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COMPARATIVE EFFECTIVENESS OF PEER AND TRADITIONAL ASSESSMENT TECHNIQUES ON SENIOR SECONDARY SCHOOL STUDENTS' ACADEMIC ACHIEVEMENT IN DELTA CENTRAL SENATORIAL DISTRICT, DELTA STATE

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ABSTRACT

This study compared the effectiveness of peer and traditional assessment techniques on the academic achievement of senior secondary school Economics students in Delta Central Senatorial District, Delta State, Nigeria. A quasi-experimental pretest–posttest nonequivalent-group design was adopted. The sample comprised 100 SS II Economics students (50 per group) drawn from two public schools; one intact class was assessed through peer assessment and the other through traditional teacher-led assessment over four weeks. Data were collected with a researcher-developed Economics Achievement Test (KR-20 = .78) and analysed using means, standard deviations, mean gain scores, an independent-samples *t* test, and a two-way ANOVA at the .05 level. Students in the peer assessment group (M = 23.96, SD = 3.41) outperformed those in the traditional group (M = 18.34, SD = 3.14), $t(98) = 8.57$, $p < .001$, and recorded larger mean gains (8.54 vs. 3.60). The advantage held across achievement levels. The paper recommends the structured integration of peer assessment into continuous assessment practice in Nigerian secondary schools.

Keywords: peer assessment, traditional assessment, academic achievement, Economics, senior secondary school, Delta State

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Introduction

Teaching and learning are interdependent processes, and the extent to which teaching succeeds is judged by what learners are able to demonstrate at the end of instruction. Assessment is the systematic process through which evidence of that learning is gathered, interpreted, and used (Black & Wiliam, 1998; Sadler, 1989). Historically, schools have used assessment mainly to measure and certify achievement, a purpose often described as assessment *of*

learning. More recent scholarship emphasises assessment *for* learning, in which evidence from classroom tasks is used to give feedback, adjust instruction, and help learners understand where they are, where they are going, and how to close the gap (Wiliam, 2011).

In Nigeria, the National Policy on Education places continuous assessment at the centre of how learner progress is judged (Federal Republic of Nigeria [FRN], 2014). In practice, however, classroom assessment is dominated by teacher-set and teacher-marked tests, quizzes, and examinations, which are the techniques commonly grouped as traditional assessment. These instruments are familiar, structured, and easy to standardise, but they position the learner as a passive recipient of marks and offer limited opportunity for students to examine criteria, compare work, or reflect on their own errors (Shepard, 2000).

Peer assessment offers a different arrangement. It is an arrangement in which students consider and specify the level, value, or quality of a product or performance produced by equal-status learners (Topping, 1998). When students apply criteria to a classmate's work and explain their judgments, they are required to retrieve content, evaluate it, and communicate feedback, activities that can deepen understanding for both the assessor and the assesse (Li et al., 2010; Topping, 2009). A meta-analysis of control-group studies reported that peer assessment improved academic performance relative to no assessment, teacher assessment, and self-assessment (Double et al., 2020).

Economics is an elective subject at the senior secondary level in Nigeria and contributes directly to the national goal of economic literacy. Yet performance in the subject in external examinations has remained a concern, and the West African Examinations Council has repeatedly reported weaknesses in candidates' command of core concepts, application, and analysis (West African Examinations Council [WAEC], 2022). Because Economics requires learners to apply abstract concepts such as scarcity, utility, and public finance to

concrete situations, assessment practices that make reasoning visible and open to discussion may be especially valuable. This study therefore compares the effectiveness of peer and traditional assessment techniques on the academic achievement of senior secondary school Economics students in Delta Central Senatorial District, Delta State.

Statement of the Problem

Economics is fundamental to the development of critical thinking, problem-solving, and logical reasoning among senior secondary students, yet learning outcomes in the subject continue to fall below the desired standard. One plausible contributor is the heavy reliance on traditional assessment for classroom testing. Under this arrangement students seldom see one another's marked work, rarely engage with marking criteria, and therefore have limited opportunity to learn from and support each other in correcting misconceptions. Teachers, for their part, often use peer assessment sparingly or only as a last resort.

