Teachers’ and Learners’ ICT-Readiness Assessment for Agricultural Science Instruction in Oyo State, Nigeria

EGUNJOBI, A. OLUSEGUN Ph.D
CENTRE FOR EDUCATIONAL MEDIA RESOURCE STUDIES, FACULTY OF EDUCATION,
UNIVERSITY OF IBADAN, NIGERIA

Abstract
This study investigated the teachers’ and learners’ ICT-readiness assessment for agricultural science instruction in secondary schools in Oyo State, Nigeria. However, the sample population of 30 and 600 agricultural science teachers and learners were randomly selected respectively from 15 public and 15 private senior secondary schools (SSS) in Ibadan North Local Government Area (LGA) of Oyo State, Nigeria. Descriptive survey design of ex post-facto type was adopted for the study. Two structured questionnaires tagged Teachers’ and Learners’ Questionnaires on ICT-Readiness for Agricultural Science Instruction (TQICTRASI) and (LQICTRASI) respectively were used for data collection. The two questionnaires were subjected to Cronbach Alpha Coefficient with the results 0.86 and 0.82 respectively. Five hypotheses were tested in the study at 0.05 level of significance. Findings revealed that teachers in private SSS were more ready and prepared to utilise ICT facilities for agricultural instruction than their counterparts in public SSS with the result t-value = 4.25 greater than t-critical = 2.77, df = 28 at p<0.05. Also, learners in private SSS were more prepared and ready for the utilisation of ICT-facilities for agricultural science instruction with the result t-value = 3.51 greater than t-critical = 1.98, df = 598 at p<0.05. However, male and female learners in both private and public SSS were equally prepared and ready for the ICT-facilities utilisation for agricultural science instruction thus there were no significant differences in their ICT-readiness. Therefore, the study proffered that, both male and female teachers and learners should be more ICT-compliant and always ready to upgrade their skills and knowledge in ICT-facilities, utilisation for agricultural science instruction and even for other school subjects particularly in Oyo State and generally in Nigeria.

Key words: ICT-readiness, Teachers’ and learners’ assessment, Private and public senior secondary schools, Agricultural science instruction

1. Background to the Study
ICT (Information and Communication Technology) is now the “in-thing” globally in all human endeavours most especially in the instructional process. In the institutional process, ICT involves the use of multimedia and e-learning. Multimedia technology affords teachers and students a lot of opportunities for effective teaching-learning outcomes. E-learning is an example of the use of these ICT-supported teaching and learning techniques whose use in educational institutions is gaining momentum with the passage of time (Omwenga, 2012).

Multimedia is a carefully woven combination of text, graphic, art, sound, animation and video elements. It is an integration of multiple media elements (audio, video, graphics, texts, animation, etc) into one synergetic and symbolic whole that results in more benefits for the end user than any of the media elements can provide individual. This device if use in agricultural science instruction in the teaching learning process is expected to boost the learners’ performance at public examinations.

The benefits of ICT-facilities for learners in agricultural science instruction include; learners

• can learn at their own pace. They can learn according to their abilities in terms of time and rate of assimilation. Programmes like simulation for example, allow teachers to show experiments that would not otherwise be possible, and have great educational potential to enhance teaching (McFarlane and Sakellariou, 2010).

• have different best time for learning. Individual learner like slow and fast learner as well as their individual learning styles are taken care of by the differentiation of learning afforded by multimedia. Furthermore, ICT can be linked to specific needs of learners. Desisting from the “one size fits all” approach (Leach, 2009). It is most effectively used as learner-entered tool, instead of within a more traditional pedagogy.

• are free from impatient teachers. This is because they have access to other forms of learning.

• are saved from vacuum created because there are frequent transfers or inadequate numbers of teachers at schools. This is severe in schools located in rural areas and in difficult subjects like physics, mathematics etc. Schools located in urban areas lack adequate space for meaningful practical in
agricultural science instruction. This situation can be ameliorated via the use of ICT-facilities (Leach, 2009).

- can undertake learning actively and receive desired feedback. This is in agreement with the findings of Slaouti and Barton (2008) which reported that ICT can motivate students in their learning by bringing variety into the lessons, and at the same time, sustaining teachers’ own interest in teaching.

The benefits of ICT-facilities to teachers in agricultural science instruction are also numerous and they include:

- **Allows for creativity.** The teacher has access to several methods he/she can use to pass instruction to his/her learners. He/she chooses the one he/she deems best to teach after weighting the entry point of the students.

