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Perception of Dramatization Method in Teaching-Learning of Scientific Concepts by Basic Science and Technology Teachers in Abuja

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Abstract

The study explored the perception of basic science and technology teachers over the use of dramatization method in the teaching-learning of scientific concepts in Abuja Municipal Council Area. Carried out between January and March 2024, the study aimed at ascertaining teachers' view of dramatization as a possible activity-based and learner-centered method to mitigate the dwindling interests and poor attitude of students to the learning of scientific concepts. The study employed descriptive survey in which a sample size of 125 (made of 58 males and 67 females) were selected from a target population of Basic Science and Technology subject Teachers of the Universal Basic Education Board, Abuja Municipal Council Area using cluster sampling technique. The study was guided by five research questions. The instrument for data collection was researcher-developed 16-item questionnaire validated by experts with a modest coefficient of internal consistency. Data collected were analyzed using mean and standard deviation. The findings showed that basic science and technology teachers in Abuja have

relatively high perception of the efficacy of dramatization method in teaching-learning of scientific concepts. Some constraints associated with the method include inadequate familiarization of dramatization by science teachers, limited resources such as props, costumes and dedicated spaces for stage performance and the complexity associated with assessing students through dramatization. Some remedies proffered included the training/re-training of teachers on dramatization method, sufficient resource allocation for procurement of materials and equipment for dramatization, curriculum integration and community involvement. It is recommended that teachers of basic science and technology could improve teaching using dramatization.

Keywords: Perception, Dramatization method, Scientific concepts, Basic Science and Technology Teachers, Activity and learner-centered approach

Introduction

Goal-4 target of the United Nations' Sustainable Development Goals (SDGs) stipulates the inclusivity and equitability of quality education as well as the promotion of life-long learning for all by the year 2030 (UNESCO, 2021). This goal is geared towards reducing disparities and inequities in education, both in terms of access and in terms of quality particularly as it concerns the sub -Saharan Africa (UNICEF, 2024). To aim at and possibly achieve this noble goal-4 target of the SDG, young and adult learners alongside the disadvantaged groups especially in developing nations as Nigeria need basic scientific and technological knowledge, attitude and process skills to help them develop innovative thinking, high productivity and research ability (Okenjom, Ogar, Bake & Eze-Anyim, 2016). It has become an imperative considering the aftermath of the pandemic era and the

way it has exposed the poor teaching-learning system which Africa is struggling to tackle (Kanu & Agu, 2020). Among the critical factors being considered for standard education is effective teaching-learning methodologies cum strategies capable of propelling the realization of the United Nations' target. Effective teaching-learning methodology and innovative strategy could help learners develop their critical thinking ability and entrepreneurial skills to attain self- reliance, creativity and research capability useful in solving daily basic private and common societal problems (Afuwape & Oriola, 2017).

Findings abound in contemporary times that one of the major pitfalls of education in developing countries is the failure of learners to conceptualize learning experiences and concepts. Another source of concern is the inability of basic education graduates to translate organized knowledge-based structure and learning experiences into solving problems (Agu & Isei 2018). Method of instruction has remained dogmatic, didactic, teacher and text-book centered without conscientious recourse to the special methods and strategies postulated by the Constructivists' education theory of learning. Students are encouraged to 'do' through active participation rather than being passive learners. In schools of contemporary period, some teachers are still found to over-rely on the traditional methods of instruction which tend to make students redundant recipients of knowledge and incapable of conceptualizing scientific concepts (Afolabi, 2020). The consequence is high failure rate in public examinations, lack of self-confidence, poor productivity and inability to translate theoretical knowledge into practical relevance. Ever heard of 'half-baked' graduates paddling paper certificates all around and yet lacking essential skills needed to cope with life's challenges and navigate the post- pandemic era (Adaji, 2023). Educationists, educators and researchers this time are preaching the

application of active teaching-learning methods and innovative strategies worthy of enhancing students/pupils' learning experiences (Bowale & Ogundipe, 2022). Different teaching methods and innovative strategies have been advocated as a means of achieving meaningful learning in science of which the dramatization method is one (National Teachers' Institute, 2021).

