



## Investigating Application and Challenges of Dialogic Teaching as A Formative Assessment Tool Among Science Education University Lecturers

**OKEKE, A. O.**

Department of Science Education, Faculty of Education, University of Nigeria, Nsukka

obianuju.okeke@unn.edu.ng

### Abstract

The study investigated the application and challenges of dialogic teaching as a formative The study investigated the use of dialogic teaching as a formative assessment strategy among university lecturers in Science Education. It was conducted at the University of Nigeria, Nsukka (UNN). Two research questions guided the inquiry, which employed a descriptive survey design. The target population included all 57 academic staff members in the Department of Science Education, Faculty of Education, UNN (2025). A sample of 42 lecturers was selected using a volunteer sampling method. Data were collected using a researcher-developed 20-item questionnaire titled “Application and Challenges of Dialogic Teaching as Formative Assessment Tool Questionnaire (ACDTFATQ),” structured into two sections with 10 items each. The instrument underwent face validation by three experts in Research, Measurement, and Evaluation from UNN. Reliability testing using Cronbach's alpha produced coefficients of 0.82 and 0.86 for Clusters A and B, respectively. Descriptive statistics, mean and standard deviation, were employed to analyze the research questions. The findings revealed that dialogic teaching is utilized by Science Education lecturers as a formative assessment method, though its implementation is met with various challenges. In light of these findings, it was recommended that dialogic teaching be integrated into the curriculum wherever appropriate to enhance student achievement.

**Keywords:** Assessment, Formative Assessment, Dialogic Teaching, Application, Challenges

### Introduction

In educational setting, knowledge and skills are transferred through instruction after which assessment is done to determine if the objectives of the instruction are achieved. Assessment is used to understand the state or condition of learning. Assessment refers to the systematic collection and analysis of information from various sources to gain a comprehensive understanding of what learners know, comprehend, and how they apply their knowledge based on their educational encounters (Okafor, 2023). According to Munro (2022), it includes the use of measurable data related to student learning in order to enhance educational programs and promote better learning outcomes. Essentially, it encompasses identifying, designing, gathering, evaluating, and interpreting relevant information to support student growth and academic development. During the teaching process, it is often necessary to implement formative assessments to monitor progress and inform instructional adjustments.

Formative assessment is primarily aimed at enhancing student learning. It involves ongoing, interactive evaluations of students' understanding and academic progress, helping to identify their learning needs and inform necessary adjustments in teaching strategies (Asare, 2021). This type of assessment offers timely feedback to both instructors and learners, supporting the overall learning experience (Olagunju, 2015). Educators utilize formative assessment to track students' learning and provide constructive input throughout the instructional period. Typically conducted at the beginning or midway through a lesson, term, or subject, formative assessment is centered on refining and supporting the learning process. When students use it to improve learning, it is called assessment as learning while when teacher use it to improve teaching, it is called assessment for learning. One way of performing formative assessment during instruction in the classroom is through dialogic teaching.

Dialogic teaching is very important in the classroom, which is capable of assisting to achieve the

instructional objectives of teaching. Dialogic teaching, a pedagogical approach that emphasizes structured conversation aligns closely with formative assessment. It involves ongoing talk between teacher and students, not just teacher-presentation (Nwogu & Eze, 2022). It involves purposeful interactions between teachers and students to facilitate deeper learning and understanding (Mercer & Howe, 2020). Dialogic teaching as coined by Robin Alexander since the early 2000s is a tutorial approach that leverages the power of talk to enhance students' learning and engagement. According to Kerem and Cihan (2020), a good interaction in the classroom help the students to identify their learning methods, guide them to easily communicate with their peers, give them an exposure to learning, and enhance their academic achievement. It emphasizes ongoing exchange of ideas between teachers and students, where students' ideas are valued and used to co-construct knowledge. Since the poor achievement of university students continue to be a worry in educational sector especially in Science education department, University of Nigeria Nsukka (UNN), it becomes important to determine if the academic staff (lecturers) apply dialogic teaching as a form of formative assessment tool.

Application is the act of using something for a specific purpose. Okonkwo (2023) stated that application is the action of putting something into operation. It is an act of making something to function, utilize it in order to achieve the objectives for which that thing is established (Nwogu & Eze, 2022). The application of a dialogic teaching as a form of formative assessment tool refers to the process of utilizing opportunities to gather real-time feedback, assess students understanding, and guide their learning effectively in an interactive classroom. If dialogic teaching is applied as formative assessment tool, there's possibility of making students' and teachers' to monitor their progress, evaluate their learning strategies, and set goals for improvement. In utilization of dialogic teaching, there may be possible challenges instructors may encounter.

Challenges are capable of affecting utilization, making it possible not to achieve the goals. Challenges is the difficulties or obstacles that one encounter which must be overcome to achieve a goal or navigate a situation (Okafor, 2023). It is a task, problem or situation that requires effort, determination, and skill to overcome (Eze, 2021). These challenges may be personal, social, moral or situational, and they are often used to drive the narrative forward and develop the

characters' resilience, growth, or understanding. It is a task, a duty or a situation that is difficult to handle. When there's challenge, a lot of effort, determination and skill are required to face it and overcome it successfully. In application of dialogic teaching, there may be possible challenges which may affect the success.

