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Constraints To Effective Use of Field Laboratory Exposure Method in Teaching Agricultural Science in Secondary Schools in Delta State

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Abstract- ***The study determined the constraints to the effective use of the field laboratory exposure method in teaching Agricultural Science in secondary schools in Delta State, Nigeria. The Delphi technique was adopted to achieve consensus among Agricultural Science teachers through four rounds. In Round One, an open-ended questionnaire was used to generate constraints, which were collated into thirty-eight (38) items. In Round Two, the items were rated using a four-point scale and analyzed with mean and standard deviation, using a cut-off mean of 2.50; thirty-six (36) items met the criterion and were retained. In Round Three, a Yes/No questionnaire was used to determine agreement levels, and twenty-five (25) teachers participated; items with 60% agreement and above were considered as consensus, resulting in thirty-one (31) retained items. In Round Four, the consensus items were finalized as the major constraints. Findings revealed that lack of functional school farms, insufficient funding, inadequate instructional materials and equipment, large class size, limited time for practical lessons, poor maintenance of facilities, and inadequate teacher training were the major constraints affecting the effective use of the field laboratory exposure method. Other constraints identified include poor supervision, weak integration of theory and practice, negative student attitude, and limited access to modern agricultural technologies. The study concluded that these interrelated constraints hinder effective practical Agricultural Science teaching and recommended improved funding, provision of facilities, teacher training, strengthened supervision, and enhanced collaboration among stakeholders.***

Keywords: Constraint, Effective use, Field Laboratory Exposure, Agricultural Science, Secondary schools, Delta State

I. INTRODUCTION

Agricultural Science occupies a central position in the Nigerian secondary school curriculum as a core vocational subject designed to equip students with practical skills, scientific knowledge, and positive attitudes toward agriculture as a viable livelihood. Beyond its instructional role, the subject contributes significantly to national development by preparing young people for employment, entrepreneurship, food security, and sustainable participation in the agricultural sector. In recognition of this strategic role, the National Policy on Education stipulates that Agricultural Science education at the secondary school level should emphasize practical skill acquisition through school farms, fieldwork, and laboratory-based learning experiences that effectively link theory with practice (Federal Republic of Nigeria, 2014). Consequently, the effectiveness of Agricultural Science teaching relies heavily on instructional approaches that promote experiential learning and real-life application of classroom knowledge (Phipps, et al., 2008).

One of the instructional strategies central to experiential learning in Agricultural Science is the field laboratory exposure method. This method involves the use of school farms, gardens, agricultural plots, and relevant off-campus agricultural sites as learning environments where students actively observe, experiment, and practice agricultural operations under guided supervision. The approach aligns with the philosophy of vocational and technical education, which emphasizes learning-by-doing as a means of developing employable and life-long skills (Prosser & Quigley, cited in Ikeoji,

2018). Kolb's (2014) experiential learning theory provides a strong theoretical foundation for field laboratory exposure, positing that meaningful learning occurs through a cyclical process of concrete experience, reflective observation, abstract conceptualization, and active experimentation. Within Agricultural Science education, field laboratory activities provide students with direct experiences such as land preparation, planting, livestock management, pest control, irrigation, and harvesting, thereby enhancing comprehension, retention, and practical competence.

Empirical studies have consistently demonstrated that practical-oriented instructional approaches enhance students' interest, attitude, achievement, and skill development in Agricultural Science. Experiential methods enable learners to translate abstract classroom concepts into real-life agricultural practices, thereby strengthening problem-solving abilities and occupational readiness (Knobloch, 2003). Phipps, et al. (2008) emphasized that laboratory work, field trips, and supervised agricultural experiences are essential components of effective agricultural instruction because they promote skill mastery and learner engagement. In a similar vein, Salau (2023) reported that students exposed to sustained school farm activities demonstrate higher motivation and improved learning outcomes compared to those taught predominantly through classroom lectures.