Studies in Nigeria and elsewhere have examined peer assessment in subjects such as Geography, Chemistry, Mathematics, and English Language, but comparative experimental evidence from Economics classrooms, and from Delta Central Senatorial District in particular, remains scarce. Without such evidence, teachers and school administrators have little empirical basis for deciding whether to move beyond teacher-only assessment. The problem addressed by this study is, therefore, whether students whose Economics learning is assessed through peer assessment achieve more than students assessed through traditional techniques.

Research Questions

The following research questions guided the study:

1. What is the mean achievement score of senior secondary school Economics students exposed to peer assessment in Delta Central Senatorial District of Delta State?
2. What is the mean difference in the achievement scores of students exposed to peer assessment and

those exposed to traditional assessment techniques in Delta Central Senatorial District of Delta State?

3. What are the mean gain scores of students exposed to peer assessment compared with those exposed to traditional assessment techniques in Delta Central Senatorial District of Delta State?

Objectives of the Study

The study sought:

1. To determine the mean achievement score of senior secondary school students exposed to peer assessment techniques in Delta Central Senatorial District, Delta State.
2. To compare the effectiveness of traditional and peer assessment techniques on the mean achievement scores of senior secondary school students in the district.
3. To determine the difference in the mean gain scores of students exposed to peer assessment and those exposed to traditional assessment techniques in the district.

Literature Review

The review is organised around the three objectives of the study, following a brief statement of the theoretical anchor.

Theoretical Anchor

The study is anchored in Bandura's (1986) social cognitive theory, which holds that learning is shaped by observation, social interaction, and learners' beliefs about their own capability. Peer assessment places students in precisely such a setting. By reading and judging classmates' work, learners observe how others reason, compare their own performance with that of peers (vicarious experience), and receive feedback from sources they regard as credible and similar to themselves. These experiences can strengthen self-efficacy and motivation. The socio-cultural position that learning is mediated by social interaction (Vygotsky, 1978) and the account of formative assessment as a driver of self-regulated learning (Nicol & Macfarlane-Dick, 2006) point in the same direction.

Peer Assessment and Students' Academic Achievement

Peer assessment has been defined as an arrangement in which students judge the quality of work produced by equals and give feedback on it (Topping, 1998). Reviews of the field identify several routes through which it may raise achievement: it clarifies assessment criteria, increases the volume and immediacy of feedback, and obliges students to process content actively rather than passively (Dochy et al., 1999; Topping, 2009). Kollar and Fischer (2010) argue that peer assessment is best understood as a collaborative learning activity in which the cognitive processes of explaining, justifying, and revising are the real engines of improvement.

Empirical evidence is broadly supportive. Double et al. (2020) synthesised control-group studies and found that peer assessment produced a positive effect on academic performance compared with no assessment, teacher assessment, and self-assessment, with the effect holding across educational levels and subject areas. Li et al. (2010) found that students who gave quality feedback to peers improved their own subsequent work, suggesting that the assessor, and not only the assessee, benefits. Earlier, Falchikov and Goldfinch (2000) reported reasonable agreement between peer and teacher marks, which supports the credibility of peer judgments when clear criteria are used.

Evidence from secondary school settings is thinner than evidence from higher education, and much of it concerns subjects other than Economics. The literature also cautions that benefits are conditional: students need training in applying criteria, and unstructured peer marking can be unreliable or can reinforce misconceptions (Harris & Brown, 2013; Sluijsmans et al., 2002). Evidence of mean performance among peer-assessed Economics students in a Nigerian district would therefore add to a literature that is still largely drawn from other contexts.

