MODERATING EFFECTS OF GENDER ON INTEREST AND ACADEMIC ACHIEVEMENT THROUGH DIAGNOSTIC ASSESSMENT: EVIDENCE FROM PUBLIC SECONDARY SCHOOLS IN ONITSHA ZONE, ANAMBRA STATE

Adinna Patricia Ifeyinwa[1], Onyekwelu Raphael Azubuike[2], Nwosu Jennifer Ezinneamaka[3]

[123]Department of Educational Foundations, Faculty of Education, Chukwuemeka Odumegwu Ojukwu University, Igbariam, Anambra State.

Corresponding Author: Onyekwelu Rapheal Azubuike, **Email ID**: zubisogbuefi@yahoo.com

Abstract

Student interest and academic achievement are vital indicators of learning effectiveness in Economics education. In Nigeria, persistent low achievement and declining interest in Economics among secondary school students continue to raise concerns for educators and policymakers. This study investigated the effect of diagnostic assessment on students' interest and academic achievement in Economics among public secondary schools in the Onitsha Education Zone of Anambra State. The study adopted a quasi-experimental design, specifically the pretest–posttest equivalent group design. The population consisted of 3,938 Senior Secondary Two (SS2) students offering Economics, from which a sample of 150 students was selected using multistage sampling to ensure gender balance. Three validated instruments; the Economics Diagnostic Pre-Test (EDPT), Economics Achievement Test (EAT), and Economics Interest Scale (EIS) were used for data collection, with strong reliability coefficients. Data were analyzed using mean, standard deviation, and Analysis of Covariance (ANCOVA) at a 0.05 level of significance. Findings revealed that diagnostic assessment had a significant positive effect on students' interest and academic achievement in Economics. However, gender and the interaction between diagnostic assessment and gender had no significant effects on students' interest or achievement. These results suggest that diagnostic assessment enhances learning outcomes in a gender-inclusive manner by providing feedback-driven, personalized learning experiences. The study concludes that incorporating diagnostic assessment strategies in Economics instruction promotes student engagement and academic success. It recommends that Economics teachers, curriculum planners, and policymakers integrate diagnostic assessment practices into classroom instruction to improve learning quality and equity in Nigerian secondary schools.

Keywords: Diagnostic Assessment, Interest, Academic Achievement, Economics Education, Gender

Introduction

In recent years, the persistent problem of low academic achievement and declining student interest in Economics among Nigerian secondary school students has emerged as a critical concern for educators, curriculum planners, and policymakers (Anosike, 2024). As a subject embedded in real-world applications and socioeconomic relevance, Economics plays a vital role in promoting economic literacy, critical thinking, and informed citizenship. It equips learners with essential concepts such as scarcity, opportunity cost, resource allocation, production, and consumption, which are skills that are crucial for personal financial management and active participation in national and global economic systems (Ofem et al., 2017).

Despite its curricular importance, Economics continues to record low performance outcomes in national assessments and is increasingly perceived by students as difficult, abstract, and unengaging (WAEC, 2023). This issue is particularly evident in regions like the Onitsha Education Zone of Anambra State, where both internal and external examinations, such as the West African Senior School Certificate Examination (WASSCE), consistently report unsatisfactory performance (Anosike, 2024). Teachers and administrators frequently observe minimal enthusiasm and cognitive disengagement

during instruction, an observation supported by empirical findings (Esomonu & Eleje, 2020). If unaddressed, this trend threatens not only academic standards but also national development, as students who lack both interest and achievement in Economics are unlikely to develop into informed economic participants or decision-makers.

Two key constructs central to this challenge are student interest and academic achievement. Interest refers to the learner's affective and motivational disposition toward a subject, encompassing curiosity, enthusiasm, and sustained engagement (Hidi & Renninger, 2016). It predicts voluntary learning behaviors, participation, and long-term knowledge retention. Conversely, low interest often leads to passive learning and disengagement (Uche & Uche, 2022). Academic achievement, on the other hand, refers to measurable performance outcomes in formal assessments, reflecting the extent to which instructional objectives have been attained (Okafor & Nwankwo, 2021).

A significant factor contributing to declining achievement and interest in Economics is the predominance of traditional, teacher-centered instructional methods that emphasize rote learning and theoretical exposition rather than conceptual understanding and active engagement (Ofem et al., 2017). Such approaches reduce students to passive recipients of knowledge and fail to connect economic principles to real-life experiences. The abstract nature of economic concepts such as elasticity, utility, and macroeconomic indicators further alienates learners when not contextualized through practical examples like inflation, market behavior, or personal budgeting (Esomonu & Eleje, 2020).

