

CHAPTER ONE

INTRODUCTION

1.0 Overview

This chapter describes study, covering the background to the study, statement of the problem, purpose of the study, objectives of the study, study questions, significance of the study, delimitation, limitations, theoretical frame work and operational definitions.

1.1 Background

In the last decade, Formative Assessment also called assessment for learning has drawn much attention, especially after comparative studies conducted by Black and William (1998) on the impact of formative assessment and summative assessment on the quality of learning effect on student. The studies revealed that classroom based formative assessment improved the quality of learning and raised student achievement standards (Harlen: 2006). The Ministry of Education, Science, Technical, Vocational Training and Early Education (Zambia), the Lead and Learn Foundation (USA) and VVOB (Belgium organization) entered into a partnership to improve the quality of instruction and learning in colleges of education in Zambia. In this partnership programme among other aspects, they identified Instruction Based Formative Assessment as an important tool in the provision of quality higher education to learners in the Colleges of Education despite their learning challenges. Training programmes for lecturers have been conducted in the past years, but there has been no empirical evaluation of components of the programme.

1.2 Statement of the problem

The Ministry of Education, Science, Technical, Vocational Training and Early Education (Zambia) in association with the Lead and Learn Centre (USA) and VVOB (Belgium) have identified Instruction Based Formative Assessment as an important tool in the provision of quality education to learners in the Colleges of Education despite their learning challenges. However, although Instruction Based Formative Assessment is recognized as an important tool in the provision of quality higher education, and measures have been taken to train lecturers in the same, there have been no empirical studies conducted to evaluate the use of Instruction Based Formative Assessment during lectures in the delivery of quality higher education in Colleges of

Education in Zambia. This study therefore sought to evaluate the use of and factors affecting Instruction Based Formative Assessment during lectures in Colleges of Education in Zambia.

1.3 Purpose of the study

The purpose of the study was to evaluate the use of Instruction Based Formative Assessment and to establish factors affecting its use during lectures in Colleges of Education in Zambia.

1.4 Objectives

The study was guided by the following objectives:

1. To evaluate the use of Instruction Based Formative Assessment during lectures in Colleges of Education in Zambia.
2. To determine the predominant Instruction Based Formative Assessment techniques used during lectures in Colleges of Education in Zambia.
3. To examine factors affecting the use of Instruction Based Formative Assessment in Colleges of Education in Zambia.

1.5 Study questions

The study sought to answer the following questions:

1. Is Instruction Based Formative Assessment being used during lectures in Colleges of Education in Zambia?
2. What are the predominant Instruction Based Formative Assessment techniques being used during lectures in Colleges of Education in Zambia?
3. What factors affect the use of Instruction Based Formative Assessment during lectures in Colleges of Education in Zambia?

1.6 Significance of the study

It is hoped that the findings of this study may contribute to the critical lack of literature on formative assessment in Zambia. It is also hoped that the study may help the Ministry of Education, Science, Technical, Vocational Training and Early Education, Lead and Learn Centre (USA) and VVOB (Belgium) to evaluate and redesign the existing and future programmes to improve instruction-learning process in Colleges of Educations in Zambia. It is also hoped that

the study may help Colleges of Education re-examine the quality of the instruction based assessments to improve student learning and achievement.

1.7 Delimitations

This study was conducted in government and grant aided Colleges of Education in the 10 provinces of Zambia.

1.8 Limitations

The limitation related to this study was that it was a quantitative research as such; qualitative data that would have been considered to explain or triangulate the statistical information collected was not collected. Interviews and observations would have helped to generate in depth understanding of Instruction Based Formative Assessment in Zambian Colleges of Education.

However despite the limitations of the study, findings can be generalised to the Zambian situation, because it covered 10 out of 11 provinces, 10 out of 14 colleges of education spread out nationwide.

1.9 Theoretical Framework

The theory that guided the study was Vygotskian Theory on the social cultural context of learning and development. The theory proposes that cognitive development and learning does not proceed through innate, age-based developmental thresholds, but that it is the product of social and cultural interaction around the use of tools of a cognitive, linguistic and physical nature. The theory emphasizes that the interactional nature of the learning process, the Zone of proximal development and scaffolding were important in the process of learning. Rogoff (1995) relating Vygotsky's learning theory and formative assessment, posits that in this theory pedagogy occurs in the Zone of proximal development, where scaffolding and interactional learning process forms the basis on which Instruction Based Formative Assessment practices are conducted. Teachers in the scaffolding process, acting as mentors initiate and guide the students as learner-novices into the use of feedback on their learning to maximize learning effect. Students using this feedback construct their learning process

Another observation was that Formative assessment was also consistent with constructivist theories of learning and motivation. This is where learners through a dynamic process construct their own meaning to develop a personal representation of knowledge (Tynjala, 1997). In line with constructivist learning theory, students through formative assessment interactions construct and reconstruct their own knowledge and learning process. This increases their learning effect.

1.10 Operational definitions

Formative assessment: a range of formal and informal assessment procedures employed by teachers during the learning process in order to modify teaching and learning activities to improve student attainment

Instruction Based Formative Assessment: a range of formal and informal assessments used to monitor and update classroom instruction, and not necessarily used to award a grade point average for the student.

Coordinator: the coordinators of Continuous Professional Development (CPD) and coordinators of Open and Distance Education Learning (CODEL) programmes in Colleges of Education in Zambia.

1.11 Summary

This chapter has covered the introduction to the study. It focused on describing the process of the study, beginning with background to the study, proceeding to cover statement of the problem and the purpose of the study. The chapter further covered objectives of the study and the study questions which the study sought to respond to. Significance of the study, delimitations, limitations and the theoretical framework of the study were also covered. The researcher ended the chapter with operational definitions of the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Overview

This chapter reviews literature on formative assessment. The literature is reviewed mainly along themes based on the objectives of the study covering, historical trends in formative assessment, and conceptions of formative assessment, formative assessment techniques and strategies, feedback in formative assessment, frequency of using formative assessment and calumniates in comparison of summative and formative assessment in the instruction and learning process. It also covers challenges of implementing Formative Assessment in Africa.

2.1 Formative Assessment

Formative Assessment also called assessment for learning has drawn much attention in academic realms especially after studies by Black and William (1998). The studies revealed that classroom based formative assessment improved the quality of learning and raised student achievement standards (Harlen: 2006).