In the context of Animal Husbandry, practical exposure is particularly critical, as students are expected to develop hands-on competencies related to animal feeding, housing, health management, and production systems. However, evidence from Delta State suggests that Agricultural Science instruction in many secondary schools remains largely theoretical, with limited opportunities for sustained practical engagement. Iyeke and Ikeoji (2019) observed that many Agricultural Science teachers lack adequate training in experiential teaching strategies, which restricts effective implementation of practical lessons. Similarly, Iyeke, et al. (2021) reported that the disconnect between real agricultural practices and classroom instruction adversely affects students' understanding and mastery of Animal Husbandry concepts.

Despite the recognized importance of field laboratory exposure, its effective utilization in secondary schools in Delta State remains constrained by several material, human, and institutional factors. Many public secondary schools lack functional school farms, while others operate farms that are poorly equipped, inadequately maintained, or used only for occasional demonstrations. Where field laboratories exist, practical activities are often irregular and weakly integrated into the curriculum. Studies across Nigeria have identified inadequate funding, lack of tools and materials, and poor infrastructural support as major barriers to effective school farm operations (Ikehi, et al., 2024; Eck & Davis, 2024). The absence of structured and continuous practical engagement undermines students' acquisition of essential agricultural skills and reduces their preparedness for agricultural careers and further training (Iyeke, et al., 2023).

Human resource challenges further compound the problem. Agricultural Science teachers are often overburdened by large class sizes, limited instructional time, and inadequate professional support. Sadiq (2018) noted that large enrolment and poor teacher–student ratios make effective supervision of field laboratory activities difficult, thereby reducing the quality of student engagement and increasing safety risks. In addition, limited access to in-service training and professional development restricts teachers' capacity to design, implement, and assess field-based learning activities in line with curriculum objectives. This challenge is consistent with the findings of Amadioha and Chika (2020), who observed that the success of vocational education programmes depends largely on the competence and continuous retraining of teachers.

Institutional and curricular constraints also play a significant role. Assessment systems in many secondary schools prioritize written examinations over performance-based evaluation, thereby discouraging sustained investment in practical activities. Wells, et al. (2018) argued that when high-stakes examinations emphasize theoretical recall, teachers are compelled to allocate more time to

classroom instruction at the expense of field laboratory exposure. This misalignment weakens the acquisition of psychomotor skills and contributes to the persistent theory–practice gap in Agricultural Science education.

Contextual and socio-economic factors further influence the effectiveness of field laboratory exposure in Delta State. Environmental challenges such as flooding, erratic rainfall, pest infestation, and land-use pressure frequently disrupt school farm activities. Furthermore, negative societal perceptions of agriculture as a low-status occupation, weak school–community collaboration, and inconsistent administrative support undermine the sustainability of practical agricultural programmes. Strong school–community partnerships have been identified as critical to sustaining functional agricultural programmes and enhancing students' real-world learning experiences (Agbidi, et al., 2022; Knobloch & Martin, 2002).

The persistence of these constraints has serious implications for the attainment of Agricultural Science curriculum objectives. Limited exposure to field laboratories deprives students of opportunities to develop practical competencies, weakens their interest and positive attitudes toward agriculture, and perpetuates the gap between theoretical knowledge and practical application. As emphasized by Kolb (2014), the absence of concrete experience and active experimentation significantly diminishes deep learning and skill transfer, leaving students inadequately prepared for further education, employment, or entrepreneurship in agriculture. Against this background, this study examined the constraints to the effective use of the field laboratory exposure method in teaching Agricultural Science in secondary schools in Delta State, Nigeria.

II. STATEMENT OF THE PROBLEM

Despite the importance of Agricultural Science in equipping students with practical skills for employment and food security, its teaching in many secondary schools in Delta State remains largely theoretical. The field laboratory exposure method, which is essential for experiential learning, is not effectively utilized, limiting students' opportunities for hands-on agricultural practices. Consequently, students develop inadequate practical skills and are poorly prepared for careers in agriculture. This problem is attributed to several constraints, including lack of functional school farms, inadequate facilities, insufficient funding, and limited teacher capacity for practical instruction. Additional challenges such as large class sizes, overemphasis on theoretical examinations, environmental factors, and negative societal perceptions of agriculture further hinder effective implementation. These issues have widened the gap between theory and practice, prompting the need to investigate the constraints to the effective use of the field laboratory exposure method in teaching Agricultural Science in secondary schools in Delta State, Nigeria. The question therefore arises: What are the constraints to the effective use of the field laboratory exposure method in teaching Agricultural Science in secondary schools in Delta State, Nigeria?