- **Saves time.** In as much as the learners have access to the lesson even in the absent of the teacher, the teacher therefore have more time to concentrate on the all important task of solving more difficulty topics.

- **Ineffective learning activities are replaced.** Both the teacher and learners have no reason for irrelevancies occasioned by the face-to-face and chalk-talk method. Hence there is ample time for quality and effective for quality and effective lesson. Closely related to this is the need to acquire necessary skills to use effectively the multimedia facilities. Cox, Preston and Cox (2009) stated that the factors contributing to ongoing use of ICT by teachers include: making lessons more interesting, more enjoyable for teachers and their students, more diverse, more motivating, and supportive of productive learning. Overall, it is clear that the psychological factors of a teacher’s own beliefs and attitudes to ICT and pedagogical innovation are both primary facilitators and barriers to teacher use of technology in the classroom. There are difficulties in the use of ICT-facilities in classrooms.

There is the need for continuous acquisition of skills by teachers. In addition, obstacles such as access to equipment, time pressure, lack of mentor and opportunities for apprenticeship of observation also have an impact on teachers’ ability to use ICT (Slaouti and Barton, 2008). Furthermore, teachers’ workload and time management was found to be inhibiting the implementation of computer instruction in classroom. While, there is a great deal of studies about how ICT is being used in developed countries, there is not much information on how ICT is being integrated into schools in developing countries (Beukes-Amiss and Chiware, 2010). However, teachers are required to decide how to make appropriate educational use of ICT in the classroom, where there are no longer lecture-based or didactic teaching methods in classrooms any more. In other words, teachers need to upgrade their skills and knowledge in the field of ICT as well as in other subjects. It is important teachers and government see the need for skills acquisition to effectively use the technology created by multimedia in the teaching process. This training would be better, achieved through professionalisation. According to Giwa, (2011) professionalisation ensures that only professionally qualified teachers are allowed to teach in Nigeria. However, teachers need to be trained in following areas: (a) personal skills in use of ICT, (b) professional skills and competence in ICT, such as understanding the relevance of ICT in education, understanding the importance of ICT in teaching and learning, understanding how to plan ICT for teaching and learning across the curriculum, and managing ICT in the classroom is vital. He opined further that, educating teachers in effective use of ICT in the classroom needs to start from the pre-service education. In this regard Maeers (2009) expressed that student teachers need to know about ICT and about what ICT can provide. They also need to be able to critically evaluate and discriminate what (technological) resource to use, and whether one should be used at all. They need to be able to understand conceptually and in pedagogically-appropriate ways, how, where and why to use computer related technologies’. This in agricultural science will ensure that students and teachers of private and public SSS enjoy effective agricultural science instruction and in particular boost performance in public examinations by students. Other advantages of professionalisation include:

It ensures that teachers undergo periodic re-training through in-service course. The pedagogy of teachers need to be improved to enhance the use of many new teaching-learning styles. Therefore, the role of teacher at this point is vital. It is known that teachers do not have time to thoroughly evaluate the educational strengths and weaknesses of a considerably portion of the existing curriculum materials, software and texts before they are used (Giwa, 2011). Ya’acob (2010) has suggested, training should be offered to teachers on a continuous, rather than a one-off, basis so that their IT knowledge is upgraded over time. This is in agreement with previous studies which found teachers’ attitude toward computers as a key factor in predicting the frequency of technology use (Becker, 2005; Zhao and Frank, 2007). The finding is consistent with the findings of previous study which concluded that teachers who are more competent in using computers have also more favorable attitudes towards computer (Sa’ari 2005 and Jegede, 2007). A lot of teachers of agricultural science hardly see the relevance of ICT-facilities in agricultural science instruction. There is need to train them in this
These include upgrading the curricula and science instruction to include ICT-facilities for teachers and students. This will improve practical training in Nigeria the giant of Africa should not be left behind. There is need to fine-tune our curriculum in agricultural increasing the research component in education (Schware & Jaramillo, 1998). Some countries have done this and agriculture particularly for senior secondary schools in urban areas. In Turkey, there have been tremendous instructional materials, revising students' achievement tests, improving the teacher training system, and retention, and are better motivated to learn when work with computers. The gains notwithstanding, we need to...
curricula revised and a new department in education facilities created. In the new programmes, courses about Information and Communication Technology and its uses in teaching and learning will be provided to improve the quality of teachers. In short, the curriculum of each ITE programme was reformed, from theory-laden course to more practice-based courses (Alev, 2003).