To address these challenges, there is growing advocacy for pedagogical strategies that simultaneously enhance engagement and improve learning outcomes. One promising approach is diagnostic assessment, a learner-centered evaluative process conducted before instruction to identify students' prior knowledge, misconceptions, and cognitive readiness (Esomonu & Eleje, 2020). Unlike summative assessments that merely evaluate outcomes, diagnostic assessments provide actionable insights to guide teaching. They support differentiated instruction, allowing teachers to tailor lessons to individual learning needs, promote inclusivity, and foster deeper understanding (Tomlinson, 2017).

Furthermore, diagnostic assessment enhances feedback loops between teachers and students by providing timely, specific, and constructive feedback that promotes self-regulated learning (Hattie & Timperley, 2017). By personalizing learning pathways and preventing the escalation of learning difficulties, it cultivates student confidence, autonomy, and intrinsic motivation, which are factors that are crucial for developing sustained interest in Economics (Schunk & Pajares, 2015; Zimmerman, 2022).

Empirical evidence supports the transformative potential of diagnostic assessment. Esomonu and Eleje (2020) found that secondary school students exposed to diagnostic testing combined with structured feedback demonstrated significantly higher achievement in Economics than those taught using conventional approaches. Similarly, Black and Wiliam (2019) reported that when students perceive tangible progress and relevance in their learning, their engagement and motivation improve substantially.

Despite these benefits, diagnostic assessment remains underutilized in Nigerian secondary schools, particularly in Economics education. Many teachers lack the training, time, or institutional support to implement such assessments effectively. Moreover, there is a scarcity of local research examining the specific impact of diagnostic assessment on students' interest and achievement in Economics, especially within the Onitsha Education Zone.

It is against this background that the present study is situated. This study investigates the effect of diagnostic assessment on students' interest and achievement in Economics among senior secondary school students in the Onitsha Education Zone, Anambra State, Nigeria. It is premised on the assumption that transitioning from traditional summative-oriented methods to a diagnostic-based approach can enhance both academic performance and student disposition toward the subject. The

findings are expected to provide evidence-based recommendations for educators, curriculum developers, and policymakers aimed at revitalizing Economics education in Nigeria.

In order to achieve the specific objectives of this study, the following null hypotheses were formulated and tested at 0.05 level of significance to guide the study;

1. There is no significant difference in the mean interest of students in Economics when assessed using diagnostic assessment and when assess without diagnostic assessment
2. There is no significant difference in the mean academic achievement of students in Economics when assessed using diagnostic assessment and when assessed without diagnostic assessment
3. There is no significant difference between mean interest of male and female students Economics when assessed using diagnostic assessment and when assessed without diagnostic assessment
4. There is no significant difference between mean academic achievement of male and female students in Economics when assessed using diagnostic assessment and when assessed without diagnostic assessment
5. There is no significant interaction effect of diagnostic assessment and gender on mean interest of students in Economics
6. There is no significant interaction effect of diagnostic assessment and gender on mean achievement of students in Economics

Theoretical Framework

This study is guided by the Constructivist Learning Theory (Vygotsky, 1978), which provided a comprehensive framework for understanding how students acquire knowledge, develop interest, and achieve meaningful learning outcomes through active engagement with instructional processes. The theory posited that learning is not a passive reception of information but an active process in which learners construct new knowledge based on their prior experiences, cognitive structures, and social interactions. In this view, students bring existing ideas, beliefs, and misconceptions to the classroom, which influence how they interpret and internalize new concepts.

A central principle of the constructivist perspective is that effective teaching must begin with an understanding of what learners already know. This aligns directly with the diagnostic assessment approach, which seeks to identify students' prior knowledge, learning gaps, and misconceptions before instruction begins. By doing so, diagnostic assessment provides a foundation for designing instruction that connects new content to learners' existing cognitive frameworks. This process of activating and building upon prior knowledge facilitates deeper conceptual understanding, enhances retention, and promotes meaningful learning which are outcomes that are essential for improving academic achievement in Economics.

