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## LEARNING TEACHING SKILLS THROUGH MICRO-TEACHING IN TEACHER TRAINING FOR CHEMISTRY TEACHING

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### ABSTRACT

Teacher training equips teachers with skills that help them to substantially develop learner knowledge, skills and attitudes that translate to quality education and eventual development of a nation. The professional preparation of teachers requires that the individual being trained as a teacher should gain skills and abilities that are required to teach in a real classroom setting. To improve the acquisition of basic teaching skills, most initial teacher training programs include practice sessions through microteaching. It is notable that in most developing countries, there are serious resource constraints with many institutions lacking basic facilities such as microteaching laboratories, enough personnel for practice and adequate technological support. However, the importance of microteaching in teacher training is highly emphasized in many countries including Kenya. It is therefore important to determine whether microteaching carried out during teacher training is helpful in imparting intended skills. This study seeks to describe the teaching skills that are gained during microteaching, the perception of teacher trainees towards the effectiveness of microteaching in imparting the skills and the practices during microteaching process that assist in skill acquisition. Sixty Chemistry teacher trainees participated in the study. Descriptive research design was used. Questionnaires, microteaching lesson observation guide and focus group discussions were used to collect data from the participants. Over 85% of the student teachers indicated that microteaching helped them develop and practice teaching skills to a great extent. Many teaching skills were observed during the microteaching sessions and the participants were of the opinion that peer collaboration and lesson review were key activities in improving teaching skills. Teacher trainers should focus on improving specific teaching skills through microteaching. Teacher training should allocate more time and resources (detailed guides), in microteaching for quality teacher preparation.

**Key words:** Microteaching, Teaching skills, Teacher training, Microteaching skills

### INTRODUCTION

The quality of education highly depends on the quality of teaching provided to the young generation. Teaching is a demanding task that requires well trained teachers. The professional preparation of teachers therefore involves formal coursework and practice in teaching. Basic practice in classroom teaching starts with a teacher training program where teaching is done within a simulated setting where individual teacher trainees teach a small group of peers for a short duration of time and then reflects on their teaching afterwards (Reddy, 2019). This practice is commonly referred to as Microteaching. The small group of peers take the role of learners during the teaching process after which each of the students provide peer evaluation of the lesson taught and provide suggestions for the improvement of the lesson. The key foundation of microteaching protocol is the ability to practice teaching and provide immediate, focused feedback and encouragement, combined with the opportunity to practice the suggested improvements in the same training session (Allen, 1969).

Microteaching is regarded as a key feature of teacher training program in many countries. It is considered as an indispensable technique for learning teaching skills as well as a professional developmental tool. It is an efficient technique in learning effective teaching techniques and developing competence in teaching skills (Ramesh, 2013; Reddy, 2019). Teaching is generally a complex task that involves many skills and its effectiveness may only be achieved through proper training, experience and competence. Microteaching, which is the first experience in teaching should be simplified and properly organized to allow trainee teachers to gain a variety of experiences and competencies from the practice (Koross, 2016). According to Reddy (2019), microteaching helps teachers in understanding the processes of teaching and learning and provides the opportunity to learn teaching. The teacher trainee is able to practice the transfer of theories learnt into practice within a relatively simple, controlled environment that provides a feeling of safety and confidence (Godek, 2016; Banga, 2014). Microteaching helps teachers learn and practice techniques for active learner involvement, communication (both verbal and non-verbal), class control, as well as design and use of teaching resources in the classroom. It also helps to expose the student teachers to best practice through collaboration and observation. (Ijioma et al, 2014). It has been forwarded that micro-teaching does not only contribute to teaching skills but also improves attitudes towards the profession (Atav et al., 2014).

Various studies have described the importance of microteaching in integrating theory into practice, learning and gaining experience in teaching skills, provision of repeated practice, as well as provision of expert supervision and a constructive feedback (Reddy, 2019; Bakır, 2014; Ijioma et al, 2014; Ramesh, 2013; Chuanjun & Chunmei, 2011; Banga, 2014). Other studies have focused on the experiences of teacher trainees during microteaching (Godek, 2016; Sentumbwe, 2018) and attitude and perceptions of teacher trainees regarding microteaching (Koross, 2016; Vandana et al, 2016; Sumeyra, 2015). A study by Gödek (2016) on science teacher trainee's microteaching experiences in Turkey shows that use of microteaching to integrate theory and practice in teacher training is a worthy course. The study however does not focus on the skills gained during the practice. Ijioma et al (2014) studied integrating microteaching theory and practice in concurrent and consecutive teacher education programmes, with focus on benefits and challenges in Nigeria. The study argues that discussion of theories does not provide the critical answers to how best classroom teaching should be carried out. It views microteaching practical as the only experience that brings practical skill experience to teacher training. With this important emphasis, the study recommends that micro teaching laboratories should be established in all the faculties of education. Chuanjun & Chunmei (2011) carried out a study to examine the extent to which microteaching could contribute to teacher trainees' professional development and possible practical constraints that needed to be addressed to maximize its positive effect. It was found that microteaching was useful for pre-service teacher's development.

