



Multidisciplinary Research and Extension Journal (MREJ) Central Bicol State University of Agriculture

EFFECTS OF COOPERATIVE INSTRUCTIONAL STRATEGY ON SENIOR SCHOOL STUDENTS' ACHIEVEMENT IN AGRICULTURAL SCIENCE IN ILORIN, NIGERIA

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ABSTRACT: *Poor performance by secondary school students in Agricultural Science is a persistent issue in the Nigerian education system, and one factor contributing to this poor performance is the use of teacher-centred teaching strategies. The primary purpose of the study was to investigate the effect of cooperative instructional strategy on senior school students' achievement in Agricultural Science in Ilorin, Nigeria. The study used a quasi-experimental design with a non-randomised, non-equivalent pre-test and post-test. Control group involving a 2x2x3 factorial design. The target population comprised all Senior Secondary School One (SSS 1) students in Ilorin, Nigeria. Two hundred and thirty-six (236) students participated in the study drawn through multi-stage sampling techniques. The Cooperative Instructional Strategy Manual (CISM) and the Agricultural Science Achievement Test (ASAT) were the two instruments used for data collection. Three experts validated the two instruments. ASAT reliability was assessed using the test-retest method, yielding a reliability coefficient of 0.84 (Pearson Product-Moment Correlation). Mean, Standard Deviation, t-test, and ANCOVA were used to analyse the data at the 0.05 significance level. The study found a significant difference in achievement between students taught with a cooperative instructional strategy and those trained with a conventional teaching method, in favour of the experimental group. The study concluded that the cooperative instructional strategy was more effective at enhancing students' achievement than the traditional strategy. It is recommended that teachers adopt it to teach Agricultural Science, as this study further demonstrates its effectiveness over the conventional method.*

Keywords: *Agricultural Science, cooperative instructional strategy, effect, senior school students, Ilorin, Nigeria*

INTRODUCTION

Agriculture plays a crucial role in the Nigerian economy, spanning multiple dimensions and contributing to the nation's development and economic well-being. Agriculture contributes significantly to food security by producing essential food crops and livestock products to feed Nigeria's ever-increasing population of over 200 million. It contributes 25% of Nigeria's Gross

Domestic Product (GDP) and foreign exchange earnings, and generates employment for about 27.9% of its population (Federal Government of Nigeria, 2024). Despite synthetic fiber production in industries to replace natural fibres such as cotton, hemp, sisal, and silk, it produces essential clothing materials and raw materials for agro-based industries. Therefore, the role of Agriculture in the country's economy cannot be jettisoned.

The Nigerian economy in the past decades



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has thrived on the agricultural sector. The sector was reputed to be the mainstay of the economy in the early 1960's. It was seen as a key driver of growth and development (Kamil et al., 2017). The export of agricultural products such as cocoa, cashew, rubber, and palm oil generates foreign exchange, supporting the balance of payments and international trade. Agriculture is one of the five sectors that contribute mainly to the national Gross Domestic Product (National Bureau of Statistics, 2023). The government of Nigeria recognized these contributions and introduced it as Agricultural Science in the secondary school curriculum.

Agricultural Science is of significant importance in the secondary school curriculum in Nigeria, offering students essential knowledge and skills in agricultural practices, technologies, and sustainability. Secondary School Agricultural Education imparts knowledge, skills, and attitudes in Agriculture to learners at the secondary level. The incorporation of Agricultural Science into the secondary school curriculum in Nigeria aims to achieve multifaceted objectives that span both theoretical and practical dimensions. According to NERDC (2012), the primary goals of Secondary school agricultural education in Nigeria are to: stimulate student interest in Agriculture, enable student acquire basic knowledge in Agriculture, develop basic agricultural skills in students, enable student integrate knowledge with skills in Agriculture, expose students to opportunities (occupation) in the field of Agriculture, prepare student for further studies in Agriculture. Additionally, Agricultural Science nurtures values of environmental consciousness, resourcefulness, and community development, aligning cohesively with the broader goals of holistic education.

