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Comparative Assessment of challenges and improvement strategies in Agricultural Science Teaching Between Public Schools in Sabon Gari and Zaria LGAs of Kaduna State, Nigeria

ONWUNALI, Martin Royal Okechukwu¹

martinroyal2002@yahoo.com

<https://orcid.org/0009-0005-3653-8819>

LADAN, Shamsudeen¹

Ladanshamsu90@gmail.com

MUHAMMAD, Hashiru Bello¹

Muhammadashir51@gmail.com

¹Department of Agricultural Education, Faculty of Vocational and Technical Education
Federal University of Education, Zaria, Nigeria.

Abstract

This study evaluated teachers' perceptions of the challenges in teaching and learning Agricultural Science in public secondary schools within the Zaria Educational Zone, which includes the Zaria and Sabon Gari Local Government Areas. Data were collected using a validated structured questionnaire (Cronbach's $\alpha = 0.88$), distributed to 84 teachers across 41 registered public schools in the area. Descriptive statistics revealed demographic differences: the workforce is young (ages 30–40), married males (>70%), although Sabon Gari has a higher proportion of females (60.87%). Teachers hold bachelor's degrees (>50%) in Agricultural Education and possess 6–10 years of experience. Key challenges identified were deteriorating infrastructure, insufficient instructional materials (Zaria = 3.11; Sabon Gari = 3.03), and limited ICT resources (Zaria = 3.11; Sabon Gari = 3.03). A lack of funding severely impacted resources and motivation. Student interest was notably low, especially in Zaria (2.98), due to inadequate practical exposure, limited career counselling, and negative perceptions of agriculture. Statistical tests ($p \leq 0.05$) indicated no significant differences between zones in terms of infrastructure, ICT, funding, or student attitudes, although support for improvement strategies varied. High standard deviations (except for Sabon Gari interest and strategies) suggested a lack of consensus. Teachers, particularly in Zaria, advocated for increased funding, facility upgrades, ongoing training, better salaries, and enhanced career guidance to improve Agricultural Science education.

Keywords: Teacher Perception, instructional challenges, Agricultural Science, resource availability, practical skills

Introduction

Agricultural Science education plays a crucial role in equipping students with the knowledge and skills needed for national development, particularly in agrarian regions like Zaria and Sabon Gari, situated in the northern part of Kaduna State, referred to as Zone A. However, the teaching and learning of Agricultural Science face numerous challenges, many of which are shaped by teachers' perceptions, instructional strategies, and systemic issues (Onwunali *et al.*, 2025). Research indicates a persistent decline in Agricultural Science instruction in Nigeria secondary schools, with Zaria and Sabon Gari being no exceptions. Eya and Chukwu (2012) observed a downward trend in instructional quality, associated with obsolete teaching strategies and a lack of students' interest. Furthermore,



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poor student enrolment and engagement in agricultural education programs have been linked to uninspiring instructional approaches (Amadi and Adejoh, 2020; Oluwatosin & Olatoye, 2022), suggesting that teachers often lack motivation and innovative teaching methods. However, a strong and positive correlation has been established between age and teachers' attitude and academic success of agricultural science students (Amao, 2025) These issues are particularly pronounced in Zaria, where the need for enhanced instructional strategies to stimulate student interest is critical. Akinmade (2002) reported low interest among teachers and students in Sabon Gari, attributing this to the traditional, theory-heavy approach to a subject that ideally requires practical engagement. This lack of practical orientation diminishes the subject's appeal and effectiveness, resulting in poor student performance and increased dropout rates (Egun, 2007; Onwunali *et al.*, 2022). Teachers frequently report difficulties in delivering complex agricultural science topics, especially those integrating concepts from biology, chemistry, and geography. Egun (2007) reported that many teachers experience "phobia" toward teaching challenging scientific concepts such as chemical reactions, plant physiology, and genetics, which are integral to the Agricultural Science curriculum. The curriculum and content difficulty cause discomfort, lead to misconceptions and inadequate coverage of key topics, ultimately contributing to students' poor understanding and performance in external examinations.

A significant barrier identified across studies is the lack of adequate facilities and resources for practical Agricultural Science teaching. Reports have shown that insufficiently trained teachers, inadequate infrastructure, and poorly specified curricula hinder effective teaching and learning (Ohadiugha, 2020; Onwunali, 2020). In Zaria, where most families are resource-poor subsistence farmers, these challenges are compounded by socioeconomic factors, including cultural norms such as early marriage, which restrict female participation in agricultural education. Earlier, studies comparing Zaria and Sabon Gari reported that while students in Sabon Gari often perform better (Onwunali *et al.*, 2022), overall results remain sub-optimal, with average grades falling below expectations (Omodara *et al.*, 2024). Factors influencing these outcomes include school type, location, and the availability of qualified teachers. The interaction between these variables underscores the importance of context-specific interventions to address the unique challenges faced by teachers and students in each locality. Therefore, the need to enhance teacher training and professional development to build confidence in teaching complex scientific concepts remains *sine qua non* to facilitate the adoption of innovative, student-centered instructional strategies. Such foster greater interest and engagement (Eya and Chukwu., 2012). Studies have also shown that supply of modern and improved teaching facilities and practical resources supports experiential learning when adequate policies that clarify curriculum specifications and promote gender equity in agricultural education are put in place (Amadi & Okagwa, 2020).