The term formative assessment, however, among teachers often raises confusion as to whether they are referring to the product of learning or the process of learning. Kamm (2011) observes that the word assessment to most teachers or educators tends to translate to the summative product of learning rather than the formative process of learning. Shepard et.al (2005:275) in their survey, observed that studies grounded in cognitive sciences had shown that formative assessment when used to explore and discover what the learner understood or not, was “a powerful tool in targeting instruction so as to move learning forward” Black and William(1998) in their meta-analysis studies of more than 250 studies that focused on the impact of formative and summative assessment found out that formative assessment experiments produced more powerful effect on student’s learning than summative assessment.

Lindsey (2013) in her study reviewing formative assessment in Africa observed that Formative assessment in Africa was more linked to the concept of continuous assessment (CA). Kapambwe

(2010) in his study of the Zambian 2006-2009 continuous assessment(CA-formative assessment) pilot project, posits that CA in Zambia consisted of two components. The components were class based formative assessment and a series of accumulative summative assessment. In other words formative assessment was imbedded in the CA scheme of assessment. This entails that the term formative assessment in many African, Zambian teachers included, also raises some level of confusion as to what is specifically being referred to. This seems so because most of the time the term formative assessment is either used synonymously with of CA or used interchangeably with CA especially in institutions of higher learning.

2.2 Historical Trends of Formative Assessment

Historical trends of Formative assessment can be traced back to the early philosophers like Socrates. Socrates used formative assessment attributes when instructing his students. Using questioning techniques that probed and provoked his students, he is said to have used their responses to assess or measure their learning and to inform and guide his own instruction approach (Greenstein: 2010). Though at the time the term formative assessment had not yet been coined. Later Michael Scriven in 1967 coined the terms formative evaluation and summative evaluation (Scriven: 1967). Scriven called evaluation information that was used to design and redesign a program as “formative evaluation” while evaluation information that was used to determine whether a program had met its intended goal was called “summative evaluation” this introduce the concept and the term formative assessment.

In the late 20th century, Benjamin Bloom became one of the first people to apply the concepts of formative and summative assessment to educational assessment (Bloom: 1968). Bloom in his theoretical work on mastery learning, identified two major elements of formative learning. These were feedback to learners and corrective conditions for learning (Greenstein: 2010). Bloom further posited that formative information could be used as a basis for dividing learners into groups based on the nature of correction that they needed to progress in their learning. Based on these groupings, teachers could modify their instruction to meet the needs of the learners according their grouping, by differentiating their teaching strategies and corrective feedback to the learners. Later, Sadler (1989) refined the concept of formative assessment by identifying and arguing that both the teacher and the learner were co actors and partners in the formative

assessment process. This laid down the foundations of the range of definitions of formative assessment that rose later.

The breakthrough in trends towards formative assessment seems to have come by 1998. This is when Black Williams and Dylan Williams published their compelling meta-analysis study of more than 250 studies on formative and summative assessment (Black and Williams: 1998). Their findings were that formative assessment had a greater effect on student learning than summative assessment. It is this study that generated widespread interest, in the education circles in the last decades.

2.3 Conceptions of Formative Assessment

Discussing the concept of formative assessment, Cowie and Bell(2001) define formative assessment as the process used by both the teacher and the student to identify and respond to student learning in order to enhance the teaching-learning process during the period of learning. Cauley and McMillan(2010) define formative assessment as a process through which assessment-elicited evidence of student learning is gathered and instruction is modified in response to feedback. Popham(2008:6) posits that both teachers and students can drive and make informed decision on instructional changes; specifically, "assessment-elicited evidence of students' status is used by teachers to adjust their on going instructional procedures or by students to adjust their current learning tactics". Three components are key to this definition: evidence of students' knowledge and understanding, the nature of the feedback given to students, and shifts in the way that students learn. Formative assessment helps students get information about the progress of their own learning in the classroom situation. It helps them understand and clarify their own learning and how they are learning.

2.4 Formative Assessment Techniques and Strategies

Cauley and McMillan(2010:2) observe that formative assessment in the “classroom is conducted primarily through informal observations and oral questions posed to students while content is being taught or reviewed”. The information from the observations and questions to learners is used by the teacher to identify instructional adjustments that must be made to help improve student learning. Studies by Black et al. (2003), Wiliam and Thompson (2007), Wiliam (2007)

identified several key strategies for Instruction Based Formative Assessment. The first is Clarifying and sharing learning intentions or outcomes and criteria for success with the Learners. The second is designing and engineering classroom discussions, activities and other learning tasks in such a way that they elicit evidence of learner understanding; Classroom questioning, think pair are some of the ways used to elicit the needed information. The third strategy is providing effective feedback to learners that move learners forward. “comment-only marking” is one of the ways that teachers might use. The fourth strategy is: “activating students as instructional resources for one another”. This involves learners self and peers assessing themselves. This strategy is in line with collaborative learning (Slavin et al., 2003) and reciprocal teaching (Brown and Campione, 1996).

The fifth strategy is activating students to become owners of their own learning, building their capacity to direct their own learning. This is in line with metacognition, motivation, interest and attribution (Hacker et al., 1998;Dweck, 2000). Hidi and Harackiewicz (2000)state that one of the activities that can be done is collaborative designing of scoring guides, using exemplars or sample of learners best, average and worst works. Stiggins(2007) observes that examples were powerful feedback because they enabled students to understand where they are going, what needs to be done and why the teacher provided feedback.

Lindsey(2013) in the study reviewing formative assessment practices used in Africa, observed that there was a variety of formative assessment techniques that were being used in Africa. The practices covered formal and informal methods. Some of the informal methods of formative assessment noted during the study were oral questioning, monitoring and giving feedback to students as they worked on their tasks during the lesson, while some of the formal methods noted were assigning home works, projects to be done by students, written comments, asking students to redo their assignments.

2.5 Feedback in Formative Assessment

Feedback is central to effective formative assessment. Hattie and Temperly (2007) in their review of feedback in Formative Assessment note that it can be classified into three levels namely:

(a) Task Level Feedback

This type of feedback focuses on the task given to the student. It tends to focus on deficits or faults that the student has made in interpreting and understanding the given task or expected outcome or product. This helps the student to clarify and rectify mistakes made.

(b) Process Level Feedback

This type of feedback focuses on understanding of how the task is to be performed. This type of feedback enhances the students' capacity of error detection strategies, providing cues that lead to better strategies.

(c) Self-regulation Feedback Level

This type of feedback involves enhancing the students self monitoring, directing and regulation of the learning action.