This connection between dialogic teaching and formative assessment is crucial in fostering critical thinking, creativity, and problem-solving skills. Kyriakidou, Chrisostomou and Banks (2023) were of the view that the integration of dialogic teaching in the classrooms has been surrounded with lots of challenges in this 21<sup>st</sup> century. A study of Oladimeji, Adeyanju and Fakorede (2021) on Colleges of Education (COE) lecturers' application of dialogic teaching as a correlate of students' engagement and academic achievement revealed a positive relationship on academic achievement, which is an indication that this can only happen if dialogic teaching is applied. Nwankwo (2021) in a study on influence of knowledge and application of dialogic teaching in secondary schools in Abia State found out that teachers are knowledgeable of dialogic teaching but fails to apply it due to time factor. This shows that teachers may have negative attitude towards dialogic teaching which may be as a result of hindrances in the application. Ibenyenwa (2021) in a study on assessment of awareness and utilization of dialogic teaching among pupils in nursery schools in Anambra State found out that teachers utilized dialogic teaching which makes pupils to be active in classroom.

Moreover, studies have highlighted the challenges faced by teachers in implementing dialogic teaching, including lack of training, large class sizes, and rigid curricula (Nwogu & Eze, 2022). These challenges hinder the realization of the potential benefits of dialogic teaching in fostering students' critical thinking, collaboration, and independent learning. Research has shown that dialogic teaching enhances students' learning outcomes by creating a classroom environment where ideas are explored, challenged, and refined collaboratively (Mercer & Howe, 2020). Despite efforts by educational stakeholder especially teachers, there's still poor academic achievement of undergraduate students of Science Education department UNN, it moves the researcher to determine the application and challenges of dialogic teaching as a formative assessment tool. Despite the growing interest in innovative teaching and assessment methods, the extent to which teachers apply dialogic teaching as a formative assessment tool

remains under-explored and if there are hindrances to that effect remain unknown. Previous studies failed to determine this study using university institution which may have large class size and where many lecturers fix appropriate time for teaching, despite the poor achievement. This necessitates this study.

### Research Questions

The study was guided by the following research questions:

1. What level do science education department lecturers apply dialogic teaching as a formative assessment tool?
2. What are the challenges facing the application of dialogic teaching as formative assessment tool among Science education department lecturers?

### Methods

This study adopted the descriptive survey research design. The population of this study comprised of all the 57 lecturers (teaching staff) from the Science Education Department in the Faculty of Education, UNN (source: from the secretary Science Education, 2025). The sample size was 42 academic staff which was obtained through volunteer sampling technique. The choice of the sampling technique was because these were the teaching staff who accepted to participate for the study. The choice of these teaching staff was because there was poor academic achievement of the students of Science Education department and these staff are their teachers, it maybe because of poor assessment. A 20-item questionnaire instrument named “Application and Challenges of Dialogic Teaching as Formative Assessment Tool Questionnaire (ACDTFATQ)” developed by the researcher was used for data collection. The instrument was developed by the researcher from the review of literature, based on

the research questions. The questionnaire was divided into two sections: section A and B. The section A deals with instruction while the section B which had twenty (20) items in two clusters. Cluster A which has ten (10) items sought data on application of dialogic teaching as formative assessment tool, and the responses were guided by 4-point rating scale of often (4 points), sometimes (3 points), rarely (2 points) and never (1 point) for positive items whereas often (1 point), sometimes (2 points), rarely (3 points) and never (4 points) for negative items. Cluster B also has ten (10) items which sought data on challenges of dialogic teaching as formative assessment tool, and the responses were guided by 4-point rating scale of guided by 4-point rating scale of Strongly Agree (4 points), Agree (3 points), Disagree (2 Points) and Strongly Disagree (1 Point) for positive items whereas Strongly Agree (1 Point), Agree (2 points), Disagree (3 Points) and Strongly Disagree (4 Points) for negative items.

Three specialists from Research, Measurement and Evaluation unit in Science Education Department, Faculty of Education, University of Nigeria Nsukka validated the instrument to ascertain the face validity. To determine the internal consistency reliability of the instrument, the instrument was administered to twenty (20) teaching staff from Arts Education, Faculty of Education, University of Nigeria Nsukka which were not part of the sample but under the same faculty in the institution, their students also offer few courses together with the sampled department. The internal consistency reliability of the items of the instrument was established using Cronbach alpha formular for cluster A and B to be 0.86 and 0.92 respectively, with overall reliability of 0.89. The instrument was administered by the researcher through face-to-face method. In analysis of data, items with mean of 2.5 and above were considered as the positive item while items with mean ratings below 2.5 were considered negative item.

