



Influence of Teaching Experience on Secondary School Biology Teachers' Competency in Classroom and Instruction Management in Enugu State

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Abstract

This study centred on the influence of teaching experience on secondary school biology teachers' competency in classroom and instruction management in Enugu state. Two research questions and two null hypotheses guided the study. An ex-post facto research design was adopted. The population comprised 105 Biology teachers, and the entire population participated in the study. Data were collected using an observational checklist which was validated by experts and yielded a Cohen's Kappa reliability coefficient of 0.801. Mean and standard deviation were used to answer the research questions while Analysis of Variance (ANOVA) was used to test the null hypotheses at 0.05 level of significance. The findings revealed that Biology teachers teaching experience significantly influence teachers' competences in classroom and instruction management. The study recommended that Biology teachers with fewer years of experience should adopt the highly experienced ones as their role models and show total compliance to their mentorship. The State Government should provide enough infrastructures in the schools so that biology teachers will have enabling environment for effective delivery of instructions.

Keywords: Teaching experience, Competency, Biology Teachers, instruction management, classroom management.

Introduction

Among the three core science subjects (Chemistry, Physics and Biology) taught and learnt in secondary schools in Nigeria, Biology stand out. Biology is the study of living organisms, divided into many specialized fields that cover their morphology, physiology, anatomy, behaviour, origin and distribution (UK English Lexico Dictionary, 2021). Biology is so imperative and indispensable so long as life continues to exist on earth. Emphasizing on the importance of Biology, Biology education stands out to offer both individual and societal gains. For individual gains, biology education directs individuals to understand themselves, understand parts of their body and how they function, question superstitions, prepares individual interest and aesthetic appreciation of nature, provide individuals with career choices, inculcate in individuals scientific skills and attitudes in an attempt to solve personal and social problems. In the same vein, current issues like over

population, food production, diseases control, environmental degradation, ecology, drug abuse, genetic, smoking, alcoholism, dehumanizing life (incessant killing, cultism, ritualism, kidnapping) among others are all addressed in the study of biology to improve the standard of living in the society (Egbunonu and Maduabum, 2012 as cited by Nnamani, 2023). It's privilege role in many professions like; Medicine, Agriculture, Nursing, Pharmacy, Medical Laboratory, Food Science and Technology highlights the need for Biology to be properly taught in schools. Effective Biology teaching requires teachers to organize instructional activities systematically, guide learners during classroom activities and create conditions that support active participation in learning. Consequently, the quality of Biology teaching depends not only on teachers' knowledge of the subject but also on their ability to manage instruction and maintain a good classroom

management. Research has continued to identify classroom management and instructional practices as important elements of effective teaching and learning (Berger et al., 2018; Abdullahi, 2019).

Management of instruction refers to the teacher's ability to organize, coordinate and control the teaching and learning process in a way that promotes the achievement of instructional objectives. It includes organising classroom activities, managing lesson time, giving clear directions, monitoring learners' participation, maintaining appropriate classroom procedures, exhibiting effective communication skills and responding to instructional challenges as they arise. Effective instructional management enables teachers to maintain an orderly teaching process while giving learners appropriate opportunities to participate in classroom activities. Yasin and Mustafa (2020) found that teachers' instructional management skills were related to instructional quality and learners' perceptions of teaching, indicating the importance of effective management of instruction in classroom practice. In view of this, for Biology teachers to manage and deliver instructions accurately and as well achieve positive results, they must comply with the opinion of Slideshare (Slideshare, 2021) such as having sound knowledge of students' behaviour, their pattern of learning, their interest, background, age, needs and ability.

Management of instruction is particularly important in Biology because the subject involves different forms of classroom activities, including explanations, discussions, demonstrations, practical activities and the use of instructional materials. Biology teachers therefore need to organise these activities appropriately, provide clear instructions and monitor learners throughout the teaching process. Effective management helps to reduce unnecessary interruptions and ensures that instructional activities remain focused on the intended learning outcomes. Gage et al. (2018) reported that teachers' classroom management practices were related to students' engagement in instruction and classroom behavior. Demonstrating the instructional importance of effective a classroom management. Teaching experience is another variable of interest in this study.

