

**AGRICULTURAL SCIENCE TEACHERS' CONSTRAINTS TO
UTILIZATION OF DIGITAL INSTRUCTIONAL TOOLS IN SECONDARY
SCHOOLS IN EBONYI STATE, NIGERIA**

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Abstract:

The study investigated the constraints to agricultural science teachers' utilization of digital instructional tools in secondary schools in Ebonyi State. The study adopted descriptive survey research design. The population of the study comprised of all the agricultural science teachers in public secondary schools in the study area. A sample size of 120 respondents was used for the study. A well-structured and pre-tested questionnaire was used for data collection. Data was analyzed using percentages, mean and standard deviation. Findings revealed that digital instructional tools are available. Majority of the teachers are not competent in the use of digital instructional tools such as google classroom, electronic white boards, web pages, simulation. Constraints to utilization of digital instructional tools include: lack of computer laboratories, low funding of education, insufficient time allocated to teaching of agricultural sciences, dilapidated school structure, low teachers incentives among others. Recommendations made based on the findings include: government to increase funding of education; provision of incentives to motivate teacher; rehabilitation of schools structures and regular training of teachers and provision of power supply to schools.

Key words: Digital tools, teachers, constraints and utilization.

Background of the Study

Teachers have been saddled with the responsibility to equip students to observe and solve problems for the society through effective teaching and learning. It is noted that necessary materials and skills required to perform the vital task of imparting knowledge are rarely provided, evidenced from students abysmal performance in recent years (Aniaku, 2012). According to Agharuwhe (2013), teachers had to revert to lecture method resulting to decline in students' performance in most science subjects particularly Agricultural Science. Teachers ought to possess a good content of the subject area with innovative pedagogies; be a classroom manager and outstanding communication skills (Simmin et al, 2015).

Technology is an effective tool for stimulating activities for learners. The use of digital tools in classroom shows a real learning experience that increases learner's responsibility (Idika, Orji, Bichene & Oke, 2021). In the last two decades, different technologies have become more available and accessible for teachers leading to the development of new digital instructional tools to support teaching and learning. Consequently, government initiatives and training programmes have been presented to facilitate the process of digitalization in secondary schools (Life Long Learning Strategy in Estonia, 2020).

The need for teachers' development in using digital resources as a means to bridge the knowledge gap in teaching need to be emphasized in these recent times. According to Eady and Lockyer (2013), agricultural science teachers' use of digital resources for a variety of

purpose include introduction of teaching method, instructional aids, access to different information, personal learning among others. However, while availability of the hardware and software for education may be widespread, the utilization of these tools in practice of teaching is still uneven (Idaka & Ukpong, 2012).

Problem Statement

Despite the potentials of integrating digital instructional tools to enhance teaching and learning of agricultural science, research has shown that teachers have limited understanding in the effective utilization of the innovation (Oguguo, Ezechukwu & Offor 2023). The result of the 2018 OECD Teaching and Learning International Survey revealed a high need for teachers training in technology related skills and that only 43% of teachers are prepared to use technology in teaching . Belay, Khatete & Mugo (2020) observed that most agricultural science teachers avoid the use of modern technological pattern in instructional delivery. The challenge could lie on knowing how to use digital tools to “transform learning into a normal act of everyday life.

The assumed lack of digital competence among teachers has necessitated a lot of questions on what would have been other factors for the non utilization of digital learning tools. Sibanda, Mapenda & Furusa (2016), noted that assumptions that may be beyond the professional capacity of teachers may prevent them from the efficient transition from talk-and-chalk approaches to digital technology integrated learner centered approaches, which require the acquisition of skills. Learner centeredness and digital technological practice make the learner a continuous point of reference and grows their proficiency (Idaka & Ukpong ,2020).

The effect was that the educational systems were bereft of the globally appreciated best practices. For example, during the COVID19 pandemic, all schools were shut down without any learning activities occurring because we are still tied to the traditional pedagogical method of instruction. The research is poised to assess the constraints faced by agricultural science teachers in the utilization of digital instructional tools like zoom, google classroom, video clips and power point in secondary schools in Ebonyi State.

Purpose of the Study

The main purpose of the study was to find out the constraints faced by agricultural science teachers in utilizing digital instructional tools in secondary schools in Ebonyi State. Specifically, the study sought to:

- i. examine the availability of digital tools in secondary schools;

- ii. identify the competences of agricultural science teachers in the utilization of digital instructional tool;
- iii. determine the challenges facing agricultural science teachers in utilizing digital instructional tools in the study area and

Significance of the Study

Result of this study would be beneficial to teachers, educational development agencies, policy makers and governmental organizations by revealing the existing challenges to the use of digital tools in teaching and learning. The understanding of the effect of this situation in the study area would provide an empirical guide for identifying the gap and the intervention required towards achieving better learning outcomes in the field of agricultural science. Information derived from this research will serve as a feedback to researchers to proffer valuable prospects for efficiency, pointing out direction for sustainability.