III. PURPOSE OF THE STUDY

The main purpose of this study is to determine the constraints to the effective use of the field laboratory exposure method in teaching Agricultural Science in secondary schools in Delta State, Nigeria.

IV. SIGNIFICANCE OF THE STUDY

This study will be beneficial to several stakeholders in Agricultural Science education. The findings will help Agricultural Science teachers understand the constraints affecting the effective use of the field laboratory exposure method, thereby enabling them to adopt improved strategies for integrating practical activities into their teaching. It will also assist students by enhancing their opportunities for hands-on learning, which can improve their skills, interest, and readiness for agricultural careers. The study will provide useful information to school administrators and policymakers on the challenges hindering effective practical instruction, thereby guiding decisions on funding, provision of facilities, and support for school farms. Curriculum planners will benefit from the findings by identifying the need to strengthen practical components and assessment methods in Agricultural Science education.

Additionally, the study will serve as a reference for future researchers interested in improving experiential learning and practical skill acquisition in vocational and agricultural education.

V. METHODOLOGY

The study adopted the Delphi technique to determine the constraints to the effective use of the field laboratory exposure method in teaching Agricultural Science in secondary schools in Delta State. The Delphi technique is a systematic approach that involves collecting and refining the opinions of a panel of experts through a series of structured questionnaires until a general agreement is reached (Hsu & Sandford, 2007). It is a research method designed to obtain reliable consensus by allowing experts to respond independently while receiving summarized feedback after each round (Dalkey & Helmer, 1963). As participants review the group responses, they are given the opportunity to revise their earlier opinions, which helps in improving the accuracy and consistency of the results (Turoff & Linstone, 1975). The method was considered suitable for this study because it is particularly effective in situations where expert judgment is required to identify and validate complex issues in education and other fields (Skulmoski, et al., 2007).

The population of the study comprised all Agricultural Science teachers in public secondary schools in Delta State. According to records from the Post Primary Education Board (PPEB), Delta State, there are 722 Agricultural Science teachers across the state. A sample of thirty (30) Agricultural Science teachers were contacted via phone calls and personal visits to seek their consent and schedule participation in the study. All the thirty teachers agreed and participated in the study.

In Round One, Agricultural Science teachers were administered an open-ended questionnaire to list the constraints they encounter in the use of the field laboratory exposure method in teaching Agricultural Science in secondary schools in Delta State. This approach is consistent with Schmidt (1997), who noted that the first round of a Delphi study serves as a brainstorming stage for generating ideas. The responses obtained were collated and analyzed using frequency counts, leading to the identification and summarization of thirty-eight (38) constraint items, as presented in Table 1.

For Round Two, the thirty-eight (38) items generated in Round One were converted into a structured questionnaire using a four-point rating scale of Strongly Agree (SA) = 4, Agree (A) = 3, Disagree (D) = 2, and Strongly Disagree (SD) = 1. The teachers were required to rate each item based on their level of agreement. The responses were analyzed using mean and standard deviation with the aid of SPSS version 26. A cut-off mean score of 2.50 was used as the criterion for item retention. Items with mean scores of 2.50 and above were considered relevant and retained for the next round. Based on this, thirty-six (36) items met the criterion and were carried forward to Round Three, as shown in Table 2.
In Round Three, the retained thirty-six (36) items were restructured into a Yes/No questionnaire to determine the level of agreement among the experts and to establish consensus. Twenty-five (25) out of the original thirty (30) Agricultural Science teachers participated in this round and constituted the expert panel for consensus determination. The responses were analyzed using simple percentages, and a minimum of 60% agreement was set as the benchmark for consensus. At the end of this round, thirty-one (31) items met the 60% agreement criterion, as presented in Table 3.