In Nigeria, the provision of the national curriculum has it that:

1. Each student be guaranteed adequate equipment. Farm space (plot), farm structures and regular supply of inputs e.g. fertilizers, animal feeds etc.
2. Students achievement should be continuously assessed through various forms of tests and during field and laboratory practical, field trips/executions.
3. Individual assessment should be carried out for activities in crop production while group assessment be restricted to performance in animal production activities.

The study of agricultural science at the senior secondary school is expected to cover the following areas:

1. Pigs, rabbit and poultry production
2. Goats, sheep and cattle and where feasible, fish pond.

Others areas to be covered include practical notebooks, weed album, insects boxes, field trips, and records of specimen collected. Agricultural science involves psychomotor skills even in traditional education is not limited to general education alone, it is also vocational oriented.

2. Statement of the Problem

ICT is now in vogue in all human endeavours. Therefore, education cannot be left out Nigerian teachers, and learners should be ready to be ICT complaint and in fact techno-phile to be able to cope with the global trend in instructional process. In the light of this, this study investigated the ICT-readiness of teachers and learners assessment for agricultural science instruction in public and private senior secondary schools in Oyo State, Nigeria.

3. Research Hypotheses

The following hypotheses were tested in this study at 0.05 level of significance.

HO1: There is no significant difference in the ICT readiness for agricultural science instruction between teachers in public and private senior secondary schools (SSS).

HO2: There is no significant difference in the ICT readiness for agricultural science instruction between learners in public and private SSS.

HO3: There is no significant difference in the ICT readiness for agricultural science instruction between teachers and learners in public and private SSS.

HO4: There is no significant difference in the ICT readiness for agricultural science instruction between male and female teachers in public and private SSS.

HO5: There is no significant difference in the ICT readiness for agricultural science instruction between male and female learners in public and private SSS.

4. Methodology

4.1 Research Design

Descriptive survey design of the ex-post-facto type was adopted in this study because the variables investigated were all ready in existence viz: ICT – readiness of teachers and learners, gender and school type. No variable was manipulated in the study.

4.2 Population and Sampling Technique

The target population for this study consisted of all public and private senior secondary school two agricultural science teachers and learners in Ibadan North Local Government Area (LGA) of Oyo State, Nigeria. However, the sample population of 30 and 600 agricultural science teachers and learners respectively were purposively and randomly selected respectively from 15 public and 15 private SSS within the LGA used for the study. They consisted of both male and female teachers and learners.

4.3 Instruments

Two structured questionnaires tagged Teachers’ and Learners’ Questionnaires on ICT Readiness for Agricultural Science Instruction (TQICTRASI) and (LQKICTRASI) respectively were used for data collection. Each questionnaire was designed in two sections A and B. Section A deals with respondent’s bio-data viz: school type Private/Public, sex (male/female), age and religion while Section B consists of items on ICT-
readiness of the respondent. Both questionnaires were developed on 4 likert format of Strongly Agree, Agree, Disagree and Strongly Disagree, (SA, A, D, SD). The TQICTRAFI consists of 40 items while, LQKICTRAFI is made up of 34 items.

4.4 Validation and Reliability of Instruments

The experts in ICT, educational technology and agricultural science gave the two questionnaires thorough and proper scrutiny to establish their face and content validity. Based on their criticisms and suggestions, items in the two questionnaires were modified, thus making them suitable and appropriate for the study. However, the reliability of the two questionnaires were carried out on sample of 20 and 40 agricultural science teachers and learners respectively, apart from those used for the main study. The data collected were analysed using Cronbach Alpha coefficient with the results 0.86 and 0.82 respectively which were found reliable and appropriate for the study.

4.5 Data Collection Procedure

The two questionnaires were distributed to the agricultural science teachers and learners in the schools used for the study through the help of research assistants who were already been orientated on how the questionnaires will be filled. The data collection was done within six weeks.

5.0 Data analysis and Discussion of Findings

5.1 Data Analysis

HO1: There is no significant difference in the ICT readiness for agricultural science instruction between teachers in public and private senior secondary schools (SSS).

Table 1 shows the findings.