Comparing Peer and Traditional Assessment

Traditional assessment refers to teacher-constructed and teacher-marked

tests, quizzes, examinations, and assignments. Its strengths are efficiency, familiarity, and the apparent objectivity of standardised scoring, and these are the reasons it remains dominant in Nigerian classrooms, where continuous assessment is frequently implemented as a series of periodic written tests (Ghaicha, 2016; FRN, 2014). Its weakness lies in what students do with the result. Black and Wiliam (1998) reviewed more than 250 studies and concluded that classroom tests often encourage rote learning and that marks without usable feedback contribute little to improvement. Shepard (2000) similarly argued that assessment conducted only to grade learners sits uneasily with contemporary understandings of how learning occurs.

Comparative studies of the two approaches generally favour the participatory model when it is well implemented. Double et al. (2020) found peer assessment outperformed teacher assessment, although the advantage was modest. Gielen et al. (2010) showed that the effectiveness of peer feedback depends on its design, including the quality and justification of comments. Taken together, the literature suggests that the comparison is not between a good method and a bad one, but between a teacher-centred approach that is efficient yet limited in feedback and a learner-centred approach that is richer in feedback yet dependent on careful structuring. Whether that general pattern holds for Economics classrooms in Delta Central is an empirical question that the present study addresses.

Gain Scores and Learning Improvement

Mean gain, the difference between posttest and pretest performance, offers a direct indicator of how much students have learned during an intervention, independent of where they started. It is particularly useful in quasi-experimental studies with intact classes because it expresses change within each group. The feedback literature suggests why assessment type may affect gains. Hattie and Timperley (2007) reported that feedback is among the most powerful influences on achievement, but that its effect

depends on whether it tells learners where they are going, how they are doing, and what to do next. Shute (2008) similarly concluded that formative feedback is most effective when it is specific, timely, and usable.

Peer assessment can supply feedback of this kind more frequently than a single teacher can, because every learner in the class is simultaneously a source of feedback. Boud et al. (1999) argued that peer learning and assessment encourage reflection on one's own work, which in turn supports improvement. Formative assessment more broadly has been associated with substantial learning gains (Black & Wiliam, 1998; Wiliam, 2011). The expectation, therefore, is that students exposed to peer assessment will show larger gains than those assessed only through teacher-marked tests, an expectation tested in this study.

Methodology

A quasi-experimental pretest–posttest nonequivalent-group design was adopted (Kerlinger & Lee, 2000). Random assignment of individual students was not possible without disrupting school timetables, so intact classes were used. The experimental group was assessed through peer assessment (PA), and the control group through traditional assessment (TA). The population comprised 8,485 SS II Economics students (4,640 female and 3,845 male) in 35 public senior secondary schools in Delta Central Senatorial District. SS II was chosen because these students were neither new to Economics nor preparing for an external examination. Two public co-educational schools in Sapele Local Government Area, located far enough apart to limit contact between groups, were selected, and one intact Economics class in each was used. The sample was 100 students (60 female and 40 male), with 50 in each group.

Data were collected with a researcher-developed Economics Achievement Test (EAT), a 30-item multiple-choice test scored dichotomously and built from a table of specification based on Bloom's taxonomy across four SS II topics: Agriculture, Public Finance, Utility Theory, and Industrialisation. Two experts in Economics Education and in

Measurement and Evaluation established face and content validity. A pilot test with 40 SS II Economics students outside the sample yielded a Kuder–Richardson 20 reliability coefficient of .78 (Kuder & Richardson, 1937). Separate instructional plans were prepared for the PA and TA groups.

The EAT was administered as a pretest, after which both groups were taught the same four topics in their regular timetabled periods over four weeks, using eight lesson plans (four per group). In the PA group, students applied marking schemes to classmates' scripts and exercises and gave written and oral feedback; in the TA group, the teacher set, marked, and returned all tasks. The EAT was then re-administered as a posttest within one hour. Gain scores were computed as posttest minus pretest. Data were analysed in SPSS version 25 using means, standard deviations, and gain scores for the research questions, an independent-samples *t* test for $H_0$1, and a two-way analysis of variance (assessment type × achievement level) for the gain scores, all at the .05 level of significance. Effect sizes (Cohen's *d*, partial η^2) were interpreted using Cohen's (1988) benchmarks.