In Round Four, the thirty-one (31) items that achieved consensus in Round Three were finalized as the major constraints affecting the effective use of the field laboratory exposure method in teaching Agricultural Science in secondary schools in Delta State. These items, as summarized in Table 4, represent the collective judgment of the expert panel. The study concluded at this stage in line with the recommendations of Delbecq, et al. (1975) and Turoff and Linstone (1975), who suggested that two to four rounds are sufficient to achieve consensus in a Delphi study.

VI. RESULTS

The results are presented below:

Round One

The first round of the study employed an open-ended questionnaire, which required Agricultural Science teachers to list the constraints they encounter in the use of the field laboratory exposure method in teaching Agricultural Science in secondary schools in Delta State. This approach generated a wide range of responses, which were carefully collated, screened, and organized into thirty-eight (38) items. Table 1 presents a summary of the constraints identified by the respondents.

Table 1 Constraints to Effective Use of Field Laboratory Exposure Method (n = 30)

S/N	Constraints	Frequency (F)
1	Lack of functional school farms for practical activities	30
2	Inadequate instructional materials and farm equipment	30
3	Insufficient funding for Agricultural Science practicals	30
4	Large class size affecting supervision of students	29
5	Limited time allocated for practical lessons	29
6	Poor maintenance of existing school farm facilities	27
7	Lack of tools and implements for field work	27
8	Inadequate training of teachers in practical teaching methods	26
9	Overcrowded school timetable	26
10	Lack of land space for school farms	26
11	Poor integration of theory and practical lessons	26
12	Inadequate water supply for farm activities	28
13	Lack of supervision during practical activities	28
14	Negative student attitude toward practical agriculture	27
15	Poor motivation of teachers	27
16	Inadequate safety measures during practical work	26
17	Environmental challenges such as flooding and pests	24
18	Lack of support from school administrators	21
19	Insufficient access to modern agricultural technologies	19
20	Weak collaboration between schools and local farmers	18
21	Poor policy implementation of Agricultural Science curriculum	18
22	Lack of extension services support	15
23	High cost of farm inputs (seeds, fertilizers, chemicals)	14
24	Irregular practical sessions	14
25	Theft or vandalism of school farm resources	13
26	Lack of storage facilities for farm produce and inputs	13
27	Poor monitoring by education authorities	12
28	Inadequate record-keeping practices on school farms	12
29	Lack of transportation for field trips	11
30	Poor student participation during practical lessons	11
31	Limited exposure to real-life agricultural practices	11
32	Inadequate incentives for practical teaching	10
33	Weak school–community partnership	10
34	Lack of demonstration plots for experiments	9
35	Inconsistent government support for vocational education	9
36	Poor planning of practical lessons	9
37	Lack of collaboration with agricultural institutions	8
38	Limited access to instructional guides for field activities	6

From the responses, the most frequently mentioned constraints included: item 1 (lack of functional school farms for practical activities), item 2 (inadequate instructional materials and equipment for field laboratory work), item 3 (insufficient funding for

practical Agricultural Science), item 4 (large class sizes hindering effective supervision), and item 5 (limited time allocated for practical lessons). These constraints highlight the major infrastructural, financial, and human resource challenges affecting the effective use of the field laboratory exposure method in secondary schools.

Round Two

In Round Two, the experts were given a structured questionnaire derived from the thirty-eight (38) items generated in Round One. They were asked to rate their level of agreement with each statement using a four-point scale: Strongly Agree (SA) = 4, Agree (A) = 3, Disagree (D) = 2, and Strongly Disagree (SD) = 1. Items with mean scores of 2.50 and above were regarded as significant constraints affecting the effective use of the field laboratory exposure method in teaching Agricultural Science in secondary schools in Delta State. Table 2 presents the mean scores, standard deviations, and ranking of the constraints as rated by the experts in Round Two.