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>DF</th>
<th>t-value</th>
<th>t-critical</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trs in Public SSS</td>
<td>15</td>
<td>61.30</td>
<td>7.30</td>
<td></td>
<td>4.25</td>
<td>2.77</td>
<td>*</td>
</tr>
<tr>
<td>Trs in private SSS</td>
<td>15</td>
<td>68.66</td>
<td>5.51</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significant at P <0.05

Table 1 reveals the significant difference in the ICT-readiness of teachers for agricultural science instruction in public and private SSS with the result t-value = 4.25 greater than t-critical = 2.77, Degree of Freedom (DF)=28, at P<0.05. This implies that, teachers in private SSS were more prepared and ready for ICT-facilities utilisation for agricultural science instruction than their counterparts in public SSS. Therefore, this hypothesis was rejected.

HO2: There is no significant difference in the ICT readiness for agricultural science instruction between learners in public and private SSS.

Table 2 presents the finding.

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>DF</th>
<th>t-value</th>
<th>t-critical</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learners in Public SSS</td>
<td>300</td>
<td>60.50</td>
<td>9.50</td>
<td></td>
<td>3.51</td>
<td>1.98</td>
<td>*</td>
</tr>
<tr>
<td>Learners in Private SSS</td>
<td>300</td>
<td>90.61</td>
<td>6.52</td>
<td>598</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significant at P <0.05

Table 2, indicates a significant differences in the ICT-readiness of learners for agricultural science instruction in public and private SSS with the result t-value=3.51 greater than t-critical = 1.98, Degree of Freedom (DF) = 598 at P<0.05. This connotes that, learners in private SSS were more prepared for the utilisation of ICT facilities in agricultural science instruction than their counterparts in public SSS. Hence, this hypothesis was rejected.

HO3: There is no significant difference in the ICT readiness for agricultural science instruction between teachers and learners in both public and private SSS.

Table 3 presents the finding.
Table 3: T-test Comparison of ICT – Readiness for Agricultural Science Instruction of Teachers and Learners in Public and Private SSS

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>DF</th>
<th>t-value</th>
<th>t-critical</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trs in both public and private SSS</td>
<td>30</td>
<td>55.25</td>
<td>4.20</td>
<td>628</td>
<td>1.12</td>
<td>1.96</td>
<td>NS</td>
</tr>
<tr>
<td>Learners in both public and private SSS</td>
<td>600</td>
<td>56.31</td>
<td>4.25</td>
<td>628</td>
<td>1.12</td>
<td>1.96</td>
<td>NS</td>
</tr>
</tbody>
</table>

NS: Not Significant at P <0.05

Table 3 shows no significant difference in teachers’ and learners’ ICT-readiness for agricultural science instruction in both public and private SSS with the result t-value 1.12 less than t-critical = 1.96 Degree of Freedom (DF) = 628 at P<0.05. This means that, both teachers and learners in public and private SSS were ready and prepared for the utilisation of ICT-facilities in agricultural science instruction. Therefore, the hypothesis was not rejected.

HO4: There is no significant difference in the ICT readiness for agricultural science instruction between male and female teachers in both public and private SSS.

Table 4 shows the finding.

Table 4: T-test Comparison of Male and Female Teachers’ ICT Readiness for Agricultural Science Instruction in Public and Private SSS

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>DF</th>
<th>t-value</th>
<th>t-critical</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male Trs in both Public and Private SSS</td>
<td>15</td>
<td>52.31</td>
<td>3.41</td>
<td>28</td>
<td>2.10</td>
<td>2.77</td>
<td>NS</td>
</tr>
<tr>
<td>Female Trs in both Public and Private SSS</td>
<td>15</td>
<td>51.41</td>
<td>3.31</td>
<td>28</td>
<td>2.10</td>
<td>2.77</td>
<td>NS</td>
</tr>
</tbody>
</table>

NS: Not Significant at P <0.05

Table 4 indicates no significant difference between male and female teachers’ ICT-readiness for agricultural science instruction with the result t-value 2.10 less than t-critical = 2.77, Degree of Freedom (DF) = 28, at P<0.05. This implies that, both male and female teachers were ready and prepared for the ICT-facilities utilisation in agricultural science instruction in both public and private SSS. Thus, this hypothesis was not rejected.

HO5: There is no significant difference in the ICT readiness for agricultural science instruction between male and female learners in both public and private SSS. Table 5 presents the finding.