## Results

**Table 1: Mean and Standard deviation of the ratings of science education lecturers' application on dialogic teaching as a formative assessment tool**

S/N	Item Statement	N = 42	Mean	Std. Dev.	Decision
1	I incorporate group work and collaborative learning activities as part of my teaching practice		3.31	1.20	PA
2	I use dialogue to assess students understanding and provide feedback.		3.55	1.48	PA
3	I allow students to ask open-ended questions that foster discussions and reflections.		3.26	1.29	PA
4	I use dialogic teaching to identify students misconceptions		3.14	1.22	PA
5	I encourage students to assess their learning and reflect on their progress during the lesson.		3.26	1.23	PA
6	I use dialogic teaching to encourage students to think critically during lessons.		2.88	1.40	PA
7	I use dialogic teaching to promote problem-solving skills among students during teaching		2.79	1.49	PA
8	I use dialogic teaching for development of communication skills among students		3.17	1.17	PA
9	I use dialogic teaching to stimulates motivation of students		3.38	1.21	PA
10	I use dialogic teaching for students to self assess their level of competencies		3.24	1.30	PA
<b>Grand Mean</b>			<b>3.20</b>	<b>1.26</b>	<b>PA</b>

PA stands for *Positive Application*

Table 1 revealed the level science education department lecturers apply dialogic teaching as a formative assessment tool. It shows the mean ratings of all item are above 2.5 set as bench mark. It also showed a grand

mean of 3.20 with standard deviation of 1.26 which is above 2.5. It indicates that science education department lecturers apply dialogic teaching as a formative assessment tool.

**Table 2: Mean and Standard deviation of the ratings on the challenges facing the application of dialogic teaching as formative assessment tool among Science education department lecturers**

S/N	Item Statement	N = 42	Mean	Std. Dev.	Decision
1	Lack of adequate training for teachers on application of dialogic teaching as formative assessment tool		3.12	1.25	PC
2	Limited time during lesson, makes it hard to incorporate dialogic teaching as formative assessment tool		3.00	1.33	PC
3	Large class size make it difficult to apply dialogic teaching as formative assessment tool		3.10	1.32	PC
4	It is difficult to integrate during teaching		2.71	1.29	PC
5	Lack of resources to apply dialogic teaching as formative assessment tool		2.81	1.37	PC
6	Curriculum is rigid and does not support dialogic teaching as formative assessment tool		3.29	1.29	PC
7	Lack of students participation makes it difficult to apply dialogic teaching as formative assessment tool		3.00	1.27	PC

8	Lack of management support makes it hard to apply dialogic teaching as formative assessment tool	2.60	1.25	PC
9	Teachers lack of skills on application of dialogic teaching as formative assessment tool	2.83	1.41	PC
10	Difficult in maintaining classroom management in application of dialogic teaching as formative assessment tool	3.07	1.30	PC
<b>Grand Mean</b>		<b>2.95</b>	<b>1.31</b>	<b>PC</b>

PA stands for *Positive Challenge*

Table 2 revealed the challenges facing the application of dialogic teaching as a formative assessment tool among science education department lecturers. It shows the mean ratings of all item are above 2.5 set as bench mark. It indicates that all the items are challenges facing the application of dialogic teaching as a formative assessment tool among science education department lecturers. It also showed a grand mean of 2.95 with standard deviation of 1.31 which is above 2.5 which also indicates that there are challenges facing the application of dialogic teaching as a formative assessment tool among science education department lecturers.

## Discussion

The study revealed that science education department lecturers apply dialogic teaching as a formative assessment tool. The university lecturers mostly utilize dialogic teaching because they sort for all strategies to make sure the instructional objectives are achieved. Besides, the observations of the researcher showed that most of those university lecturers do attend seminar, workshop or conferences where they can update their knowledge of the innovative assessment methods. The result of study is in support with the studies who found out that teachers utilized dialogic teaching in the classroom (Oladimeji, Adeyanju & Fakorede, 2021; Ibenyenwa, 2021). The study is in contradiction with the study of Nwankwo (2021) who found out that secondary school teachers are knowledgeable about dialogic teaching but fails to apply it due to time factor.

The study also revealed that there are challenges facing the application of dialogic teaching as a formative assessment tool among science education department lecturers. This may be as a result of stakeholders' not maintaining educational policy like appropriate class size etc. The finding of the study is in line with the studies who also found out some hindrances affecting implementation of dialogic teaching as a formative tool in the classroom (Kyriakidou, Chrisostomou & Banks, 2023; Nwogu &

Eze, 2022). None of the previous studies was in disagreement with the finding of this study.

## Conclusion

From the findings, it is concluded that science education department lecturers apply dialogic teaching as a formative assessment tool but encounter some challenges on the process of implementation. Certain skills are required to solve any hindrance, teachers should possess all necessary classroom skills (good classroom management, good communication, good relationship with the students etc) of dialogic teaching in order not to allow the challenges of dialogic teaching to affect the instruction which will in turn improve academic achievement of students.

## Recommendations

- ❖ Regular free in-service training on dialogic teaching as a formative assessment tool for all the lecturers especially new lecturers in the university in order to equip them with all necessary skills to solve any hindrance.
- ❖ Dialogic teaching should be incorporated to appropriate contents in the curriculum.
- ❖ Educational stakeholders should assist to solve the challenges in implementation of dialogic teaching.

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