Despite Agriculture's relevance to Nigeria's economy, students' achievement in the subject has been consistently low. The underachievement of students in Agricultural Science within Nigerian secondary schools can be attributed to many factors. These factors include: students' attitudes to the subject, inadequate use of innovative and active teaching techniques, insufficient funding, and inadequate farmland to practice agriculture (Otekunrin et al., 2017), lack of school facilities

and equipment (Muhammed, 2023), poor interest about learning Agriculture or pursuing agricultural related careers (Mulvane et al., 2023), poor parental guidance, lack of motivation, poor training environment, inadequate competent teachers, lack of pilot farms (Ekezie, 2020), examination malpractice (Oloidi, 2023), inadequate relevant instructional materials, and suitable textbooks, the wide coverage of the subject, and shortage of professional trained Agricultural Science teachers (Appiah et al., 2020), poor teaching methods, materials and techniques used in teaching Agriculture (Ugwuoke et al., 2023; Ikegbusi & Okeke, 2022).

Additionally, several factors were truly identified by previous scholars and researchers in Agricultural Education. However, it is worth noting that the methods adopted by Agricultural Science teachers are the most predominant cause of poor students' achievement in the subject (Cheptirim et al., 2023; Ugwuoke et al., 2023; Ikegbusi et al., 2022). Most Agricultural Science teachers in secondary schools use the conventional teaching method. The conventional method of instruction is mainly employed in the teaching of Agriculture by secondary school teachers.

The conventional method is a teaching technique in which a more knowledgeable person (the teacher) supplies information and ideas to the less knowledgeable person (the student). In this teaching method, the teacher dominates the class proceedings, leaving students with very little chance to contribute. This method is also known as a teacher-centered approach. Most of the time, this method lacks detailed demonstration and fails to effectively develop students' agricultural competence and skills (Ibrahim, 2014). The absence of interactive sessions and practical demonstrations curtails students' opportunities to develop hands-on skills and gain insights into modern agricultural practices. This results in a superficial knowledge and understanding of the subject matter, making it difficult for students to apply practical knowledge in real-world contexts and leading to a loss of interest in agriculturally related occupations. To enhance students' achievement, there is a need to shift towards student-centred methodologies that foster active

participation, critical thinking, permanent learning, and practical experiences. One of these student-centred methods is the integration of cooperative instructional strategy for teaching Agricultural science in Secondary schools.

Okagbere (2022) explained a cooperative instructional strategy as a learner-centred approach in which learners study in groups to attain a target goal. Cooperative group teaching is a classroom instructional environment in which small groups of students work together to accomplish tasks for individuals and for the group's common goals. According to Johnson et al. (2013), cooperative instructional strategy is an instructional method in which students or individuals work together in small heterogeneous groups to complete a problem project or other instructional goal, while teachers act as guides or facilitators. The group is usually made up of four to five members. Tran (2014) asserted that cooperative teaching has five basic elements: positive independence, promotive interaction, individual accountability, the teaching of interpersonal and social skills, and the quality of group processing. Group objectives provide a stronger means of pulling students together to achieve goals, earn rewards or respect, and ensure that the group's accomplishments are based on the personal learning of each member (Offiah & Okonkwo, 2011; Abdulwaheed, 2023).

When students work together in small groups, they can exchange ideas, discuss concepts, and jointly solve problems, thereby deepening their comprehension of the subject matter. Cooperative learning encourages the development of critical thinking, communication, and interpersonal skills, as students learn from their peers' diverse perspectives and contributions. This approach not only fosters a positive learning environment but also prepares students for collaborative tasks in real-life situations, aligning with the demands of modern education and workplace contexts. Furthermore, a cooperative instructional strategy creates a positive learning environment where students feel supported, valued, and motivated to participate actively. This approach aligns with the shift from conventional teacher-centred methods to student-centred learning approaches that prioritize engagement,

active participation, and the development of higher-order cognitive skills.

