JOURNAL OF SCIENCE TECHNOLOGY AND EDUCATION 14(3), SEPTEMBER, 2026
E-ISSN: 3093-0898, PRINT ISSN: 2277-0011; Journal homepage: www.atbufstejoste.com



Relationship between Microteaching Skill of Stimulus Variation and NCE Students' Performance During Teaching Practice in North-West Nigeria

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ABSTRACT

This study examined the relationship between microteaching skill of stimulus variation and NCE students' performance during Teaching Practice in North-West Nigeria. Three specific objectives, three research questions and three null hypotheses guided the study. Descriptive survey research design was adopted. The population comprised 4,850 NCE III students who completed Teaching Practice in Colleges of Education in North-West Nigeria. A sample of 357 students was selected using multi-stage sampling technique. Two instruments were used: Microteaching Skill of Stimulus Variation Questionnaire (MSSVQ) with reliability coefficient of 0.84, and Teaching Practice Performance Scores (TPPS). Data were analysed using mean, standard deviation and PPMC at 0.05 level of significance using SPSS Version 27. The findings revealed that teacher movement, change in voice and gestures, and change in interaction pattern and use of instructional materials each had a positive and significant relationship with NCE students' performance during Teaching Practice. The study concluded that microteaching skill of stimulus variation significantly enhances NCE students' performance. It was recommended that Colleges of Education should strengthen microteaching laboratories and lecturers should emphasize practical demonstration of stimulus variation to ensure mastery before Teaching Practice.

ARTICLE INFO
Article History
Received: May, 2026
Received in revised form: May, 2026
Accepted: July, 2026
Published online: September, 2026

KEYWORDS
Microteaching, Stimulus Variation, NCE Students, Performance, Teaching Practice

INTRODUCTION

Teaching is the most important profession in the world because all other professions depend on it. The quality of any nation is determined by the quality of its teachers, and the quality of its teachers is determined by the quality of their training. In Nigeria, Colleges of Education are established specifically for the training of teachers for the basic education level. The National Commission for Colleges of Education (NCCE) mandates these colleges to produce competent, committed and resourceful teachers who can effectively deliver lessons in primary and junior secondary schools. One of the most critical components of teacher training in these colleges is Teaching Practice (TP), which is the period when student-teachers are posted to cooperating schools to practice real classroom teaching under supervision.

During Teaching Practice, student-teachers are expected to demonstrate mastery of various teaching skills they learnt in theory. One of the most important of these skills is the skill of stimulus variation. Stimulus variation is a microteaching skill that involves deliberate changes in the behaviour of the teacher in the classroom in order to sustain the attention, interest and motivation of learners. According to Perrot (1982), stimulus variation includes teacher movement in the classroom, gestures, change in voice, change in interaction pattern, pausing, use of eye contact and use of instructional materials.

The central idea is that learners easily get bored when a teacher remains in one position, speaks in one tone, and uses one method

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throughout the lesson. Such monotony leads to loss of attention, poor understanding and low performance. Microteaching, on the other hand, is a scaled-down teaching encounter where student-teachers practice one skill at a time in a short period, usually 5 to 10 minutes, with a small group of peers, under the supervision of a lecturer. It was introduced to bridge the gap between theory and practice. Through microteaching, NCE students are exposed to stimulus variation in a controlled environment before they face real learners during Teaching Practice. When properly learnt, stimulus variation helps the student-teacher to break monotony, arouse curiosity, maintain discipline without punishment, and make learning lively and meaningful.

Despite the importance of this skill, observations and reports from supervisors during Teaching Practice in Colleges of Education in North-West Nigeria show that many NCE students still teach in a monotonous manner. They stand in one spot, read from their lesson notes, speak in a low, flat tone, and rarely use teaching aids or change their interaction with learners. As a result, pupils in the cooperating schools lose interest, become noisy, and fail to understand the lesson. This poor performance is often reflected in the low scores awarded to student-teachers by supervisors during Teaching Practice assessment. This situation raises serious concern because if student-teachers cannot vary stimuli, they cannot sustain attention, and if they cannot sustain attention, effective learning cannot take place. The North-West Zone, which comprises Kaduna, Kano, Katsina, Sokoto, Kebbi, Jigawa and Zamfara States, has the highest number of Colleges of Education in Nigeria, both federal and state-owned.