Statement of the Problem

Despite the immense importance of Agricultural Science, its teaching and learning have been plagued by several challenges, including inadequate infrastructure, lack of qualified teachers, and poor learning resources, *inter alia*. These challenges have resulted in poor students' performances, and lack of interest in the subject. Previously, it has been demonstrated that inadequate infrastructure, incompetent teachers, poor application of ICT facilities and insufficient power supply mostly in rural environments were responsible for poor students' achievement in secondary schools (Onwunali *et al.*, 2024b; Omodara *et al.*, 2024). Hence the need to identify the basic challenges for sustainable



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teaching and learning of the subject in Zaria and Sabon Gari Local Government Areas of Kaduna State. The necessity is based on speculations and findings on students' performance and interest in Kaduna (Onwunali et al., 2024a), as well as the recent government policies on teachers' development and rehabilitation of secondary school to enhance effectiveness and performance.

Objectives of the Study

The specific objectives of this study are to:

1. Identify the socioeconomic characteristics of Agricultural Science teachers in secondary schools in Kaduna State,
2. examine the infrastructural and instructional materials challenges in teaching and learning Agricultural Science,
3. evaluate the Information and Communication Technology (ICT) challenges in teaching and learning Agricultural Science,
4. access challenges of school funding on teaching and learning of Agricultural Science,
5. determine challenges of students' interest and attitude towards Agricultural Science, and
6. identify strategies for improving the teaching and learning of Agricultural Science in Zaria and Sabon Gari Local Government, Kaduna State.

Research Questions

The following questions guided the study:

1. What are the demographic differences between Agricultural Science teachers in Public Secondary Schools that influence teaching in Zaria and Sabon Gari areas?
2. Does the availability of infrastructure and instructional materials depict modern and skillful teaching and learning of Agricultural Science in the study areas?
3. Is the level of application of Information and Communication Technology (ICT) suitable for global experience in teaching and learning Agricultural Science in Zaria and Sabon Gari areas?
4. What are the challenges of school funding on teaching and learning Agricultural Science in Zaria and Sabon Gari areas?
5. What are the factors responsible for students' lack of interest and poor attitude towards learning Agricultural Science in Zaria and Sabon Gari areas? and
6. What are the possible strategies to improve the teaching and learning of Agricultural Science in Zaria and Sabon Gari Local Government Areas of Kaduna State?

Research Hypotheses

The study tested the following null hypotheses at 5% level of significance.

- Ho₁: There are no significant differences between infrastructure and instructional materials in Zaria and Sabon Gari.
- Ho₂: There are no significant differences between level and application of Information and Communication Technology in Zaria and Sabon Gari.
- Ho₃: There are no significant differences between funding challenges in Zaria and Sabon Gari.
- Ho₄: There are no significant differences between factors responsible for lack of interest and poor attitude of students to agricultural science in Zaria and Sabon Gari.
- Ho₅: There are no significant differences between the strategies used to improve teaching and learning of Agricultural Science in Zaria and Sabon Gari.

Materials and Methods

Description of the Study Area



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The investigation was carried out in Zaria metropolitan city which comprised both Zaria and Sabon Gari Local Government Areas (LGAs) in Kaduna North Senatorial District. Zaria lies between latitude 11.07° and 12° North and longitude 07.44° and 8° East with land area of 300 square kilometers (Nwanosike, 2013; Ubandoma *et al.*, 2021), and an estimated population of approximately 736,000 according to 2006 census. Sabon Gari lies between longitude 7° and 8° East and latitude 10° and 12° North with average altitude of 675m above sea level (*masl*), with a land area of approximately 600km² (Kaduna Agricultural Development Agency, 2018). In 2018, it had a projected population of 725,069 at an annual growth rate of 3.2% (National Population Commission, NPC and National Bureau of Statistics, NBS, 2016). Inhabitants of both areas are mostly farmers and traders. The cosmopolitan nature attracts a lot of civil servants from various ethnic groups in Nigeria and beyond, due presence of several primary, secondary and tertiary institutions

Research Design

The study adopted a descriptive survey of research design. The population of the study comprised that of the 84 Agricultural Science teachers in the 41 registered public secondary schools. Of the population, Zaria had 17 registered public schools and 15 agricultural teachers while Sabon Gari had 24 registered schools and 69 teachers. The entire population of schools and teachers were used for data collection, considering the limited and negligible numbers, hence sampling was not done. The instrument used for data collection was close structured questionnaire, comprising three sections: the demographic information (sex, age, marital status, qualification and years of teaching experience) and perceived challenges affecting teaching and learning of Agricultural Science (Infrastructure and instructional materials, use of ICT, funding, interests and attitudes) and strategies. The challenges and strategies were designed in a 4-point rating scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD), and assigned values of 4, 3, 2 and 1, respectively. The instrument was validated by three experts from Federal University of Education, Zaria. Observations of the experts in terms of Language, sentence and spelling were incorporated before the pretest that yielded reliability coefficient value of 0.88 using Cronbach Alpha.

Data Analysis

Data on the demographic information of the teachers was subjected to simple descriptive statistics of mean and percentage while challenges and strategies of teaching and learning were analyzed using mathematical technique. Standard deviation was used to determine teachers' consensus agreement on their perception on the items. Standard deviation values 0 to 0.49 implied high common agreement on the significance of the challenge and strategy while values ≥ 0.5 depicted diverging opinions. Mean benchmark of ≥ 2.5 determined the decision for the significance of challenges and strategies, while < 2.5 indicated not significant and as such, the item in the challenges and strategies was assumed not to have strong influence (Onwunali *et al.*, 2024b). t-test independent ($p \leq 0.05$) was used to test hypotheses of the study. All the analyses were carried out using Statistical Package for Social Science (SPSS) version 23.

