Innovations

Impediments faced in teaching agricultural trade-based curriculum amid the Covid-19 era and sustainable resilient measures in Delta state, Nigeria

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Abstract

The Delphi expert approach was employed in identifying the impediments faced by Agricultural science teachers in teaching the Agricultural trade-based curriculum amid the Covid-19 era and the expository approach was used to determine the Sustainable Resilient Measures (SRMs) that could be taken to overcome future occurrences in Delta State, Nigeria. The study population is made up of 1143 Agricultural science teachers in 464 public secondary schools in Delta State, out of which only 35 head teachers formed the expert panel. At the end of the first stage, a total of 31 items were identified by the Agricultural science teachers as the impediments faced during the COVID-19 era in Delta State, Nigeria. In the second stage, only 23 items reached the benchmark of 2.5, which were later utilized for the third stage. At the end of the third stage, at the 60% benchmark only 16 items reached consensus. The items were inadequate infrastructural technology, inadequately skilled teachers in the use of outside school learning platforms,inadequate training of teachers among others. Therefore, it was concluded that SRMs such as immediate and sustainable responses in line with the current situation in the society, and smart agricultural technology in passing learning instructions among others could be adopted against future impediments of a pandemic. Based on these findings, it was recommended among others that the Agricultural science teachers should be professionally trained and the trade-based curriculum be reviewed to respond to future occurrences that may result in lockdowns.

Keywords: 1.Agricultural Trade-Based Curriculum, 2.Covid-19, 3.Delphi Expert Approach, 4.Impediments, 5.Sustainable Resilient Measures

Introduction

The Agricultural trade curriculum is a skill-based hands-on-instruction in Animal husbandry and Fishery subjects introduced by the Nigeria Educational Research and Development Council (NERDC) basically to bridge the gap of skill acquisition in food production, self-sufficiency, job creation, and entrepreneurship among secondary school students in Nigeria. This curriculum is vocational in learning and as such, emphasizestechnological adaptation and mastery of skills in Agricultural trade subjects useful not only to the students but also to the teachers of agriculture (Agbidi & Ikeoji, 2018; NERDC, 2013).

The Agricultural science teachers in Nigeria are personnel saddled with the responsibility of teaching the trade-based curriculum in the absence of specially trained Animal husbandry and Fishery education teachers in public secondary schools. Amid responsibilities as the teacher of Agricultural science, they are expected to ensure that the skill-based curriculum is taught as directed by the NERDC and the Ministry of Education irrespective of any impediments that may hinder them from performing these functions.

The advent of the novel *Corona Virus* (COVID-19) pandemic in 2019 brought difficulties for many Agricultural science teachers in Nigeria in actualizing the objectives of the NERDC Agricultural trade-based curriculum due to inter-connected impediments. The World Health Organization (WHO, 2020) described COVID-19 as a pandemic that extends beyond mere public health issues. However, in an attempt tocheckmate social spread, most nations short-down their educational institutions temporarily (Mckim& Sorensen, 2021; Desiandes-Martineu et al., 2020; Lee, 2020). Consequently, academic activities were technically slowed down but electronically active in some countries with advanced communication technology and services (Macdonald, 2022; Tadesse &Muluye, 2020).Furthermore, schooling in the COVID-19 era has not only affected social and economic life but has also impacted the Agricultural trade-based curriculum because no teacher in Nigeria had experienced a lockdown of this magnitude before.

More so, the enforcement of COVID-19 provisional protocol guidelines in many countries further increased the gap inachieving the Agricultural trade-based curriculum. United Nations Education, Scientific and Cultural Organization (UNESCO, 2020) reported that the COVID-19 pandemic exposed many countries including Nigeria's fragile educational system, noting that 40 out of 100 countries regarded as poor are yet to come out of it. Hayat et al. (2021) observed that many educational institutions intended to manage the situation but they could not do so. This situation was made worst because many Agricultural science teachers could not adapt and thus find it difficult to implement the trade curriculum, while others lack access to internet service at home and or lack the requisite skills to handle hands-on agriculture online (Mckim, Sorensen & Burrows, 2021; Dietrich et al., 2020; Tadesse &Muluye, 2020). More so, not managing or stepping out of the pandemic impediments, had negative consequences on skill-based subjects, particularly impacting disadvantaged schools lacking infrastructures for electronic distance learning (Macdonald, 2022; Tadesse &Muluye, 2020).