Koross, (2016) studies the experiences, competencies, and perceptions of 100 pre-service teacher trainees from the Kiswahili language Education program in the school of education, University of Eldoret Kenya. The findings indicate that majority of the teacher trainees have positive attitudes toward microteaching as a training technique and that they acquired a variety of experiences and competencies from microteaching. The study recommended increased use of microteaching sessions and use of modern technologies. Wambua et al (2011) carried out a survey on the perception of micro teaching on 200 undergraduate students taking education course at Kenya Methodist University in Kenya. The study concluded that the students considered the micro-teaching experience as effective in preparing them for the teaching practice and future teaching profession. The study recommended an emphasis on the teaching skills and development of microteaching rooms and infrastructure for ICT integration in micro teaching sessions. These studies however did not focus on the specific skills acquired during microteaching within the limitations of the teaching facilities and application of technology.

Kafu (2011) examined the present status of teacher education as practiced in Kenya and observes that the issue of facilities and resources for preparing school teachers is critical. The status of current materials for preparing school teachers is pathetic. The study argues that they are inadequate, obsolete, dilapidated and unsuitable for producing a competent teacher who can operate in this century. We can therefore not underestimate the challenges experienced in teacher training programs in developing countries and specifically Kenya. Due to the challenges in teacher training, many have raised issues concerning the components and quality of teacher education curriculum, as well as the effectiveness of the microteaching sessions in equipping teacher trainees to become skilled teachers (Reddy, 2019; Vandana et al, 2016), while others question professionalism of teaching as practiced in Kenya (Kafu, 2011).

In respect to these arguments, teacher training should be guided to transmit the best of skills through microteaching regardless of the challenges faced by the training facilities. This study seeks to establish and guide on the microteaching aspect of teacher training that is adversely affected by these limitations. The concept of microteaching technique in teacher training is to help the teacher trainee to master the teaching skills. Most of the studies however did not focus on efficiently describing the efficacy of specific microteaching skills especially in the Chemistry teacher training particularly in Kenya. This study therefore focuses on the aspect of acquisition and practice of teaching skills through microteaching by the Chemistry teacher trainees during their training within the limitations in practice.

### **Background: (i) The Process of Microteaching**

The overall process of microteaching involves three different phases which are; knowledge acquisition (pre-active phase), skill acquisition (inter-action phase), and transfer (post-active phase). Knowledge acquisition phase is the preparatory phase in which the student teacher gets trained on the knowledge, skills and components of teaching through lectures, discussion, illustration, and demonstration of the skill by the experts. In the interactive, skill acquisition phase, the teacher plans a micro-lesson for practicing the demonstrated skills. Skill transfer involves integration of learnt skills in a real classroom situation (Reddy, 2019; Kumar, 2016; Banga, 2014)

The focus of this study is on the microteaching procedure during skill acquisition phase which requires that the skill is defined and demonstrated by the trainer, the learners are then allowed to plan for the lesson, teach /implement the lesson to a small group of peers who act as the learners during the lesson presentation, receive feedback from peers and the supervisor and then re-plan and re-teach the lesson to another group. These steps could be repeated until the learner acquires competency in the specific skill. Micro-teaching is therefore a cyclic process that involves six basic steps (Reddy, 2019; Koross, 2016; Kumar, 2016; Banga, 2014).

These are:

- i. Defining the skill-The trainer defines and explains the particular skill to be practiced. The trainer explains the purpose of the skill as well as teaching behaviours that indicate the skill. Relevant examples may be used to describe the expected skill. A microteaching lesson may focus on a single teaching skill or on several skills.
- ii. Demonstrating the skill-the teacher trainer who should be an expert in the particular area of training should then demonstrate the application of the skill in a simulated setting. Video lessons can be used to demonstrate the expected skill.
- iii. Lesson planning- the trainee then selects the content area and plans for a short lesson (5-10 minutes) that will be used to demonstrate the particular skill discussed. The lesson should focus on a single concept to be taught so that the objectives stated can be achieved. The duration of the lesson should be agreed on between the trainer/supervisor and the trainee teacher. Depending on the supervisor/trainer, the trainee may be required to prepare a written sample of scheme of work as well as the lesson plan. The trainee teacher also plans for resources to use during the presentation of the lesson.
- iv. Lesson presentation-the teacher trainee teaches the lesson to a small group of peers (five to ten). The situation simulates the actual classroom for which the skill is being developed such as a preschool classroom, primary school classroom or the secondary school classroom in Kenya. The peers act as the learners during the teaching period and the presenting individual should be able to handle the class situation confidently and effectively.
- v. Lesson observation- during the presentation, the lesson is observed by the supervisor and the peers who double up as students and peer-evaluators. The lesson could be video recorded for the teacher trainee to be able to observe after the presentation.
- vi. Provision of feedback- after lesson presentation, constructive feedback based on observations made is provided. This may start with viewing of the video recording followed by comments on the teacher's observable behavior and suggestions for improvement. It is important the presenter him/herself gives the first comments first, followed by peers and the supervisor. It is also advisable to first point out the positive points of strength before the areas of weakness. The supervisor's comments should include a recognition of instances of effective use of skill and areas that may need improvement. Since feedback is focused on improving the lesson, it is important for members not to repeat pointing out the area of weakness already mentioned by the presenter or other peers.