Presentation of Results

Socioeconomic Characteristics of the Teachers

Results in table 1 revealed that male teachers (73.33%) dominated in Zaria while female teachers were more in Sabon Gari. (60.87%). Majority of the teachers were young and energetic within the ages of 31 and 40 years and married, 73.33% and 71.01% for Zaria and Sabon Gari, respectively. Results also showed that Bachelor of Science in education (B.Sc. Ed) dominated teachers' qualification, however Sabon Gari had relatively a greater number of graduates teachers (55.07%) compared to Zaria (53.33%). Teacher's years of teaching experience was between 6 to 10 corresponding to 46.67% and 31.88 in Zaria and Sabo Gari, respectively.



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Table 1: Socioeconomic Characteristics of Agricultural Science Teachers in Zaria Education Zone

Variable	ZRX (%)	SBG (%)
Sex		
Male	73.33	39.13
Female	26.67	60.87
Age (in years)		
20 – 25	-	5.80
26 – 30	6.67	15.94
31 – 35	26.67	27.54
36 – 40	46.67	23.19
41 – 45	13.33	14.50
46 – 50	6.67	11.59
> 50	-	1.45
Marital Status		
Single	20.00	27.54
Married	73.33	71.01
Widowed	6.67	1.45
Qualification		
NCE	6.67	8.70
B.Sc.	13.33	20.29
B.Sc. Ed.	53.33	55.07
M.Sc.	-	10.14
M.Sc. Ed.	6.67	5.80
Others	13.33	-
Years of Teaching Experience		
1 – 5	20.00	30.43
6 – 10	46.67	31.88
11 – 15	20.00	14.50
16 – 20	-	13.04
21 – 25	6.67	8.70
26 – 30	6.67	-
> 30	-	1.45
Total	100	100

ZRX = Zaria, SBG = Sabon Gari, % = Percentage

Infrastructure and Instructional Materials Challenges

Results (Table 2) revealed significant infrastructural decay in both Zaria and Sabon Gari, with grand means and standard deviation of 3.11 ± 0.76 and 3.03 ± 0.32 , respectively. Results also showed prominent levels of inadequacy in farm tools, equipment and chemicals, teaching materials and power supply for supporting teaching facilities in both locations, however such challenges were highly inadequate in Zaria with 3.93, 3.87 and 3.87, respectively. Contrarily, in Sabon Gari inadequate power supply for supporting teaching facilities (3.39), inadequate equipment and chemicals (3.29) and dilapidated laboratories (3.26) were more serious challenges, implying that location, school and teachers' activities influence the availability of infrastructures. Results also revealed significant standard deviation values in Zaria 0.76 and low value in Sabon Gari (0.32).



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Despite the variation in means, t-test value of $t = 0.29 < 0.05$ indicated no significant difference in infrastructural challenges of the two locations, hence H_{01} was accepted.

Table 2: Challenges in Infrastructure and Instructional Materials in Zaria and Sabon Gari Educational Zone

ZRX= Zaria, SBG= Sabon Gari, \bar{x} = mean, SD= Standard Deviation, Df= 28, $t_{-cal.} = 0.29$, $t_{-crit.} = 2.048^{NS}$

S/N	Items	ZRX (\bar{x})	SD	SBG (\bar{x})	SD
1	Dilapidated laboratories	3.37	0.59	3.26	0.81
2	Inadequate equipment and chemicals	3.67	0.80	3.29	0.71
3	Dilapidated and poorly equipped libraries	3.73	0.74	3.20	0.85
4	Inadequate number of classrooms	2.07	0.88	2.58	0.99
5	Small-sized classrooms	1.53	0.64	2.35	1.03
6	Inadequate teaching materials (specimen, charts, posters)	3.87	0.35	3.09	0.84
7	Inadequate school garden for farm practical	2.53	1.06	3.14	1.07
8	Inadequate farm tools, equipment, and machines	3.93	0.26	3.35	0.84
9	Inadequate power supply for supporting teaching facilities	3.27	1.03	3.39	0.83
10	Lack of storage for safekeep of instructional materials	2.60	0.91	3.17	0.89
11	Lack of farm for practical	3.40	0.74	2.94	1.01
12	Lack of government monitoring to assess infrastructural decay	3.40	0.74	3.09	0.90
13	Lack of security for farms and other facilities	3.87	0.35	3.17	0.91
14	Inadequate maintenance of facilities for teaching	3.13	0.99	2.93	0.86
15	Lack of maintenance culture by the staff	2.07	0.88	2.48	0.98
Grand Mean		3.11	0.76	3.03	0.32

Challenges in the use of ICT

The grand mean and standard deviation in Table 3 showed that ICT challenges were high both locations however, it was significantly higher in Zaria (3.03 ± 0.73) compared to Sabon Gari (2.28 ± 0.53). Standard deviation values implied diverging opinions of teachers at both locations. In Zaria could be due to availability of computer laboratories in some schools and absence in others. Different in Sabon Gari where majority of schools do not have computer laboratories, hence confirming relatively low diverging consensus in their perception. Mean results varied significantly from 1.60 to 3.87 in Zaria to 2.13 to 3.52 in Sabon Gari. However, teachers disagreed with incompetence in internet browsing (< 2.49) was a strong challenge, probably due the fact that most of them are conversant with mobile browsing and may not be efficient using computers. Comparatively, the t-test value of $t = 0.55 < 0.05$ between ICT challenges in Zaria and Sabon Gari, was not significant, therefore the hypothesis there is no significance between the two locations was accepted. The use of ICT and digital devices in teaching agriculture in Kaduna North Senatorial Zone is grossly inadequate and jeopardizes youths' participation in global digital communication. Specifically, inadequate computers and accessories, inadequate ICT facilities, and inadequate power supply dominated challenges in both LGAs. Subsequently, location of schools also influenced ICT availability and application, while inadequate number ICT skilled teachers, teachers' incompetent skills in ICT applications and inadequate experience of teachers in application of power point were