Scope and Limitation of the Study

This study will specifically be carried in secondary schools in Ebonyi State Nigeria.

Research Questions

The following research questions were raised for the study:

- i. what are the available digital instructional tools in secondary schools ?
- i. what are the competences of teachers in utilizing digital instructional tools?
- ii. what are the constraints faced by agricultural science teachers in utilizing digital instructional tools in secondary schools?
- ii. what are the possible solutions to the constraints faced by teachers in utilizing digital instructional materials?

Materials and Methods

The design adopted for this study was descriptive survey. The population of the study was made up of all the agricultural science teachers in government secondary schools in Ebonyi state totaling one hundred and twenty (120). The entire population was used as the sample due to its manageable size. The instrument for data collection was structured and pre- tested questionnaire containing adequate information on the challenges of agricultural science teachers in the utilization of digital tools in teaching and learning. The instrument was face and content validated by experienced agricultural education lecturers in Alex Ekwueme

Federal University Ndufu Alike, Ikwo and Ebonyi State University Abakaliki. The experts vetted the instruments and made useful that led to its improvement.

Reliability of the instrument was established through test and retest technique. The trial testing was done in one the educational zones. The instrument was structured four rating scale of highly competent, moderately competent, somehow competent and not competent. Data was analyzed using percentages, means and standard deviation.

Result and Discussions

The findings of the study based on the research questions were presented below:

Research Question 1: What are the available instructional tools used for teaching in Secondary Schools?

Table 1: Mean rating and standard deviation available digital instructional tools used in teaching Agricultural Science in Secondary Schools.

S/N	Item	X	SD	DECISION
1.	Google classroom	2.68	0.84	Accept
2.	Internet based resources	2.59	0.92	Accept
3.	Simulation	2.81	0.74	Accept
4.	Games	1.75	0.72	Reject
5.	Padlet	2.44	0.70	Reject
6.	Web pages	2.56	1.01	Accept
7.	Electronic white board	2.54	0.97	Accept
8.	Socrative	1.76	0.84	Reject
9.	Quizizz	2.78	0.98	Accept
10.	Edpuzzle	2.69	0.76	Accept
11.	Rahoot	1.86	0.88	Reject

X = Mean; SD = standard deviation

Source: Field Survey, 2026

Table 1 Showed that seven of the items scored above 2.5 which implied teachers accepted the availability of those digital tools in teaching Agricultural Science. The remaining items received means responses below 2.5.

Research Question 2: What are the competences of agriculture science teachers in utilization of digital instructional tools in secondary schools in Ebonyi State?

Table 2: Simple percent analysis of competence of agriculture science teachers in utilization of digital instructional tools

Competency Measure	No of respondents	Percentage
Highly competent	5	4.72
Moderately competent	20	16.7
Somehow competent	35	29.1
Not competent	60	50
	120	100

Field Survey, 2026

HC= Highly Competent, MC= Moderately Competent, SC= Somehow Competent, NC = Not competent

The result in table 2 showed that five (5) respondent representing 4.7% noted that they are highly competent in the use of digital instructional tools in secondary schools. Twenty (20) representing 16.7% noted that they are moderately (35) representing 29.1% noted that they are somehow competent while sixty (60) representing 50% agreed that they are not competent in the use of digital instructional tools in secondary school. This implies that agricultural science teachers in Secondary schools are not competent in the use digital instructional tools.

Research Question 3

What are challenges hindering the utilization of digital instructional tools by agricultural science teachers I secondary schools in Ebonyi State?

Table 3: Mean rating and standard deviation of teachers of Agricultural Sciences on constraints faced by teachers in utilizing digital instructional tools in teaching agricultural science in Secondary schools.

S/N	ITEMS	$\bar{X}$	SD	DECISION
1.	Insufficient time to prepare and use digital content	2.51	1.07	Accept
2.	Lack of computers and other digital instructional materials	3.26	0.90	Accept
3.	Low computer literacy skills of Agricultural science teachers	2.58	1.09	Accept
4.	Underfunding of education from government	3.62	0.58	Accept

5.	Inadequate digital training for teachers	2.63	1.03	Reject
6.	Lack of power supply (electricity) in schools	2.61	0.97	Accept
7.	Teachers low incentives to afford a computer	3.53	3.53	Accept
8.	Lack of functional computer laboratory	2.24	1.04	Reject
9.	Inadequate finance for internet subscriptions	2.34	1.08	Reject
10.	Lack of internet facilities in schools	3.29	0.92	Accept
11.	Poor/dilapidated school infrastructure	2.75	1.0	Accept
	Total	2.85	0.92	Accept

X = Mean; SD = Standard Deviation.