Table 5: T-test Comparison of Male and Female Learners’ ICT-Readiness for Agricultural Science Instruction in Public and Private SSS

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>DF</th>
<th>t-value</th>
<th>t-critical</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male learners in public and private SSS</td>
<td>300</td>
<td>53.21</td>
<td>4.45</td>
<td>598</td>
<td>1.34</td>
<td>1.98</td>
<td>NS</td>
</tr>
<tr>
<td>Female learners in public and private SSS</td>
<td>300</td>
<td>52.61</td>
<td>4.31</td>
<td>598</td>
<td>1.34</td>
<td>1.98</td>
<td>NS</td>
</tr>
</tbody>
</table>

NS: Not Significant at P <0.05

Table 5 reveals no significant difference in the ICT-readiness of male and female learners for agricultural science instruction in both public and private SSS with the result t-value = 1.34 less than t-critical = 1.98, Degree of Freedom (DF) = 598 at P<0.05. This shows that, both male and female learners in public and private SSS were ready and prepared for the ICT-facilities utilisation in agricultural science instruction. Therefore, this hypothesis was not rejected.

5.2 Discussion of Findings

Findings showed that, there were no significant differences in ICT-readiness of male and female teachers and learners in both public and private SSS for agricultural science instruction. These imply that, both male and female teachers and learners were already and prepared for the utilisation of ICT facilities in agricultural science instruction in both public and private SSS. That is, such ICT facilities as computer sets, television sets, radio sets, cell phones among others are available in their schools and they are ready to use them for the teaching and learning of agricultural science to enhance their learners’ performance and foster teacher’s
presentation. These findings corroborate that of Egunjobi and Awodele (2012) and Lawal (2006) that there is gender imbalance in the use of ICT worldwide even for educational purposes. Therefore, there is the need to address this situation so as to facilitate the girl child education via ICT. For instance, Nigeria is confronted with a persistent problem in girls’ education, principally in the northern and rural areas, because of traditional beliefs and roles reserved for girls in the family and religious set-ups.

Findings also indicated that there were significant differences between the teachers’ and learners ICT readiness in public and private SSS for agricultural science instruction. That is, teachers and learners in private SSS were ready and fully prepared to utilise ICT-facilities than their counterparts in public SSS due to the availability of the facilities in the private SSS coupled with the training they might received in using these facilities. The findings support that of Egunjobi and Oseni (2011) and Wasiu (2012) that, most private senior secondary schools in Nigeria are more ICT-compliant and even friendly than their public counterparts. In fact, the former teachers and learners are more techno-phile and ICT-compliant than the latter.

6. Conclusion
Based on the findings of this study, the following could be deduced.

Teachers and learners in the private senior secondary schools (SSS) are more prepared and fully ready for ICT-facilities utilization for agricultural science instruction than their counterparts in public SSS in Oyo State, Nigeria. Moreover, findings revealed that, teachers and learners in the private SSS had acquired skills for ICT facilities utilisation more than their counterparts in public SSS. Such skills include the use of electronic interactive board, power point presentation, among others.

Findings also showed that, gender has no influence on ICT readiness of teachers and learners in both private and public SSS in Oyo State. That is, both male and female teachers and learners are ready and prepared for ICT facilities utilisation for agricultural science instruction in the State.

7. Recommendations
The following recommendations are proffered based on the findings of this study:

- Authorities in both public and private secondary schools in Nigeria should make provision for ICT facilities and in fact, internet connectivity in their schools for both teachers and students’ utilisation.
- Teachers and learners in both public and private secondary schools in Nigeria should be ready to be ICT-compliant by acquiring skills in ICT-facilities utilisation for instruction
- Government should make adequate provision for ICT facilities procurement at reasonable and affordable prices in the country for schools, teachers and students.
- All stakeholders in education viz: parents, Non Governmental Organisations, well-to-do individuals in the society and network providers (MTN, Airtel, Visafone, Etisalat, Glo etc) should also contribute their quota to the provision of adequate functioning and effective ICT-facilities for institutions in Nigeria at all levels (primary, secondary and tertiary).

REFERENCES


Leach, J. (2009). Do New Information and Communication Technologies have a Role to Play in the Achievement of Education for all?


The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage: http://www.iiste.org

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: http://www.iiste.org/journals/ All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: http://www.iiste.org/book/

Academic conference: http://www.iiste.org/conference/upcoming-conferences-call-for-paper/

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digital Library, NewJour, Google Scholar