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major challenges in Zaria, poor internet facilities, network and service and lack of ICT laboratory dominated in Sabon Gari. Despite variation in means, there was no significant difference between ICT challenges in Zaria and Sabon Gari. Hence the hypothesis was accepted. Previous reports have shown that inadequate computers and accessories, inadequate ICT facilities, and inadequate power supply dominated challenges in secondary schools (Onwunali *et al.*, 2024b; Omodara *et al.*, 2025).

Table 3: Challenges in the use of ICT in Zaria and Sabon Gari Educational Zone

S/N	Items	ZRX (\bar{x})	SD	SBG (\bar{x})	SD
1	Inadequate computers, printers, scanners, photocopiers	3.87	0.52	3.52	0.74
2	Inadequate power supply	3.73	0.80	3.46	0.85
3	Teachers' incompetent skills in ICT application	3.47	0.52	2.29	0.96
4	Inadequate number of ICT skilled teachers	3.93	0.26	2.59	0.97
5	Poor internet facilities, network, and service	2.53	0.92	3.32	0.76
6	Incompetence in word processing (typing & printing)	2.73	1.03	2.78	0.95
7	Low experience of teachers in use of excel for calculation	2.93	1.16	2.43	0.95
8	Inadequate experience of teachers in power point usage	3.00	0.65	2.36	0.87
9	Incompetence of teacher's internet browsing	1.60	0.74	2.13	0.95
10	Lack of ICT laboratory	2.60	1.12	3.30	0.99
Grand Mean		3.04	0.73	2.28	0.53

ZRX= Zaria, SBG= Sabon Gari, \bar{x} = mean, SD= Standard Deviation, Df= 18, t-cal. = 0.55, t-crit. = 2.10^{NS}

Challenges in Funding

Results (Table 4) revealed that both Zaria 3.03 and Sabon Gari 3.22 were underfunded. However, the uniform (± 0.12) agreement on funding barriers were slightly high in Sabon Gari and diverging (± 0.76) in Zaria. By indication, school funding experiences vary significantly among teachers in Zaria, due to additional funds by politicians and Alumni interventions, creating variation in funding of schools. Consequently, insufficient financial motivation for teachers (3.38), inadequate funds for instructional materials (3.80) and shortage of funds for chemicals and specimens (3.80) significantly dominated funding barriers in Zaria. But they were not in administrative impress, young farmers club activities and school inspection and monitoring. In Sabon Gari, inadequate funds for regular farm exhibitions and shows (3.39), lack of money to buy farm tools and machinery (3.32) and insufficient financial motivation for teachers' (3.30) were prominent. Despite disparities in perception, t- value of $-0.68 < 0.05$ indicated no significant difference between funding challenges in the two locations, as such the H_03 was accepted.

Table 4: Challenges on the funding Agricultural Science in Zaria and Sabon Gari Educational Zone

S/N	Items	ZRX (\bar{x})	SD	SBG (\bar{x})	SD
1	Inadequate funds to purchase instructional materials	3.80	0.56	3.30	0.75
2	Lack of administrative impress for Agricultural Science	2.27	1.10	3.09	0.76
3	Unsuitable teachers' salaries and wages	3.00	1.07	3.07	0.94
4	Shortage of funds for chemicals & Agricultural Science specimen	3.80	0.41	3.25	0.76
5	Lack of support for young farmers club activities	2.27	1.10	3.14	0.79



www.foefugusau.com.ng
des@fugusau.edu.ng

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6	Insufficient financial motivation of teachers	3.87	0.35	3.30	0.75
7	Inadequate funds for regular farm exhibition & show	3.47	0.92	3.39	0.69
8	Inadequate funds to organize field trips/excursion	3.47	0.91	3.28	0.66
9	Inadequate funds for school inspection and monitoring	1.73	0.80	3.03	0.80
10	Lack of money to buy farm tools and machinery	2.67	0.98	3.32	0.74
Grand Mean		3.03	0.76	3.22	0.12

ZRX= Zaria, SBG= Sabon Gari, \bar{x} = mean, SD= Standard Deviation, Df = 18, t-cal. = -0.68, t-crit. = 2.101^{NS}

Poor Interest and Attitudes of Students

Results in Table 5 revealed significantly poor interest and attitude in Zaria and Sabo Gari, however Zaria recorded a higher mean (2.98) than Sabon Gari (2.67). The standard deviation value of ± 0.67 and ± 0.33 for Zaria and Sabo Gari respectively diverge perception in Zaria and uniform opinion in Sabon Gari, reflecting differing experiences among teachers. Unwilling attitude of students to Agricultural Science (3.87) due to lack of career counseling (3.80) and poor attitude to farm work and practice (3.67) were main barriers in Zaria, despite having competent Agricultural Science teachers (1.93). In Sabon Gari, poor attitude to farm work and practice (2.93), lack of counseling (2.91), home background and parental perception in Agricultural Science (2.86) and unwilling attitude of students to Agricultural Science (2.86) were prominent to poor student's interest. Field observation revealed and confirmed that limited land for farm practical encouraged theoretical teaching in Sabon Gari, contrary to Zaria, where majority of schools have land that are used for farm practical mostly during cropping season, however not in all possibly why Zaria have high diverging opinion. The t-test value of $1.01 < 0.05$ indicated no significant, hence the hypothesis that there is no significant difference in student's interest and attitude in the two locations was accepted.