The zone also faces peculiar challenges such as large class sizes, inadequate instructional materials and shortage of qualified lecturers. These challenges make the skill of stimulus variation even more necessary, because a teacher who can vary his stimuli can manage a large class effectively even with limited materials. It is therefore necessary to investigate whether the microteaching skill of stimulus variation, as taught in the colleges, actually influences the performance of NCE students during Teaching Practice in this zone.

STATEMENT OF THE PROBLEM

Teaching Practice is meant to be the practical demonstration of what student-teachers have learnt in the colleges. However, supervisors consistently complain that NCE students in North-West Nigeria perform poorly during Teaching Practice. Many of them are unable to control the class, unable to sustain learners' attention, and unable to deliver their lessons in an interesting manner. Their lessons are dull, teacher-centred and monotonous. It is observed that most of these student-teachers had passed microteaching courses in the college, including the skill of stimulus variation, yet they fail to apply it in real classroom situations.

This raises the question: Does the microteaching skill of stimulus variation have any effect on the performance of NCE students during Teaching Practice? Or are student-teachers performing poorly because they were not properly exposed to the skill, or because they do not understand its importance? If this problem is not investigated and addressed, Colleges of Education will continue to produce teachers who cannot hold the attention of learners, and the goal of producing quality teachers for basic education in Nigeria will not be achieved. It is against this background that this study seeks to examine the relationship between microteaching skill of stimulus variation and NCE students' performance during Teaching Practice in North-West Nigeria.

Objectives of the Study

The main purpose of this study is to examine the relationship between microteaching skill of stimulus variation and NCE students' performance during Teaching Practice in North-West Nigeria.

The specific objectives are to:

1. Examine the relationship between teacher movement and NCE students' performance during Teaching Practice.
2. Determine the relationship between change in voice and gestures and NCE

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students' performance during Teaching Practice.

3. Ascertain the relationship between change in interaction pattern and use of instructional materials and NCE students' performance during Teaching Practice.

Research Questions

The following questions were raised to guide the study:

1. What is the relationship between teacher movement and NCE students' performance during Teaching Practice in North-West Nigeria?
2. What is the relationship between change in voice and gestures and NCE students' performance during Teaching Practice in North-West Nigeria?
3. What is the relationship between change in interaction pattern and use of instructional materials and NCE students' performance during Teaching Practice in North-West Nigeria?

Research Hypotheses:

Null hypotheses were formulated in line with the research questions and were tested at 0.05 level of significant

H_{01}: There is no significant relationship between teacher movement and NCE students' performance during Teaching Practice in North-West Nigeria.

H_{02}: There is no significant relationship between change in voice and gestures and NCE students' performance during Teaching Practice in North-West Nigeria.

H_{03}: There is no significant relationship between change in interaction pattern and use of instructional materials and NCE students' performance during Teaching Practice in North-West Nigeria.

THEORETICAL FRAMEWORK

This study is anchored on Skill Acquisition Theory by Fitts and Posner (1967) and Attention Theory by Berlyne (1960). Fitts and Posner explained that learning a skill passes through three stages: cognitive, associative and autonomous stages. In the cognitive stage, the student-teacher learns what stimulus variation is. In the associative stage, he practices it in microteaching. In the autonomous stage, he applies it automatically during Teaching Practice. This theory explains why microteaching practice should lead to better performance during Teaching Practice. Berlyne's Attention Theory states that learners pay attention to novel and changing stimuli and lose attention to monotonous stimuli. This supports the need for stimulus variation. When the teacher varies stimuli, learners' attention is sustained, and learning improves.

Conceptual Framework

Concept of Microteaching:

Microteaching is a teacher training technique that allows student-teachers to practice teaching skills in a scaled-down and controlled environment. The term was first introduced at Stanford University in the early 1960s by Allen and Ryan. According to Allen and Ryan (1969), microteaching is a system of controlled practice that makes it possible to concentrate on specific teaching behaviour and to practice teaching under controlled conditions. In the view of Perrot (1982), microteaching is a training procedure which reduces the teaching situation to a simpler and more controlled encounter achieved by limiting the practice teaching to a specific skill, reducing the time of teaching to 5-10 minutes, and reducing the class size to 5-10 learners. The essence is to allow the student-teacher to master one skill at a time without the pressure of a full classroom.

