

EFFECTS OF PROJECT AND INQUIRY-BASED TEACHING METHODS ON ACADEMIC ACHIEVEMENT OF BUSINESS STUDIES STUDENTS IN JUNIOR SECONDARY SCHOOLS IN ADAMAWA STATE, NIGERIA

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ABSTRACT

This study examined the effects of project and inquiry-based teaching methods on the academic achievement of Business Studies students in Junior Secondary Schools in Adamawa State, Nigeria. A quasi-experimental pre-test-post-test non-equivalent control group design was adopted, involving 537 JSS II students from three public secondary schools in Yola Educational Zone. The Business Studies Achievement Test (BSAT), adapted from Junior WAEC past questions, was used for data collection. Mean, standard deviation, and t-tests were employed for data analysis at a 0.05 significance level. Findings revealed that the project teaching method produced the highest post-test mean score (80.54), followed by inquiry-based method (68.35), and lecture method (52.37). Significant differences were found between project and lecture methods ($t=35.93$, $p<0.05$), inquiry and lecture methods ($t=18.44$, $p<0.05$), and project and inquiry methods ($t=11.83$, $p<0.05$). Gender had no significant interaction effect on achievement across the three methods ($F=0.358$, $p=0.699$). The study concludes that project and inquiry-based teaching methods are significantly more effective than the lecture method in enhancing students' academic achievement in Business Studies. Recommendations include prioritizing project-based instruction, integrating inquiry-based approaches alongside projects, providing teacher professional development in learner-centered strategies, and implementing gender-inclusive instructional designs.

Keywords: *Project teaching method, inquiry-based teaching method, academic achievement, Business Studies, junior secondary schools, Adamawa State*

INTRODUCTION

Education serves as the cornerstone of national development, with teaching methods playing a crucial role in effectively delivering curriculum content. Okoro and Nwachukwu (2021) define teaching methods as systematic procedures or strategies used by teachers to facilitate learning, which vary according to subject content, learner characteristics, and desired outcomes. Their perspective highlights three key elements: systematic planning, contextual relevance, and outcome orientation. According to Ibrahim and Musa (2023), teaching methods are context-specific instructional procedures employed by teachers to translate curriculum content into learning experiences that meet student needs. This definition is particularly relevant in developing countries or under-resourced settings, emphasizing the need for methods to be culturally and contextually adaptable.

Modern educational research has shifted from traditional teacher-centered approaches to learner-centered methods such as project-based and inquiry-based teaching. Project Teaching Method (PTM), often referred to as Project-Based Learning (PBL), is a learner-centered instructional approach where students acquire knowledge and skills through sustained engagement in meaningful projects that address real-world problems. Contemporary educational research emphasizes that

project-based teaching enhances critical thinking, collaboration, creativity, and problem-solving skills required in modern societies (Kokotsaki et al., 2021). Similarly, Inquiry-Based Teaching Method (IBTM) is a learner-centered instructional approach that emphasizes active learning through questioning, investigation, and critical thinking. Rather than presenting facts directly, the teacher guides students to explore problems, ask questions, collect evidence, and construct knowledge on their own.

Business Studies as a core subject in Basic Secondary Schools in Nigeria plays a critical role in equipping students with foundational knowledge and skills for future careers in commerce, entrepreneurship, and office administration. According to Amoor (2020), Business Studies is a career-oriented subject taught in junior secondary schools that introduces learners to fundamental business concepts, customer relations, and workplace etiquette necessary for entry-level business roles. The Junior Secondary School (JSS) level is a crucial phase in the Nigerian education system, representing the first three years of secondary education, serving as a bridge between basic primary education and more specialized senior secondary or technical/vocational education.

Despite the inclusion of Business Studies in the Nigerian Junior Secondary School curriculum, students' performance remains below standard in Adamawa State. This underperformance has been linked to the use of ineffective teaching methods that fail to stimulate learner interest and understanding (Olowele & Mohammed, 2023). The continued reliance on the traditional lecture method by many teachers has been criticized for being teacher-centered and monotonous, often resulting in minimal student engagement and poor knowledge retention (Ibrahim & Gambo, 2023). Analysis of Basic Certificate Examination (BECE) results in Business Studies from 2020 to 2024 reveals a significant performance gap. In 2020, only 22.64% obtained grade A, while 61.13% had grade B, 12.35% had pass, and 3.87% failed. By 2024, although the A grade percentage rose to 33.98%, over 64% of students still achieved only average or low results. These fluctuations suggest that teaching methods could be a contributing factor to student outcomes.

The purpose of this study is to determine the effects of project and inquiry-based teaching methods on the academic achievement of Business Studies students in junior secondary schools in Adamawa State, Nigeria. Specifically, the study sought to determine the pre-test scores of students taught using lecture, project, and inquiry-based teaching methods; determine the effect of each teaching method on academic achievement; and determine the interaction effect of gender on academic achievement.