Teaching experience may influence how teachers manage instruction because teachers encounter different classroom situations and

different categories of learners as they progress in their careers. Repeated exposure to learners' instructional challenges and classroom routines may provide teachers with opportunities to develop practical approaches to organising and managing teaching activities. However, the challenge is to identify the years of experience operational levels of Biology teachers in relation to managing instructions. Ochomma, Ani, Nwodo, Dyages, Ingwu and Igwe (2018) discovered that there was high significant relationships between managing conflicts, motivating employees and years of Experience. Berger, Girardet, Vaudroz and Crahay (2018) found that teaching experience was associated with teachers' self-efficacy and pedagogical beliefs but did not have a direct impact on their reported classroom management practices.

The relationship between teaching experience and management of instruction therefore requires empirical examination among Biology teachers. Teachers with fewer years of experience may or may not demonstrate effective instructional management when they possess appropriate professional preparation and classroom-management skills. Similarly, teachers with many years of experience may not necessarily demonstrate substantially different instructional-management practices if other professional factors influence their classroom behaviour. Çakmak (2019), provided evidence that teachers' management orientations can be examined in relation to differences in teaching experience and that was why Biology teachers were investigated on this teaching competence.

Another important dimension of effective Biology teaching is the maintenance of a conducive learning environment. A conducive learning environment is one in which learners experience appropriate physical, social and psychological conditions that support concentration, participation, interaction and learning. Teachers contribute to such an environment by establishing orderly classroom routines, promoting respectful teacher-learner relationships, managing disruptive behaviour and encouraging learners to participate actively in lessons. Abdullahi (2019) identified a conducive learning environment, teacher competency, supervision and staff development as important factors associated with quality education in Nigerian secondary schools.

Maintaining a classroom management requires teachers to manage both classroom behaviour and the conditions under which instruction takes place. Teachers are expected to establish classroom routines, encourage positive learner behaviour, respond appropriately to disruptions and create an atmosphere in which learners feel able to participate in learning activities. Such practices can promote learner engagement and reduce classroom conditions that interfere with effective teaching and learning. Berger et al. (2018) noted that classroom management encompasses actions directed towards creating a productive and orderly learning environment, while their findings showed that teachers' classroom-management practices were connected more closely with professional beliefs than with teaching experience itself.

The maintenance of a conducive learning environment is also important in Biology because many Biology lessons require interaction, observation, discussion, practical work and collaborative learning. A poorly managed environment may make it difficult for teachers to conduct these activities effectively and may reduce learners' concentration and participation. In contrast, an organised and supportive classroom can provide conditions that enable learners to participate meaningfully in instructional activities. Kucukakin and Göloğlu Demir (2021), in a systematic review, reported that teachers' classroom-management practices are important in creating productive learning environments that support students' learning and development, providing opportunities for teachers to develop practical ways of responding to disruptive behaviour, organising classroom activities and sustaining positive interactions with learners. Nevertheless, the influence of experience may vary because classroom-management practices are also affected by teachers' beliefs, self-efficacy, school conditions and professional development opportunities. Berger et al. (2018) found that teaching experience was positively associated with teachers' self-efficacy and pedagogical beliefs, although experience itself did not directly affect reported classroom-management practices.

Teachers with different lengths of teaching experience may differ in their ability to organise classroom activities, manage learner behaviour, maintain positive classroom relationships and sustain conditions that support effective learning.

However, differences in experience should not automatically be assumed to produce differences in teachers' ability to maintain a conducive learning environment because other professional and school-related factors may also contribute to classroom conditions. Research on classroom management has emphasised the importance of examining the factors that influence teachers' adoption and maintenance of effective classroom-management practices (Girardet, 2018).

Secondary school Biology teachers are expected to have adequate teaching experience to effectively manage classroom instruction and create an environment that supports meaningful learning. Experience gained over the years can help teachers improve their ability to organise lessons, allocate instructional time appropriately, coordinate classroom activities, monitor students' participation, and respond to difficulties that arise during teaching. It can also contribute to teachers' ability to maintain a conducive learning environment through effective classroom control, positive interaction with students, appropriate management of students' behaviour, and the establishment of conditions that encourage students to participate actively in Biology lessons. Despite these expectations, concerns may exist regarding the extent to which Biology teachers' years of teaching experience are reflected in their management of instruction and maintenance of a conducive learning environment in secondary schools in Enugu Education Zone.