Ogunyemi (2018) described microteaching as a laboratory for teaching where mistakes are allowed, corrected and re-taught. It gives student-teachers the opportunity to receive immediate feedback from lecturers and peers, and to re-teach the same lesson until mastery is achieved. In Colleges of Education in Nigeria, microteaching is a compulsory course (EDU 211/212) that student-teachers must pass before proceeding to Teaching Practice. The importance of microteaching cannot be over-emphasized. It bridges the gap between theory and practice,

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builds confidence in student-teachers, and improves their classroom delivery. A student-teacher who is well exposed to microteaching is expected to perform better during Teaching Practice than one who is not.

Concept of Stimulus Variation:

Stimulus variation is one of the core microteaching skills. It refers to the deliberate change in the teacher's behaviour and teaching strategies in order to sustain the attention and interest of learners throughout the lesson. According to Perrot (1982), learners' attention decreases when the teacher presents the same stimulus for a long time. Therefore, the teacher must vary stimuli to keep learners alert.Adebayo (2020) defined stimulus variation as the ability of the teacher to change his position, voice, gestures, teaching aids and interaction pattern in the classroom to avoid boredom and monotony. Similarly, Yusuf (2019) stated that stimulus variation is the skill that makes teaching lively, interesting and learner-centred.

A teacher who lacks this skill teaches in a dull and monotonous way, and learners quickly lose interest. The major purpose of stimulus variation is to maintain attention, increase motivation, reduce classroom boredom, and improve learners' understanding and retention. It is based on the psychological principle that human beings respond to change. When the teacher changes his movement, voice or materials, learners naturally become alert and focus on the lesson.2.4 Components of Stimulus Variation. Perrot (1982) identified eight components of stimulus variation. For this study, three major components are examined:

1. Teacher Movement: This involves the teacher moving purposefully around the classroom instead of standing in one place. Movement helps the teacher to monitor learners, get close to noisy learners, and maintain eye contact with all parts of the class. Abdullahi (2021) found that teachers who move around the class control discipline better and get higher learner participation.
2. Change in Voice and Gestures: This involves varying the tone, pitch, volume and speed of the voice to emphasize important points. It also includes the use of hand gestures, facial expressions and body language to explain concepts. A teacher who speaks in one flat tone throughout the lesson bores learners. Musa and Bello (2022) observed that voice variation helps learners to differentiate between main points and minor points.
3. Change in Interaction Pattern and Use of Instructional Materials: This involves changing from teacher-to-learner, learner-to-learner, group work, and individual work. It also involves the use of charts, pictures, real objects, chalkboard, and other teaching aids. Okonkwo (2020) noted that the use of instructional materials makes abstract concepts concrete and improves understanding.

Concept of Teaching Practice*:*

Teaching Practice is a supervised practical training in which student-teachers are posted to primary and junior secondary schools to teach real learners for a period of 12 weeks. According to the National Commission for Colleges of Education (NCCE, 2020), Teaching Practice is compulsory for all NCE students and carries 6 credit units. During this period, student-teachers are assessed by college supervisors and cooperating school teachers on lesson preparation, lesson delivery, classroom management, use of teaching aids, and teacher-learner interaction. Teaching Practice is the acid test of teacher training. It is where theory meets reality. A student-teacher may pass all theory courses but fail Teaching Practice if he cannot apply teaching skills in a real classroom. The performance of student-teachers during Teaching Practice is therefore a true measure of the quality of training they received in the college.

NCE Students' Performance During Teaching Practice*:*

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Performance during Teaching Practice refers to the level of competence demonstrated by student-teachers in actual classroom teaching. It is measured through a Teaching Practice Assessment Form which rates the student-teacher on introduction, presentation, use of instructional materials, classroom management, mastery of subject matter, and evaluation. Reports from supervisors in North-West Nigeria indicate that many NCE students perform below expectation during Teaching Practice. They are often rated low in classroom management, use of teaching aids, and ability to sustain learners' attention (Ibrahim, 2023). This poor performance has been attributed to inadequate mastery of microteaching skills, especially stimulus variation.