Results

Research Question 1: Mean Achievement Score of Students Exposed to Peer Assessment

Table 1 presents the posttest descriptive statistics for the two groups on the 30-item EAT.

Table 1

Descriptive Statistics of Students' Posttest Achievement Scores by Assessment Type

Assessment type	*N*	*M*	*SD*
Peer assessment	50	23.96	3.41
Traditional assessment	50	18.34	3.14

Note. Maximum possible score = 30. *N* = 100.

Students exposed to peer assessment obtained a mean posttest score of 23.96 (*SD* = 3.41), which is about 80% of the maximum obtainable score of 30. The traditional assessment group obtained a mean of 18.34 (*SD* = 3.14), or about 61% of the maximum.

The similar standard deviations indicate comparable spread within the groups.

Research Question 2: Mean Difference in Achievement Between the Two Techniques

Table 2 reports the difference between the posttest means and the result of the independent-samples *t* test used to test $H_0$1.

Table 2

Independent-Samples t Test of Posttest Achievement Scores by Assessment Type

Group	*n*	*M*	*SD*	*SE*	*t*(98)	*p*	*d*
Peer assessment	50	23.96	3.41	0.48	8.57	< .001	1.71
Traditional assessment	50	18.34	3.14	0.44			

Note. Mean difference = 5.62, 95% CI [4.32, 6.92]. Critical *t* (df = 98, α = .05, two-tailed) = 1.98. *d* = Cohen's *d* computed from the pooled standard deviation.

The mean difference of 5.62 points favoured the peer assessment group. The independent-samples *t* test showed that this difference was statistically significant, *t*(98) = 8.57, *p* < .001, 95% CI [4.32, 6.92]. The calculated *t* value exceeded the critical value of 1.98, so $H_0$1 was rejected. The effect size was very large by conventional benchmarks (Cohen's *d* = 1.71; Cohen, 1988), meaning that the mean of the peer assessment group lay well over one and a half pooled standard deviations above that of the traditional group.

Research Question 3: Mean Gain Scores of the Two Groups

Table 3 summarises the learning gains (posttest minus pretest) of the two groups. Pretest means are reported as implied by the posttest means and mean gains.

Table 3

Pretest, Posttest, and Mean Gain Scores by Assessment Type

Assessment type	*n*	Pretest *M*[a]	Posttest *M*	Mean gain	*SD* of gain
Peer assessment	50	15.42	23.96	8.54	1.64
Traditional assessment	50	14.74	18.34	3.60	1.44

[a] Derived as posttest mean minus mean gain. Gain = posttest score minus pretest score.

Students exposed to peer assessment gained an average of 8.54 points (*SD* = 1.64), compared with 3.60 points (*SD* = 1.44) for those assessed traditionally, a difference of 4.94 points. The implied pretest means (15.42 and 14.74) differ by less than one point, which suggests that the groups began from broadly similar positions and that the posttest advantage is not simply a product of initial differences between the intact classes.

To test $H_0$2, a two-way ANOVA was run on gain scores with assessment type and post-intervention achievement level (high vs. low) as factors. Table 4 presents the result.

Table 4

Two-Way ANOVA of Gain Scores by Assessment Type and Achievement Level

Source	*SS*	*df*	*MS*	*F*	*p*
Assessment type	371.667	1	371.667	166.44	< .001
Achievement level	18.195	1	18.195	8.15	.005
Type × Level	3.176	1	3.176	1.42	.236
Error	214.376	96	2.233		
Corrected total	844.510	99			

Note. Corrected model: $F(3, 96) = 94.06$, $p < .001$. Partial η^2 for assessment type = .63.

The main effect of assessment type was significant, $F(1, 96) = 166.44$, $p < .001$, partial $\eta^2 = .63$, so $H_0$2 was rejected. The main effect of achievement level was also significant, $F(1, 96) = 8.15$, $p = .005$, with high achievers ($M = 7.50$, $SD = 2.69$) gaining more than low achievers ($M = 4.39$, $SD = 2.22$). The interaction between assessment type and achievement level was not significant, $F(1, 96) = 1.42$, $p = .236$,

indicating that the advantage of peer assessment was consistent for both high and low achievers.