Teachers with different levels of experience may vary in how they organise and deliver lessons, handle classroom activities, manage students' behaviour, resolve classroom disruptions, and sustain students' interest during instruction. While some experienced teachers may have developed effective classroom management practices through repeated teaching experiences, others may still encounter difficulties in coordinating instructional activities and maintaining classroom order. Ineffective management of instruction can result in poor organisation of lessons, ineffective utilisation of instructional time, limited student participation, and difficulty in achieving stated learning objectives. Likewise, an environment that is not conducive to learning may encourage disruptive behaviour, weaken teacher-student interaction, reduce students' concentration, and hinder effective participation in Biology lessons. These

conditions may ultimately affect the quality of teaching and learning in secondary schools. It is therefore necessary to examine whether differences in the years of teaching experience of Biology teachers are associated with their management of instruction and maintenance of a conducive learning environment in secondary schools in Enugu Education Zone of Enugu State.

In Enugu Education Zone of Enugu State, secondary school Biology teachers have different levels of teaching experience and are expected to manage instruction effectively while maintaining classroom environments that support learning. However, empirical evidence is required to determine whether teachers with different years of experience differ in their management of instruction and their ability to maintain a conducive learning environment. Existing studies have examined teaching experience and classroom management, but evidence specifically relating teaching experience to these two dimensions among secondary school Biology teachers in Enugu Education Zone remains limited. The present study therefore examined the influence of teaching experience on the management of instruction and maintenance of a conducive learning environment among secondary school Biology teachers in Enugu Education Zone of Enugu State.

Research Questions

The following research questions guided the study:

1. What is the mean score of biology teachers' instruction management based on years of teaching experience in Enugu State?
2. What is the mean rating score of maintenance of conducive learning environment of secondary school Biology teachers with different years of teaching experience in Enugu State?

Hypotheses

The following hypotheses were tested at .05 level of significance:

- H₀₁:** There is no significant difference in the mean score of biology teachers' instruction management based on years of teaching experience in Enugu State.
- H₀₂:** There is no significant difference in the mean rating scores of secondary school Biology teachers with different years of teaching experience in their maintenance of conducive learning environment in Enugu State.

Methods

The study employed an ex-post facto research design. The choice of the design was appropriate because the teachers' years of teaching experience were naturally existing characteristics that had been established before the study and, therefore, could not be manipulated by the researcher. A total of 105 Biology teachers in secondary schools within the study area constituted the population of the study. Because the number of teachers was sufficiently manageable, all the 105 Biology teachers were included in the study through census sampling.

Data were obtained through an observational checklist developed to assess Biology teachers' competency in management of instruction and classroom management. The checklist was validated by experts to ascertain the adequacy, clarity, and relevance of its items to the competencies being measured. Its reliability was established using Cohen's Kappa, which produced a coefficient of 0.801, indicating an acceptable level of agreement among the observations. The research questions were answered using mean and standard deviation while hypotheses were tested using Analysis of Variance (ANOVA) at 0.05 level of significance.

Results

Research Question 1: What is the mean score of biology teachers' instruction management based on years of teaching experience in Enugu State?

Table 1: Mean and standard deviation instruction management scores biology teachers based on teaching experience

Years of experience	Mean	Std. Deviation	N	Dec
1-5 years	2.50	.89	35	P
6-10 years	2.52	.84	23	P
11-15 years	2.81	.82	19	P
15 years and above	2.82	.86	28	P
Average	2.66	.85	105	P

Table 1 shows that biology teachers whose years of experience is 15years and above have a mean score of 2.82 and standard deviation of .86 respectively. This was followed by biology teachers with 11 – 15years (mean = 2.81 and SD = .82), 6 -

10years (mean = 2.52 and SD = 0.84) and 1 -5years (mean = 2.50 and SD = .89) respectively based on their application of management of instruction in teaching. The standard deviations were all low indicating no much variability.

Research Question 2: What is the mean rating score of biology teachers with different years of experience on maintenance of conducive learning environment in teaching in Enugu State?

Table 2: Mean and standard deviation classroom management scores of biology teachers based on years of experience

Years of experience	Mean	Std. Deviation	N	Dec
1-5 years	2.67	.91	35	P
6-10 years	2.87	.89	23	P
11-15 years	3.62	.91	19	P
15 years and above	3.44	.99	28	P
Average	3.15	.93	105	P

Table 2 shows that biology teachers whose years of experience is 11-15years have a mean score of 3.62 and standard deviation of .91 respectively. This was followed by biology teachers with 15years and above teaching experience (mean = 3.44 and SD

= .99), 6 -10years (mean = 2.87 and SD = 0.89) and 1 -5years (mean = 2.67 and SD = .91) respectively based on their application of maintaining conducive learning environment while teaching. The standard deviations were all low indicating no much variability.