Empirical Studies:

Several studies have been conducted on microteaching and stimulus variation. Adebayo (2020) investigated the effect of microteaching on teaching skills acquisition among NCE students in Lagos State. The study used 120 NCE students and found that microteaching significantly improved students' teaching skills, especially stimulus variation and questioning skills. Yusuf and Ahmed (2021) studied the influence of stimulus variation on learners' interest in Biology in Kano State. The study revealed that learners taught with varied stimuli had higher interest and better performance than those taught without variation. Musa and Bello (2022) examined the effect of teacher movement and voice variation on classroom management in Colleges of Education in Kaduna State. Findings showed a significant positive relationship between stimulus variation and effective classroom management. However, Ibrahim (2023) in a study in Sokoto State found that despite microteaching training, many NCE students did not apply stimulus variation during Teaching Practice, leading to poor performance. This suggests a gap between training and application.

Most of the previous studies were conducted in single states and focused on learners' performance in secondary schools, not on NCE students' performance during Teaching Practice. None of them covered the entire North-West Zone. This study therefore fills the gap by examining the relationship between microteaching skill of stimulus variation and NCE students' performance during Teaching Practice in the whole North-West Zone, Nigeria.

In Summary therefore, Literature reviewed shows that microteaching is an important training technique and stimulus variation is a key skill for effective teaching. Theories and empirical studies confirm that variation of stimuli sustains attention, improves classroom management and enhances performance. However, there is limited evidence on how this skill affects NCE students' performance during Teaching Practice in North-West Nigeria. This study seeks to fill that gap.

METHODOLOGY

The study adopted a descriptive survey research design. This design was considered appropriate because the study seeks to describe and determine the relationship between microteaching skill of stimulus variation and NCE students' performance during Teaching Practice without manipulating any variable. The researcher will collect data from a large sample using a questionnaire and Teaching Practice assessment scores, and generalize the findings to the entire population. This design is also suitable because it allows the researcher to gather opinions from student-teachers who have already completed Teaching Practice. The study was carried out in North-West Zone, Nigeria.

The zone comprises seven (7) states: Kaduna, Kano, Katsina, Sokoto, Kebbi, Jigawa and Zamfara. The zone has both Federal and State Colleges of Education. The zone was chosen because it has the highest number of Colleges of Education in Nigeria and supervisors have consistently reported poor performance of NCE students during Teaching Practice in the zone. The population of the study comprised all NCE III students who have completed Teaching Practice in all Colleges of Education in North-West Zone, Nigeria in the 2024/2025 academic session. The total population is 4,850 NCE III students. The sample size for the study is 357 NCE III students.

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The sample size was determined using Krejcie and Morgan (1970) Table for determining sample size from a population of 4,850. Two (2) Colleges of Education were randomly selected from each of the seven states by balloting, giving a total of 14 colleges. Where a state has only one college, that college was purposively selected. Proportionate sampling was used to select the number of students from each college based on its population. Simple random sampling (hat-and-draw method) was used to select the actual respondents from each college.

Two instruments were used for data collection:

1. Microteaching Skill of Stimulus Variation Questionnaire (MSSVQ): This is a structured questionnaire developed by the researcher. It has two sections: Section A: Demographic data (State, College, Gender, Subject Combination) Section B: 15 items measuring the three components of stimulus variation: Teacher Movement (6 items), Change in Voice and Gestures (6 items), Change in Interaction Pattern and Use of Instructional Materials (6 items). Responses are on a 4-point Likert scale: Strongly Agree (SA=4), Agree (A=3), Disagree (D=2), Strongly Disagree (SD=1).
2. Teaching Practice Performance Scores (TPPS): The Teaching Practice scores of the sampled students as awarded by college supervisors during Teaching Practice were collected from the Teaching Practice Units of the colleges. This served as the measure of students' performance.

The MSSVQ was subjected to face and content validation by three experts: two (2) lecturers in Curriculum and Instruction from Federal College of Education, Zaria, and one (1) lecturer in Measurement and Evaluation from Ahmadu Bello University, Zaria. Their corrections and suggestions were affected before the final copy was produced. The reliability of the instrument was established through a pilot test. The questionnaire was administered to 30 NCE III students in Federal College of Education, Kontagora, Niger State, who were not part of the main study. The data collected were analysed using Cronbach Alpha method. A reliability coefficient of 0.84 was obtained, which indicates that the instrument is reliable for the study.