Discussion of Findings

Achievement of Students Exposed to Peer Assessment

Students assessed through peer assessment reached a mean of 23.96 out of 30, a level that is high in absolute terms and substantially above that of their traditionally assessed counterparts. This is consistent with Double et al.'s (2020) meta-analytic conclusion that peer assessment improves academic performance. It also fits the proposition that assessing others requires learners to retrieve, apply, and explain content, which strengthens their own understanding (Li et al., 2010; Topping, 2009). In Economics, where learners must apply concepts such as utility or public finance to unfamiliar cases, judging a classmate's answer against a marking scheme may have exposed students to alternative reasoning and prompted self-correction, a process Bandura's (1986) account of vicarious experience would predict.

Peer Versus Traditional Assessment

The 5.62-point difference between the groups was statistically significant and very large (d = 1.71), so the null hypothesis of no difference was rejected. This agrees with the direction of Double et al.'s (2020) finding that peer assessment outperforms teacher assessment, although the magnitude here is considerably larger than the modest pooled effects typically reported. Several features of the present study may explain this. The students were new to peer assessment, and novelty and increased engagement can inflate short-term effects; the treatment was delivered by the researcher, who was committed to the peer approach; and the PA group worked with explicit marking schemes, a condition that the literature identifies as important for effective peer feedback (Gielen et al., 2010; Harris & Brown, 2013). The traditional group, by contrast, received teacher-marked tasks, an arrangement that Black and Wiliam (1998) and Shepard (2000) argue offers limited feedback that students can actually use. The result should therefore be read as strong evidence that structured peer assessment can outperform

conventional testing practice in this setting, and not as a universal estimate of its effect.

Gain Scores and the Role of Achievement Level

The peer assessment group gained 8.54 points, against 3.60 for the traditional group, and the main effect of assessment type on gains was large and significant. This supports the view that frequent, criterion-referenced feedback is a powerful lever for improvement (Hattie & Timperley, 2007; Shute, 2008) and that peer learning encourages reflection on one's own work (Boud et al., 1999). Because every student in a peer-assessed class both gives and receives feedback, the volume of feedback available per learner is far greater than a single teacher could provide, which is particularly relevant in the large classes common in Nigerian public schools.

High achievers gained more than low achievers overall, which is expected given that stronger students are better positioned to use new information. Crucially, the non-significant interaction indicates that the benefit of peer assessment did not depend on prior ability: both groups of learners gained more under peer assessment. This suggests that peer assessment can be used as an inclusive strategy. The result should nonetheless be treated cautiously because achievement level was defined after the intervention, and a post-intervention classification can be confounded with the treatment itself.

Conclusion

This study set out to compare peer and traditional assessment on the achievement of senior secondary school Economics students in Delta Central Senatorial District. Students assessed through peer assessment scored significantly higher on the posttest (M = 23.96 vs. 18.34), with a very large effect, and recorded considerably larger learning gains (8.54 vs. 3.60) than students assessed through traditional teacher-led techniques. The advantage was evident for both higher- and lower-achieving students. Within the limits of a short quasi-experimental study, the evidence indicates that structured peer assessment is a more effective classroom assessment technique for Economics than traditional teacher-marked assessment alone.

Recommendations

On the basis of the findings, the following recommendations are made:

1. Economics teachers should incorporate structured peer assessment, supported by clear marking schemes, into their continuous assessment practice alongside traditional tests.
2. School administrators and curriculum planners should make provision for peer assessment in school assessment policies and timetables.
3. Ministries of education and teacher-training institutions should organise workshops that train teachers to design criteria, brief students, and moderate peer feedback, given that the benefits depend on careful implementation.
4. Teachers should train students in the use of marking criteria before peer assessment begins, in order to improve the reliability and fairness of peer judgments.
5. Future researchers should replicate the study with larger, randomly selected samples across several local government areas and subjects, and over longer periods.

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