The theoretical framework for the study is based on the theories of constructivism espoused by Piaget (1973) and Vygotsky's (1968) social constructivism. According to Saleem et al. (2021), constructivism is a theory of knowledge that explains how humans create knowledge and meaning by engaging in the interaction between their experience and their ideas. Theory holds that during teaching and learning, learners construct their knowledge. The use of the constructivist approach necessitates that teachers consider various ways to assess how students are engaged in learning on their own, which the cooperative instructional strategy can achieve when properly executed. The Social constructivist theory was developed by Vygotsky in 1968. It is a theory that views learning as an active process in which learners should discover principles, concepts, and facts for themselves; hence, the importance of encouraging group work among learners. According to social constructivists, knowledge originates from social interactions between individuals. Social constructivism emphasises the importance of engaging learners actively in the learning process (Bozkurt, 2017). This is evident in the cooperative instructional strategy, where learners and teachers interact socially during group work, with teacher(s) acting as facilitators of learning.

Globally, several studies have shown that a cooperative instructional strategy enhances students' academic performance. Such empirical studies include: Dei et al. (2025) in Ghana, Abdullah et al. (2023), Abdulwahab et al. (2016), Abdulwaheed (2023), Okagbare (2022) in Nigeria, Waiganjo et al. (2014) in Kenya, Roka and Khatri (2024) in Nepal, Kaymak et al. (2021) in Kazakhstan, Nou et al. (2025) in Cambodia, and Karali and Aydemir (2018) in Turkey have revealed that cooperative learning strategy improved students' performance in the context of the study focusing on the effects of the cooperative instructional strategy on senior school students' achievement in Agricultural Science in Ilorin, Kwara state, Nigeria. Understanding the influence of gender is crucial. Gender differences,

which can influence students' engagement, participation, and academic achievement in the subject, have received greater attention in recent years. Ofoegbu (2015) studied the effect of videotaped instruction on the acquisition of practical agricultural science skills among male and female secondary school students and provided valuable insights into the role of gender in academic achievement in Agriculture. Although the study did not find a significant gender difference in the acquisition of slashing and raking skills, it highlights the importance of considering gender-related factors in instructional strategies. The absence of a significant gender difference in Ofoegbu's study suggested that the influence of gender might vary depending on the specific skills or tasks being assessed in Agricultural Science, and the results may not be consistent. Waiganjo (2017) investigated the effect of the cooperative learning approach on students' academic performance and found no significant difference in the mean scores of male and female students taught Agriculture using the cooperative learning approach. Ogunjobi et al. (2020) also found that gender did not significantly influence students' achievement in Agricultural Science. Furthermore, Muchiri (2018) reported a significant difference in performance between male and female students in Agriculture, with male students performing better than female students. The results on the influence of gender on student achievement, as reviewed in these studies, are inconsistent and warrant further investigation.

Another variable of interest in this study, reported to influence students' academic performance, is score level (Nomsoor et al., 2021). The score level is a ranking model used in educational research to group students into three categories: high, medium, and low based on their test scores. Score Level pertains to the categorization of students' achievement based on predefined criteria in assessments, evaluations, or examinations (Abdulwahab et al., 2016). Score levels have been claimed to have the same meaning and use as the ability level (Alabi & Abimbola, 2022; Bada, 2022). Researchers in the field of Science Education have established differences in students' score levels, and their

results are inconsistent. Nomsoor et al. (2021) reported a significant difference in achievement among low-, medium-, and high-scoring students taught with the Gallery Walk Instructional Strategy in Ilorin. Similarly, Abdulwahab et al. (2016) found a significant difference in students' achievement when taught using a cooperative instructional strategy, with low-scoring students performing better than high- and medium-scoring students. Obochi (2021) also found that problem-solving strategies significantly influence the achievement and retention of low-scoring students. Bada (2022) found that the level of instruction significantly influenced students' achievement when taught using a brain-based teaching strategy. The study by Adeniji et al. (2018) reported no significant difference in achievement among low-, medium-, and high-scoring groups. Alabi and Abimbola (2022) reported no significant difference in achievement among low-, medium-, and high-scoring students. Akanmu (2019) also reported no statistically significant difference in students' achievement in set theory when taught using think-pair-share, as measured by scoring levels.