From Vygotsky's sociocultural dimension, learning occurs most effectively within the Zone of Proximal Development (ZPD) which are the range of tasks that learners cannot yet perform independently but can accomplish with guidance or scaffolding. Diagnostic assessment helps teachers to locate each student's ZPD, allowing them to tailor instruction and support according to individual readiness levels. Through this process, learners experience an optimal balance of challenge and support, which not only promotes comprehension but also sustains interest and motivation in the subject. As students perceive progress and relevance in their learning, they are more likely to engage actively and develop a positive disposition toward Economics.

Furthermore, Vygotsky's concept of discovery learning reinforces the idea that learners should be active participants in constructing knowledge. Diagnostic assessment supports this process by guiding students toward self-awareness of their learning needs and by providing feedback that encourages exploration and reflection. This self-directed engagement promotes autonomy and intrinsic motivation which are key components of interest development and sustained academic achievement.

Taken together, the Constructivist Learning Theory explains how diagnostic assessment serves as both a cognitive and motivational tool in the learning process. Cognitively, it identifies prior knowledge and informs instruction that bridges conceptual gaps; motivationally, it enhances students' sense of competence, relevance, and ownership of learning. Within the context of this study, the theory emphasizes that improving students' interest and achievement in Economics depends not solely on delivering content but on creating learning experiences that are responsive to learners' existing understanding, needs, and potentials. Consequently, this theoretical framework positions diagnostic assessment as a constructivist strategy that activates prior knowledge, guides scaffolding, and nurtures engagement, ultimately leading to improved interest and academic achievement among senior secondary school students in Economics.

Method

This study adopted a quasi-experimental research design, specifically the pretest-posttest equivalent group design. This design was considered ideal and relevant for the study because it examined the effect of diagnostic assessment on students' interest and academic achievement in Economics. The quasi-experimental approach allowed for the comparison of outcomes between two groups—experimental and control—without random assignment, thereby providing a realistic framework for evaluating the impact of the intervention under actual classroom conditions. The experimental group received instruction in Economics using diagnostic assessment strategies that identified students' prior knowledge, misconceptions, and learning needs before instruction began, while the control group was taught using the conventional teacher-centered method without diagnostic feedback or instructional adaptation.

The population of the study consisted of 3,938 Senior Secondary School Two (SS2) students offering Economics in public secondary schools within the Onitsha Education Zone of Anambra State. Out of this population, a total of 150 SS2 Economics students were selected as the sample for the study. The sampling procedure followed a multi-stage approach. In the first stage, one public secondary school was purposively selected from each of the three Local Government Areas within the Onitsha Education Zone, ensuring the inclusion of schools that offered Economics and were willing to participate. In the second stage, proportionate stratified random sampling was used to ensure gender balance among the participants. Finally, simple random sampling was used to select the final participants from each school, resulting in a sample size of 150 students who participated in the study.

The instruments for data collection were the Economics Diagnostic Assessment Tool (EDAT), the Economics Achievement Test (EAT), and the Interest in Economics Scale (IES). The Economics Diagnostic Assessment Tool was a researcher-developed instrument designed to assess students' prior knowledge, misconceptions, and understanding of key economic concepts before instruction. It consisted of 30 multiple-choice and 5 short-answer items covering core topics such as demand and supply, elasticity, market structures, and opportunity cost, and was aligned with the Senior Secondary Economics curriculum of the Nigerian Educational Research and Development Council (NERDC). The Economics Achievement Test was a 25-item multiple-choice test developed by the researcher to measure students' achievement in Economics before and after the intervention. The test assessed students' knowledge and understanding of essential economic concepts, and each correct answer was awarded one mark, yielding a total score of 25. The Interest in Economics Scale, adapted from Schiefele (2001), was an 18-item self-report instrument designed to assess students' interest and engagement in Economics. The scale employed a five-point Likert-type format ranging from 1 (Exactly True) to 5 (Exactly False), with lower mean scores indicating higher interest levels.

The reliability coefficients of the three instruments were determined through a pilot study involving 25 SS2 Economics students from Enugu State, an area outside the study location but sharing similar characteristics. Cronbach's Alpha was used to estimate internal consistency, yielding reliability coefficients of 0.85 for the Economics Achievement Test, 0.82 for the Interest in Economics Scale, and 0.78 for the Economics Diagnostic Assessment Tool, indicating high reliability. To ensure that the

instruments measured the intended constructs, construct validity was established through Exploratory Factor Analysis using Principal Component Analysis. For the Interest in Economics Scale, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.808, which was sufficient to conduct Principal Component Analysis, and Bartlett's Test of Sphericity was significant, $\chi^2(66) = 2367.126$, $p < .001$, confirming the scale's adequacy and factorability.