Guskey (2007) observed from his studies that classroom assessment helped to improve the teaching and learning process. He further postulates that to use formative assessment in classroom teachers must change both the way they view formative and the way they interpret the results. This entails that formative assessments need to be considered as an integral part of the instructional process and as an essential element in the effort to help learners learn effectively. Stiggins (1999) and Guskey (2007) point out that for Formative Assessment to become an integral part of the instructional process to enhance standards of learner achievements, teachers needed to change their approach to instruction (teaching) in three major ways.

The first change is that teachers need to use formative assessment as a source of information for both the learner and the teachers. Harlen(2006) argues that both learners and educators tend not to generally use summative assessment to make decisions that affect the instruction (teaching) and learning in the short term, rather they tend to use it to record and report learning achievement. To both the learner and the teacher this tends to have little effect on learning as it tends to come at the conclusion of the learning process. When teachers use formative assessment in the classroom, they generate immediate information about the learning process that helps them make decisions that improve the teaching-learning process while it is still in progress, in effect enhancing and maximising learning before it concludes.

The second change that teachers need to effect is to follow up assessments with high quality corrective instruction designed to help the learner remedy their own learning errors. Sternberg (1994), Guskey (2007) and Kamm (2011) point out that high quality corrective instruction greatly differs from re-teaching the original lesson. Corrective instruction involves, based on the assessment information, modifying the original instruction to take into account and accommodate the different learning styles and intelligences of the learners in order to maximise learning. The third change is that teachers need to give learners second chance to demonstrate success. Learners need to be given multiple opportunities to demonstrate success. This allows learners to learn from their mistakes and have the opportunity to perfect their learning.

Shepard (2005) and York (2003) point out that formative assessment is a fundamentally collaborative and inherently social act that requires thoughtful interaction between teachers and learners. Ainsworth and Viegut(2006:23) posit that teachers benefit from formative assessment in four major ways: Firstly, it helps them determine the current level of standards, knowledge and performance of student. Secondly, it helps them decide what modifications in instruction that they need to make so that all learners can learn, succeed in the current instruction and subsequent assessment tasks. Thirdly, it helps them create and design appropriate learning lessons and experiences that cater for groups and individual learners. Fourthly, it helps inform learners about their current progress with a view of helping them set goals and strategising for improvement. The main purpose of formative assessment is to improve teaching and learning.

2.6 Frequency of Using Formative Assessment

Formative assessment is ideally conducted during the Instruction-Learning process to maximize student learning effect. Harlen (2006), Shepard (2005) and York (2003) indicate that it is imbedded in the Instruction-learning process. This entails that educators using formative assessment use it frequently during the teaching-learning process during lessons or lectures. This is as opposed to summative assessment that is used at the end of the instruction-learning process. In the studies reviewing the frequency of using formative assessment in Africa(Lindsey, 2013) and in Zambia (Kapambwe,2010) it was observed that informal methods of formative assessment such as oral questioning, monitoring and giving feedback to students as they worked on their tasks, were often (almost daily) used during the instruction-learning process in class. However,

most teachers used this informal method of formative assessment without being obviously aware that they were using formative assessment techniques. This mode of using formative assessment seems to come naturally as part of the instruction-learning process.

The study further observed that formal methods of formative assessment such as assigning home work, assigning projects to students, giving written comments, asking students to redo their assignments, were used as part of cumulative continuous assessment for students especially in institutions of higher learning. As such the frequency of using formative assessment as noted by Kapambwe (2010) was weekly, termly or annually conducted. Grades were assigned to provide cumulative Continuous Assessment (CA) grade.

2.7 Summative and Formative Assessment and Learning

Discussing the relationship between Formative assessment and Summative assessment, Harlen (2006) posits that the purpose of summative assessment is to record and report on learning achievement of the learner at a given time, while the purpose of formative assessment is to identify areas in the instruction and learning process that need improvements to enhance the quality of delivery of learning experiences.

Summative assessment has multiple internal and external functions. Internal function is used within the classroom by the teacher to grade and monitor the learners' progress. The tasks usually have high stake point value that is used to grade the student performance and achievement. Some summative assessment tasks may take the form of tests, midterm exams, final examinations, final projects, teacher self evaluations. Venture(2011) further explains that External function of summative assessment is used to report to external groups for several purposes ranging from selection, certification, monitoring of progress to evaluation of learner achievement.

While Formative assessment, integrated in the instruction and learning process, seems to mainly have an internal two fold function within the classroom. This is to provide feedback on the learning process to the instructor (teacher) so that he/she can improve the teaching and the learner so that he/she can improve his/her learning. The tasks in formative assessment have a low

stake point value or no point value ungraded guidelines that are used to provide standards to guide the learning process. Some formative assessment tasks may take the form of summaries, dummy essays, portfolios, projects, process of research proposal supervision, and classroom pairs.

2.7 Challenges of Implementing Formative Assessment in Africa

Studies on the implementation of formative assessment in Africa (Lindsey, 2013) and in Zambia (Kapambwe, 2010) revealed that teachers faced several challenges in using formative assessment during lessons. One of the significant challenges was large class size. In the studies noted above most teachers indicated that large class size was their major challenge. The other challenge was that teachers feared that they would not complete the syllabus as they perceived formative assessment to be time consuming

Another challenge implied by the study above, was a belief amongst teachers that formative assessment involved too much work, as such it was perceived to be an extra work load. Inadequate capacity building and lack of ownership amongst the teachers was another challenge that was noted. Formative assessment was viewed as foreign to their traditional teaching-learning process orientation.

2.8 Summary

This chapter has reviewed literature on Formative Assessment. The review covered definitions of Formative Assessment, conceptions of Formative Assessment, techniques and strategies used in Formative Assessment and the nature of feedback in formative Assessment. The review also covered the frequency of using Formative Assessment in the instruction-learning process. The review of literature further made a comparative review of summative and formative assessment and learning. The literature review indicates that African and Zambian Literature on instruction based Formative Assessment is inadequate, however from the available literature in comparison to the Zambian context, it can be observed that though Zambia has made efforts to address classroom based formative assessment the focus has been continuous assessment as a form of formative assessment and not instruction based formative assessment.

CHAPTER THREE

METHODOLOGY

3.0 Overview

This chapter describes the methodology that was used in the study. It describes the type of research design that was employed in the study. It further describes the target population, the sample size, sampling procedure, description of the sample, research instruments, data collection and data analysis procedures that were used in the study.

3.1 Location of the study

The study was conducted in 10 Colleges of Education in Zambia. These Colleges of Education were selected to participate in the study because they were Teacher training institutions that trained teachers in instructional and assessment strategies.