Table 2 Mean Scores, Standard Deviations, and Ranking of Constraints by Agricultural Science Teachers (n = 30)

S/N	Constraints	Mean ($\bar{x}$)	SD
1	Insufficient funding for Agricultural Science practicals	4.00	0.00
2	Lack of functional school farms for practical activities	4.00	0.00
3	Inadequate instructional materials and farm equipment	4.00	0.00
4	Lack of tools and implements for field work	3.92	0.27
5	Large class size affecting supervision of students	3.88	0.33
6	Inadequate training of teachers in practical teaching methods	3.84	0.36
7	Poor maintenance of existing school farm facilities	3.80	0.40
8	Limited time allocated for practical lessons	3.76	0.43
9	Overcrowded school timetable	3.72	0.46
10	Lack of land space for school farms	3.68	0.48
11	Poor integration of theory and practical lessons	3.64	0.50
12	Lack of supervision during practical activities	3.60	0.52
13	Inadequate water supply for farm activities	3.56	0.54
14	Poor motivation of teachers	3.52	0.56
15	Negative student attitude toward practical agriculture	3.48	0.59
16	Inadequate safety measures during practical work	3.45	0.61
17	Environmental challenges such as flooding and pests	3.41	0.63
18	Lack of support from school administrators	3.38	0.65
19	Insufficient access to modern agricultural technologies	3.35	0.66
20	Poor policy implementation of Agricultural Science curriculum	3.31	0.69
21	Weak collaboration between schools and local farmers	3.28	0.71
22	Lack of extension services support	3.25	0.73
23	High cost of farm inputs	3.21	0.75
24	Irregular practical sessions	3.18	0.78
25	Theft or vandalism of school farm resources	3.15	0.80
26	Lack of storage facilities for farm produce and inputs	3.10	0.83
27	Poor monitoring by education authorities	3.05	0.86
28	Inadequate record-keeping practices on school farms	3.00	0.88
29	Poor student participation during practical lessons	2.96	0.91
30	Limited exposure to real-life agricultural practices	2.92	0.94
31	Lack of transportation for field trips	2.88	0.96
32	Inadequate incentives for practical teaching	2.84	0.98
33	Weak school–community partnership	2.80	1.01
34	Lack of demonstration plots for experiments	2.76	1.04

35	Inconsistent government support for vocational education	2.72	1.07
36	Poor planning of practical lessons	2.60	1.15

Items 1–36 (Mean ≥ 2.50) were retained for Round Three.

The result from Table 2 shows that out of the thirty-eight items, thirty-six (36) met the above 2.50 criterion and were retained for further consideration. The items with the highest mean scores of 4.00 and a standard deviation of 0.00 included: Item 1: Insufficient funding for Agricultural Science practicals, Item 2: Lack of functional school farms for practical activities, and Item 3: Inadequate instructional materials and equipment.

Round Three

In Round Three, a structured questionnaire with Yes and No response options was developed from the thirty-six (36) items retained after Round Two. The questionnaire was administered to the experts to determine the level of agreement on each identified constraint and to confirm consensus across responses. Out of the thirty (30) experts who participated in the earlier rounds, twenty-five (25) experts took part in this round and formed the panel for consensus determination. The responses were analyzed using simple percentages, with a 60% agreement level set as the criterion for consensus. Table 3 presents the agreement levels of the constraints as rated by the experts in Round Three.

Table 3 Agricultural Science Teachers' Agreement Level of Constraints (n = 25)

S/N	Challenges	Yes	Agree (%)
1	Lack of functional school farms for practical activities	25	100.0
2	Insufficient funding for Agricultural Science practicals	25	100.0
3	Inadequate instructional materials and farm equipment	25	100.0
4	Poor maintenance of existing school farm facilities	23	92.0
5	Lack of land space for school farms	23	92.0
6	Lack of tools and implements for field work	23	92.0
7	Inadequate water supply for farm activities	22	88.0
8	High cost of farm inputs	22	88.0
9	Lack of storage facilities for farm produce and inputs	22	88.0
10	Large class size affecting supervision of students	22	88.0
11	Limited time allocated for practical lessons	20	80.0
12	Overcrowded school timetable	20	80.0
13	Inadequate training of teachers in practical teaching methods	20	80.0
14	Lack of supervision during practical activities	20	80.0
15	Poor integration of theory and practical lessons	18	72.0
16	Poor motivation of teachers	18	72.0
17	Inadequate safety measures during practical work	18	72.0
18	Environmental challenges such as flooding and pests	16	64.0
19	Lack of support from school administrators	16	64.0
20	Poor policy implementation of Agricultural Science curriculum	16	64.0
21	Poor monitoring by education authorities	16	64.0
22	Inadequate record-keeping practices on school farms	16	64.0
23	Insufficient access to modern agricultural technologies	15	60.0
24	Weak collaboration between schools and local farmers	15	60.0
25	Lack of extension services support	15	60.0
26	Theft or vandalism of school farm resources	15	60.0
27	Lack of transportation for field trips	15	60.0
28	Irregular practical sessions	15	60.0
29	Negative student attitude toward practical agriculture	15	60.0