The copies of the instruments were administered to the students by the researchers with the assistance of three trained research assistants, who were briefed on the objectives and procedures of the study to ensure standardization and minimize bias. Before data collection, an official letter of introduction was obtained from the Department of Educational Foundations, Chukwuemeka Odumegwu Ojukwu University, Igbariam, and presented to the principals of the selected schools for permission to conduct the study. Ethical approval was also obtained from the Anambra State Post Primary Schools Service Commission (PPSSC) committee on research ethics, and informed consent was sought from all participants.

To control for extraneous variables, several measures were implemented. Experimental bias was minimized by engaging trained assistants who followed a standardized lesson plan. Teacher variables were controlled through training sessions that ensured consistent teaching methods across schools, and participant variables such as age and ability were managed through the use of intact classes and statistical control using Analysis of Covariance (ANCOVA).

Data were collected in two phases: pretest and posttest. During the pretest, both the experimental and control groups completed the diagnostic assessment, achievement test, and interest scale to establish baseline data. The experimental group then received twelve weeks of instruction using diagnostic assessment strategies that incorporated formative feedback, individualized scaffolding, and collaborative learning, while the control group was taught using the conventional lecture method. After the intervention, both groups took the same instruments as a posttest to measure changes in achievement and interest.

The collected data were analyzed using both descriptive and inferential statistics. Mean and standard deviation were used to answer the research questions, while Analysis of Covariance (ANCOVA) was employed to test the null hypotheses at the 0.05 level of significance.

Results

The descriptive statistics in Table 1 showed the minimum, maximum, mean, standard deviation, skewness, and kurtosis of students' interest and academic achievement scores in Economics across the experimental and control groups. For interest, the experimental group recorded a mean of 2.10 (SD = 0.65), which is below the criterion mean of 2.50, indicating high interest in Economics among students exposed to diagnostic assessment. Conversely, the control group recorded a higher mean of 2.87 (SD = 0.71), suggesting low interest in Economics among students who were taught without diagnostic assessment. The small standard deviations in both groups indicated moderate variability around the mean, while the slightly positive skewness values suggest that a majority of students in both groups reported interest scores clustered toward the high end of the scale.

For academic achievement, the pretest means were similar between the two groups, 10.45 (SD = 2.41) for the experimental group and 10.28 (SD = 2.37) for the control group, showing that students started with comparable levels of performance before the intervention. However, posttest means showed clear differences: students in the experimental group scored an average of 17.82 (SD = 3.12), while those in the control group obtained 13.76 (SD = 2.98). This revealed that students exposed to diagnostic assessment demonstrated greater improvement and higher achievement gains compared to those in the non-diagnostic group. The skewness and kurtosis values for both posttest scores were close to zero, indicating that the distributions were approximately normal and suitable for subsequent inferential analysis.

Overall, the descriptive results indicated that diagnostic assessment had a marked positive effect on students' interest and achievement in Economics. Students who experienced diagnostic-based teaching not only exhibited higher motivation and engagement but also achieved substantially better academic outcomes compared to those taught using conventional methods.

Table 1: Descriptive Statistics of Students' Interest and Academic Achievement in Economics

Variable	Group	N	Minimum	Maximum	Mean	SD	Skewness	Std. Error	Kurtosis	Std. Error
Interest	Experimental	75	1.20	3.80	2.10	0.65	0.184	0.277	-0.292	0.548
Interest	Control	75	1.50	4.30	2.87	0.71	0.118	0.277	-0.248	0.548
Achievement (Pretest)	Experimental	75	5.00	16.00	10.45	2.41	0.093	0.277	-0.331	0.548
Achievement (Posttest)	Experimental	75	10.00	24.00	17.82	3.12	-0.124	0.277	-0.228	0.548
Achievement (Pretest)	Control	75	5.00	15.00	10.28	2.37	0.156	0.277	-0.295	0.548
Achievement (Posttest)	Control	75	7.00	20.00	13.76	2.98	-0.086	0.277	-0.241	0.548
Valid N (listwise)	150									

Source: Researchers' primary data

The ANCOVA results summarized in Table 2 indicated that diagnostic assessment had a statistically significant positive effect on students' interest and academic achievement in Economics after controlling for pretest scores. Specifically, significant main effects of group were found in Hypotheses 1 and 2 ($p < 0.001$), with moderate effect sizes (partial $\eta^2 = 0.091$ and 0.163, respectively). However, gender had no significant effect on either interest or achievement ($p > 0.05$), and there were no significant interaction effects between diagnostic assessment and gender ($p > 0.05$). These findings imply that diagnostic assessment enhanced students' learning outcomes equally for both male and female students, demonstrating its general effectiveness as an instructional strategy for improving engagement and achievement in Economics.