Sustainable Resilient Measures (SRMs) are strategies that could be adopted over time by nations and their educational institutions in supporting other health and social efforts viably directed towards cautioning the effect or completely avoiding impeding pandemics that could impede classroom learning or learning from home either at present or in the future. Avoiding impediments in any pandemic situation in the future, demand immediate responses in ensuring quality delivery of learning instructions to students offering the Agricultural trade-based curriculum sustainably. The methodology and pedagogy of the subject have to change in line with the trending times because everything around our environment today is evolving. Notwithstanding, there is a need for Agricultural science teachers to be resilient in adapting swiftly to these changes otherwise it would weaken our educational system and aggravate inequalities in vocational education (Agbidi, Iyeke& Ikeoji, 2022; Mckim et al., 2021; Tadesse &Muluye, 2020).

Notwithstanding, during lockdowns, some Agricultural science teachers were able to cope with learning activities by engaging their students using existing platforms like google, social media apps like WhatsApp, Facebook, and Zoom among others in delivering learning instructions (Hayat et al., 2021; Linder et al., 2020; Tadesse &Muluye, 2020; UNESCO, 2020). Azzah et al. (2021) remarked that online learning became an urgent necessity. Using online platforms at home, was the only means to continue the attainment of the trade-based curriculum in Nigeria, as many of the Agricultural science teachers alongside their students struggle to keep in touch through remote instruction. Furthermore, UNESCO (2020) reported that many of these teachers and students do not have computers and internet services in their homes. Hayat et al. (2021) identified further that, non-compliance with virtual classroom technology, irregular interactions, the limited time factor, and infrastructural defects in schools exacerbated the situation.

Furthermore, the challenge of COVID-19 was compounded in most secondary schools as students' attitudes toward trade subjects in agriculture declined, resulting in additional pressure on the Agricultural science teachers to adopt appropriate strategies for passing prescribed examinations (Azzah et al., 2021; Agbidi & Ikeoji, 2018). Many scholars had traced the challenges facing the Agricultural science teachers in implementing the trade-based curriculum to poor education funding, lack of administrative support, lack of political will, use of school farms for labour, lack of manpower and infrastructures, poor attitude towards agriculture, an overworked load of teachers, lack of involvement in curriculum planning, technological gaps, use of technology for practical instruction, poor curriculum implementation among others (Mckim&

Sorensen, 2021; Lee, 2020; Tadesse &Muluye, 2020; Agbidi& Ikeoji, 2018). While Mckim et al. (2021) remarked that transiting from the practical nature of Agricultural education to remote instruction has been challenging to teachers as each problem is connected to COVID -19 rather than in isolation.Mckim& Sorensen (2021) added that there was unprecedented unhappiness among teachers despite the pandemic restrictions.

The inability to bridge opportunities for the students of Agricultural education is worrisome because of COVID-19 and future pandemics, hence, the right attitude and skills are required in an evolving world if Nigeria's educational system is to be technologically advanced as envisaged in the design of the Agricultural trade-based curriculum by the NERDC. To avoid further risk of academic activities due to the future occurrence of a pandemic, the issues that affected Agricultural science teachers need to be addressed appropriately. Nevertheless, the UN2030 Agenda on Sustainable Development Goal 4 according to Agbidi et al. (2022) emphasized that quality Agricultural education should be vocational in learning with training and development given to attract youths and every other person despite their demographics.