3.2 Research Design

The research design that was used to conduct this study was the survey. Kombo and Tromp (2006), posit that a survey is a method of collecting data by either administering a questionnaire or by interviewing subjects in the given sample of the target population. The researcher opted to use this method because of the scope of the study that covered all the provinces of Zambia, the size of the sample that was over 100 and type of quantitative descriptive statistical data that would be used.

3.3 Target Population

This study targeted all lecturers in Colleges of Education in Zambia, Coordinators for Continuous Professional Development (CPD) and Open and Distance Education Learning (CODEL).

3.4 Sample Size

The sample size of the study was 120 participants comprising ten(10) Continuous Professional Development coordinators(CPD), ten(10) Coordinators of Open and Distance Education Learning (CODEL) and one hundred(100)lecturers ten(10) from each of the ten(10) selected government or grant aided Colleges of Education in Zambia.

3.5 Sampling Procedure

The study used stratified random sampling technique. This technique was chosen because it eliminates biasness in the study and accords the elements of the target population an equal probability to participate in the study. It also allows the sample to be representative of the target population (Kombo and Tromp, 2006).

3.5.1 Sampling Procedure for Selecting Participating Colleges of Education

The sample consisted of Coordinators of Continuous Professional Development, Coordinators for Open and Distance Education Learning and Lecturers from each selected college of Education. In drawing up the study sample, the researcher started by selecting ten (10) colleges of Education from the fourteen (14) government colleges to participate in the study. A sampling frame for colleges was created, the name of each college was written on a piece of paper. These pieces of paper were put in a small bag where they were drawn randomly one at a time. The first 10 names of colleges that were picked were selected to participate in the study. These selected Colleges of Education formed 10 strata for the study.

3.5.2 Sampling Procedure for Selecting Lecturers

From the selected colleges, the researcher then selected ten (10) lecturers and one (1) Coordinators of Continuous Professional Development (CPD), and one (1) Coordinator for Open and Distance Education Learning (CODEL) from each participating college using stratified random sampling procedure. Strata were made up of a College of Education. Each stratum consisted of all lecturers and coordinators from a selected College of Education. From each stratum ten (10) lecturers were selected using simple random sampling procedure as described above when selecting the colleges. The total number of lecturers that were selected to participate in the study to one hundred (100).

3.5.3 Sampling Procedure for Selecting Coordinator for Open and Distance Education Learning (CODEL) and Coordinators of Continuous Professional Development (CPD)

When selecting the CODELs and the CPDs, sampling frame was created per college, for all CODELs and all CPDs from the participating College of Education. Random sampling procedure that was used when selecting colleges and Lecturers was employed. The total number of coordinators that were selected to participate in the study was twenty (20) comprising ten(10) CODELs and ten(10) CPDs, two(2) from each participating college.

The total sample for the study was one hundred twenty (120) respondents. These one hundred and twenty (120) respondents were the key informants for the study because they were directly involved in the instruction-learning processes in the Colleges of Education.

3.6 Description of the Sample (Demographic Data)

The sample covered a total of 10 Colleges of Education. These Colleges of Education were located in 10 districts in 8 of the 10 provinces in Zambia. A total of 120 respondents completed the questionnaire of whom 56 % were male and 44 % were female; 82% were lecturers and 19% were coordinators of either CPD or ODEL in the Colleges of Education in Zambia. Table 3.1 shows a summary of the study sample.

Table 3.1: Study sample by district, college and respondent

Province	Number			% of Total
	Districts	Colleges	Respondents	
Northern	2	2	24	20
Lusaka	2	2	24	20
Central	1	1	12	10
Copperbelt	1	1	12	10
Eastern	1	1	12	10
North Western	1	1	12	10
Southern	1	1	12	10
Western	1	1	12	10
Total	10	10	120	100

According to Table 3.1 above, the participating colleges of Education were distributed by districts(on average one college per district and province). Northern province (20%) and Lusaka

province (20%) had fair shares of the representation in the sample totalling to 40%, while the remaining 6 provinces: southern (10%), Western(10%), Central(10%), Copperbelt(10%), Eastern(10%),and North-western (10%) provinces each had an equal share of representation (of 10% each) in the sample bring a total of 60%. Northern and Lusaka provinces were allocated 20% each because they had more colleges of education than the rest of the provinces. This entails that the views represented by the respondents were not biased to a particular province or district but were representative of the provinces, districts and Colleges of Education in Zambia

3.6.1 Sample by College Type

Figure 3.1 below shows the sample of the institutions by type of college.

Figure 3:1: Respondents by College type

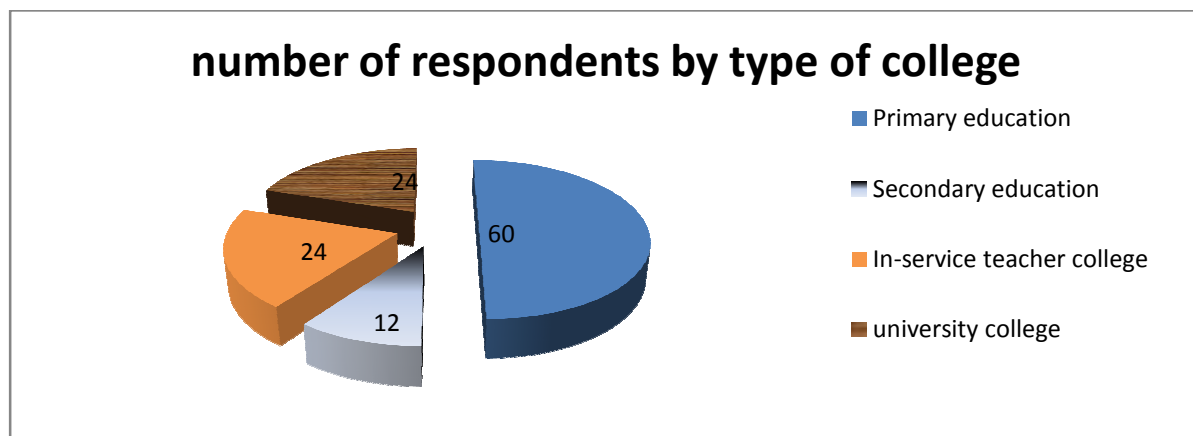


Figure 3:1 above shows that majority 60 (50%) of the respondents came from primary education college, while other respondents 24(20%) were from In-service Teacher colleges, 24(20%) were from University colleges and minority 12(10%) were from secondary education Colleges of Education. There were no respondents from private Colleges of Education.