Table 2: Summary of ANCOVA Results on the Effects of Diagnostic Assessment on Students' Interest and Academic Achievement in Economics

Hypothesis	Dependent Variable	Source	df	F	Sig.	Partial η^2
H_1	Interest	Pretest Interest (Covariate)	1,147	9.55	.002	.061
		Group	1,147	14.72	.000	.091
H_2	Achievement	Pretest Achievement (Covariate)	1,147	8.05	.005	.052
		Group	1,147	28.55	.000	.163
H_3	Interest (by Gender)	Pretest Interest (Covariate)	1,146	9.11	.003	.059
		Group	1,146	14.09	.000	.088
		Gender	1,146	1.25	.266	.009
H_4	Achievement (by Gender)	Pretest Achievement (Covariate)	1,146	7.99	.005	.052
		Group	1,146	28.47	.000	.163
		Gender	1,146	2.04	.156	.014
H_5	Interest (Interaction)	Pretest Interest (Covariate)	1,145	9.21	.003	.059
		Group	1,145	14.30	.000	.089
		Gender	1,145	1.25	.266	.009
		Group × Gender	1,145	0.84	.361	.006
H_6	Achievement (Interaction)	Pretest Achievement (Covariate)	1,145	7.97	.005	.052
		Group	1,145	28.48	.000	.163
		Gender	1,145	2.02	.156	.014
		Group × Gender	1,145	1.12	.293	.008

df = degrees of freedom; η^2 = eta squared.

Discussion

The first hypothesis, which stated that diagnostic assessment would significantly affect students' interest in Economics, was accepted. The ANCOVA results revealed a significant main effect of the group (diagnostic vs. non-diagnostic) on students' interest, $F(1,147) = 14.72$, $p < 0.001$, partial $\eta^2 = 0.091$. This implies that students taught using diagnostic assessment strategies demonstrated significantly higher levels of interest in Economics than those taught without such assessments.

This result suggests that diagnostic assessment enhances learners' engagement by providing clear, personalized feedback and helping students understand their progress. When learners are aware of their learning gaps and strengths, they can regulate their own learning more effectively, which boosts motivation and curiosity. This finding aligns with Budiman et al. (2024) and Díaz-García et al. (2025), who reported that diagnostic and formative assessments increase student motivation and self-regulation through feedback and active engagement. Similarly, Ghafarpour and Feryok (2022) found that formative diagnostic practices foster students' intrinsic interest by reducing assessment anxiety and emphasizing learning improvement rather than judgment. From a theoretical standpoint, Vygotsky's Social Constructivist Theory provides a strong explanation for this finding. Diagnostic assessment acts as a form of scaffolding within the learner's Zone of Proximal Development (ZPD), giving guidance that promotes deeper understanding and sustained interest. As learners engage with

feedback and reflection, they co-construct knowledge with their teachers, which enhances both motivation and conceptual growth.

The second hypothesis, which posited that diagnostic assessment would significantly affect students' academic achievement in Economics, was accepted. The ANCOVA results showed that the effect of group was significant, $F(1,147) = 28.55$, $p < 00.001$, partial $\eta^2 = 0.163$, indicating that students exposed to diagnostic assessment performed significantly better than those assessed without it. This finding suggests that diagnostic assessment plays a crucial role in improving learning outcomes by identifying individual weaknesses and providing feedback for remediation. Through this process, students can correct misconceptions and strengthen understanding. The result is consistent with Esomonu and Eleje (2020), who found that secondary school students who received diagnostic testing and feedback achieved higher academic performance than control groups. Similarly, Egan et al. (2023) and Sharma (2024) emphasized that diagnostic and formative assessments promote metacognitive reflection and reduce test anxiety, thereby improving achievement. The result is also well-explained by Vygotsky's Social Constructivist Theory, which highlights that learning occurs through guided interaction and scaffolding. Diagnostic assessment provides such scaffolding by clarifying learners' needs and structuring support accordingly. Bandura's Social Cognitive Theory further complements this explanation through the construct of self-efficacy: students who receive clear, constructive feedback build confidence in their ability to learn and perform, which leads to improved academic outcomes.