Despite some studies examining the challenges faced by teachers in teaching agricultural education during the COVID-19 era, none have investigated these impediments on teachers concerning the teaching of the Agricultural trade-based curriculum using the Delphi approach and at the same time explore the resilient strategies to adopt against future occurrences. Understanding these impediments faced by the Agricultural science teachers could help them and educational administrators to be more resilient and responsive to future occurrences. This study, therefore, seeks to identify the major challenges faced by Agricultural science teachers in teaching the trade-based curriculum amid the COVID-19 era as well as outlining SRMs as strategies that could be adopted against future occurrences.

Purpose of the Study

The purpose of this research was to rely on the Agricultural science teachers as an anonymous panel of experts to identify the major impediments faced by teachers in teaching Agricultural trade-based curriculum amid covid-19 era in Delta State, Nigeria; and to determine the sustainable resilient measures that could be adopted against impending occurrences.

Methods

The study adopted the Delphi technique (Estimate-Talk-Estimate) to solicit the Agricultural science teachers' (experts) opinion in reaching a consensus on the impediments faced in teaching the Agricultural trade-based curriculum amid the COVID-19 pandemic era and also employed an exploratory researchtechnique to determine SRMs that could be adopted against impending occurrences. The Delphi technique describes a means whereby experts' opinion is collated over several stages of questionnaire administration in an attempt to address what could be the problem until a consensus is reached (Twin, 2021;Markmann et al., 2020). Furthermore, Twin (2021) remarked that the technique utilizes the data generated from several stages of questionnaires retrieved from the experts' panel even if the experts adjust their opinion in each stage based on their interpretation.The study population is 1,143 Agricultural science teachers in 464 public secondary schools in Delta State (Delta State Post-Primary Education Board, 2019). Based on administrative headship in schools and usage of the WhatsApp platform for the study, only the head Agricultural science teachers were purposely selected for this study. Out of 120 head teachers who initially indicated interest, only 35 were able to undergo the first stage as expert panels. The instrument for data collection was assigned a 4-point scale of agreement, and Yes and No responses at various stages. Data collected for the study were analyzed using simple percentages and means. A benchmark of 2.5 and 60% were set as a criterion for consensus at various stages.

Results

The study started with an open-ended questionnaire that solicited Agricultural science teachers'opinions to make a list of the impediments they faced in teaching the Agricultural trade-based

curriculum in secondary schools during the COVID-19era. This gave a collection of responses, which were sum-up into 31 items in stage one. Table 1 presents a summary of the list of impediments faced by Agricultural science teachers in implementing the Agricultural trade-based curriculum. From the items, the most frequent impediment faced as identified by the 35 respondents were poor funding for Agricultural education in schools, lack of in-service training on the use of the internet for teaching trade subjects in agriculture, non-availability of infrastructural farm facilities in schools, and difficulties associated with teaching on-line practical agriculture for item 1, 2, 3, and 4 respectively.

Table 1: *Stage One Impediments Faced by Teachers (n = 35)*

Table 2 present the second stage of administration of the questionnaire designed on a 4-point scale requesting the respondents to rate the level of agreement of the 31 items summarized from the first stage. Items with a Mean value of more than 2.50 were regarded as agreed, signifying that the items are the impediments faced by Agricultural science teachers in implementing the Agricultural trade-based curriculum. Twenty-three out of 31 items had a Mean rating of more than 2.50, signifying agreement that items such as poor funding of Agricultural education in schools, lack of in-service training on the use of the internet for teaching trade subjects in agriculture, difficulties associated with teaching online practical agriculture, communication gap in new information practices and technologies in agriculture among others are impediments faced during COVID-19 in implementing the Agricultural trade-based curriculum in Delta State, Nigeria.