After step (vi), re-planning, re-teaching and re-feedback is done to make it a cyclic process. From the feedback provided, the teacher trainee should re-plan the lesson, re-teach the lesson to a different group of peers and get feedback for further improvement. Teaching can be done to the same group of pupils if the topic is changed. This cycle can be repeated until the teacher trainee is able to master the specific teaching skill.

Variations of microteaching protocols have also been adapted, some due to limitations of facilities and trainers. Videotaping of the microteaching lesson is usually very beneficial for the learners to be able to view their own lessons. However, some teacher training institutions in the developing countries lack sufficient facilities for this application (Kafu, 2011). The effectiveness of the microteaching skill may be affected when microteaching process is not adequately followed. Also, a number of skills may be learnt and practiced together. The number of cycles of re-planning, re-teaching and further feedback depends on the resources available as well as time duration set aside for the microteaching process (Reddy, 2019).

### **Development of Teaching Skills During Microteaching**

Teaching as a profession has key basic teaching skills that trainees ought to acquire before being sent out to practice in the actual classroom. The skills may include personal characteristics, interpersonal skills, subject matter skills and teaching skills (Godek, 2016). This study focuses on teaching skills acquired during training. These skills are practiced during microteaching sessions and are in this study referred to as teaching skills or microteaching skills. The term skills refer to the ability to do something well or expertly. Teaching skills therefore include a set of teachers' behaviours that are specially effective in bringing about the desired changes in the learners. Teaching skills are described by Ajilaye (2013), as behaviours and actions that teachers acquire through practice and experiences which are used during classroom teaching in order to make the lessons contents easier for the learners to understand.

Kumar (2016), noted that teaching constitutes a number of verbal and nonverbal teaching acts like questioning, giving information, listening, accepting pupil responses, rewarding, smiling, facial expressions, movements and gestures. Kumar (2016) further noted that microteaching applies to observable, demonstrated and quantifiable skills. Bakir (2014), argues that microteaching has been noted to impact effective lesson teaching in the areas of: lesson introduction, classroom management, lesson conclusion, self-confidence, planning and effective communication. It also helps learners to detect their own deficiencies thus self-improvement. Banga (2014) proposes the development of teaching skills such as lecturing skill, skill of black-board use and the use of questions. Further, the teacher is responsible for planning, implementing, making management decisions in the classroom and evaluating classroom activities (Cooper et al, 2010).

The number of microteaching skills may depend on specific educators: Reddy (2019) identified 11 skills which are; lesson planning, introduction skill (set induction), presentation and explanation skills, skill of stimulus variation, proper use of audio-visual aids, skill of black-board writing, reinforcement, skill of probing questions, silence and nonverbal cues (body language), classroom management, skill of achieving closure. Sentumbwe (2018) identifies lesson planning, communication, content knowledge, use of teaching aids, classroom organization and management. Ajileye (2013), identified; set induction, stimulus variation, planned repetition, reinforcement, non-verbal communication, questioning, closure and evaluation, planning, classroom management, use of instructional materials and use of chalkboard. Kumar (2016) focuses on use of probing questions, explaining clarity illustrating with examples stimulus variation reinforcement classroom management and use of blackboard.

From combining views of various educators and researchers, nine micro-teaching skills were consolidated for the purpose of this study. This study therefore focused the following key skills applicable during teaching that can be practiced in microteaching: i) Lesson planning, ii) Lesson introduction skill (Set induction) iii) skills in Presentation and explanation, iv) use of stimulus variation, v) proper use of teaching aids and vi) black-board writing, vii) use of question/answer technique and reinforcement, viii) classroom management and, ix) proper lesson conclusion. A discussion of what each of these skills entail in a microteaching lesson is provided in the paragraphs that follow.

