rivers State.

Research Question 4

What is the relationship between head teachers’ infrastructure support competencies and ICT integration in model primary schools in Rivers State?

Table 4.4: Correlation Summary for Relationship between Head teachers’ technology Infrastructure Support Competencies and ICT Integration in Model Primary Schools in Rivers State

<table>
<thead>
<tr>
<th>Correlations</th>
<th>ICT_Integration</th>
<th>Infrastructure Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICT Integration</td>
<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.193*</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>246</td>
</tr>
<tr>
<td>Infrastructure Competencies</td>
<td>Pearson Correlation</td>
<td>.193*</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.083</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>246</td>
</tr>
</tbody>
</table>

*. Correlation is significant at the 0.05 level (2-tailed).

Results from Table 4.4 produced a correlation coefficient, ‘r’ of 0.193 between head teachers’ Infrastructure Support Competencies and ICT Integration in Model Primary Schools in Rivers State. This means that there is a weak positive relationship between Head teachers’ Infrastructure Support Competencies and ICT Integration in Model Primary Schools in Rivers State.

Hypothesis 4

There is no significant relationship between head teachers’ infrastructure support competencies and ICT integration in model primary schools in Rivers State.

To test the hypothesis, r of 0.193 with P (0.083) > 0.05 is not significant. Thus, the null hypothesis of no significant relationship was accepted. This implies that there is no significant relationship between Head Teachers’ Infrastructure Support Competencies and ICT Integration in Model Primary Schools in Rivers State.
DISCUSSIONS OF FINDINGS

Research question 1: What is the relationship between head teachers’ well-articulated vision statement and ICT integration in model primary schools in Rivers State?

The study found a weak but positive relationship between head teachers’ well-articulated vision and ICT integration in model primary schools in Rivers State (r of 0.145). The positive relationship suggests that vision competencies which involve having a vision statement for the school, involving teachers in making the vision and clearly articulating the vision, positively relate to teachers’ effective use of ICT in teaching and learning. The relationship was found to be weak; this could be the inability of some head teachers to articulate a shared compelling vision of ICT use in their schools. This finding is in agreement with Samancioglu, et al (2015) who discovered a weak but positive relationship between the vision sub-dimension of technology leadership and teachers’ ICT integration in their study. Chang (2012) argued that school administrators should develop a shared vision of ICT and articulate the vision among stakeholders for effective integration of ICT in teaching and learning. The tested hypothesis showed significant relationship between head teachers’ technology leadership competencies in articulating vision and ICT integration in model primary schools in Rivers State. As shown in table 4.1b, r of 0.145 with p (0.022) <0.05. The null hypothesis of no significant relationship was rejected. This implies that there is a significant relationship between vision and ICT integration in model primary schools in Rivers State. It could be deduced that an improvement in head teachers’ technology leadership could bring an improvement in teachers’ ICT integration in model primary schools in Rivers State.

Research question 2: What is the relationship between head teachers’ planning competencies and ICT integration in model primary schools in Rivers State?

The study found a weak but positive relationship between head teachers’ planning competencies and ICT integration (r of 0.257). The findings were in agreement with Chang (2012) and kolsovic (2007) who acknowledge the importance of planning to ICT integration in schools. There is therefore need to improve the planning competencies of head teachers for a better instructional performance of teachers using ICT.

The tested hypothesis revealed a non-significant relationship between head teachers planning competencies and ICT integration. Table 2 revealed r of 0.257 with p (0.073)> 0.05. Thus, the null hypothesis was accepted. The non-significant relationship could be that the head teachers were not competent in planning for ICT integration in their schools. This finding corroborate with the findings of Chang (2012) and Lafont (2011) who found no significant relationship between head teachers’ planning competencies and ICT Integration. Yee (2000) believes that a leader who implements technology plans and share a common ICT vision with the teachers stimulate them to integrate it in teaching.

Research question 3: What is the relationship between head teachers’ staff development competencies and ICT integration in model primary schools in Rivers State?

The study found a moderate positive relationship between head teachers’ staff development competencies and ICT integration. (r of 0.496) The findings of this study are in line with the views of Chang (2012) who noted that staff development is crucial to prepare teacher for effective integration of ICT. The tested hypothesis revealed a significant relationship between head teachers’ staff development and ICT integration in model primary schools in Rivers State. Table 3 shows that r of 0.496 with p (0.044) < 0.05 is significant. Thus, the null hypothesis was rejected. This finding is consistent with the findings made in previous study by Arumugam, et al, (2014) that discovered significant relationship exist between staff development and ICT integration. These results disagree with the findings of Lafont (2011) and Page-Jones (2009) who found that there was no significant relationship. The significant relationship found implies that head teachers’ staff development competencies are needed for effective ICT integration in model primary schools.

Research question 4: What is the relationship between head teachers’ infrastructure support competencies and ICT integration in model primary schools in Rivers State?

The study found a weak but positive relationship between head teachers’ technology infrastructure support competencies and ICT integration. (r of 0.193). The weak relationship could be as a result of the head teachers’ inability to provide support for ICT integration in their schools. These findings collaborate with the findings of Samanicoğlu et al, (2015) who found a weak and positive relationship between infrastructure support and ICT integration. Table 4.4b revealed r of 0.193 with p (0.083) >
0.05 is not significant. Thus the null hypothesis of no significant relationship was accepted. Previous studies discovered school administrators’ infrastructure support a predator of ICT integration in schools (Polizzi, 2011; Chang, 2012). According to Polizzi (2011) school administrators’ infrastructure support for ICT integration is a product of the amount of ICT facilities available. In other words, support for ICT is a predictor of teachers’ ICT integration.

CONCLUSION
Based on the findings made, the researcher concludes that the effective articulation of a unifying vision by the Head teachers will determine the level of ICT integration in model primary schools in Rivers State. Therefore, Head teachers should involve teachers and school stakeholders in developing the schools’ ICT vision. A well stated vision will give teachers direction and guidance on how to go about the integration of ICT in the classroom. Technology plans are needed for effective integration of ICT in model primary schools in Rivers State. Head teachers should develop planning competencies that are in line with the ICT vision. Head teachers’ infrastructure support will assist and encourage teachers to continuously use ICT in instruction. Support could come in the form of funds from PTA or from wealthy individuals in the community where the school is located. The school head teachers are expected to figure out how to go about it.

RECOMMENDATIONS
Based on the findings, the following recommendations were made:

1. Head teachers should articulate clear vision statements about ICT integration.
2. The ministry of education should organize regular ICT staff development programs for school administrators and teachers to equip them with skills for ICT integration.
3. Head teachers should develop means of obtaining funds to sustain on-going ICT programs in their schools.

REFERENCES