Table 2: *Stage Two Mean Ratings and Standard Deviation and Ranking of the ChallengesFaced by Teachers (n = 35)*

In stage 3, thethird process questionnaire was administered requesting responses on a Yes and No option. The questionnaire was designed from the 23 items derived from the second round. In this round, the Agricultural science teachers were requested to go through the items like that of round 2 in an attempt to detect any adjustment in their responses from the previous stage, by indicating their level of agreement with each item. Due to poor network connection, only 27 Agricultural science teachers were involved in this round. This, therefore, constituted the expert panel for the stage. Out of the 23 items, only 16 items reached the consensus set at the 60% benchmark. Hence, these 16 items are regarded as the main impediments faced by the Agricultural science teachers in teaching the Agricultural trade-based curriculum in secondary schools amid the COVID-19era.

Table 3: *Stage Three Agreement Level of the Impediments Faced by Teachers (n = 27)*

Data in Table 4 shows the main impediments faced by Agricultural science teachers that meet the 60% benchmark of consensus. Sixteen items scored 60% and above with Item 1 (poor funding of Agricultural education in schools), 2 (lack of in-service training on the use of the internet for teaching trade subjects in agriculture), 3 (lack of access and connectivity to internet services), and 4 (non-availability of infrastructural farm facilities in schools) having the highest consensus at 100%.

Table 4: *Stage Four Main Impediments that Meet Consensus at 60% Criterion*

Discussion of Findings

The main impediments identified in the study aligned with Azzah et al. (2021) who reported that inadequate infrastructural technology, inadequately skilled teachers in the use of outside school learning platforms, inadequate training of teachers among others were the major impediments faced during the pandemic.Draissi and Young (2020) added that online learning in many schools was inadequate. Agbidi and Ikeoji (2018) fingered the roots of these challenges emanating from inadequate agricultural infrastructures in schools for the teaching of the Agricultural trade-based curriculum. The finding of this study demonstrated that putting in place the right infrastructures in schools is vital for stimulating learning.

Mckim and Sorensen (2021) and Dietrich et al. (2020) were in contrast with the findings of the study as they remarked that many teachers struggled with issues of connectivity, knowledge, and skills in the usage of onlinelearning platforms, and lack of technological infrastructures, while some teachers adjusted to the realities of teaching outside the school environment. However, in line with the findings, Mckim, et al (2021) asserted that these impediments are pervasive. The findings of the study also support UNESCO's (2020) report that COVID-19 caused a damaging effect on our educational system. This implied that school-based agriculture was greatly affected.

Sustainable Resilient Measures that could be Adopted Against Impending Occurrences

Recently, it has been observed that there is a steady rise in cases of Monkey-pox and Lassa fever virus in Nigeria, yet schools are keenly perceived to be still running normally in contrast to the case of COVID-19 where there was a total breakdown of school activities. This suggests that immediate response in the educational sector to any pandemic in the future has to be handled in line with what is current in society in a sustainable manner. Desiandes-Martineu et al. (2020) reported that COVID-19 transformed the landscape of teachers' classroom relationships in the area of curriculum, content, implementation, and learning outcomes with the students. This bridge in the relationship resulted in teachers seeking alternative means to strengthen the attainment of learning objectives while focusing on theories (Agbidi & Ikeoji, 2018).

Nevertheless, a school-based curriculum is supposed to be stimulating to both the teacher and the student by leveraging smart agricultural technology in passing learning instructions. The Canadian Commission for UNESCO according to Desiandes-Martineu et al. (2020) reported that improving the school curriculum, setting priorities and opportunities for meaningful learning, minimizing the use of outside classroom learning, supporting students learning on their own, and enhancing digital skills in responsiveness to impediments are ways to prepare for future pandemic occurrence. These ways suggest that responsive, coordinated, and sustainable actions need to be adopted against future occurrences of any pandemic that would impact our educational system. In avoiding future impediments faced by teachers during the pandemic, Macdonald (2022) emphasized that technology in schools urgently needs to be addressed and should be focused on remote learning, learning needs to be improved upon through a strengthened educational system, the well-being of student need to be safeguarded, teachers' capacity and professionalism need to be developed, and the need for promoting accelerated learning outcome. This implies that the designers of the Agricultural trade-based curriculum need to re-engineer a more responsive and resilient skill-based curriculum that could withstand unforeseen events in the future.