RESEARCH METHODOLOGY

Research Design

This study adopted a quasi-experimental research design, specifically the pre-test-post-test non-equivalent control group design. This design was considered appropriate because intact classes were used and random assignment of students to groups was not feasible due to existing school structures. The design involved three experimental groups exposed to different teaching methods: Lecture Method Group, Project Method Group, and Inquiry-based Method Group.

Area of the Study

The study was carried out in Adamawa State, Nigeria, located in the North-East geopolitical zone. The state shares international boundaries with the Republic of Cameroon to the East, and national boundaries with Borno State to the North, Gombe to the West, and Taraba to the South. Yola Educational Zone, where the study was conducted, consists of Yola North, Yola South, Girei, and Song Local Government Areas.

Population of the Study

The population of the study consisted of all Junior Secondary School II (JSS 2) students offering Business Studies in public secondary schools in Adamawa State. Based on available education records from Adamawa State Education Resource Center, the population was estimated at 55,041 JSS 2 students offering Business Studies across the state.

Sample and Sampling Technique

From the population of 55,041 students, a sample of 537 students was drawn from three selected public secondary schools in Yola Educational Zone: Government Day Junior Secondary School Sangere (245 students), Government Day Secondary School Karewa (190 students), and Government Day Secondary School Yola Town (102 students). A two-stage sampling technique was adopted. At the first stage, purposive sampling was used to select the three schools based on large student population, proper organization of Business Studies classes, and willingness to participate. At the second stage, intact class sampling was employed. The intact classes were randomly assigned to groups: Lecture Method Group (GDSS Sangere, 245 students), Project Method Group (GDSS Karewa, 190 students), and Inquiry-Based Method Group (GDSS Yola Town, 102 students).

Instrument for Data Collection

The instrument used for data collection was a Business Studies Achievement Test (BSAT) consisting of fifty (50) multiple-choice test items adopted from Junior West African Examinations Council (Junior WAEC) past examination questions. The BSAT covered major topics in the Junior Secondary School Business Studies syllabus, including Production, Advertising, and Banking. Each correct response attracted two marks, making the maximum obtainable score 100 marks. The instrument was adopted from a standardized examination body with established content validity and reliability.

Method of Data Collection

The researcher obtained a letter of introduction from the Head of Department, Vocational Education, Faculty of Education, Modibbo Adama University Yola. Data were collected through administration of pre-test and post-test. The experimental groups were taught Business Studies using project-based and inquiry-based teaching methods, while the control group was taught using the conventional lecture method for six weeks. At the end of the treatment, the BSAT was administered as a post-test to all groups.

Method of Data Analysis

Data were analyzed using Mean and Standard Deviation to answer the research questions, and t-tests were used to test the hypotheses at 0.05 significance level. The independent samples t-test was used to compare the mean post-test achievement scores of students taught using different teaching methods.

RESULTS

Effect of Project Teaching Method on Academic Achievement

Table 3: Mean Scores of Students Taught Using Project Teaching Method

Test Scores	N	\bar{x}	SD
Pre-test Scores	190	32.86	7.96

Test Scores	N	\bar{x}	SD
Post-test Scores	190	80.54	8.94
Mean Gain		47.68	

Table 3 shows a significant improvement in students' performance using the project teaching method, with the mean score increasing from 32.86 in the pre-test to 80.54 in the post-test, resulting in a high mean gain of 47.68.

Effect of Inquiry-Based Teaching Method on Academic Achievement
Table 4: Mean Scores of Students Taught Using Inquiry-Based Teaching Method

Test Scores	N	\bar{x}	SD
Pre-test Scores	102	33.24	7.51
Post-test Scores	102	68.35	7.25
Mean Gain		35.11	

Table 4 reveals a notable improvement in students' performance using the inquiry-based teaching method, with the mean score increasing from 33.24 in the pre-test to 68.35 in the post-test, resulting in a mean gain of 35.11.

Hypothesis Testing

H₀₁: No significant difference in mean scores of students taught using Lecture and Project teaching methods

Table 5: t-test Analysis Comparing Project and Lecture Teaching Methods

Respondents	N	\bar{x}	SD	df	LS	t	Sig.	Rmk
Project Method	190	80.54	8.94	433	0.05	35.93	0.00	Reject
Lecture Method	245	52.37	7.40					

Table 5 reveals that students taught using the project method obtained a significantly higher mean score ($\bar{x} = 80.54$) than those taught using the lecture method ($\bar{x} = 52.37$). The calculated t-value of 35.93 and significance value of 0.00 indicate a statistically significant difference. The null hypothesis is rejected.