Planning what to teach, is a decision making leadership aspect of teaching that involves understanding, using and reconstituting curriculum frameworks and standards, interpreting educational objectives as well as constructing and using instructional objectives, it also involves constructing effective use of time and space (Arends, 2012). Planning involves setting out clear, specific, measurable, achievable, relevant statements of expected outcomes that learners will achieve within the specified time duration. It also involves selection of the content that is appropriate, relevant, concise and sufficient for the given duration of time and to achieve the set objectives. It is important to note that lesson planning is a key teaching skill with an influence on overall teaching. This is because the lesson plan serves as a frame of reference and guide for the entire lesson process (Ajileye, 2013). The trainees plan for suitable learning activities and organize knowledge to be learnt appropriately. According to Arends (2012) planning influences what learners learn. It helps the teacher to be sensitive to the needs of the learners and provides direction for instructional processes which leads to a smooth flow of learning in the classroom. Learners practice planning for a short 5-10- minute lesson period and train to expand the experience to larger durations of time such as the usual 40-minute lesson time for a secondary school class period in Kenya. The learners are allowed to plan before the lesson presentation. The observer/trainer may not be available during planning but can check on planning abilities through a careful study of the lesson plan and the scheme of work used during the microteaching lesson.

The skill of lesson introduction and set induction involves capturing learner attention, developing a rapport, focusing the attention on the lesson and understanding learner pre-requisite knowledge, unveiling required background information as well as linking the content to the existing knowledge (Reddy, 2019; Ajileye, 2013). Presentation and explanation skills make the difference between what learners may refer to as an interesting teacher and a “boring” teacher. It encompasses teacher enthusiasm, explanation, narration, giving appropriate illustrations and examples, and encouraging learner participation. The teacher should ensure clarity, continuity, relevance to content using beginning and concluding statements and covering essential points (Kumar, 2016).

Teacher communication skills were considered in this category of skills. In order to increase learners’ understanding and retention of taught content, classroom teaching should be highly characterized by a teacher who is active and explains the content in a simple, relevant and interesting way as well as students who are active listeners and responders (Reddy, 2019; Cooper et al, 2010, Arends, 2012). Stimulus variation is meant to capture and sustain learner attention throughout the lesson. This can be achieved through skillful change in situations such as teaching

style, teaching behaviours or learning activities (Cooper et al, 2010). This can be achieved through use of various teaching aids, proper use of verbal communication such as voice tone variation, modulation of speed and volume and change in speech pattern and emphasis on key points through planned repetition. Non-verbal patterns of reinforcement such as movement in the classroom space, changing interaction patterns, use of gestures and facial expressions can also be used (Reddy, 2019; Kumar, 2016)

Proper use of relevant teaching aids and audio-visual resources is a key skill in teaching. Visual resources should be well written, properly legible, neat, appropriate size to be seen by all members of the class and should facilitate transmission of content ideas designed for the particular class. Innovativeness and its method of use such as displaying increase learner interest and attention in class. The writing board is a key resource in every science classroom and should therefore be appropriately used. The key skills included in writing on the board are use of appropriate size of letters, the legibility, alignment and spacing of lines. The teacher should also train to utilize the writing board space appropriately, use appropriate colour pen or chalk for contrast, write key points on board, stand in an appropriate position for learners to see the board and ensure that eye-contact with the learners is constantly sustained. Question and answer technique is integrated into all methods of teaching. The teacher uses question to acquire feedback on learners' knowledge and understanding, develop a lesson systematically and encourage learners to participate. It may also help the teacher discover scientific misunderstanding of some chemistry concepts. The teacher should therefore practice the art of using open ended structured questions, proving, re-phrasing, refocusing, re-directing, giving cues and using appropriate verbal and non-verbal reinforcement during teaching (Kumar, 2016).

It is essential for the teacher to maintain appropriate and acceptable behavior in class. The teacher should create an orderly learning environment and deal with student behavior appropriately. Arends (2012) argues that classroom management is one of the key challenges beginning teachers face, yet classroom management and instruction are highly interrelated. Practice in class management and control is therefore an indispensable skill during the microteaching lesson. This may be observed in the teacher giving appropriate and adequate instructions, calling learners by name and restricting inappropriate behavior in the classroom. Kumar (2016), explains that the teacher should make norms of classroom behaviour, reinforce attending behaviour, provide clarity of direction, check non-attending behaviour, keep pupils in 'Eye Span' and check inappropriate behaviour immediately. The method of concluding the lesson should ensure to bring relevance to what has been learnt. The lesson conclusion should be able to bring out a summary of key learning points, connect the lesson with the past and show ability of applying the knowledge in future learning. Time management is also key. The lesson should be covered within the stipulated time period (Reddy, 2019). These were the key skills on which the study focused.

### **Theoretical basis**

The study is based on social cognitive theory advanced by Albert Bandura that proponents that knowledge acquisition of an individual is influenced by social interactions and experiences. The theory proposes that the behavior of and individual can be guided by observing a model performing a behavior and the consequences of the behavior (Nabavi, 2012). The theory has often been called a bridge between behaviorist and cognitive learning theories because it encompasses attention, memory, and motivation. It is a development of Skinnerian theory of shaping where the process of microteaching borrows from Skinnerian operant conditioning that means responses that occur are followed by reinforcement. (Kumar, 2016).