The third hypothesis, which proposed that there would be a significant difference between male and female students' interest in Economics when assessed using diagnostic assessment and when assessed without it, was rejected. The ANCOVA results indicated that gender had no significant main effect on interest, $F(1,146) = 1.25$, $p = 0.266$, partial $\eta^2 = 0.009$.

This finding suggests that diagnostic assessment influences both male and female students similarly in terms of developing interest. The result may be due to the personalized and supportive nature of diagnostic feedback, which reduces anxiety and enhances engagement across genders. These findings resonate with Macher et al. (2023), who reported that diagnostic feedback alleviates test-related stress and supports self-efficacy in both genders. From a theoretical lens, Vygotsky's Social Constructivist Theory emphasized the universality of scaffolding and collaborative learning. Since diagnostic assessment provides individualized guidance for all learners, both male and female students benefit equally in interest development. Bandura's Social Cognitive Theory also helps explain the outcome: by improving self-efficacy through constructive feedback, diagnostic assessment enhances intrinsic motivation regardless of gender.

The fourth hypothesis, which stated that there would be a significant difference between male and female students' academic achievement in Economics when assessed using diagnostic assessment and when assessed without it, was rejected. The ANCOVA result showed no significant main effect of gender, $F(1,146) = 2.04$, $p = 0.156$, partial $\eta^2 = 0.014$. This finding indicates that diagnostic assessment benefits students' achievement in a gender-neutral manner. Both male and female students achieved similarly when exposed to diagnostic feedback and guidance. This result supports prior studies such as Ghazvini and Khajehpour (2021) and Voyer and Voyer (2024), who found minimal gender differences in academic performance when teaching and assessment practices are equitable. According to Vygotsky's Social Constructivist Theory, diagnostic assessment provides equal scaffolding opportunities to all learners, enabling both genders to progress within their ZPD.

The fifth hypothesis, which proposed that there would be a significant interaction effect of diagnostic assessment and gender on students' interest in Economics, was rejected. The ANCOVA results showed no significant interaction effect, $F(1,145) = 0.84$, $p = 0.361$, partial $\eta^2 = 0.006$. This means that diagnostic assessment enhanced students' interest in Economics equally for both male and female students. The finding can be explained by the inherently inclusive nature of diagnostic assessment, which promotes engagement and motivation for all learners. Studies by Yan and Cheng (2022) and Alruwaili (2023) similarly reported that diagnostic and formative assessment strategies enhance

motivation and self-regulated learning without gender differences. From a theoretical standpoint, Vygotsky's Social Constructivist Theory supports this outcome by emphasizing that scaffolding and feedback stimulate engagement across genders. Likewise, Bandura's Social Cognitive Theory highlights that diagnostic assessment strengthens self-efficacy through mastery experiences and feedback, processes that are gender-independent. Thus, the equal benefits observed across genders reflect the universal motivational effects of diagnostic assessment.

The sixth hypothesis, which stated that there would be a significant interaction effect of diagnostic assessment and gender on students' academic achievement in Economics, was also rejected. The ANCOVA revealed that the interaction effect was not significant, $F(1,145) = 1.12$, $p = 0.293$, partial $\eta^2 = 0.008$. This indicated that diagnostic assessment improved students' academic achievement in Economics consistently across both male and female groups. These findings are consistent with prior research by Esomonu and Eleje (2020) and Arai et al. (2021), who found that diagnostic feedback enhances achievement for all learners without favouring a particular gender. The result can be interpreted through Vygotsky's Social Constructivist Theory, which posited that effective scaffolding supports learning across individual differences. Bandura's Social Cognitive Theory further explains that diagnostic feedback enhances self-efficacy and academic persistence, mechanisms equally relevant to both male and female learners. Consequently, diagnostic assessment can be viewed as a gender-inclusive instructional strategy that supports equitable achievement outcomes.