H₀₁: There is no significant difference in the mean rating scores of biology teachers with different years of experience on management of instruction in teaching.

Table 3: One-Way ANOVA of the Mean Rating Scores of Biology Teachers by Years of Experience on Management of Instruction

Source of Variation	SS	df	MS	F	Sig. Decision
Between Groups	18.470	3	6.156	6.670	0.002 S
Within Groups	85.012	101	0.518		
Total	103.482	104			

The ANOVA table was calculated to show the mean rating scores of biology teachers in management of instructions. The result showed that

$F(3, 101) = 6.670$ $p = 0.002$. Since the significance level of 0.002 is less than 0.05 set for the study,

the null hypothesis was rejected because it was significant.

H₀₄: There is no significant difference in the mean rating scores of biology teachers with different years of experience on maintaining conducive learning environment while teaching.

Table 4: One-Way ANOVA of the Mean Rating Scores of Biology Teachers by Years of Experience on Maintaining Conducive Learning Environment while Teaching

Source of Variation	SS	Df	MS	F	Sig.	Decision
Between Groups	16.054	3	5.351	6.216	0.001	Significant
Within Groups	86.950	101	0.861			
Total	103.004	104				

The ANOVA table was calculated to show the mean rating scores of biology teachers in maintaining conducive learning environment. The result showed that $F(3, 101) = 6.216$, $p = .001$. Since the significance value of .001 was less than .05, the null hypothesis was rejected since it was significant.

Discussion

The findings of the study showed that Biology teachers' management of instruction in teaching was significant. This finding is in agreement with the results of Ochomma et al (2018), which revealed that managers job performance is significantly influenced by years of experience. Ochomma et al concluded that designing appropriate work experience to enhance managers job performance like improving length of experience in certain skills and management functions in desired areas and department would be a good step in the right direction. This statement demonstrates that biology teachers with high level of experience are in position to deliver and organize the lessons effectively with good methods, proper instrument and materials, manage time well, communicate adequately and give students sustainable guidance, support and direction. Also, Slideshare (2018) had supportive statements to the findings of this study by stating that for teachers to manage the instructions appropriately, they must have sound knowledge of students behaviour, their pattern of learning, their interest, background, age, needs and ability so as to achieve smooth and effective delivery and only highly experienced teachers can possess the aforementioned qualities.

Influence of years of teaching experience on the maintenance of conducive learning environment among secondary school Biology teachers

The findings of the study showed that Biology teachers' maintenance of classroom conducive learning environment was significant. The findings agreed with Masoom (2021), who found that more experienced teachers had more positive perceptions of a conducive school environment. The findings are also consistent with Wu, The and Lai (2022), who examined teaching experience in relation to classroom management and reported that experience was relevant to teachers' classroom-management practices. These findings suggest that teachers may develop practical knowledge and classroom-management skills through repeated exposure to different classroom situations over the course of their careers. Therefore, the significant influence observed in the present study indicates that teaching experience may contribute to Biology teachers' ability to establish and sustain a learning environment that supports effective teaching and learning.

Conclusion

The findings showed that Biology teachers of different years of experience demonstrated different levels of management of instruction as well as maintenance of conducive learning environment in teaching. The ANOVA result indicated that years of experience significantly influenced both management of instruction in teaching and maintenance of a conducive learning environment. Conclusively, this study has actually revealed that teachers can attain perfection in their job through constant practice as years advance.

Recommendations

Based on the findings, the following recommendations were proffered:

1. Biology teachers with fewer years of experience should adopt the highly experienced ones as their role models and strive for their mentorship so as to acquire more skills in managing instructions and maintaining a conducive learning environment.
2. State Government should provide enough infrastructures like well-equipped science laboratories, modern classroom structures, in schools to equip both experienced and less experienced biology teachers so that they will have enabling environment for effective delivery of instructions.
3. School Supervisors should visit schools frequently to detect the inadequacies hindering the effective teaching and learning in schools and report to the appropriate authorities or make immediate corrections if need be.
4. Biology teachers should be encouraged to embark on excursions or field trips especially when environmental related topics are involved. Such will indicate high sense of management of instruction.
5. Ministry of education and School administrators should organise workshops as well as seminars, outreach and other inspiring educational programmes for Biology teachers across all experience levels to promote effective teaching practices.

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