Basic science and technology curriculum recommends guided inquiry and activity-centered teaching and learning with the use of materials and resources that are indigenous in nature (Nigerian Educational, Research and Development Council [NERDC] (2012). In addition, the contents of the curriculum which is spiral in nature supports improvisation. It is fortified with teachers' activity, students' activity and real-life examples drawn from the local environment. The curriculum offers contents and greater learning experiences which would engender the inculcation of functional, practical and relevant entrepreneurial skills for job creation and wealth generation also ensuring inclusivity (Obioma, Nworgu, Owodunni, Emenike & Thomas, 2014).

Dramatization method of teaching is a powerful educational approach in which dramatic techniques are used to engage students in learning process. By incorporating elements of theater and performance arts, this method attempts to create a dynamic and interactive learning environment that could enhance comprehension and retention of learning experience (Wang, 2019). Through role-playing, improvisation, and creative expression, students are encouraged to actively participate and dip themselves in the subject matter. This method not only fosters critical thinking and problem-solving skills but also promotes collaboration, empathy, and self-confidence (Braund, 2015). Dramatization aims to enhance

dynamism in learners' understanding and emotional connection through interactive experience. This method often involves the use of dialogue, characterization, and visual elements to convey meaning and evoke a response from the audience. Smith and Herring (2015) examined multiple studies on the use of dramatization in education with evidence of impact on students' learning, found out that dramatization enhanced comprehension, retention, and application of knowledge across various disciplines and themes. It has to do with real presentation and transformation of mental and physical potentials of learners into creative arts and meant to be acted on the stage. Duban and Duzgun (2013) affirmed its tendency to create a cooperative learning environment in which students are assigned character roles to act on the concept or process being investigated.

Dramatization is a pedagogical approach that involves the use of dramatic techniques, such as role-playing, skits- creation, and stage performances to engage students in active learning. Even though literature is limited on the use of the dramatization method for teaching science and technology concepts, curriculum designers and educators appreciate the value of the method in propagating conceptual understanding through game-like activities (Abed, 2016). The dramatization of scientific ideas is viewed as a particular type of modelling used to express descriptive, experimental, mathematical and figurative/ pictorial understanding of a concept or a process not excluding gestural representation (kinesthetic). Students animate the roles given in their preferred ways allowing them the opportunity to reflect, discuss and make connections with real life situation and from different perspectives. Drama reinforces the attainment of the three educational domains: cognitive, affective and psychomotor as they relate to analysis, synthesis and evaluation.

The social change paradigm, as a framework, assesses the notions of development, change, communication, audiences, and education that underpin the conceptualization and design of an entertainment education (Komarac et al., 2020). For instance, a television drama, entitled *'Tsha Tsha'* used a novel cultural approach to address issues surrounding HIV and AIDS in South Africa ((Moyer-Guse & Nabi 2018). Dual coding theory postulated that information is processed through two independent channels: verbal channels and visual channels (Feiyue, 2022). Such verbal channels include texts and sound. The visual channels include diagrams, animations and images. Dual coding theory as researched by Paivio, Badget and Kozma indicates that the mixture of appropriate media could lead to an improvement in learning outcomes. Information dissemination that uses verbal and relevant visual illustrations tend to be more comprehensible than information that relies on text, voice alone, a combination of text and sound or illustration alone. Another theory upon which dramatization method is hinged is the Sensory stimulation theory. It involves the exploration of stimuli which includes auditory, visual, olfactory, tactile, taste and kinesthetic stimulation (Lykkeslet, Gjengedal, Skrondal & Storjord, 2014).

Efforts have been made in the past by some authors to categorize drama in science into 'science as a product', 'process and nature of science' and 'science as an institution in the society'. Others have categorized dramatization in science based on the theme such as science concepts drama, science character drama, science debate drama and science expression drama. Yoon in Abed (2016) categorized dramatization in science into -with script and without scripts. 'With scripts' involves the provision of some scripts either by the teacher or by the students themselves to be acted upon or read out in a game-like manner by the students. 'Without scripts' has to do

with improvisation and role-play in which a task or a role is assigned a student character to act in a non-verbal presentation such as mime. Two strategies offered to science education by dramatization method according to Abed (2016) include social simulation and physical simulation. Social simulations engage students by studying the impact of science and technology on society using role- play, debates and conferences that have the capacity of conveying affective educational objectives through empathy. Physical simulations translate and imitate abstract concepts and natural phenomena by acting physical activities that are portrayed cleverly. Some factors that must be considered before the deployment of the dramatization method – the level of use and the potential problem it is meant to solve.