H₀₂: No significant difference in mean scores of students taught using Lecture and Inquiry-based teaching methods

Table 6: t-test Analysis Comparing Inquiry-Based and Lecture Teaching Methods

Respondents	N	\bar{x}	SD	df	LS	t	Sig.	Rmk
Inquiry-Based Method	102	68.35	7.25	345	0.05	18.44	0.00	Reject
Lecture Method	245	52.37	7.40					

Table 6 indicates that students exposed to the inquiry-based method achieved a higher mean score ($\bar{x} = 68.35$) compared to those taught using the lecture method ($\bar{x} = 52.37$). The calculated t-value of 18.44 and significance value of 0.00 show a statistically significant difference. The null hypothesis is rejected.

DISCUSSION OF FINDINGS

The findings revealed that the three instructional groups demonstrated comparable baseline academic capabilities prior to the intervention. This outcome is consistent with Omeje (2018), who emphasized that establishing group equivalency through pretest assessment is a fundamental prerequisite for valid quasi-experimental research. The absence of substantial differences at the baseline stage suggests that the sampling and group assignment procedures were methodologically sound.

The lecture teaching method had a positive but moderate effect on students' academic achievement (mean gain of 20.64). This finding aligns with Shin (2018), who observed that lecture-based pedagogy typically results in surface-level learning characterized by rote memorization rather than conceptual understanding. The limited improvement observed underscores the need for educators to complement traditional instruction with more engaging pedagogical strategies.

The project teaching method had a very strong positive effect on students' academic achievement (mean gain of 47.68). This outcome is consistent with Chong et al. (2024), who demonstrated that project-based learning fosters deep engagement with subject matter by immersing students in authentic, real-world tasks requiring sustained inquiry and collaboration. The pronounced improvement suggests that this approach is particularly well-suited for Business Studies, where the application of knowledge to realistic scenarios can significantly deepen students' comprehension.

The inquiry-based teaching method significantly improved students' academic achievement (mean gain of 35.11). This finding is in agreement with Zhang (2023), who found that inquiry-based learning environments encourage students to pose questions, investigate phenomena, and construct explanations through evidence-based reasoning. The strong positive effect suggests that encouraging students to think critically and participate actively in their own learning process is a powerful strategy for improving academic achievement.

The significant differences found between the lecture method and both the project and inquiry-based methods confirm that learner-centered approaches are superior to traditional teacher-centered instruction. This finding is consistent with Ugo and Oliweh (2024), who demonstrated that student-centered methods consistently outperform traditional lecture methods in terms of student achievement.

The significant difference between the project and inquiry-based methods, with the project method being more effective, suggests that while both active learning approaches are effective, they may operate through distinct mechanisms. This finding aligns with Witt (2023), who argued that while both approaches outperform traditional instruction, project-based learning may have a slight edge in contexts where the curriculum values tangible outputs and applied skills.

The finding that gender had no significant interaction effect on academic achievement across the three teaching methods indicates that the effectiveness of these instructional strategies is largely independent of gender. This outcome is consistent with Chen (2019), who contended that the absence of significant gender interactions supports the view that effective instructional design should focus on universal principles of learning rather than tailoring approaches based on gendered assumptions.

CONCLUSION

The study established that learner-centered instructional strategies, particularly the Project and Inquiry-Based Teaching Methods, significantly enhanced the academic achievement of Business Studies students in Junior Secondary Schools in Adamawa State compared to the conventional Lecture Method. While both male and female students benefited from all teaching approaches, female students consistently recorded slightly higher post-test performance and mean gains, especially under the Project Teaching Method. However, the absence of a significant interaction effect between teaching method and gender indicates that the effectiveness of these instructional strategies is largely independent of gender, affirming their broad applicability. Overall, the findings emphasize the superiority of experiential and inquiry-oriented pedagogies over traditional lecture-based instruction and advocate for their integration into Junior Secondary School curricula to maximize students' engagement, understanding, and achievement in Business Studies.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations are made:

1. **Teachers** should limit exclusive use of the Lecture Teaching Method, as it yielded the lowest achievement gains, and instead complement lectures with interactive and hands-on learning strategies.
2. **Junior Secondary Schools in Adamawa State** should prioritize the use of the Project Teaching Method in Business Studies classrooms, as it consistently produced the highest achievement outcomes among students.
3. **Schools** should incorporate the Inquiry-Based Teaching Method alongside the project approach to encourage active exploration, critical thinking, and problem-solving skills, which were shown to improve student performance over conventional lectures.
4. **Educators** should design learning activities that leverage collaborative and participatory opportunities to further enhance the performance of both male and female students, while providing support structures such as mentoring, group activities, and guided projects to increase male students' engagement.
5. **Professional development programs** should be organized for teachers to build capacity in effectively implementing Project and Inquiry-Based Teaching Methods, ensuring pedagogical strategies are applied consistently and effectively.

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