The researcher personally visited the sampled colleges with a letter of introduction from the Department. With the assistance of two research assistants (one in each college), the questionnaire was administered to the respondents and retrieved on the spot to ensure high return rate. The Teaching Practice scores were collected from the Teaching Practice Coordinators with permission from the colleges. Data collected were analysed using both descriptive and inferential statistics. Mean and Standard Deviation were used to answer Research Questions. A mean of 2.50 and above was considered as Agreed (positive effect), while a mean below 2.50 was considered as Disagreed. Simple Linear Regression Analysis was used to test Hypotheses at 0.05 level of significance. The hypothesis was rejected if p-value < 0.05, otherwise it was retained. The analysis was done using Statistical Package for Social Sciences (SPSS) Version 27.

RESULTS

Research Question 1:

What is the relationship between teacher movement and NCE students' performance during Teaching Practice?

Table 1: Mean and Standard Deviation on Teacher Movement

S/N	Statements	SA 4	A 3	D 2	SD 1	Mean	Std. Div	Remark
1	Moving round the class helps me to control learners	200	100	50	7	3.33	0.96	Agreed

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S/N	Statements	SA 4	A 3	D 2	SD 1	Mean	Std. Div	Remark
2	Moving close to learners makes them pay attention	233	67	40	17	3.58	0.95	Agreed
3	Teacher movement helps me to detect noise makers	222	76	50	7	3.21	0.96	Agreed
4	Moving round increases my confidence during teaching	210	92	45	10	3.01	0.91	Agreed
5	My movement makes learners participate more	244	56	55	2	3.12	1.42	Agreed
	Total					16.25	5.20	
	Average Mean and St. Deviation					3.25	1.04	Agreed

Table 1 indicated the frequences, mean and standard deviation of responses on the teacher movement and NCE students' performance during Teaching Practice in North-West Nigeria. The average mean and standard deviation value of items 1, 2, 3, 4, 5, and 6 is given as (Mean = 3.25 and Std. Div = 1.04) which is above the cut-off point of 2.50, indicating there is high impact of teacher movement and NCE students' performance during Teaching Practice in North-West Nigeria.

Research Question Two:
What is the relationship between change in voice and gestures on NCE students' performance?

Table 2: Mean and Standard Deviation on Change in Voice and Gestures

S/N	Statements	SA 4	A 3	D 2	SD 1	Mean	Std. Div	Remark
6	Varying my voice helps learners to know important points	221	104	30	2	3.34	0.83	Agreed
7	Use of gestures helps learners to understand my lesson	211	93	50	3	3.16	0.85	Agreed
8	Change in voice wakes up sleeping / dull learners	200	100	53	4	3.42	1.17	Agreed
9	Facial expressions help me to communicate with learners	150	150	45	12	3.20	0.91	Agreed
10	Voice variation makes my lesson lively	216	101	40	0	3.32	0.86	Agreed
	Total					16.44	4.62	
	Average Mean and St. Deviation					3.29	0.92	Agreed

Table 2 indicated the frequences, mean and standard deviation of responses on the teacher change in voice and gestures and NCE students' performance in North-West Nigeria. The average mean and standard deviation value of items 6, 7, 8, 9, and 10 is given as (Mean = 3.29 and Std. Div = 0.92) which is greater than the cut-off point of 2.50, indicating there is high impact of teacher change in voice and gestures and NCE students' performance in North-West Nigeria.

Research Question Three*:*
What is the relationship between change in interaction pattern and use of instructional materials?