Furthermore, the unanticipated shift from normal classroom/laboratory instruction to online based according to Azzah et al. (2021) was stressful and shocking to many teachers and thus are required to put greater efforts into lesson preparation, while school administrators and curriculum planners should ensure that infrastructures are in place to sustain learning in all circumstances. This further suggests that innovative technologies should be used in various schools for effective teaching of the Agricultural trade-based curriculum in Nigeria.

Conclusion/Recommendations

The study identified 16 main impediments faced by Agricultural science teachers in teaching the Agricultural trade-based curriculum in Nigeria amid the COVID-19 era. The impediments include poor funding of Agricultural education in schools, lack of in-service training on the use of the internet for

teaching trade subjects in agriculture, lack of access and connectivity to internet services, non-availability of infrastructural farm facilities in schools among others.

The determined SRMs that could be adopted against impeding occurrences include among others that immediate and sustainable responses in line with the current situation in the society, smart agricultural technology in passing learning instructions, adopting responsive, coordinated, and sustainable actions, reengineering a more responsive and resilient skill-based curriculum that could withstand unforeseen events, and encourage innovative technologies in schools for effective teaching of the Agricultural trade-based curriculum in Nigeria. Based on the findings, it was recommended among others that:

i. the Agricultural science teachers should be professionally trained to respond to future occurrences that may result in lockdowns;

ii. there should be a curriculum priority review of the Agricultural trade-based curriculum to suit future pandemics or disasters; and

iii. schools offering the Agricultural trade-based curriculum should be provided with adequate smart-based agricultural infrastructural technologies to stimulate learning.

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Tables file

Table 1: *Stage One Impediments Faced by Teachers (n = 35)*

S/N	Items	Frequency (F)
1	Poor funding of agricultural education in schools	35
2	Lack of in-service training on the use of the internet for teaching trade subjects in agriculture	35
3	Non-availability of infrastructural farm facilities in schools	35
4	Difficulties associated with teaching online practical agriculture	35
5	Communication gap about COVID-19pandemic	34
6	Zoom not effective	33
7	Lack of access-connectivity to internet services	32
8	Poor water supply for hand washing	32
9	High cost of data for internet services	31
10	The communication gap in new information-practices-technologies in agriculture	31
11	Lack of political will to support the trade curriculum	30
12	Issues about social distancing	30
13	Inability to access community resources for fieldwork	29
14	Poor policy implementation of the trade curriculum	28
15	Short supply of sanitizers to schools	27
16	Lack of qualified agricultural teachers to handle the trade subjects	25
17	Lack of incentives for teaching agricultural trade subjects	24
18	Fear of being infected with COVID-19	22
19	Irregular power supply	20
20	Lack of access to computers at home for online lessons	18
21	Declining student attitude toward practical agriculture	17
22	Inadequate agricultural teaching staff	13
23	Poor attitude of agricultural teachers	12
24	Lack of farming space within school premises	12
25	Difficulties in accessing farm inputs	10
26	Economic-social unrest in school communities	9
27	Not enough time assigned for practical work	7
28	Lack of adequate knowledge for teaching trade subject	5
29	The poor public value of agricultural occupation	5
30	Inconsistent education policy	4
31	Lack of cooperation between teachers-head teachers	1

Table 2: *Stage Two Mean Ratings and Standard Deviation and Ranking of the Challenges Faced by Teachers (n = 35)*