These reviewed studies underscore the pivotal role of scoring levels in assessing and improving students' academic achievement, highlighting how higher levels of mastery are associated with better overall achievement. Evidently, the aforementioned studies have not typically focused on the teaching of Agricultural Science. The literature shows that few studies have investigated the effect of a cooperative instructional strategy on students' academic achievement; therefore, this study was conceived to examine the effect of a cooperative instructional strategy in Ilorin, considering the influence of gender and scoring level.

This research aims to provide insights into the efficacy of active and innovative teaching approaches in Agricultural Science education, enabling educators and policymakers to make informed decisions to enhance the quality of agricultural education in Nigeria. This study, therefore, investigated the effects of a cooperative instructional strategy on senior school students' achievement in Agricultural Science in Ilorin, Kwara State, Nigeria, while examining the

moderating effects of gender and score level on students' achievement.

The primary aim of this study was to investigate the effects of cooperative instructional strategy on senior school students' achievement in Agricultural Science in Ilorin, Kwara State, Nigeria. Specifically, the study examined: (i) effect of cooperative instructional strategy on students' academic achievement in Agricultural Science in Ilorin, Kwara state; (ii) influence of gender on students' academic achievement when taught with instructional strategy in Ilorin, Kwara State; (iii) influence of score level on students' academic achievement in Agricultural Science when taught using cooperative instructional strategy in Ilorin, Kwara State; and (iv) interactive effects of the treatment, gender and score level on students' academic achievement in Agricultural Science in Ilorin, Kwara State. All four specific research aims or objectives were translated into research questions.

In order to these aims the following null hypotheses were formulated and tested at 0.05 level of significance: (i) there is no significant difference between the academic achievement of senior school students taught Agricultural Science with cooperative instructional strategy and those taught with Conventional teaching methods; (ii) there is no significant difference in the mean scores of male and female senior school students taught Agricultural Science using cooperative instructional strategy; (iii) there is no significant difference in the achievement of low, medium and high scoring students when taught Agricultural Science using cooperative instructional strategy; and (iv) there is no interactive effect among the treatment, gender and score levels on students' achievement in Agricultural Science.

METHODOLOGY

The study used a quasi-experimental, non-randomised, non-equivalent pre-test and post-test intact-class design. Control group involving a 2x2x3 factorial design indicating instructional strategies at two levels (Cooperative Instructional Strategy and Conventional method), gender at two levels (male and female), and score level at

three levels (high, medium, and low level).

The target population was all Senior Secondary School One (SSS 1) Students in Ilorin, Nigeria. Two hundred and thirty-six (236) students participated in the study, drawn through multi-stage sampling techniques: the first stage involved purposive selection of two Local Government Areas in Ilorin Metropolis, namely Ilorin West and Ilorin South Local Government Areas. Stage two involved selection of two co-educational schools from each of the two local government areas making a total of four (4) co-educational senior secondary and third stage entailed a balloting to distribute schools into experimental and control groups, the last stage selection of an intact class from each school making a total of four (4) intact classes from the four co-educational schools (two control groups and two experimental groups).