Some potential benefits have been found with the use of dramatization in teaching scientific concepts. It promotes students' engagement by making the learning process pleasurable and interactive, thereby leading to increased motivation in the subject matter, ultimately improving students' academic performance (Wang, 2019). By actively participating in role-plays, stage performance and skits, students can explore different perspectives, analyze complex situations, identify strengths and weaknesses of their individual personality, develop problem-solving skills and be able to connect study and application in real life situation (Jarrah, 2019). Through group activities and performance, students learn to work together as a team, share ideas, and effectively communicate their thoughts and opinions (Smith & Herring, 2015 and Wang, 2019).

However, it is important to consider potential challenges and limitations associated with the implementation of the dramatization teaching method. The constraints might include paucity of

resources, pressure of time, teacher-training inadequacy, and lack of careful planning and coordination (Duban & Duzgun, 2013). This paper, therefore, explores the perception of the dramatization method in teaching scientific concepts by basic science and technology teachers in Abuja Municipal Council Area.

Statement of the Problem

Despite the lofty promises in science education, secondary students tend to shy away from science-related subjects. In-built fears and false public perception of science subjects as being difficult to understand, uninteresting, full of dogmas and abstract terms tend to discourage potential science students from opting for science. Even the ones who study it to go for science subjects at the senior classes are under-performing in terms of learning outcome, also not living up to expectation at job places after graduation. Inability of Basic Education graduates to translate theoretical concepts and principles learnt into practicality, functionality and relevance has raised doubts as to the effectiveness of teaching methodologies being implemented in schools. Results of examining bodies such as that of the States and Federal Basic Education Certificate Examinations (BECEs) in Basic Science and Technology leaves much to be desired. High failure rate has been recorded consistently for some years now both in NECO-BECE and ERC-BECE conducted across the nation. The crux of the matter is mainly on how to demystify the mystery behind the sentiments attached to science subjects as being difficult to conceptualize. To do so, it has become expedient to explore basic science and technology teachers' level of awareness of the potential benefits, limitations and possible strategies that could enable them effectively deploy the dramatization method in instructional delivery. The thrust of this study therefore was the perception of basic science and technology teachers towards the use of dramatization method in teaching-

learning of scientific concepts in Abuja Municipal Council Area, Abuja.

Purpose of the Study

The study was undertaken to determine the perception of Basic Science and Technology (BST) teachers towards the use of dramatization method in teaching scientific concepts. The study specifically tried to:

- assess teachers' perception of dramatization as a means of improving students' critical thinking skill and learning process in Basic Science and Technology.

- determine teachers' perception of dramatization method as a means of maintaining students' engagement in the learning of scientific concepts.

- find out teachers' perception of dramatization method as a means to boost students' self-confidence and motivation towards the learning of scientific concepts.

- find out the potential challenges and limitations associated with the dramatization method in the teaching-learning of scientific concepts.

- ascertain teachers' perception of probable strategies that can be deployed to effectively integrate dramatization method into the existing curriculum and maximize its benefits for the teaching-learning of scientific concepts.

Research Questions

The following research questions were formulated to guide the study:

- What is the perception of teachers towards the use of dramatization as a teaching-learning method to improve students critical thinking skill and learning process in Basic Science and Technology?

- How would teachers perceive the use of dramatization method to enhance students' engagement in the learning of scientific concepts?

- How would teachers perceive the use of dramatization method to boost students' self-confidence and motivation towards the learning of scientific concepts?

- What are the potential challenges and limitations of using the dramatization method in teaching scientific concepts?

- What is teachers' perception of probable strategies that can be deployed to effectively integrate the dramatization method into the existing curriculum and maximize its benefits for students learning of scientific concepts?