Table 5: Poor Interest and Attitudes of Students to Agricultural Science in Zaria and Sabon Gari Education Zone

S/N	Items	ZRX(-)	SD	SBG(-)	SD
1	Low interest in classroom teaching (theory)	3.40	0.83	2.80	0.90
2	Lack of interest in young farmers club activities	2.67	0.98	2.70	0.77
3	Poor attitudes to farm work and practical	3.67	0.72	2.93	0.83
4	Unwilling attitude of students to Agric. Science	3.87	0.35	2.65	0.89
5	Teachers' preference for male students to females in Agricultural Science	2.47	0.99	2.57	1.05
6	Home background and parental perception in Agric. Science	2.67	0.98	2.87	0.73
7	Poor students' performance in Agric. Science examinations	3.27	0.88	2.61	0.83
8	Unwillingness of students to accept careers in Agriculture	2.93	0.88	2.86	0.79
9	Students' Truancy to Agricultural Science classes	2.13	0.83	2.70	0.77
10	Lack of students counseling for careers in Agricultural Science	3.80	0.56	2.91	0.84
11	Incompetent Agricultural Science teachers	1.93	1.16	1.75	0.91



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Grand Mean	2.98	0.67	2.67	0.3 3
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ZRX= Zaria, SBG= Sabon Gari, \bar{x} = mean, SD= Standard Deviation, Df = 20, t-calculated = 1.01, t-critical. = 2.086^{NS}

Strategies for Improvement of teaching and leaning Agricultural Science

In table 6, the grand mean of 3.70 and 3.34 for Zaria and Sabon Gari, respectively indicated support for the seventeen identified strategies to improve the teaching and learning of Agricultural Science. Similarly, the low standard deviations values of 0.31 and 0.14 in the two locations confirmed teachers' collective agreement on the strategies. Although the 17 perceived strategies were significant (≥ 2.5), results showed that sustainable salary structure and regular payment were major strategies of improvement in both Zaria and Sabon Gari. Teachers also emphasized the need for financial motivation, adequate funding of schools, recruitment of qualified Agricultural Science teachers, sufficient administrative fund for agriculture, and training and retraining of teachers to enhance knowledge. The t-test value of $t = 3.30 > 0.05$ showed a significant difference between the strategic approaches in Zaria and Sabon Gari, suggesting stronger support for improvement of strategies in Zaria. Therefore, the hypothesis that there is no significant difference in the strategic approaches in each location was rejected

Table 6: Strategies for Improvement of Teaching Agricultural Science in Secondary Schools in Zaria Education Zone

S/N	Items	ZRX (\bar{x})	SD	SBG (\bar{x})	SD
1	Regular school inspection by the ministry of education	3.87	0.35	3.29	0.84
2	Provision of well-equipped Agric. Science laboratory	3.53	0.61	3.29	0.93
3	Availability of well-equipped and spacious classroom	3.93	0.26	3.28	0.96
4	Required teacher student class ratio	3.93	0.26	2.97	0.91
5	Functional and convenient Agric. Science farm for practical	3.73	0.59	3.36	0.91
6	Adequate farm tools and machines to ease students work	3.87	0.35	3.35	0.89
7	Sufficient administrative fund for agriculture	3.93	0.26	3.30	0.83
8	Sustainable salary structure and regular payment	4.00	0.00	3.57	0.70
9	Financial motivation of teachers	3.87	0.35	3.49	0.80
10	Recruitment of enough and qualified Agric. Science teachers	3.80	0.41	3.39	0.81
11	Training and retraining of teachers to enhance knowledge	3.47	0.92	3.48	0.74
12	Regular Agricultural workshop and conferences for teachers	3.80	0.41	3.42	0.79
13	ICT training on Agric. Science packages and program	3.73	0.59	3.20	0.92
14	Regular supply of electricity	3.87	0.35	3.28	0.84
15	Availability of ICT facilities in the secondary schools	3.67	0.88	3.26	0.87
16	Regular agricultural exhibition, farm show, quiz, competition and seminars for students	2.93	1.16	3.48	0.72
17	Effective career guidance and counselor for students	3.00	0.93	3.39	0.73
	Grand Mean	3.70	0.31	3.34	0.14



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ZRX= Zaria, SBG= Sabon Gari, \bar{x} = mean, SD= Standard Deviation, Df= 32, t-calculated value. = 3.30, t-critical value. = 2.042*