Two research Instruments were used for data collection: the Cooperative Instructional Strategy Manual (CISM) and the Agricultural Science Achievement Test (ASAT). The ASAT contained the demographic data of the students such as the name of the school, class and gender and the content was drawn from West Africa Examination Council (WAEC) past questions consisting of 20 multiple choice questions on the topics: Agriculture and its importance, and subsistence and commercial Agriculture as contained in the National Curriculum for Senior Secondary Agricultural Science developed by NERDC. Also, the CISM was developed by the researchers, and the two instruments were validated by three experts in Agricultural Education from the Department of Science Education, University of Ilorin, Ilorin, Nigeria, to determine their appropriateness. The reliability of the ASAT was assessed using the test-retest method, and a reliability coefficient of 0.84 was obtained using Pearson's product-moment correlation.

A letter of informed consent was presented to the authorities of the participating schools seeking their consent before administering the treatment to the students. Informed consent was given to teachers, students, and parents to seek their permission. Other ethical issues, such as avoiding risks to the participants, plagiarism, and others, were addressed. A pre-test was

administered to both experimental and control groups to obtain their pre-test scores. After a period of four weeks, another test (post-test) was administered across the two groups to obtain their achievement scores.

The mean was used to answer all research questions, and t-tests and ANCOVA were used to test the hypotheses at the 0.05 level of significance. The data were analysed using the Statistical Package for the Social Sciences (SPSS) version 26.

RESULTS AND DISCUSSION

Research Question 1: *Is there any difference in the academic achievement of students taught with a cooperative instructional strategy and those taught with the conventional method in Ilorin?*

Table 1 shows the mean and standard deviation scores of students taught using a

achievement of senior school students taught Agricultural Science with a cooperative instructional strategy and those taught with conventional teaching methods in Ilorin ($t_{234} = 6.03$; $p < 0.05$). This is because the p-value of 0.00 was less than the 0.05 significance level. Hence, Hypothesis 1 was rejected. This implies that students taught using a cooperative instructional strategy performed better than those taught with the conventional method.

The findings of the hypothesis revealed that there was a significant difference in the academic achievement of senior school students taught Agricultural Science with a cooperative instructional strategy and those taught with conventional teaching methods in Ilorin, which favoured the cooperative instructional strategy. This may be because cooperative instructional strategies have been shown to be effective in enhancing students' academic achievement. This could also be because the strategy allows students

Table 1. Mean Gain Difference between Experimental and Control Groups

Treatment	Control		Experimental		Mean Diff.		Mean Gain
	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test	
Mean	7.11	8.83	8.42	12.36	1.31	3.53	3.53
SD	2.39	3.78	2.91	5.15	0.52	1.37	

cooperative instructional strategy (experimental) (Mean=12.36; SD=5.15) and those taught using a conventional method (control) (Mean=8.42; SD=2.91), respectively. The mean gain score in favour of the cooperative instructional strategy is 3.53.

H₀₁: There is no significant difference between the academic achievement of senior school students taught Agricultural Science with cooperative instructional strategy and those taught with Conventional teaching methods in Ilorin.

Table 2 shows the t-test results, which indicate a significant difference in the academic

to freely express themselves while learning, and correcting one another during instruction helps raise their achievement compared to a conventional strategy. This finding implies that a cooperative instructional strategy could enhance students' academic achievement in Agricultural Science. The classroom implication of the finding is that a cooperative instructional strategy could be used to teach Agricultural Science to enhance students' achievement. Therefore, this finding is similar to those of Waiganjo et al. (2014) and Ikegbusi and Okeke (2022), who conducted studies to determine the effect of cooperative learning on students' academic achievement in

Table 2. T-test Showing Results for Students in Experimental and Control Groups

Treatment	N	Mean	Std. Deviation	df	t	Sig. (2-tailed)	Remark
Experimental	114	12.36	5.15	234	6.03	.00	Sig.
Control	122	8.83	3.78				

Agricultural Science. These authors' findings showed that the experimental group had a significantly higher mean score in Agricultural Science than the control group. This is also in line with the findings of Hobri et al. (2018), Roka and Khatri (2024), Nou et al. (2025), and Dei et al. (2025) that cooperative learning improved students' academic achievement in Mathematics and Science.