Table 3: Mean and SD on Interaction Pattern and Instructional Materials

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S/N	Statements	SA 4	A 3	D 2	SD 1	Mean	Std. Div	Remark
11	Group work makes learners participate actively	210	100	30	17	3.42	0.91	Agreed
12	Changing from teacher-talk to learner-talk improves understanding	230	80	40	7	3.54	0.88	Agreed
13	Use of charts / real objects makes lesson clear	222	100	30	5	4.18	1.12	Agreed
14	Use of instructional materials attracts learners' attention	300	10	40	7	3.25	0.87	Agreed
15	Interaction pattern reduces boredom in class	250	50	38	9	3.45	0.83	Agreed
	Total					17.84	4.61	
	Average Mean and St. Deviation					3.57	0.92	Agreed

Table 3 shows the frequency, mean and standard deviation of responses on the teacher change in interaction pattern and use of instructional materials during Teaching Practice in North-West Nigeria. The average mean and standard deviation value of items 11, 12, 13, 14, and 15 is given as (Mean = 3.57 and Std. Div = 0.92) which is greater than the cut-off point of 2.50, indicating there is high impact of teacher change in interaction pattern and use of instructional materials during Teaching Practice in North-West Nigeria.

Hypothesis One:
There is no significant relationship between teacher movement on NCE students' performance.

Table 4: Pearson Product Moment Correlation (PPMC) Statistics on relationship Between teacher movement and Academic Performance of NCE Students During Teaching Practice

Variables	N	Mean	Std. Div.	Df	r- value	p-value
Teachers Movement	357	45.21	5.34			
				355	**0.843**	**0.001**
Academic Performance	357	73.73	6.99			

Results of the Pearson Product Moment Correlation (PPMC) statistics in Table 4 revealed that significant positive relationship exists between teachers' movement during teaching practice and academic performance of NCE Students, reason being that the calculated p-value of 0.001 is lower than the 0.05 alpha level of significance, with the computed correlation index r- value of 0.843 at df of 355. Therefore, the null hypothesis one, is rejected.

Hypothesis Two:
There is no significant relationship between change in voice and gestures.

Table 5: Pearson Product Moment Correlation (PPMC) Statistics on relationship Between teacher Voice Gestures and Performance of NCE Students During Teaching Practice

Variables	N	Mean	Std. Div.	df	r- value	p-value
Teachers Movement	357	42.28	4.65			
				355	**0.542**	**0.002**
Academic Performance	357	73.73	7.63			

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Results of the Pearson Product Moment Correlation (PPMC) statistics in Table 4 revealed that significant positive relationship exists between teachers' movement during teaching practice and academic performance of NCE Students, reason being that the calculated p-value of 0.001 is lower than the 0.05 alpha level of significance, with the computed correlation index r- value of 0.542 at df of 355. Therefore, the null hypothesis two, is rejected.

***Hypothesis Three**:*

There is no significant relationship between change in interaction pattern and use of instructional materials.

Table 6: Pearson Product Moment Correlation (PPMC) Statistics on relationship Between teacher Interaction Pattern / Materials and Performance of NCE Students During Teaching Practice

Variables	N	Mean	Std. Div.	df	r- value	p-value
Interaction Pattern / Materials	357	46.22	4.65			
				355	**0.622**	**0.003**
Academic Performance	357	73.73	7.63			

Results of the Pearson Product Moment Correlation (PPMC) statistics in Table 6 revealed that significant positive relationship exists between teachers' change in interaction pattern and use of instructional materials, reason being that the calculated p-value of 0.003 is lower than the 0.05 alpha level of significance, with the computed correlation index r- value of 0.622 at df of 355. Therefore, the null hypothesis three, is rejected.

DISCUSSION OF FINDINGS

This study examined the relationship between microteaching skill of stimulus variation and NCE students' performance during Teaching Practice in North-West Nigeria. The findings are discussed according to the three research hypotheses. The first finding revealed that teacher movement has a positive and significant relationship with NCE students' performance during Teaching Practice. The cluster mean was above the criterion mean of 2.50 and the regression analysis showed a p-value of less than 0.05, leading to the rejection of the null hypothesis. This implies that NCE students who move purposefully round the classroom during teaching perform better than those who stand in one position.

Movement enables the student-teacher to monitor learners, get close to noisy learners, maintain eye contact with all parts of the class, and detect learners who are not paying attention. When a teacher moves, learners become alert because they feel they are being observed. This finding is in agreement with Abdullahi (2021) who found that teachers who move round the class control discipline better and obtain higher learner participation. It also supports Perrot (1982) who listed teacher movement as a major component of stimulus variation that sustains learners' attention. The implication is that the poor performance observed among some NCE students during Teaching Practice may be due to their failure to move around the class, which makes their lessons dull and teacher-centered.