### **Statement of the Problem**

The function of microteaching in improving teaching skills cannot be over emphasized. Since classroom teaching involves facilitation of learning by use of various skills, microteaching has been incorporated in the teacher training program in Kenya with an aim of exposing teacher trainees to as many skills of teaching as possible. Microteaching has been seen as a requisite condition of teacher education aimed at providing professional experience and teaching competence to teacher trainees. Even with its importance emphasized, many teacher training institutions especially in the developing countries like Kenya lack some basic facilities such as Microteaching rooms and enough personnel for this practice. Many scholars have questioned the quality of teacher training as well as the effectiveness of microteaching practice. This raises concern as to whether microteaching done during teacher training is effective in ensuring that the trainees acquire basic teaching skills expected of them before going to the actual classroom practice. This study therefore explored the experiences of chemistry teacher trainees with a focus on gathering information on the skills they were able to acquire during microteaching practice that would help them in the profession of teaching.

### **Purpose of the Study**

This study was carried out to explore the experience and skills acquired by chemistry teacher trainees during microteaching and therefore to guide teacher trainers as well as learners on protocols and skill areas to focus on during microteaching sessions for the purpose of improving the quality of teacher training. This study emphasizes on the need to use microteaching to enable teacher trainee learn and practice primary teaching skills efficiently with minimum available resources and facilities.

### **Objectives of the Study**

The study was guided by the following objectives:

1. To explore the student teacher perception towards skill learning during microteaching lesson in teacher training.
2. To describe effectiveness of the application of teaching skills during a microteaching lesson.
3. To determine the importance of various aspects of micro-teaching in assisting skill acquisition and development of teaching abilities of Chemistry teachers.

### **METHODOLOGY**

Descriptive research design that involved the use of both qualitative and quantitative methods was used. Descriptive research aims to accurately describe and analyze a research problem and allows one to collect data about from the participants within their social setting. This design was appropriate since the key aim of the study is to provide a description of skills learnt and practiced during microteaching. Descriptive research allows the researcher to obtain information on the current status of the phenomena and to describe what exists with respect to variables or conditions in a situation (Bernard, 2012).

The study involved sixty (60) third year university student training in the teaching of Chemistry subject at secondary school level. The teacher trainees carried out microteaching as part of their Chemistry subject teaching methods course. The study was carried out during their course in which each student was involved in the microteaching process and thus did not distract their actual learning processes. They were divided into six groups of ten learners each. Each trainee was allowed to prepare a 7-minute Chemistry lesson from Kenyan secondary school teaching content as provided by the Kenya Institute of Curriculum Development (KICD) syllabus. This was because the teacher trainees were training to teach Chemistry at secondary school level. After the lesson each presenter was requested to provide feedback/evaluation on their own performance, the peers evaluated them and finally the supervisor would provide feedback on the presentation. The process mainly consisted of four key stages which involved discussion of skills for teaching, planning, implementation and feedback stage. This was due to the limitation of time, the class size and the intensity of course content. The trainees prepared a two-week scheme of work and a lesson plan for the lesson they taught. These two documents were evaluated by the instructor to determine the quality of planning and written feedback provided to the teacher trainees.

During the study, microteaching lessons were observed. Observational method is used in descriptive research in order to allow the researcher collect data based on the behavior and characteristics of respondents. A microteaching Lesson observation schedule was used to guide identification of key skills used during microteaching lesson. The schedule focused on skills practiced during microteaching. These are i) Lesson planning, Lesson introduction (set induction), Presentation and explanation, stimulus variation, use of teaching aids and black-board writing, use of question/answer technique and reinforcement, classroom management and lesson conclusion and closure. Observed behavior would be rated between one (1) and five (5) according to levels of performance where: Excellent (5); Very good (4); Good (3); Weak (2); Very weak(1). Room was made for comments in the observation schedule. This ensured that a record of any unexpected teacher behavior that had an influence in the teaching learning process could be recorded. The learners who participated in the microteaching practice were requested to complete questionnaires that would help the researcher determine their perspectives concerning skills gained during the microteaching practice sessions.

A questionnaire was used to collect data on what learners perceived as key skills acquired during microteaching. The questionnaire was composed of five parts. The first part gathered the bio-data of the participants in order to ensure that the study was not gender biased. The second part was intended to gain feedback on the aspects/activities of micro-teaching that teachers considered important for their development as chemistry teachers. The third part was seeking student perception towards microteaching sessions in regard to preparation for the real teaching. The fourth part sought skills the teacher trainees learnt during microteaching from their own perception to support the

observations made. The last part was to avail data on what the teacher trainees would suggest as a way of improving microteaching. After all members of the group had presented their lesson, a short session (about 30minutes) of focus group discussion was carried out. This was guided by a structured focus group interview schedule. Focused group discussion was used to collect data on the key views by the participants on what they considered important skills during the process of micro teaching. Focus group interview provided an environment for the individuals to freely reveal their ideas. Focus group interviews are commonly used to derive an understanding of participant's thoughts and reflections on their experiences (Godek, 2016). In this study, focus group interview helped gather in-depth information on their concerns and suggestions regarding microteaching practice. This was to help strengthen the data collected through interviews and questionnaires. Descriptive statistics were used to analyze data. Frequency counts and percentages were derived for quantitative data. Data was coded, and categorized, related and integrated generate meaning and answer the research questions