Research Method

The study adopted a descriptive survey research design. A sample size of 125 which consist of 58 males and 67 females selected using cluster sampling technique and determinedusing Taro Yamane method of n = where n = sample size, N= population, e = margin of error of 0.05, chosen from a population of 186 FCT Universal Basic Education Board (UBEB) teachers of Upper Basic Classes teaching Basic Science and Technology in public schools within Abuja

Municipal Council Area (AMAC), Abuja and carried out between January and March of 2024. The instrument for data collection was researcher-developed 16-item questionnaire validated by experts. The coefficient of internal consistency for the instrument was 0.76. A table of rating scale of four-point Likert scale items was used to rate teachers' level of agreement based on: Agree (A), Strongly agree (SA), Disagree (D) and Strongly disagree (SA). Likert structure weighted 4, 3, 2 and 1 respectively in that order. The data for the research questions were analyzed using the statistical tool of mean and standard deviation.

Results

From Table 1, the respondents view on whether dramatization method made students less involved in the learning process had the higher frequency (22 + 98 = 120) in disagreement with a mean of 1.28 and a standard deviation of 0.61, while item 2 on whether dramatization helped to create mental picture of scientific concepts being taught got the higher frequency(35 + 83 = 118) on agreement with a mean of 3.22 and a standard deviation of 0.56; and its enhancement of communication, problem- solving and critical thinking skills got the higher frequency (23 + 96 = 119) of respondents in strong agreement with a mean of 3.12 and standard deviation of 0.52.

Table 1: Teachers' Perception of Dramatization as a Means of Improving Students' Critical Thinking Skill and Learning Process in BST

S/No	Critical Thinking &Learning Process	A	SA	D	SD	Mean	STD
1.	When students actively participate in dramatic activities, such as role playing, they become less involved in the learning process.	3	2	22	98	1.28	0.61
2.	Drama helps to create mental picture of scientific concepts being taught.	35	83	6	1	3.22	0.56
3.	Dramatizing scientific concepts and processes enhances communication, problem-solving and critical thinking skills	23	96	4	2	3.12	0.52

Table 2 shows the highest response (95 + 12 = 107) on item 4 for disagreement that dramatization de-motivates students and hinders contextual understanding with mean score of 2.18 and standard deviation of 0.68. Item five (5) which affirmed that dramatization could enhance students' engagement by making the learning process more interactive and fun through role-playing, which had the highest frequency (6 + 95 = 101) in strong agreement with a mean of 2.72 and a standard deviation of 0.75. Item 6 which was on possibility of dramatization helping students to develop deeper understanding of scientific concepts got higher frequency (35+ 80 = 115) for agreement with a mean of 3.14 and standard deviation of 0.71.

Table 2: Teachers' Perception of Dramatization Method as a Means of Maintaining Students' Engagement in the Learning of Scientific Concepts

S/N	Students' engagement in learning	À	SA	D	SD	Mean	STD
4.	Dramatization method de-motivates students, hindering contextual understanding.?	10	8	95	12	2.18	0.68
5.	Dramatization can increase students' engagement by making the learning process more interactive and fun through role-playing	6	95	7	17	2.72	0.75
6.	Students could develop deeper understanding of scientific concepts if they engage in dramatization	35	80	3	7	3.14	0.71

Table 3 shows higher frequency (98 + 13 = 111) of respondents for disagreement on item 7 that dramatization did not increase students' self-confidence had a mean score of 2.05 and standard deviation of 0.58. Item 8, got the higher frequency (93+5 = 98) in disagreement for students that engaged in dramatization found it difficult to express themselves among peers had a mean score of 2.26 and a standard deviation of 0.67. For item 9 which opined that dramatization often created a more negative emotional connection devoid of inclusive learning environment got a higher frequency (106 + 7 = 113) of respondents in disagreement with a mean score of 2.12 and a standard deviation of 0.61.