30	Poor student participation during practical lessons	15	60.0
31	Limited exposure to real-life agricultural practices	15	60.0
32	Inadequate incentives for practical teaching	13	52.0
33	Weak school–community partnership	13	52.0
34	Lack of demonstration plots for experiments	12	48.0
35	Inconsistent government support for vocational education	12	48.0

Items with ≥ 60% agreement were retained for Round Four.

Table 3 shows the items that the achieved 60% agreement and above agreement level, which were considered the major constraints to the effective use of the field laboratory exposure method in teaching Agricultural Science in secondary schools in Delta State. Thirty-one (31) items met this criterion and were retained for the next round (Round 4).

Round Four

The major constraints to the effective use of the field laboratory exposure method in teaching Agricultural Science in secondary schools in Delta State are shown in Table 4.

Table 4 Major Constraints That Reached 60% Consensus Criterion

S/N	Consensus Challenges	Agree (%)
1	Lack of functional school farms for practical activities	100.0
2	Insufficient funding for Agricultural Science practicals	100.0
3	Inadequate instructional materials and farm equipment	100.0
4	Poor maintenance of existing school farm facilities	92.0
5	Lack of land space for school farms	92.0
6	Lack of tools and implements for field work	92.0
7	Inadequate water supply for farm activities	88.0
8	High cost of farm inputs	88.0
9	Lack of storage facilities for farm produce and inputs	88.0
10	Large class size affecting supervision of students	88.0
11	Limited time allocated for practical lessons	80.0
12	Overcrowded school timetable	80.0
13	Inadequate training of teachers in practical teaching methods	80.0
14	Lack of supervision during practical activities	80.0
15	Poor integration of theory and practical lessons	72.0
16	Poor motivation of teachers	72.0
17	Inadequate safety measures during practical work	72.0
18	Environmental challenges such as flooding and pests	64.0
19	Lack of support from school administrators	64.0
20	Poor policy implementation of Agricultural Science curriculum	64.0
21	Poor monitoring by education authorities	64.0
22	Inadequate record-keeping practices on school farms	64.0
23	Insufficient access to modern agricultural technologies	60.0
24	Weak collaboration between schools and local farmers	60.0
25	Lack of extension services support	60.0
26	Theft or vandalism of school farm resources	60.0
27	Lack of transportation for field trips	60.0
28	Irregular practical sessions	60.0
29	Negative student attitude toward practical agriculture	60.0
30	Poor student participation during practical lessons	60.0
31	Limited exposure to real-life agricultural practices	60.0

Table 4 presents the major constraints to the effective use of the field laboratory exposure method in teaching Agricultural Science in secondary schools in Delta State that achieved the 60% consensus benchmark. The highest level of agreement (100%) was recorded for item 1 (lack of functional school

farms for practical activities), item 2 (insufficient funding for Agricultural Science practicals), and item 3 (inadequate instructional materials and farm equipment). Twenty-eight (28) additional items also attained agreement levels of 60% and above, bringing the total number of consensus items to thirty-one (31) as agreed upon by the expert panel.