3.6.2 Sample by Qualification Proportions

Figure 3.2 below shows the distribution of respondents with respect to their academic qualifications.

Figure 3:2 Proportions of Respondents by Qualifications

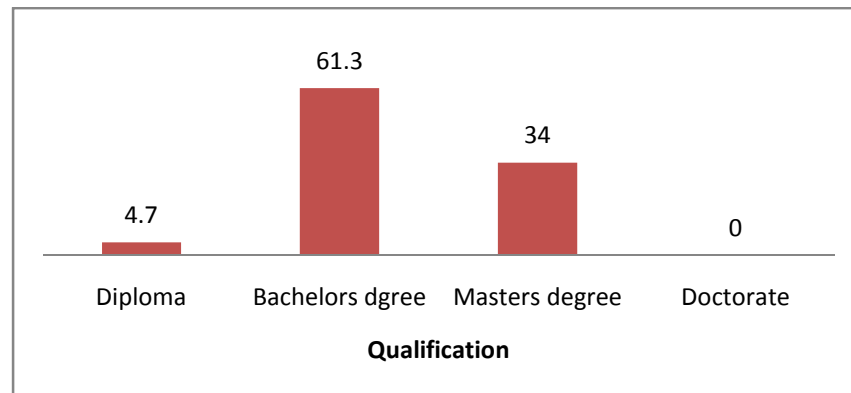
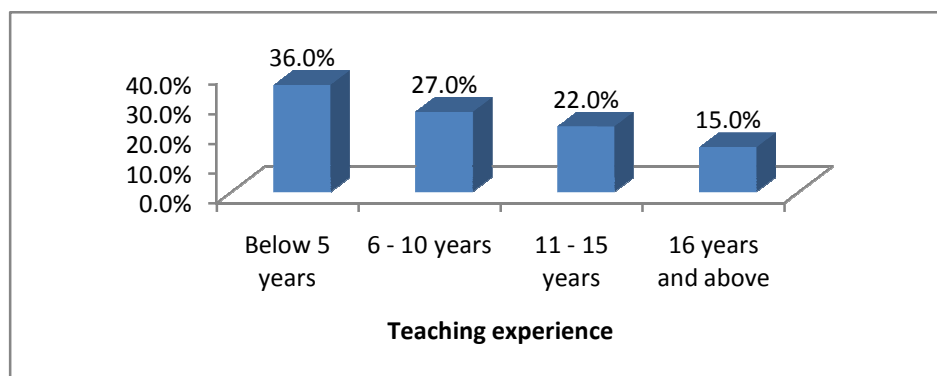


Figure 3.2 above shows that majority of the respondents were First Degree (61.3%) holders while, Masters degree holders only accounted for thirty four percent (34%) and diploma holder (4.7%) were the minority. There were no Doctorate degree holders. This entails that the significant majority (95%) of the respondents were University graduates therefore were qualified teacher trainers in the colleges of education

3.6.3 Sample by Teaching Experience as Teacher Trainer

The sample of respondents according to teaching experience as a teacher was as shown in Figure 3.3.

Figure 3.3: Proportion of respondents by teaching experience as a teacher trainer in College of Education



The figure above indicates that majority (36%) of the respondents had teaching experience below 5 years, 27% had 6-10 years experience, 22% had 11-15 years experience while minority 16% had 16 and above years teaching experience in college of education. This entails that views represented a wide range of teaching experiences of the respondents.

3.6.4 Sample by Age Range Proportion

As regards the sample and age range of the respondents, Figure 3.4 shows the distributions.

Figure 3.4: Distribution of respondents by age

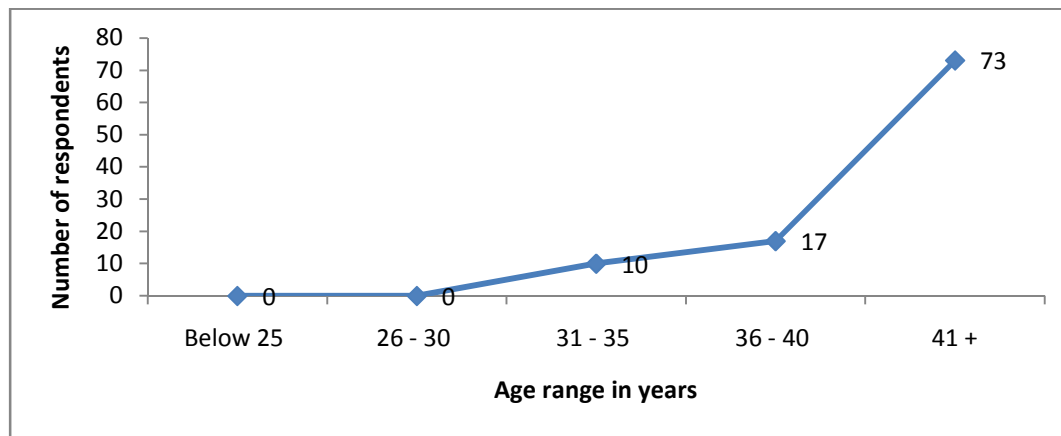


Figure 3.4 shows that majority (73) of the respondents were in the age range of 41 years old while 17 were in the age range of 36-40 years. None were below 31 years old. This entails that the views expressed in the study were of the middle aged lecturers and coordinators of CPD and CODEL.

3.7 Research Instruments

Considering that the study was designed to be a survey, the researcher used structured self-administered questionnaires to collect data. The questionnaires for lecturers contained closed question items on formative assessment techniques used during instruction time in lectures; it also contained items on basic exposure to formative assessment techniques used during instruction. The questionnaires for coordinators contained closed question items on formative assessment and CPD meetings in college.

3.7.1 Piloting Research Instruments

According to Tuckman (1994), it is very important to pilot test a questionnaire in order to revise the items based on the results of the pilot test. The purpose of pilot testing is to reveal any defects in the research instrument (Jack and Norman, 2003). In line with what Jack and Norman, cited above, the self administered questionnaires for both lecturers and the Coordinators for Open and Distance Education (CODEL) and Continuous Professional Development (CPD) were distributed to senior lecturers and administrators at Zambia Institute of Special Education (ZAMISE) for pilot purpose. The aim was to check on their validity and reliability. The questionnaires could not be piloted in two colleges as earlier planned due to logistical challenges.