Table 3: Teachers' Perception of Dramatization Method as a means to boost students' Self-confidence and Motivation towards the Learning of Scientific Concepts

S/No	Self- confidence and Motivation	A	SA	D	SD	Mean	STD
7.	Dramatization does not increase self-confidence that will help science students to step out of their comfort zone.	5	9	98	13	2.05	0.58
8.	Students who are engaged in dramatization of scientific concepts and processes find it difficult to express themselves among peers	11	16	93	5	2.26	0.67
9.	Dramatization often create a more negative emotional connection and devoid of inclusive learning environment	10	2	106	7	2.12	0.61

Table 4 is the analysis of respondents' response to the challenges and limitations associated with the dramatization method. Respondents on item 10 which elicits information on whether time is a major constraint faced in implementing dramatization. Higher frequency (27 + 81 = 108) is in agreement with a mean score of 3.02 and standard deviation of 0.72. For item 11, higher frequency (25 + 89 = 114) is in disagreement that sourcing resources and fund is not a concern for dramatization with a mean score of 1.40 and standard deviation of 0.71. For item 12, more of the respondents (15 + 88 = 103) are in agreement that assessment and evaluation of students' learning outcome using dramatization could be tedious when compared with conventional methods with a mean of 2.86 and standard deviation of 0.72. Item 13 on whether integrating dramatization into existing curriculum could be challenging, more of the respondents (85 + 13 = 98) are in agreement with a mean of 3.38 and standard deviation of 1.01.

Table 4: Potential Challenges and Limitations Associated with the Dramatization Method in the Teaching-learning of Scientific Concepts.

S/No.	Challenges with Dramatization	A	SA	D	SD	M	STD
10.	Do you think time constraint is one of the major challenges faced in dramatization teaching method?	27	81	10	7	3.02	0.72
11.	Sourcing resources and fund for costumes, props and stage to dramatize scientific concepts and processes is not a concern in dramatization	3	8	25	89	1.40	0.71
12.	Assessing and evaluating students' learning outcome through dramatization can be more complex than using traditional teaching method	15	88	12	10	2.86	0.72
13.	Integrating dramatization into existing curriculum can be a major challenge especially if it requires aligning with specific objectives or standard	85	13	16	11	3.38	1.01

Table 5 is the results of analysis on respondents' perception of probable strategies to integrate dramatization method into the existing curriculum. Item 14 on whether providing opportunities for students to be actively engaged in role-playing had a higher frequency of respondents (50 + 58 = 108) was in agreement and had a mean score of 3.18 and a standard deviation of 0.86. On the other hand, item 15 that elicited information on whether communicating the learning objectives and expected outcome in a clear way helped the students' understanding of purpose more of the respondents (23 + 88 = 111) was in agreement with a mean score of 3.02 and standard deviation of 0.66. Item 16 on whether having reflection and discussion session after acting of the drama might encourage

students to interact and share insight had a higher frequency (12 + 103 = 115) being in agreement with a mean of 2.96 and standard deviation of 0.59.

Table 5: Teachers' perception of probable strategies that can be deployed to effectively integrate dramatization method into the existing curriculum and maximize its benefits for the teaching-learning of scientific concepts

S/No	Probable coping strategies	A	SA	D	SD	Mean	STD
14.	Providing opportunities for students to actively engage in role playing is one of the many ways to integrate dramatization in teaching-learning of scientific concepts	50	58	7	10	3.18	0.86
15.	Clearly communicating the learning objectives &expected outcome helps students understand the purpose of the activity and how it relates to overall learning of scientific concepts	23	88	8	6	3.02	0.66
16.	Reflection and discussion session after the dramatic activities could encourage students to share their experiences, insights and connections made between the activity and content which deepens their understanding	12	103	3	7	2.96	0.59

Discussion

Based on the results of the data analyzed in Tables 1, 2, 3, 4 and 5 in relation to the research questions raised to guide the study, basic science and technology teachers in Abuja Municipal Council Area of Abuja expressed high perception towards the use of dramatization method for teaching. They were not in agreement that

dramatization could make students to be less involved in the learning process. Most of the teachers agreed that dramatization helped students create mental picture of scientific concepts being taught, enhanced their communication, problem-solving and critical thinking skills. Results also portrayed most of the BST teachers not in agreement that dramatization could de-motivate learners, hindering contextual understanding. They majorly agreed that when learning process is made interactive and fun through role-playing offered by dramatization, students' engagement with content would increase with deeper understanding of scientific concepts. The majority of the BST teachers were in disagreement that dramatization could decrease students' self-confidence and motivation, but some were not in agreement that it could create a more negative emotional connection devoid of inclusivity.