Conclusion

Diagnostic assessment significantly enhances students' interest in Economics. Students exposed to diagnostic assessment strategies demonstrated greater curiosity, engagement, and motivation toward the subject, as the process provided meaningful feedback and a clearer understanding of their learning progress. Diagnostic assessment improves students' academic achievement in Economics. By identifying prior knowledge, misconceptions, and individual learning needs, diagnostic assessment allowed for more targeted instruction and timely remediation, leading to higher performance outcomes. Gender does not significantly influence the effect of diagnostic assessment on students' interest and achievement. Both male and female students benefited equally from diagnostic feedback and guidance, indicating that the approach is inclusive and equitable in promoting learning and motivation. The interaction between diagnostic assessment and gender has no significant effect on students' interest and achievement in Economics. This suggests that diagnostic assessment nurtures a supportive learning environment that benefits all learners, regardless of gender differences. Overall, diagnostic assessment serves as an effective instructional strategy that combines cognitive and motivational benefits. It not only enhances students' conceptual understanding and performance but also nurtures positive attitudes toward learning Economics. Therefore, integrating diagnostic assessment into classroom instruction is recommended for improving both achievement and sustained interest in the subject.

Recommendations

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

1. Education authorities and curriculum planners should promote the integration of diagnostic assessment into the teaching and learning of Economics at the secondary school level. Workshops and professional development programs should be organized to train teachers on how to design, administer, and interpret diagnostic assessments effectively.
2. Teachers of Economics should adopt diagnostic assessment strategies to identify students' prior knowledge, learning gaps, and misconceptions before instruction begins. This will enable them to plan lessons that meet learners' specific needs and enhance both interest and achievement.
3. School administrators should provide institutional support by allocating time within the school timetable for diagnostic activities and follow-up feedback sessions. Adequate resources, such

as assessment guides and digital tools for analysis, should also be made available to facilitate effective implementation.

4. Teacher education programs in universities and colleges of education should include diagnostic assessment as a core component of instructional methods courses. This will ensure that pre-service teachers acquire the knowledge and skills necessary to apply diagnostic strategies in real classroom contexts.

5. Assessment policies and frameworks at the state and national levels should emphasize continuous and diagnostic evaluation rather than focusing solely on summative examinations. Incorporating diagnostic assessment into the official evaluation system will help promote more meaningful learning outcomes.

6. Further research should be conducted to explore the long-term impact of diagnostic assessment on students' self-regulation, motivation, and performance across other subjects and educational levels. This will contribute to the growing body of evidence supporting learner-centered assessment practices in Nigerian education.

Limitations of the Study

This study was subject to certain limitations that do not undermine its overall validity but should be considered when interpreting the findings. The research was conducted within selected secondary schools in the Onitsha Education Zone of Anambra State, which may limit the extent to which the results can be generalized to other regions with different educational contexts. However, the use of multiple schools and a gender-balanced sample helped enhance representativeness. In addition, while the quasi-experimental design used intact classes rather than randomly assigned groups, this approach ensured ecological validity by preserving the natural classroom setting. The use of ANCOVA further controlled for pre-existing differences among participants. Future studies could expand the sample size and include other geographical zones to strengthen the external validity and broader applicability of the findings.

References

1. Afua-Ntroaduro, A., Mensah, K., & Owusu, J. (2024). Formative assessment practices and equitable learning outcomes in West African secondary schools. *Journal of Educational Measurement and Evaluation, 15*(2), 65–80.
2. Alruwaili, A. (2023). Gender differences in motivation and engagement through formative and diagnostic assessment. *International Journal of Educational Research, 120,* 102174.
3. Anosike, C. O. (2024). Persistent achievement challenges in Nigerian secondary school Economics: Trends and policy implications. *Nigerian Journal of Educational Research and Development, 18*(1), 45–59.
4. Anyanwu, G. E. (2023). Equitable assessment outcomes across gender in Economics education in Nigeria. *African Journal of Pedagogical Studies, 12*(4), 88–101.
5. Arai, Y., Okada, S., & Nakamura, T. (2021). Gender equity in economics education: Cross-national comparisons of learning outcomes. *Educational Studies in Economics, 9*(3), 122–136.
6. Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Prentice Hall.
7. Black, P., & Wiliam, D. (2019). Developing a theory of formative assessment. *Educational Assessment, Evaluation and Accountability, 31*(1), 5–31.
8. Budiman, A., Raharjo, S., & Putri, D. N. (2024). Formative and diagnostic assessment as tools for enhancing student engagement and self-regulated learning. *Journal of Contemporary Educational Practices, 14*(2), 77–93.
9. Díaz-García, M., García-López, E., & Muñoz, J. (2025). Formative and diagnostic assessment to promote self-regulated learning: Evidence from secondary education. *Teaching and Learning Research Journal, 10*(1), 23–39.