3.7.2 Observations from the Field on the Questionnaires

The findings of the field piloting revealed some aspects that had been overlooked which needed to be included in the final questionnaires. The major observations were:

- That Demographic data had been omitted.
- Categorization of data by gender had not been clearly indicated

This necessitated some modifications to the questionnaire to take into account the observations. The following variables were added to the questionnaire for the lecturers, CODELs and CPDs.

- Type of College of Education
- Gender
- Age range of respondents
- Qualification of the respondents
- Experience of respondents as teacher trainer.

On the questionnaire for CODELs and CPDs the variable on whether Instruction Based Formative Assessment had been included in the Lesson Development Study programme that was being promoted by the Ministry of Education, Science, Vocational Training and Early Education to promote quality teaching was also included in the revised research instruments. The rest of the variables remained the same except for some minor spelling errors that were corrected.

3.8 Data collection Procedure

To conduct the study, the researcher got permission to conduct the study from the principals of the selected Colleges of Education. This permission was sought either directly from the administration or indirectly through a local contact person in the college. After permission was granted, the researcher worked with either the person the administration had assigned or the contact person in the college to select the respondents, administer and collect the data.

3.9 Data Analysis

Considering that the data collected was quantitative, descriptive statistics were used to analyse it. The Statistical Package for Social Sciences (SPSS) computer software was employed to analyse the data collected to generate frequencies, percentages and graphs which were used in describing distributions of the single and summated variables.

3.10 Ethical Consideration

Researchers Jack and Norman (2003) posit that in planning a study, researchers have the responsibility to evaluate carefully and ethically any ethical concerns of the study. It is this line that, the study was conducted in an ethical manner, protecting participant's rights to anonymity, confidentiality and autonomy. Confidentiality was upheld by ensuring that the identification of the participants was concealed ensuring. To ensure that anonymity was upheld, no data that would be used specifically trace the identity of any participants was collected. The participants were not coerced; they were given the choice to participate voluntarily and the freedom to withdraw from the study at any time without giving any reasons. A consent form was designed which the participants signed to ensure that their autonomy was upheld. The data collected was and will be used solely for the intended purpose of evaluating the use of Formative assessment in Institutions of Higher Learning in Zambia.

3.11 Challenges Faced During the Data Collection Process

The data collection process faced some challenges. The whole process was due by October-November 2012 but could not be conducted as several Colleges of Education were conducting their midterm and end of term tests. However when the data collection process started, some

challenges experienced by the researcher were delay in returning the questionnaires by some respondents. Some respondents did not return the questionnaires within the set time frame.

The other challenge was a general reluctance in the colleges to fill in self-administered questionnaire. This attitude of apathy seems to have been due the aspect that they had filled in and participated in too many studies due to influx of students from the learning institutions who during the same period of the study were conducting their studies too. Therefore the researcher had to delay data collection to about March-April 2013.

3.12 Summary

This chapter covered the methodology used in the study. The chapter described the location of the study, which was 10 Colleges of Education in Zambia. The research design adopted by the study was the descriptive quantitative survey. The target population of the study was all lecturers, coordinators of CPD and coordinators of Open and Distance Education and Learning (CODEL) in Colleges of Education in Zambia. The sample size of the study consisted of 120 participants who were selected using the stratified random sampling technique. The chapter also covered description of the sample by provinces, Districts, type of college, qualifications of lecturers, teaching experience and age of respondents. The chapter further described the research instruments used (self-administered structured questionnaire) and results of piloting the said research instruments. Data collection procedures, data analysis, ethical considerations of the study and challenges encountered during data collection was also covered in this chapter.

CHAPTER FOUR

PRESENTATION OF FINDINGS

4.0 Overview

This chapter presents the findings of the study according to the objectives of the study. The objectives were to: establish the use Instruction Based Formative Assessment during lectures in Colleges of Education in Zambia; determine the predominant Instruction Based Formative Assessment Techniques used during lectures in Colleges of Education in Zambia; and examine factors affecting the use of Instruction Based Formative Assessment in Colleges of Education in Zambia.

4.1 Findings from CPD and CODEL coordinators

4.1.1 Findings from CPD and CODEL coordinators on the use of Instruction Based Formative Assessment during lectures in Colleges of Education in Zambia

In order to establish the use of Instruction Based Formative Assessment during lectures in Colleges of Education in Zambia, data was collected from CPD and CODEL coordinators and Lecturers in Colleges of Education in Zambia. The findings from the CPD and CODEL coordinators are presented below.

Whether the CPD and CODEL coordinators had been trained in any form of classroom based Formative Assessment

The CPD and CODEL coordinators were asked to indicate if they had been trained in any form of Instruction Based Formative Assessment. Their responses were as shown in Table 4.1.

Table 4.1: Training of Coordinators (CPD and CODELs) in classroom based formative assessment in Colleges of Education

Item		Frequency	Percent
	yes	19	95.0
	no	1	5.0
	Total	20	100.0

Table 4.1 above shows that the majority 19 (95.0 %) of the coordinators indicated that they had training in Classroom Based Formative Assessment while one (5.0%) of them indicated having not received any form of training. This entails that the majority of the coordinators were trained in Classroom Based Formative Assessment.

Mode of Training in Formative Assessment

When respondents were requested to indicate the mode of training they had undergone, if they had been trained in Formative Assessment, their responses were as shown in Table 4.2.

Table 4.2: Training mode for formative assessment training undertaken by CPD and CODEL coordinators

Training mode	Frequency	Percent
Continuous Professional Development	15	51.7
Workshop at the college	8	27.6
Seminar at the college	1	3.4
Other (<i>means of training</i>)	5	17.2
Total	29	100.0

a. Dichotomy group tabulated at value 1.

As can be seen from the table, the CPD and CODEL coordinators indicated that the most common mode for formative assessment training was through CPD regular meetings represented by the frequency of 15 (51.5%) followed by “workshop at the college” with a frequency of eight (27.6%). The least rated was “seminar at the college”. This entails that most common mode of training coordinators in formative assessment was the CPD regular meetings.

Areas covered by the Formative Assessment training

When respondents were requested to indicate areas that were covered by the Formative Assessment training they had undergone, their responses were as shown below in Table 4.3.

Table 4.3: Frequency distribution of areas covered by formative assessment training for CPD and CODEL coordinators

Areas covered	Frequency	Percent
Classroom based assessment strategies	16	32.0
Giving effective feedback to students	14	28.0
Designing rubrics or scoring guides with student	10	20.0
Giving learners multiple opportunities to demonstrate success	5	10.0
Using exemplars	5	10.0
Total	50	100.0

a. Dichotomy group tabulated at value 1.