Discussions

The variation in gender and marriage was associated with parental reservations towards the girl child education, early marriage and the usual cultural kulle system that prevents exposure of young ladies to the society in Zaria as against Sabon Gari more cosmopolitan nature, attracting people from different ethnic groups. Teachers' academic qualifications in both locations revealed availability of qualified teachers, as majority held B.Sc. Ed. which is by national policy the required teaching qualification. However, field experience revealed that while majority were Agricultural Education trained graduates, others were graduates of related disciplines such as Biology, Geography, and Integrated Science *inter alia*, confirming earlier report that shortage of trained teachers and poor application of pedagogical skills negatively influenced students' performance in agriculture (Onwunali and Muhammad, 2025). The optimum qualification of teachers was associated with the locations proximity to Ahmadu Bello University and Federal University of Education in Zaria, that float Agricultural Education as a course, and the current Kaduna State policy in education, ensuring minimum qualification of a degree to teach in Secondary Schools. Although teaching experience in both LGAs was within 6-10 years, the variation in percentage favour Zaria (46.67%) probably due to their teacher's conservative nature preventing them from migration until retirement while majority in Sabon Gari explores opportunities even outside teaching. Similarly, Ayinde *et al.* (2023) reported high percentage of married female Agricultural Science teachers in metropolitan areas of Ogun State. Eck *et al.* (2019) emphasized the need for effective Agricultural Science teachers through balanced program, personal life, reduced extra working hours and limiting their community leadership involvement. The high infrastructural decay in Zaria was confirmed by the standard deviation of 0.76, compared to a relatively low standard deviation of 0.32 in Sabon Gari. This implied diverged opinion among Zaria teachers and uniformly agreed among teachers in Sabon Gari on the scarcity of infrastructure and instructional materials. In practice, government takes absolute responsibility for school sponsorship in Sabon Gari as against Zaria where schools' alumni supplement in certain schools. Therefore, variation in school standards because of alumni activity may have created a diverged opinion. This is because while some were equipped, others lack infrastructures, resulting in teachers' inconsistent experiences. For instance, Barewa College and Alhudahuda College among others where alumni activities strongly support their Alma Mata' as way of giving back to society, perceived availability of infrastructure differently compared to where such does not exist. Field observation revealed periodic activities like construction and renovation of classrooms and Science Laboratory, supply of computers, road construction and student hostels by alumni in Zaria. However, in Sabon Gari, most public schools have limited land space making it difficult for expansion and additional infrastructural development. Comparatively, the t-test value of $t = 0.29 < 0.05$ indicated that there is no significant difference in infrastructural challenges of the two locations, hence H_0 was accepted. Earlier, information on secondary school Agricultural Science infrastructure and instructional materials revealed severe deficiency in physical and digital facilities, such as inadequate and non-functional laboratories, farms, and processing areas. These limitations, compounded by chronic under-funding, poor electricity, and a lack of modern equipment, hinder practical training and the use of ICT (Onwunali *et al.*, 2025). Following the findings, funding of Agricultural Science activities in Northern Senatorial secondary school zone of Kaduna State was confirmed inadequate, because of poor teachers' motivation, inadequate supply of instructional materials and poor experiential teaching. Earlier, reports have shown that poor financial incentive



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negatively influences socioeconomic and work attitude of teachers. For instance, Ayinde *et al.* (2023) reported that, work attitude affected teachers socioeconomic and work-related issues like inadequate incentive and poorly equipped laboratories. Studies have also confirmed the persistent underfunding and variations in teacher perceptions, in Nigerian schools, particularly in the Northern regions (Isa & Alao, 2022; [Anyanwu, 2026](#)). This highlights ongoing teacher shortages and funding priorities among the acknowledged budget challenges. The study results further highlighted location-specific barriers to students' interest and attitudes toward Agricultural Science in Zaria and Sabon Gari, Nigeria. These results indicated consistently low student engagement in Agricultural Science across both locations, aligning with recent studies showing parental disinterest, inadequate career guidance, and negative perceptions of farming as key barriers in Kaduna State particularly in Zaria. The higher variability in Zaria's attitudes, linked to seasonal farm access, underscores how inconsistent practical resources foster divergent teacher and student experiences, a pattern reported on infrastructural and pedagogical challenges in the region (Olutosin *et al.*, 2017). Despite no statistical difference ($p \leq 0.05$), Sabon Gari's uniform low means and land constraints highlight the need for targeted interventions like enhanced counselling and school farms, as recommended in contemporary Nigerian agricultural education analyses. Obaruyi *et al.* (2024) reported that, ease or difficulty perception of students in accepting Agricultural Science influences their attitude to the subject, while Agbidi *et al.* (2022) reported a negative attitude of students towards Agricultural Science. Perception and attitude significantly shape students' choices and is influenced by parental advice (Adebayo & Oloyede 2020; Adejoh *et al.*, 2016), peer influence (Eze & Onyemeh, 2022), and career aspirations Onwunali *et al.*, 2022). The statistical results from Table 6 reveal strong teacher consensus on 17 strategies for enhancing Agricultural Science teaching and learning, evidenced by grand means of 3.70 in Zaria and 3.34 in Sabon Gari, with low standard deviations (0.31 and 0.14), indicating uniform agreement, and a significant t-test value of $3.30 > 0.05$ that favoured Zaria. Key priorities like sustainable salary structures, regular payments, financial motivation, adequate school funding, qualified teacher recruitment, administrative funds, and ongoing training align with recent Nigerian studies emphasizing remuneration improvements and professional development to boost morale and curriculum delivery (Onwunali *et al.*, 2026). These findings rejected the null hypothesis of no locational differences, underscoring the need for targeted interventions in Sabon Gari while supporting Zaria's stronger endorsement, consistent with broader calls for policy reforms in teacher preparation and resource allocation. Earlier, reports have shown that inadequate funding of Agricultural Science affected provision of facilities and resulted in students' poor academic performance (Adams *et al.*, 2018; Akatwijuka & Arinaitwe, 2024). Similarly, Tajudeen *et al.* (2023) revealed the significance of conducive or unconducive learning environment to students' academic achievement in Agricultural Science, while Amao (2025) reported positive correlation between teachers' attitude and students' academic performance in Agricultural Science.