S/N	Items	Mean ($\bar{x}$)	SD
1	Poor policy implementation of the trade curriculum	3.26	0.31
2	Lack of qualified agricultural teachers to handle the trade subjects	1.31	0.19
3	Poor funding of Agricultural education in schools	4.00	0.34
4	Communication gap about COVID-19pandemic	3.17	0.30
5	Fear of being infected with COVID-19	3.26	0.31
6	Lack of in-service training on the use of the internet for teaching trade subjects in agriculture	4.00	0.34
7	Poor water supply for hand washing	2.51	0.27
8	Lack of access to computers at home for online lessons	3.14	0.03
9	Poor attitude of agricultural teachers	0.94	0.17
10	Short supply of sanitizers to schools	2.57	0.26
11	Lack of incentives for teaching agricultural trade subject	3.14	0.03
12	Irregular power supply	3.17	0.30
13	Lack of access-connectivity to internet services	3.51	0.10
14	Inadequate agricultural teaching staff	2.86	0.28
15	Not enough time assigned for practical work	1.14	0.17
16	Difficulties associated with teaching online practical agriculture	4.00	0.34
17	Lack of adequate knowledge for teaching trade subject	2.00	0.24
18	Non-availability of infrastructural farm facilities in schools	3.26	0.03
19	Inconsistent education policy	2.86	0.28
20	Issues about social distancing	2.97	0.29
21	Economic-social unrest in school communities	2.46	0.26
22	Zoom not effective	3.46	0.31
23	Lack of cooperation between teachers-head teachers	2.11	0.25
24	Lack of farming space within school premises	2.63	0.27
25	Inability to access community resources for fieldwork	2.63	0.27
26	Difficulties in accessing farm inputs	1.65	0.22
27	High cost of data for internet services	3.37	0.31
28	The poor public value of agricultural occupation	2.23	0.25
29	Lack of political will to support the trade curriculum	2.86	0.28
30	The communication gap in new information-practices-technologies in agriculture	3.57	0.32
31	Declining student attitude toward practical agriculture	2.57	0.26

Table 3: *Stage Three Agreement Level of the Impediments Faced by Teachers (n = 27)*

S/N	Items	Yes	Agreed (%)
1	Poor funding of Agricultural education in schools	27	100.00
2	Lack of in-service training on the use of the internet for teaching trade subjects in agriculture	27	100.00
3	Lack of access-connectivity to internet services	27	100.00
4	Non-availability of infrastructural farm facilities in schools	27	100.00
5	Lack of access to computers at home for online lessons	26	96.30
6	Difficulties associated with teaching online practical agriculture	26	96.30
7	Poor policy implementation of the trade curriculum	25	92.60
8	Irregular power supply	25	92.60
9	Zoom not effective	25	92.60
10	Lack of incentives for teaching agricultural trade subject	23	85.19
11	High cost of data for internet services	23	85.19
12	The communication gap in new information-practices-technologies in agriculture	23	85.19
13	Fear of being infected with COVID-19	22	81.48
14	Inconsistent education policy	22	81.48
15	Communication gap about COVID-19pandemic	20	74.07
16	Inability to access community resources for fieldwork	17	62.96
17	Lack of political will to support the trade curriculum	16	59.26
18	Inadequate agricultural teaching staff	15	55.56
19	Lack of farming space within school premises	14	51.85
20	Declining student attitude toward practical agriculture	13	48.19
21	Issues about social distancing	12	44.44
22	Short supply of sanitizers to schools	10	37.04
23	Poor water supply for hand washing	7	25.93

Table 4: *Stage Four Main Impediments that Meet Consensus at 60% Criterion*

S/N	Items	Agreed (%)
1	Poor funding of Agricultural education in schools	100.00
2	Lack of in-service training on the use of the internet for teaching trade subjects in agriculture	100.00
3	Lack of access-connectivity to internet services	100.00
4	Non-availability of infrastructural farm facilities in schools	100.00
5	Lack of access to computers at home for online lessons	96.30
6	Difficulties associated with teaching online practical agriculture	96.30
7	Poor policy implementation of the trade curriculum	92.60
8	Irregular power supply	92.60
9	Zoom not effective	92.60
10	Lack of incentives for teaching agricultural trade subject	85.19
11	High cost of data for internet services	85.19
12	The Communication gap in new information-practices-technologies in agriculture	85.19
13	Fear of being infected with COVID-19	81.48
14	Inconsistent education policy	81.48
15	Communication gap about COVID-19pandemic	74.07
16	Inability to access community resources for field work	62.96

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