Table 4.3 shows that the most covered area by formative assessment training for CPD and CODEL coordinators was ‘classroom based assessment strategies with a frequency of 16 (32.0%) followed by “giving effective feedback to students accounting for 14 (28.0%), and then “designing rubrics or scoring guides with students” with a frequency of 10 (20.0%). The rest of the responses were as shown in the table. This entails that training in formative assessment for the coordinators, as indicated by the frequency (16), mainly covered classroom based assessment strategies.

Inclusion of Instruction based Formative Assessment in the Lesson Study programme in the college.

When respondents were asked whether Formative Assessment had been included in college lesson study program, their responses were as shown below in table 4.4.

Table 4.4 whether Formative assessments is included in college lesson study programme (n = 20)

Item		Frequency	Percent
	yes	15	75.0
	no	5	25.0
	Total	20	100.0

Table 4.4 reveals that the majority, 15 (75.0%) of the respondents agreed that Instruction based Formative Assessment was included in the college lesson study programme while 5 (25.0%) of the respondents indicated that it had not been included in the said program. This entails that, Instruction based Formative Assessment was included in the college lesson study program.

For the respondents who responded in affirmative, a further question was asked to them to rate the implementation of Formative Assessment in the lesson study programme in the college. Their responses were as shown in table 4.5 below.

Table 4.5 Rating of implementation of Instruction Based Formative Assessment in the lesson study programme (n = 20)

Item		Frequency	Percent
	Very Good	1	5.0
	Good	11	55.0
	Poor	3	15.0
	Did not know	5	25.0
	Total	20	100.0

Table 4.5: indicates that the majority, 11(55.0%) of the respondents rated the implementation of Instruction Based Formative Assessment in the lesson study programme as “good”, while three (15.0%) of them rated the implementation as “poor” and one (5.0%) of them rated it as “very good”. None of the respondents rated the implementation as “excellent” or “very poor”. The table also shows that five (25.0%) of the respondents did not rate the implementation of the formative assessment. This entails that the implementation of Instruction Based Formative Assessment in the college lesson study program was good.

Type of assessment used by CPD and CODEL coordinators during lectures

The respondents were asked to indicate the type of Formative Assessment that they used during lectures. Their responses were as shown in Table 4.6 below.

Table 4.6: Type of assessment used by CPD and CODEL coordinators during lectures in colleges of education (n = 20)

Item		Frequency	Percent
	Formative Assessment	11	55.0
	Summative	8	40.0
	Diagnostic assessment	1	5.0
	Total	20	100.0

The table above reveals that the majority 11 (55%) of the respondents used Formative Assessment during lectures, while eight (40.0%) of them indicated that they used summative assessment during lectures and one (5.0%) of the respondents used diagnostic assessment. This entails that type of assessment that the majority 11(55) of the coordinators used during lectures was formative assessment.

Frequency use of the type of assessment

In a follow up question, the CPD and CODEL coordinators were requested to indicate how frequently they used the type of assessment that they used during lectures, their responses were as shown in Figure 4.7.

Table 4.7: Frequency of using type of assessment (n = 20)

Item		Frequency	Percent
	Weekly	11	55.0
	Termly	6	30.0
	Monthly	1	5
	Often	1	4
	Rarely	1	5
	Total	20	100.0

The table above shows that the majority 11 (55.0%) of the respondents indicated that they used them weekly, while six (30.0%) of them said that they used them termly. One (5.0%) of the respondents used them monthly, while the remaining two respondents each (5.0%) indicated that they used it “often” and “rarely” respectively. This entails that formative assessment was used weekly by the coordinators as indicated by the frequency 11(55%).

4.1.2 Findings from CPD and CODEL coordinators on predominant Instruction Based Formative Assessment techniques used during lectures

In order to determine the predominant Instruction Based Formative Assessment techniques used during lectures in Colleges of Education in Zambia, information was collected from CPD and CODEL coordinators.

Instruction Based Formative Assessment Strategies used during Lectures by Coordinators (CPD, CODEL) in colleges of Education

Respondents were requested to indicate the Formative Assessment strategies they had used during lectures. Their responses were as shown below in Table 4.8.

Table 4.8: Formative Assessment strategies used by coordinators during lectures in Colleges of Education

Formative assessment strategies	Frequency	Percent
Providing feedback that moves learners forward in their learning	19	24.4
Designing and engineering effective classroom discussions and other Learning tasks that elicit evidence of student understanding	17	21.8
Activating or stimulating students as the owners of their own learning	13	16.7
Clarifying learning intentions and criteria for success	10	12.8
Allowing students share their understanding of the learning intentions and criteria for success	10	12.8
Activating or stimulating students as instructional(teaching and learning) resources for one another	9	11.5
Total	78	100.0

a. Dichotomy group tabulated at value 1.

Table 4.8 shows that “providing feedback that moves learners forward in their learning” was the most used Instruction Based Formative Assessment strategy amongst the respondents represented by the frequency of 19(24.4%). This was followed by “designing and engineering effective classroom discussions and other learning tasks that elicit evidence of student understanding” with a frequency of 17(21.8%); “activating or stimulating students as the owners of their own learning” with frequency of 13(16.7%). The strategies “allowing students share their understanding as owners of the learning intentions and criteria for success” and “clarifying learning intentions and criteria” were reported to have been used at a frequency of 10(12.8%) respectively by coordinators. The rest of the responses were as shown in the table. This indicates that the strategy of “providing feedback that moves learners forward in their learning” was the most used Instruction Based Formative Assessment strategy during lectures, amongst the coordinators in colleges of education.

Instruction Based Formative Assessment activities used during lessons by coordinators (CPD, CODEL)

When the respondents were requested to indicate any Formative Assessment activities that they had used during lectures, their responses are shown in Table 4.9.