## RESULTS AND DISCUSSION

### Student teacher perception towards skill learning during microteaching lesson in teacher training

The perception of the teacher trainee towards microteaching was gathered by use of a questionnaire and feedback from focus group discussions. The researcher sought the opinion of learners concerning their general perception towards micro-teaching sessions in regard to preparation for the real teaching. It was found that 96% indicated that microteaching practice was very useful in supporting their development as Chemistry teachers. Equally 85.6% indicated that to a great extent, microteaching has helped them in preparing for teaching practice that is done in real school situation and is usually assessed.

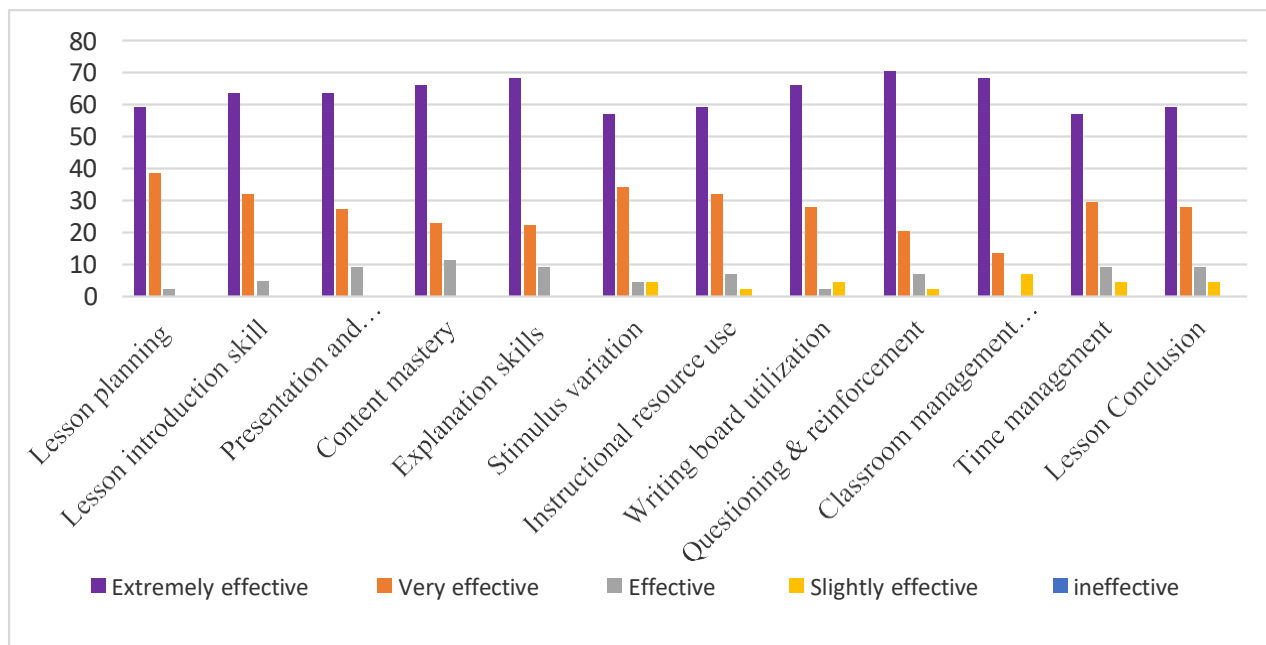
The participants were further required to express their agreement/ disagreement with specific statements indicating particular areas which they felt were highly influenced by the microteaching process. Table 1 provides the percentage of participants that indicated agreement with the specific ways they perceived microteaching as useful in their training to become teachers.

**Table 1: Student teacher's perception towards skill development during microteaching sessions**

	Microteaching;	Percentage
i	It increased my motivation to become a chemistry teacher	95.45
ii	Put me more at ease regarding classroom teaching	93.18
iii	Helped me practice being in front of a class	93.18
iv	Helped development of presentation skills	95.45
v	Increased my confidence in teaching	88.6
vi	Helped in the development of lesson evaluation skills	86.3
vii	Influenced my perspective towards pupils in class	90.9
viii	I learnt different teaching techniques from my colleagues	95.4