Conclusion

There are persistent challenges in teaching and learning Agricultural Science at the secondary schools within the Zaria and Sabon Gari Local Governments, both in Zaria Educational Zone. The studies collectively revealed that the current instructional strategies employed in teaching the subject in both LGAs are insufficient to motivate students or equip them with digital and practical skills, to match global practice and standards. Therefore, there is a clear need for more innovative, student centered, and practical approaches to teaching, as well as systemic support to address resource and perception challenges. Implementing recommendations below can significantly enhance students' interest and performance in Agricultural Science, contributing to the development of a new generation of skilled and motivated agricultural professionals in Nigeria.



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Recommendations

Based on the findings, the following recommendations were made to enhance the teaching and learning of Agricultural Science in public secondary schools in Zaria and Sabon Gari:

1. Schools should adopt learner centered and practical approaches by integrating a more hands-on and experiential learning activities like school farms, field trips, and demonstration projects to make Agricultural Science more engaging and relevant to students' lives as well as organize regular agricultural exhibitions, farm shows, and competitions to stimulate student interest.
2. Stakeholders, both governments, non-governmental (NGOs) and private partnerships should ensure employment of qualified Agricultural Science teachers and continuous professional development of those in the system. Such will regularly update teachers on use and application of modern instructional materials and the use of ICT infrastructures like computer laboratories and reliable internet access, thereby improving teachers' competences in digital teaching methods. This is because training and retraining of teachers in inquiry-based learning, and problem-solving methods overcomes instructional difficulties and improve content delivery.
3. Government and other educational stakeholders must invest in adequate teaching materials such as laboratory equipment and chemicals, and farm tools to support practical learning experiences, as well as prioritize the renovation of libraries, and classrooms. Increased budgetary allocation for Agricultural Science education will facilitate the provision of instructional materials, practical activities, and teachers' incentives by ensuring timely and adequate payment of teachers' salaries.
4. School administrators should strengthen career guidance and counseling, as effective implementation will expose students to career opportunities in agriculture, addressing cultural and parental biases that discourage student participation in Agricultural Science. In addition, the perceptive challenges are discouraged through regular awareness campaigns, career talks, and displaying successful agricultural entrepreneurs to inspire students.
5. The dynamic nature of Agricultural Science demands that the curriculum should be periodically reviewed to ensure it reflects current agricultural practices, technologies, and career opportunities, to enhance its relevance and appeal. The review should involve collaboration with stakeholders such as the teachers, industrial professionals, and entrepreneurs to facilitate schools' partnership with local farms, agricultural agencies, and NGOs who provide mentorship, internships, and exposure students to real world agricultural practices.
6. State Ministry of Education, local communities, and alumni associations should intensify efforts in monitoring schools to ascertain their level of progress, since regular inspections and monitoring of schools by educational authorities and other stakeholders ensure compliance with standards and identify areas of improvement need and intervention.

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References

- Adams, A. B., Arogundade, A. O. & Oyeleke, A. L. (2018). The roles of guidance and counselling services for the successful implementation of universal basic education in Nigeria. *Issues in Professional Counselling (IRC)*, 1(1), 227-232.
- Adebayo, O. A. & Oloyede, O. O. (2020). Parental influence on students' career choices in agriculture: A case study. *J Agric Educ Ext*, 26(1), 33 - 44.
- Adejoh, S. O., Edoke, M. H. & Shaibu, M. U. (2016), Assessment of students' attitude towards Agricultural Science Subject in secondary schools in Olamaboro Local Government Area of Kogi State, Nigeria. *Int J Agric Vet Sci*, 2(1), 18 - 27.
- Akatwijuka, B. & Arinaitwe, J. (2024). Teachers' motivation and students' academic performance secondary schools, Mbarara city metropolitan. *Journal of Social and Educational Research*, 3(4), 224-239
- Akinmade, C. T. (2002). The problem of teaching and learning agricultural science in tertiary institutions: A case study of Sabon Gari Local Government. *Project List Nigeria*.
- Amadi, N. S., & Okagwa, P. O. (2020). Effects of modern agricultural technology on the teaching and learning of agricultural science in senior secondary schools in Emolga, Rivers State. *African Journal of Agriculture and Food Science*, 3(3), 1-11.
- Amadi, U. P., & Adejoh, S. O. (2020). Students' lack of interest in agricultural education programme: Causes and remedies. *Science World Journal*, 17(2), 8-15.
- Amao S. R. (2025). Influence of teachers' characteristics on students' academic performance in Agricultural Science in selected Senior Secondary Schools in Oyo Metropolis, Oyo State, Nigeria. *Interdisciplinary Journal of Educational Practice*, 12(3), 31-42
- Anyanwu, S. (2026). Alausa leads defense of 2026 education budget, prioritizing teachers, infrastructure, and skills. Federal Ministry of Information and National orientation <https://fmino.gov.ng/alausa-leads-defence-of-2026-education-budget-prioritises-teachers-infrastructure-and-skills/>
- Ayinde, A. F. O., Bolarinwa, K. K., Sanusi, R. A., & Ajao, H. O. (2023). Factors affecting agricultural teachers' work attitude in selected secondary schools: a case of Abeokuta-South and Sagamu Local Government Areas, Ogun State, Nigeria. *Fudma Journal of Sciences*, 2(2), 234-243. <https://fjs.fudutsinma.edu.ng/index.php/fjs/article/view/1370>
- DOI: <https://doi.org/10.30574/wjarr.2024.23.3.2808>
- Eck, C. J, Robinson, J. S. Ramsey, J. W. & Cole, K. L. (2019). Identifying the characteristics of an effective agricultural education teacher: A national study. *Journal of Agricultural Education*, 60(4), 1-18 <https://doi.org/10.5032/jae.2019.04001>
- Egun, A. C. (2007). Perceived teachers' instructional difficulties in some content areas of SSS agricultural science for sustainable agricultural development in Nigeria. *Journal of Social Sciences*, 15(2), 141-145.
- Eya, L. O., & Chukwu, L. A. (2012). Assessing instructional strategies in agricultural science to enhance senior secondary school students' interest in agriculture within Zaria educational zone. *Science World Journal*, 17(2), 1-7.
- Eze, C. C, & Onyemeh, N. C. (2022). Peer influence and career choice in agriculture: A study of secondary school students. *J Agric Educ Ext*, 28(1), 31 - 42.
- Isa, S. & Alao, M. M. (2022). Perceptions of Stakeholders on Funding of Private Secondary Schools in Nigeria: A Case Study of Therbow Nursery, Primary and Secondary School Zaria, Kaduna State. *International Journal of Technology Innovation and Management*, 3(2), 91-95