Research Question 2: *Is there any difference in the mean gain score of male and female students taught with cooperative instructional strategy and those taught with conventional teaching methods in Ilorin?*

Table 3 shows the mean and standard deviation scores of students taught Agricultural Science using a cooperative instructional strategy, by gender. The mean score for male students was 10.44, while that of female students was 10.60. Thus, there was a marginal difference in favour of female students.

Table 3. Mean and Standard Deviation of Male and Female Students' Achievement in Agricultural science when taught with Cooperative Instructional Strategy

Gender	N	Mean	Std. Deviation	Mean Gain
Male	96	10.44	4.81	0.16
Female	140	10.60	4.85	

H_{02} : There is no significant difference in the mean scores of male and female senior school students taught Agricultural Science using a cooperative instructional strategy in Ilorin.

Table 4 shows the t-test analysis results, which indicate that there was no significant difference in the mean scores of male and female senior school students taught Agricultural Science using a cooperative instructional strategy in Ilorin ($t_{234} = 0.25$; $p > 0.05$). This is because the p-value of 0.80 exceeded the 0.05 significance level. Hence, Hypothesis 2 was not rejected.

This implies that students taught Agricultural Science using a cooperative instructional strategy performed equally across genders.

The findings further revealed no significant difference in the mean scores of male and female senior school students taught Agricultural Science using a cooperative instructional strategy in Ilorin. This might be because the instructional strategy is not gender-biased. Hence, male and female students had similar achievements, as it encourages full engagement and participation of both genders during its implementation. Also, the strategy allows students to learn independently and later cross-fertilize knowledge, thereby cooperating to learn, strengthening their understanding, as reflected in their achievement. The result implies that a cooperative instructional strategy could be applied in teaching both genders or in mixed classroom settings. This agrees with Waiganjo's (2017) findings that there was no significant gender difference in the mean scores of male and female students taught Agriculture using a cooperative learning approach. This

result disagrees with Muchwithi's (2018) finding that male students outperformed female students in Agriculture.

Research Question 3: *Is there any difference in the mean gain scores of high, medium, and low-scoring students taught using a cooperative instructional strategy in Ilorin?*

Table 5 shows the mean values for students taught Agricultural Science using a cooperative instructional strategy, with equal performance

Table 4: t-test Showing Results for Students' Gender

Gender	N	Mean	Std. Deviation	Df	T	Sig. (2-tailed)	Remark
Male	96	10.44	4.81	234	0.25	.80	Not Sig.
Female	140	10.60	4.85				

across score levels. The mean values for low, medium, and high score levels are 10.30, 9.82, and 11.75, respectively. This means that high-scoring students benefited most, followed by low-scoring students; the least benefit went to medium-scoring students.

Table 5. Mean Results for Students' Score Level

Score Level	N	Mean	Std. Deviation
Low	115	10.30	4.88
Medium	62	9.82	4.82
High	59	11.75	4.57
Total	236	10.53	4.82

H_{03} : There is no significant difference in the achievement of low, medium, and high-scoring students when taught Agricultural Science using a cooperative instructional strategy in Ilorin.

Table 6 shows the ANCOVA results, which indicate that there was no significant difference in the mean scores of low-, medium-, and high-scoring students when taught Agricultural Science using a cooperative instructional strategy in Ilorin ($F_{(2, 232)} = 2.65$; $p > 0.05$). This is because the p-value

achievement across scoring ability, that is, all three levels benefited accordingly. This implies that students at the lower level of achievement in Agricultural Science can be helped to boost their achievement to either medium or high, depending on the strategy that is effectively applied. This finding implies that the strategy could be used to enhance students' learning and academic achievement in mixed-ability classroom settings. The finding supports the early results of Adeniji et al. (2018), who found no significant difference in achievement among low, medium, and high scorers when taught using mastery learning, and of Alabi et al. (2022), who found no significant difference in achievement among high, medium, and low scorers. This result contradicts the findings of Abdulwahab et al. (2016), who found a significant difference in students' achievement when taught using a cooperative instructional strategy, with low-scoring students performing better than high- and medium-scoring students.