On their perception of the challenges surrounding the use of dramatization method, most BST teachers believed that time constraint was a major limiting factor. Most of them disagreed that sourcing resources and fund for costumes, props and stage was not a concern. Another obstacle which most BST teachers considered germane was that assessing and evaluating students' learning outcome through dramatization could be complex. Concerning their view on probable strategies of integrating dramatization into the existing curriculum and maximizing its benefits for teaching-learning of scientific concept, most of them agreed that providing students opportunities to actively be engaged in role-playing was essential. Most also believed that clarity in communicating learning objectives and outcomes to students in respect of scientific concepts was a good strategy. The Majority believed that engaging students in reflection and discussion session after dramatization where they shared their experiences, insights and connection between activity and content was good.

Constructivists education advocates students learning by conceptualizing understanding of their own personal encounters with information building on what they previously knew in order to form a personal perspective of the world (Illinois, 2015). The dramatization method, used in this study with BST teachers' was hinged on constructivists education theory as defined above. Dramatization, when used in the teaching-learning process could lead to positive emotional experiences and a decreased sense of exclusivity among students as attested to by the BST teachers in this study. Data analysis revealed that, students' involvement in dramatization enhanced their performance and problem-solving skills which corroborated Seniarika's (2018) finding. Dramatization also enabled students to use language effectively in interactive roles with the audience. Several studies similar studies had found such benefits, the improvement of listening skills, reflective thinking, among others (Jarrah, 2019). This study was also in agreement with Afuwape and Olugbuyi (2019) on improving science learning through activity such as the dramatization method.

Implication of the Findings

The use of dramatization as a teaching method in basic science and technology in Abuja Municipal Area Council increased student engagement, improved understanding of scientific concepts through real- world applications, enhanced retention of information, and potentially higher academic achievement. However, the effectiveness may depend on various factors such as teacher competence, resource availability, and the alignment of dramatization with the curriculum. In addition, assessing the long-term impact on academic achievement would require further research and evaluation.

Challenges and limitations associated with the dramatization method as perceived by BST teachers in this study were as follows:

- Limited availability of resources such as props, costumes, and dedicated spaces for performance could hinder the effective implementation of dramatization in schools.

- Incorporating dramatization activities into the curriculum requires careful planning and may consume more time than traditional teaching methods.

- Given the time constraints within the academic calendar and daily time-table of schools, finding suitable time slots for dramatization activities might be challenging without compromising other essential aspects of the curriculum.

- Varied levels of students' interests, reactions and participation in dramatization activities might affect the uniformity of its impact on academic achievement, as not all students might engage with or benefit equally from this method. It could even be a source of disruption.

- Assessing and evaluating students through dramatization is more complex than the conventional methods.

Conclusion

Students develop deeper understanding of scientific concepts, boosts their self-confidence and their positive emotional connection and inclusivity.

However, the method has its drawback. Challenges might arise which could be overcome by employing clear guidelines, integrating technology, fostering a supportive classroom environment, strategic proper planning, collaboration and leveraging on utilizing available resources effectively. The dramatization method can facilitate the attainment of BST curriculum goals. The diverse students' population in Abuja Municipal Council Area of FCT-Abuja, coupled with the urgent need for interactive and engaging teaching strategies, makes dramatization an appealing approach to enhance academic achievement.

Recommendations

- There is need for the comprehensive training of teachers of BST in Abuja Municipal Council Area to effectively incorporate dramatization techniques into their teaching methods. Teachers should fully understand how to fit the method into the curriculum for maximum learning outcome.

- Sufficient resources need to be allocated to schools for the acquisition of materials (e.g. costumes, props and stage etc.) and equipment for successful dramatization.

- The method should be continuously evaluated to ascertain its effectiveness.

- There is the need to engage parents, guardians, and the local community in supporting and understanding the benefits of dramatization in education in order to foster a positive learning environment and encourage broader community support for this teaching approach.

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