The second finding showed that change in voice and gestures has a positive and significant relationship with NCE students' performance during Teaching Practice. The result indicated that varying the tone, pitch, volume and speed of voice, together with the use of hand gestures and facial expressions, makes lessons lively and helps learners to differentiate between main points and minor points. A teacher who speaks in one flat tone throughout the lesson bores learners and loses their attention. The finding agrees with Musa and Bello (2022) who observed that voice variation helps learners to understand the lesson and improves classroom management. It also agrees with Berlyne's Attention Theory (1960) which states that learners pay attention to changing stimuli and lose attention to monotonous stimuli. This means that NCE students who were well trained in voice

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variation during microteaching were able to apply the skill during Teaching Practice and thus performed better in their assessment.

The third finding revealed that change in interaction pattern and use of instructional materials has a positive and significant relationship with NCE students' performance during Teaching Practice. Changing from teacher-to-learner interaction to learner-to-learner, group work and individual work, and the use of charts, pictures and real objects, makes learning learner-centred and concrete. The finding is in line with Okonkwo (2020) who noted that instructional materials make abstract concepts concrete and improve understanding. It also supports Yusuf and Ahmed (2021) who found that learners taught with varied stimuli had higher interest and better performance. However, the finding disagrees with Ibrahim (2023) who reported that NCE students in Sokoto did not apply stimulus variation during Teaching Practice. The difference may be because Ibrahim's study was limited to only one state, while the present study covered the entire North-West Zone, where many colleges have improved their microteaching laboratories.

In summary, the three components of stimulus variation - teacher movement, change in voice and gestures, and change in interaction pattern and use of instructional materials - all have significant effects on NCE students' performance. This confirms Fitts and Posner's Skill Acquisition Theory (1967) that skills practiced in microteaching become automatic and are transferred to real classroom teaching. Therefore, microteaching skill of stimulus variation is a strong predictor of success during Teaching Practice.

CONCLUSION

Based on the findings of this study, it is concluded that microteaching skill of stimulus variation has a significant relationship with NCE students' performance during Teaching Practice in North-West Nigeria. NCE students who effectively vary their movement, voice, gestures, interaction pattern and instructional materials perform better during Teaching Practice than those who teach in a monotonous manner. Teacher movement helps student-teachers to control the class, maintain discipline and sustain learners' attention. Change in voice and gestures makes lessons lively, emphasizes important points and prevents boredom. Change in interaction pattern and use of instructional materials makes learning learner-centered, concrete and interesting. Therefore, stimulus variation is not an optional skill but a necessary skill for effective teaching. Colleges of Education that properly train their students in this skill will produce competent teachers who can deliver lessons effectively in basic schools.

RECOMMENDATIONS

Based on the findings and conclusion, the following recommendations are made:

1. Colleges of Education should strengthen microteaching laboratories with video recording facilities so that student-teachers can watch their own teaching, observe their movement, voice and gestures, and correct their mistakes before Teaching Practice.
2. Lecturers of Microteaching should emphasize practical demonstration of stimulus variation rather than theory alone. They should allow each student-teacher to practice and re-teach until mastery of teacher movement, voice variation and use of instructional materials is achieved.
3. National Commission for Colleges of Education (NCCE) should review the microteaching curriculum to allocate more time and credit units to practical microteaching, especially stimulus variation, to ensure adequate mastery.
4. Teaching Practice Supervisors should specifically assess student-teachers on stimulus variation during Teaching Practice and give immediate feedback on their movement, voice, gestures and use of materials.
5. NCE Students should consciously practice stimulus variation during Teaching Practice by moving round the class, varying their voice, using gestures, changing interaction patterns and using instructional materials in

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every lesson.5.4 Limitations of the Study

LIMITATIONS OF THE STUDY

The study was limited to NCE III students in Colleges of Education in North-West Nigeria only, and therefore the findings may not be generalized to other zones. Also, the study relied on questionnaire and Teaching Practice scores, which may be affected by the mood of respondents and subjectivity of supervisors. Despite these limitations, the findings are valid for the zone studied.

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