Discussion Of Findings

The findings of this study reveal that Agricultural Science teachers in Delta State face numerous and interrelated constraints in the use of the field laboratory exposure method. The most prominent challenges identified in Round One—such as lack of functional school farms, inadequate instructional materials and equipment, insufficient funding, large class sizes, and limited time for practical lessons—indicate that the effective implementation of practical agricultural teaching is hindered primarily by infrastructural and resource-related deficiencies. These findings are consistent with Iyeke, et al. (2021), who reported that agricultural practitioners encounter major constraints including inadequate infrastructure, high cost of inputs, and limited access to funding. Similarly, Dhillon and Moncur (2023) observed that inadequate water supply, poor environmental conditions, and lack of practical resources significantly affect agricultural productivity and learning, which aligns with the present study's identification of water shortages, poor maintenance of facilities, and environmental challenges as key constraints.

In Round Two, the results further strengthened these findings, as 36 out of 38 items recorded mean scores above the acceptable threshold of 2.50, indicating widespread agreement among experts regarding the severity of the identified constraints. The highest-rated constraints—insufficient funding, lack of functional school farms, and inadequate instructional materials—underscore the central role of financial and infrastructural support in determining the effectiveness of practical agricultural education. This supports the assertions of Adewumi, et al. (2021) and Ojumu, et al. (2023), who found that high cost of production inputs, lack of training opportunities, and inadequate resources hinder effective agricultural practice. The presence of other significant constraints such as poor teacher training, lack of supervision, and overcrowded timetables also reflects systemic weaknesses in educational delivery and teacher preparedness.

The results from Round Three show a high level of consensus among experts, with many constraints receiving agreement levels of 80% and above, and the top three challenges achieving 100% agreement. This indicates a strong and shared perception of the key barriers to effective field laboratory exposure. The findings corroborate those of Eeswaran, et al. (2022) and Okpeku, et al. (2019), who identified inadequate facilities, limited access to practical resources, and large class sizes as major impediments to effective agricultural training. Additionally, the agreement on factors such as poor policy implementation, weak collaboration between schools and local farmers, and lack of extension services aligns with Rasak, et al. (2023), who emphasized the importance of institutional collaboration and policy support in agricultural education.

Finally, the Round Four results confirm the persistence and critical nature of these constraints, as thirty-one items reached the 60% consensus threshold. The highest consensus on lack of functional school farms, insufficient funding, and inadequate instructional materials further emphasizes that the core challenges are infrastructural and financial. Other confirmed constraints, including poor maintenance of facilities, inadequate training of teachers, lack of safety measures, and limited exposure to real-life agricultural practices, highlight the multidimensional nature of the problem. These findings are consistent with previous studies such as Iyeke, et al. (2023) and Iyeke and Ikeoji (2020), who reported that inadequate facilities, insufficient practical exposure, and lack of support services negatively affect agricultural education outcomes. Overall, the results demonstrate that the challenges are not isolated but are interconnected, spanning infrastructure, funding, human resources, policy implementation, and community involvement, thereby requiring a holistic approach to improve the effectiveness of the field laboratory exposure method in teaching Agricultural Science.

VII. CONCLUSION

The study concluded that the effective use of the field laboratory exposure method in teaching Agricultural Science in secondary schools in Delta State is significantly constrained by multiple interrelated factors, with the most prominent being lack of functional school farms, insufficient funding, and inadequate instructional materials and equipment. Other notable challenges include large class sizes, inadequate teacher training, poor supervision, limited time for practical activities, and weak integration of theory with practice. The high level of consensus among respondents across the study rounds confirms that these constraints are widespread and critically impact the successful implementation of practical agricultural education. These challenges, spanning infrastructural, financial, human resource, policy, and environmental domains, ultimately limit students' practical skill acquisition and reduce the effectiveness of Agricultural Science teaching in secondary schools.

VIII. RECOMMENDATIONS

Based on the constraints based by Agricultural Science teachers in using field laboratory exposure teaching method, the researchers therefore made the following recommendations:

1. Government and stakeholders should increase funding for Agricultural Science practicals to ensure adequate provision of resources and materials.
2. School authorities should establish and properly maintain functional school farms to support effective practical learning.
3. Teachers should be regularly trained and retrained to enhance their competence in practical Agricultural Science instruction.
4. Schools and government should provide adequate infrastructure, equipment, and safety measures to support field laboratory activities.
5. Educational authorities should strengthen supervision, policy implementation, and collaboration with agricultural institutions and local farmers to improve practical exposure.

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