The high percentages indicated agreement of teacher trainees with the fact that microteaching helped them develop various skills. A good number (95.5%) indicated that the process increased their motivation to become a chemistry teacher. During focus group discussion, some joked with their colleagues that they thought teaching was really difficult until the microteaching session which proved to them otherwise. The participants were required to indicate the extent to which they felt microteaching was effective in helping them develop and practice various teaching skills. The bar graph in Figure 1 indicates students' rating of effectiveness of microteaching in developing and practicing various teaching skills. From the high percentages of agreements indicating the perceptions of the participants towards the effectiveness of microteaching in learning teaching skills, it could be concluded that they found microteaching useful in their training. This is in agreement with the findings of the research by Sumeyra (2015) which showed that most the students had a positive perception of microteaching. Though this does not agree with the findings of Vandana et al (2016) that revealed that the student teachers did not generally have a favourable attitude towards microteaching, it is important to note that the participants were able to appreciate microteaching exercise when specifically focused on the skills intended. The student teachers indicated having gained a lot from the microteaching practice. They felt it prepared them for teaching practice. This was in agreement with results of other researches in the area of microteaching.





**Figure 1. Perception of student teachers on the effectiveness of microteaching in developing and practicing teaching skills**

### Teaching skills applied in a microteaching lesson

It is important to find out if the microteaching process helped in gaining appropriate skills and what could be addressed differently to improve the microteaching process. The use of various skills was observed during the microteaching class and rated as either Very weak (1), Weak (2), Good (3), Very Good (4) or Excellent (5). The average of the ratings was used to explain the extent of use of the key microteaching skills observed. The results were as indicated on Table 2.

**Table 2: Skills observed during the microteaching lesson.**

SKILL OBSERVED	Average Rating	Percentage
1. Lesson planning	3.53	70.6
2. Introduction skill	3.21	64.2
3. Presentation and explanation	3.22	64.4
4. Skill of stimulus variation	3.12	62.4
5. Utilization of instructional materials	3.84	76.8
6. Utilization of writing board	3.75	75.0
7. Questioning, reinforcement & feedback	3.37	67.4
8. Classroom management	2.64	52.8
9. Closure and evaluation	2.02	40.4

All the basic skills commonly used during microteaching identified by researchers and educators (Reddy, 2019; Vishal et al, 2017; Kumar, 2016; Ajileye, 2013; and Yusuf, 2013) were observed. These observations were made during the first cycle of the microteaching lesson. The skills are improved with subsequent cycles of teaching. It was however considered that the first cycle provides a more accurate expression on the use of skills because on the second or third teaching, the trainees would tend to shape their lessons according to the questions and comments made in the previous teaching which would make them feel restricted (Godek, 2016). Also, some researchers argue that microteaching is very time consuming and some learners may not be able to re-plan and re-teach their lesson (Reddy 2019), it is important to note that the skills discussed in this study can still be practiced within the microteaching lesson. Majoni (2017) gathered that learners gained confidence, reduced fear and improved planning. Many researchers who agree that microteaching is useful for skill learning (Godek, 2016; Bakır, 2014; Ijioma et al 2014; Ramesh, 2018). Many skills were observed during microteaching as discussed in the following paragraphs.

Lesson preparation involved preparation of a two-week scheme of work and a lesson plan. The skills that were found to develop through the preparation of these documents include ability to state the objectives that are specific, measurable, achievable within the stipulated lesson time and reliable in terms of learner behavior. It also entailed a close look at logical, properly sequenced content that is adequate (as reflecting facts/knowledge, values/attitude & skills) the organization of knowledge to be presented and planning for suitable students' activities was of importance. Planning was the among the best rated skill at 3.53 which translates to 70.6%.

The skill of introducing the lesson as well as set induction was observed through paying attention to how the lesson presenter was able to gain pupil's attention, establish rapport with pupils, link their previous knowledge with the topic. The rating of 64.2% indicates that the skill was present while the presenter needed to be more relaxed and show relevance of the introduction to the lesson. In one of the sessions the teacher started the lesson with a prayer.

The skill of lesson presentation and explanation were categorized together due to the fact that microteaching was a short lesson covered in seven minutes. The observed characteristics of include appropriate use illustrations and examples, planned repetition, focusing, movement, emphasis, voice variation and modulation (pitch, volume, speed, pausing). The observation in the skill of stimulus variation included ability to secure and sustain attention which involve non- verbal communication (gestures: hand, facial and body), the speech pattern, and change in the interaction pattern. Most teacher trainees were found to make efforts in involving learners during the learning activity. Some used exercises while others would call the learners out to use the writing board. However, the student teachers felt that they would have increased and varied the interaction patterns if the lesson was longer. During the focus group discussion, they shared some of the experiences they learnt from each other and would be willing to practice in class.

Most of the participants utilized instructional materials thus the rating at 76.8%. Some learners used real objects, chemicals and laboratory apparatus, improvised laboratory resources, models and charts. The skills in the use of instructional materials that were observed and discusses include; relevance, displaying method, method of use, clarity of the resource as well as innovativeness. Focus group discussion revealed that innovativeness and improvisation was highly appreciated by the students. Some trainees confessed that their curiosity was piqued by some innovative materials providing them with great ideas on how to handle certain areas of chemistry content.