H_{04} : There is no interactive effect among the treatment, gender, and score levels on students' achievement in Agricultural Science.

Table 6. ANCOVA Showing Results for Students' Score Level

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	282.19 ^a	3	94.06	4.21	.01
Intercept	223.00	1	223.00	9.98	.00
Pre-test	157.65	1	157.65	7.05	.01
Score level	118.40	2	59.20	2.65	.07
Error	5186.54	232	22.36		
Total	31656.00	236			
Corrected Total	5468.73	235			

Legend: ^aR Squared = .05 (Adjusted R Squared = .04)

of 0.07 was greater than the 0.05 significance level. Hence, Hypothesis 3 was not rejected. This implies that students taught Agricultural Science using a cooperative instructional strategy performed equally across score levels, despite a slight difference in their means.

Also, the findings indicated no significant difference in the mean scores of low-, medium-, and high-scoring students when taught Agricultural Science using a cooperative instructional strategy in Ilorin. This finding showed similar results for their gender. Hence, it improves their

Table 7 shows the ANCOVA results, which indicate that there was no significant interaction among treatment, gender, and score levels on students' achievement in Agricultural Science when taught using a cooperative instructional strategy ($F_{(2, 223)} = 0.22$; $p > 0.05$). This is because the p-value of 0.80 exceeded the 0.05 significance level. Hence, Hypothesis 4 was not rejected. This implies that students taught Agricultural Science using a cooperative instructional strategy performed solely in accordance with the treatment, without any moderating variables.

Table 7. ANCOVA Showing Results for Interaction Effect among Treatment, Score Level and Gender

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	930.87 ^a	12	77.57	3.81	.00
Intercept	335.81	1	335.81	16.50	.00
Pre-test	57.46	1	57.46	2.82	.09
Treatment	62.97	2	31.48	1.55	.22
Score level	.32	1	.32	.02	.90
Gender	404.44	1	404.44	19.88	.00
Treatment*Score level*Gender	9.09	2	4.54	.22	.80
Error	4537.86	223	20.35		
Total	31656.00	236			
Corrected Total	5468.73	235			

Legend: ^aR Squared = .70 (Adjusted R Squared = .13)

Finally, the findings further showed that there was no significant interaction effect among treatment, gender, and score levels on students' achievement in Agricultural Science when taught using a cooperative instructional strategy. This implies that students taught Agricultural Science using a cooperative instructional strategy performed solely in accordance with the treatment, without the assistance of any moderating variables. These findings agree with the findings of Alabi and Abimbola (2022), Odo (2023), Adewumi and Adeoye (2023), and Ekpo et al. (2025) that there was no significant influence of text structure, teaching method, instructional strategy (instructional Model), or gender on students' achievement.

CONCLUSION

The study investigated the effects of a cooperative instructional strategy on senior secondary school students' achievement in Agricultural Science in Ilorin, Nigeria. Therefore, the study concluded that the cooperative instructional strategy enhanced students' achievement more than the conventional strategy. Thus, a cooperative instructional strategy could be used to teach Agricultural Science effectively and can enhance students' achievement across gender and score level (mixed ability level), with gender not a significant factor in designing the intervention.

Recommendations

The following recommendations have been made in line with the findings of this study:

1. Agricultural Science teachers are expected to adopt cooperative instructional strategies in teaching Agricultural Science, as this study further demonstrates that this approach is superior to the conventional method.
2. Curriculum planners and developers are advised to recommend the use of a cooperative instructional strategy to teach Agricultural Science because the strategy improves students' achievement across ability levels.

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