Source: Field Survey, 2026

Results in table 2 above shows that items in 1,2,3,4,6,7,10 and 11 were accepted by the correspondents that they are constraints hindering utilization of digital tools in teaching and learning of agricultural science in Ebonyi State. While the respondents rejected items 5, 8 and 9 that they are not major constraints in utilizing digital tools in teaching agricultural science in Ebonyi State. The grand mean value of 11 items is 2.85 with a standard deviation of 0.92. Since the grand mean (2.85) is higher than the 2.5 benchmark, it is therefore accepted that that items 1-11 are the challenges of utilizing digital instructional tools by agricultural science teachers in Ebonyi State.

Research Question 4: What are the possible solutions to the constraints of utilizing digital instructional tools by agricultural science teachers in secondary schools in Ebonyi State?

Table 4: Mean rating and Standard deviation score of teachers of Agricultural Sciences on possible solutions to the constraints to utilization of digital instructional tools in teaching agricultural science in secondary schools in Ebonyi State.

S/N	ITEMS	$\bar{X}$	SD	DECISION
1.	Allocation of enough time for teaching Agricultural Science	3.17	0.71	Accept
2.	Provision of computers and computer laboratories in public secondary schools in the state	2.68	0.05	Accept
3.	School management should organize regular seminars, workshop and conference for teachers.	2.69	1.12	Accept
4.	Provision/improvement of power supply in public	3.32	0.58	Accept

	secondary schools			
5.	Increase teacher's incentives to afford personal computers.	2.47	1.24	Reject
6.	Government to increase the funding of education	3.48	.86	Accept
7	Rehabilitate dilapidated school structures	2.65	1.14	Accept
8.	Government should provide reliable, free internet to schools.	2.61	1.20	Accept
9.	Agricultural science teachers to equip themselves with digital literacy skills	2.70	1.25	Reject
	Total	23.16	8.22	Accept

X= Mean; SD = Standard Deviation

Field Survey, 2026

Results in table 3 shows that items 1,2,3,5,6,7 and9 were accepted by the respondents as the solutions to the constraints of utilizing digital instructional tools by agricultural science teachers in Ebonyi State. This was because they had mean score above 2.5. Item 5 having mean score 2.47, less than 2.5 benchmark was rejected by the respondents indicating that increase in teachers incentives to afford personal computer is not a major constraint to utilizing digital instructional tools in schools. The grand mean analysis of 8 items is 2.9 with a standard deviation of 1.02 is higher than the 2.5 benchmark for the study. This shows that the respondents accepted that items 1-9 are all solutions to challenges of utilizing digital tools by agricultural science teachers in Ebonyi State.

Discussion of Findings

The study revealed that Google classroom, simulation, internet based resources, web pages, electronic white board, quizzz and edpuzzle are available digital instructional tools used in teaching Agricultural Science. Teachers who were somehow competent and those not competent were represented by 29.1 % and 50% respectively. It implied that majority of Agricultural Science teachers were not competent in the use of digital infrastructural tools in teaching.

A number of constraints were identified to hinder Agricultural Science teachers' utilization of digital instructional tools in Secondary Schools in Ebonyi State which included: insufficient time allotted for teaching Agricultural Science, lack of computers and other digital instructional materials, absence of computer literacy skills, low funding of education and system, lack of power supply, dilapidated school infrastructure among others (Table 3). The findings of this study are line with Belay and Mugo (2020), Onwunara, (2020) and Sibande,

(2016) who affirmed that poor power supply, teachers negative attitude towards technology and inadequate skills on the of teachers are major constraints to the use of digital tools in teaching.

Table 4 revealed that most of the respondents accepted the solutions to the utilization of digital instructional tools by agricultural science teachers in Ebonyi State which included: organizing seminar to equip agricultural science teachers on computer literacy skills, increasing the incentives of teachers by Government, increased funding of education and provision of operational computer laboratories in secondary school by the government. The findings agreed with the report of Shoelace and Ruales (2011), who emphasized that provision of power supply and other infrastructures would enhance the integration and adoption of ICT in secondary schools.

Conclusion

The findings of the study revealed that Agricultural Science teachers in Secondary Schools accepted that relevant digital instructional tools were available for teaching. Constraints to the use of these tools in the classroom were inadequate infrastructure, erratic power supply, poor internet access, lack of digital competency, poor funding of educational system among others among others. Based on these findings, recommendations were made to reduce the hindrances for efficient use of digital instructional tools in teaching Agricultural Science in Ebonyi State.

Recommendation

- i. Government should stop paying lip service to education and increase funding of the system.
- ii. Provision of computer laboratory and properly equipped with modern facilities to enhance utilization of digital instructional tools.
- iii. School manage should regularly organize seminar, workshop and conference to improve the competences and skills of the teachers in utilizing digital instructional tools.
- iv. Government should provide incentive to increase the agricultural science teachers' motivation and acquire digital instructional tools such as computers.

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