Comparative Assessment of Challenges and ... Onwunali, M. R. O., Et. al. (2026)

- Obaruyi, L., Agbidi, S. S. & Ikeoji, C. N. (2024). Students' perception and attitude to agricultural science subject acceptance in government-owned secondary schools in Edo State, Nigeria. *World Journal of Advanced Research and Reviews*, 23 (3), 1879 –1885
- Ohadiugha, M. N. (2020). Physical Learning Environment for Optimum Academic Performance: Implications for National Security. *Benin Journal of Educational Studies*, Volume 26, 1 & 2, 178-191
- Olutosin A. O., Leah O. O. & Oluwaseun, A. O. (2017). Challenges, Attitudes and Academic Performance of Agricultural Science Students in Public Secondary Schools of Ibadan North, Nigeria. *Journal of Scientific Research & Reports*, 13(1), 1-11, DOI: 10.9734/JSRR/2017/31216
- Oluwatosin, F. T. & Olatoye, R. A. (2022). Factors influencing students' subject choice in senior secondary schools: A case study of Agricultural Science. *J. Agric. Educ. Ext.* 28(2), 169 - 178.
- Omodara, A. A., Onwunali, M. R. O. & Joshua, Y. F. (2024). Influence of Gender and School Location on Performance in Agricultural Science among Secondary School Students in Kaduna North, Kaduna State. *Zamfara International Journal of Education*, 4(4), 62-69
- Omodara, A. A., Onwunali, M. R.O. & Ifeakor, M. N. (2025). Adoption levels of Information and Communication Technology facilities in teaching Senior Secondary Schools Agricultural Science in Northwest Nigeria. *Zaria Journal of Educational Studies*, 25(1), 77-85, <http://zarjes.com/ZALES/article/view/1539>
- Onwunali, M. R. O, Muhammad, H. B. & Omodara, A. A. (2024). Trend of Agricultural Science Students' Performance in Co-Education Public and Private Senior Secondary Schools of Zaria Educational Zone, Kaduna State, Nigeria. *Kashere Journal of Science and Education*, 2(1), 241-254
- Onwunali, M. R. O., & Muhammad, H. B. (2025). Determination of Technical and Pedagogical Enhancement Needs of Secondary School Agricultural Science Teachers in Zaria Educational Zone, Kaduna State, Nigeria. *Nature and Trends in Science and Technology*, 1(1), 19-31. <http://doi.org/10.69798/66934181>
- Onwunali, M. R. O., Hassan Adamu & Usman Yakubu (2020). Information and communication technology as a tool for sustainable livelihood activities in rural Kauru, Kaduna State. *International Journal of Advanced Research in Social Sciences, Environmental Studies & Technology (IJARSSEST)*, 5(1), 227-238
- Onwunali, M. R. O., Muhammad, H. B. & Balogun, B. I. (2022). Comparative performance of Senior Secondary School Agricultural Science students in Zaria and Sabon Gari Local Government Areas of Kaduna State, Nigeria. *Open Journal of Social Science*, 10(5), 509-523. DOI: 10.4236/jss.2022.105033.
- Onwunali, M. R. O., Muhammad, H. B. & Omodara, A. A. (2024). Application of Information and Communication Technology in enhancing teaching of agricultural science in public senior secondary schools in Zaria, Kaduna State, Nigeria. *Zaria journal of educational studies*, 24(2), 1-11
- Onwunali, M. R. O., Omodara, A. A., Dogo, P., & Ayeni, D. (2026). Determinants of Sub-Optimal Academic Achievement in Agricultural Science: Disparities between Northern and Southern Zones of Kaduna State, Nigeria. *Open Journal of Social Sciences*, 14, 386 402. <https://doi.org/10.4236/jss.2026.143022>
- Onwunali, M. R. O., Yusuf, T. & Dikko, G. (2025). Challenges of Teaching and Learning Agricultural Science in Public Secondary Schools: A Threat to Food Security in Kaduna Metropolis, Nigeria. *International Journal of Strategic Research in Education, Technology and Humanities*, 13(2), 103-120, DOI: 10.48028/iiprds/ijsreth. v13.i2.08
- Tajudeen, M., Zahairu, A. & Aminu, H. I. (2023). Influence of learning environment and teachers' skills on academic achievement among senior secondary schools' students in Jigawa state, Nigeria. *British Journal of Multidisciplinary and Advanced Studies: Education, Learning, Training and Development*, 4(6), 19-27.