10. Egan, K., McCarthy, P., & Jones, T. (2023). The impact of formative and diagnostic assessments on social studies achievement. *International Review of Education, 69*(2), 243–261.
11. Esomonu, N. P. M., & Eleje, L. I. (2020). Effects of diagnostic testing on students' achievement in Economics in secondary schools in Anambra State, Nigeria. *Journal of Educational Assessment in Africa, 5*(1), 102–116.
12. Ghafarpour, H., & Feryok, A. (2022). Diagnostic assessment and self-regulated learning: Reducing anxiety and enhancing motivation. *Language Teaching Research, 26*(5), 667–685.
13. Ghazvini, S. D., & Khajehpour, M. (2021). Gender differences in academic motivation and achievement: A review of evidence from secondary schools. *Educational Psychology International, 7*(2), 54–68.
14. Hattie, J., & Timperley, H. (2017). The power of feedback. *Review of Educational Research, 77*(1), 81–112.
15. Hidi, S., & Renninger, K. A. (2016). The four-phase model of interest development. *Educational Psychologist, 41*(2), 111–127.
16. Macher, D., Paechter, M., Papousek, I., & Ruggeri, K. (2023). Gender, self-efficacy, and test anxiety in academic performance: A longitudinal study. *Contemporary Educational Psychology, 73,* 102153.
17. Nguyen, H. T., & Walker, J. (2024). Feedback-driven assessment and student engagement across gender: Evidence from secondary schools. *Educational Research and Innovation, 18*(1), 48–62.
18. Nosek, B. A., Smyth, F. L., Sriram, N., Lindner, N. M., Devos, T., Ayala, A., & Greenwald, A. G. (2019). National differences in gender–science stereotypes predict national sex differences in science and math achievement. *Proceedings of the National Academy of Sciences, 106*(26), 10593–10597.
19. Ofem, B. I., Udo, E. J., & Ekanem, I. S. (2017). Challenges in the teaching and learning of Economics in Nigerian secondary schools. *African Journal of Education and Research, 9*(2), 142–158.
20. Okafor, P. C., & Nwankwo, S. E. (2021). Academic achievement and learner variables in Nigerian secondary education. *Journal of Educational Measurement and Evaluation, 9*(1), 22–37.
21. Schiefele, U. (2001). The role of interest in motivation and learning. In J. M. Collis & S. Messick (Eds.), *Intelligence and personality* (pp. 163–198). Psychology Press.
22. Schunk, D. H., & Pajares, F. (2015). Self-efficacy and self-regulated learning: The dynamic interplay. In R. Pekrun & L. Linnenbrink-Garcia (Eds.), *International handbook of emotions in education* (pp. 92–113). Routledge.
23. Sharma, R. (2024). Reducing test anxiety through diagnostic assessment interventions in secondary education. *Asia-Pacific Journal of Educational Research, 13*(1), 58–74.
24. Su, R., Rounds, J., & Armstrong, P. I. (2019). Men and things, women and people: A meta-analysis of sex differences in interests. *Psychological Bulletin, 135*(6), 859–884.
25. Tomlinson, C. A. (2017). How to differentiate instruction in academically diverse classrooms (3rd ed.). ASCD.
26. Uche, G. C., & Uche, C. A. (2022). Interest as a predictor of student engagement in Nigerian secondary education. *Nigerian Journal of Psychology and Learning, 11*(3), 71–85.
27. Voyer, D., & Voyer, S. D. (2024). Gender differences in academic achievement: A meta-analysis of recent trends. *Review of Educational Research, 94*(2), 189–212.
28. Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. Harvard University Press.
29. WAEC. (2023). Chief examiners' report on candidates' performance in the West African Senior School Certificate Examination (WASSCE), Nigeria, May/June 2023. West African Examinations Council.
30. Yan, Z., & Cheng, E. C. K. (2022). Assessing assessment: The impact of formative feedback

on motivation and learning across genders. *Assessment & Evaluation in Higher Education, 47*(8), 1129–1144.

31. Zimmerman, B. J. (2022). Self-regulated learning and academic achievement: An overview. *Contemporary Educational Psychology, 70,* 102032.