It was however noted that none of the participant used ICT during the microteaching lesson. This points to the dire need of microteaching laboratories equipped with sufficient technologies to encourage ICT integration in the teaching and learning of chemistry. Most participants had no difficulty in the utilization of the writing board. Some skills in the use of writing board observed include neatness, organization and space utilization of writing board, legibility of letters and words, highlighting main points, position of the teacher (to avoid blocking the view of learners from what is written on the board) and allowing learners to use the board.

Questioning skill involved probing, use of cues, refocusing, reinforcement & feedback. Most learners used questioning skill. There was observed need to improve on reinforcement and feedback. It was therefore rated at 67.4%. Classroom management was rated at 52.8% from observed learner management, classroom control, participation, identifying learners, neatness, leadership as well as time management.

The challenge in classroom management was related to the class being artificial in nature since they were teaching colleagues instead of real learners. Godek (2016) also identifies the problem of artificial environment as one of the challenges faced during microteaching. Closure and evaluation involved summarizing and consideration of relevance of the lesson. This was the lowest rated skill (at 40.4%) because most participants felt rushed to conclude the lesson due to time limitation. They disclosed during focus discussion that they were not able to appropriately time such short lessons but the skill would improve in subsequent presentations.

### **The process of learning skills during microteaching sessions**

The third objective was to explore how teaching skills are learnt during microteaching or activities involved in skill learning. In an effort to determine the importance of various aspects of micro-teaching in assisting skill acquisition and development of teaching abilities of Chemistry teachers, the participants were asked what they found important in developing teaching skills during microteaching sessions. The aspects indicated in Table 3 were identified.

**Table 3: Aspects of microteaching important in development of teaching skill**

Aspect	Very Important (%)	Important (%)	Not Important (%)
i. Increase in confidence	90.2	9.8	0.0
ii. Bringing closer the feeling of classroom environment	86.4	13.6	0.0
iii. Learning from peers	86.3	13.7	0.0
iv. Support from peers	84.6	15.4	0.0
v. The opportunity to collaborate with peers	81.8	18.2	0.0
vi. Ability to Observe self/others from pupil's perspective	80.5	19.5	0.0

All the aspects indicated were identified as important in developing teaching abilities. It is worth noting that gaining confidence from the activity was rated the highest with 90.2% viewing microteaching as very important in developing confidence and the remaining 9.8% viewing it as important. It is important to note that peer learning, support and collaboration are equally viewed as very important aspects of microteaching. Viewing their peers' presentation of the lesson from the perspective of a learner made the participants recognize their own weaknesses. Information gathered during focus group discussion indicated the importance of this aspect.

Further suggestions by the participants indicated that the student-teachers should be allowed to decide and select the topic for their lesson, and the tutor/ lecturer be present during the teaching and group feedback sessions. Regarding the duration of teaching and planning, 64.1% were of the opinion that the lesson should be longer than 7 minutes while 35.9% found the time sufficient for the lesson. Planning needed to be provided with more time as 84.61% indicated that time provided for planning was not adequate. Since it is so effective in helping trainees to gain teaching skills, microteaching should be given far more time in the teacher training programs. This indicates that it should be conducted more often during training. This was in agreement with Atav et al (2014) and Bakir (2014). The focus group discussions also revealed that the participants highly valued peer review and the discussions done after the microteaching sessions. They were also of the view that more support on the resources used during the sessions was very necessary.

### CONCLUSION

Microteaching provides the trainees with a chance to learn skills and to try or experience different teaching techniques. This was in agreement with the findings of Godek (2016). Teacher trainees viewed microteaching as an important exercise in learning and practicing various teaching skills learning. It was found that the following skills were practiced during microteaching; lesson planning, introduction skill, presentation and explanation, skill of stimulus variation, utilization of instructional materials, utilization of writing board, questioning, reinforcement & feedback, class management and closure and evaluation of a lesson. Teacher trainers using microteaching should therefore focus on these skills. Peer evaluation was quoted by many participants as a very important section of microteaching. Collaboration and support from peers helped improve confidence in the ability of an individual as a teacher. The trainees were able to observe oneself and others from pupil's perspective and thus identify areas of weakness that needed to be improved and areas of strengths to be emphasized.

### RECOMMENDATIONS

The teacher training programs should also allocate more time for microteaching so that there is adequate time for practicing the skills to perfections. There is need for teacher training institutions to allocate more resources towards the microteaching process. There is need for a fully equipped microteaching laboratories especially with modern technological equipment to enhance ICT integration into the lessons. Considering the pivotal role of microteaching in the development of teaching skills, it is essential that the country develops a detailed microteaching policy and a well-researched manual to guide teacher trainers and trainees in the microteaching process and the skills that should be emphasized during the process.

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