Table 4.9: Formative Assessment activities used by coordinators during lectures in colleges of Education

Formative assessment activities used	Frequency	Percent
Getting students to peer assess their work	15	34.9
Getting students involved in re-assessing their own work with rubrics	10	23.3
Using exemplars (samples of student work) for feedback standards	9	20.9
Designing scoring guides or rubrics with students when giving assignments	5	11.6
Posting student exemplars(samples of student work with their identities hidden)	1	2.3
Posting marking rubrics(marking schemes)	3	7.0
Total	43	100.0

Table 4.9 reveals that “getting students to peer assess their work” was the most used Instruction Based Formative Assessment activity during lectures amongst the respondents as reported by 15 (34.0%) out of 43 responses. This was followed by “getting students to be involved in re-assessing their own work with rubrics” formative assessment activity at 10(23.3%) responses; “using exemplars (samples of student work) for feedback standards” formative assessment activity at 9(20.9%); “designing rubrics or scoring guides with students when giving assignments” formative assessment activity at 5(11.6%); “posting marking rubrics (marking schemes)” formative assessment activity at 3(7.0%); while “posting student exemplars(samples of student work with identities hidden)” at 1(2.3%) was the least used formative assessment activity during lectures in colleges of education. This entails that the most used Instruction Based Formative Assessment activity during lectures amongst the coordinators, was the activity involving “getting students to peer assess their work” as indicated by the frequency 10(23.3%).

Rating of respondent’s effectiveness in using Instruction based Formative Assessment during lectures

When the respondents were requested to rate their effectiveness in using instruction based formative assessment during lectures, their responses were as indicated below in table 4.10.

Table 4.10: Rating of effectiveness of coordinators (CPD CODELs) in using Instruction based Formative Assessment during lectures (n=20)

Item		Frequency	Percent
	Good	16	80.0
	Very Good	3	15.0
	Poor	1	5.0
	Very poor	0	0
	Excellent	0	0
	Total	20	100.0

Table 4.10 shows that majority of the respondents 16 (80.0%) rated their effectiveness in using Instruction Based Formative Assessment as “good”; while three (15.0%) of them rated their effectiveness as “very good” and one (5.0%) of the respondents rated it as “poor”. None of the respondents rated themselves as “very poor” and “excellent”. This entails that the effectiveness of

the use of Instruction Based Formative Assessment during lectures amongst the coordinators, in colleges of education was rated as good.

Rating of the coordinators (CPD CODELs) competence in using Instruction based Formative Assessment strategies and activities during lectures

When the respondents were requested to rate their competence in using instruction based formative assessment strategies and activities during lectures, their responses were as indicated below in Table 4.11.

Table 4.11: Rating of competence of coordinators (CPD CODELs) in using Instruction Based Formative Assessment strategies and activities during lectures during lectures in colleges of Education

Item		Frequency	Percent
	Good	14	70.0
	Very Good	4	20.0
	Poor	1	5.0
	Excellent	1	5.0
	Total	20	100.0

Table 4.11: shows that the majority of the respondents 14(70.0 %) rated their competence in using Instruction Based Formative Assessment strategies and activities during lectures as “good”; while four (20.0%) of them rated their competence as “very good”. One (5.0%) of them rated the competence of lecturers as “poor”. However one of the respondents rated lecturers’ competences as “excellent”. This findings entail that the competence of the coordinators in the use of instruction based formative assessment during lectures was good.

4.1.3 Factors affecting the use of Instruction Based Formative Assessment by coordinators in Zambian Colleges of Education

When the respondents were requested to indicate factors that affect the use of Instruction Based Formative during lectures, their responses were as shown below in Table 4.12.

Table 4.12: Factors that affect the use Instruction Based Formative Assessment during lectures

Factors affecting formative assessment	Frequency	Percent
Time limitation	15	33.3
Large Class size	12	26.7
Student learning orientation	11	24.4
Inadequate training in formative assessment	7	15.6
Total	45	100.0

a. Dichotomy group tabulated at value 1.

Table 4.12 above shows that majority of the respondents 15 (33.3%) pointed out “time limitation” as major factor that affected use of instruction based formative Assessment during lecture, while 12 (26.7%) of the respondents indicated “class size” followed by 11(24.4) of them who said “student learning orientation” was a factor. Nonetheless seven (15.6) respondents indicated “inadequate training in formative assessment” as a factor. This indicates that the major factor that affected the use of instruction based formative assessment during lectures among the coordinators was time limitation, as indicated by the frequency (15).

4.2 Findings from the Lecturers on Formative Assessment

4.2.1 Findings from the Lecturers on the use of Instruction Based Formative Assessment during lectures in Colleges of Education in Zambia

In order to establish the extent to which Instruction Based Formative Assessment is used during lectures in Colleges of Education in Zambia, data was collected from CPD and CODEL coordinators and Lecturers in Colleges of Education in Zambia. The findings from the lecturers are present below.

Whether Lecturers had been trained in any form of classroom based Formative Assessment

When respondents were asked if they had been trained in Formative Assessment, their responses are shown in Figure 4.1.

Figure 4.1: Whether lecturers were trained in classroom based formative assessment in Colleges of Education

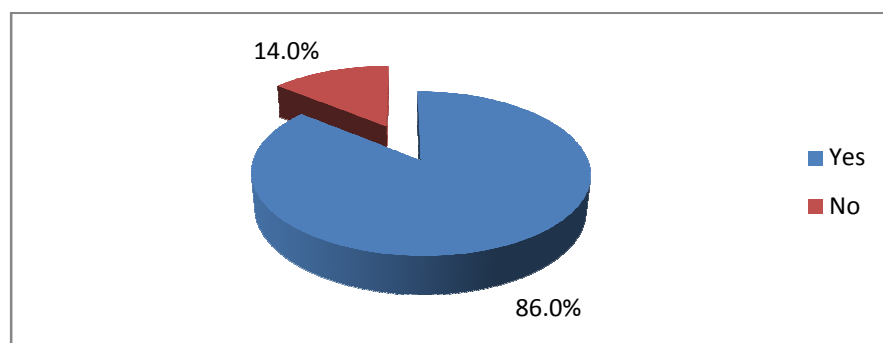


Figure 4.1 above shows that the majority, 86 (86.0 %) of the lecturers indicated that they had training in Formative Assessment while 14 (14.0%) of them indicated that they had not been trained. This entails that the majority of the Lecturers were trained in Classroom Based Formative Assessment.

Mode of training in Formative Assessment

For the respondents who indicated that they were trained in Formative Assessment, a further question was asked for them to indicate the mode of training they had undergone. Their responses were as shown in the table 4.13.

Table 4.13: Mode of training taken for Formative Assessment training by Lecturers in colleges of education

Mode of training	Frequency	Percent
Continuous Professional Development(CPD) regular meetings	61	42.4
Workshop in college	29	20.1
Seminar with Lead and Learn entre and VVOB	21	14.6
Other	20	13.9
Seminar at college	13	9.0
Total	144	100.0

Table 4.13 Shows that majority of the responses, 61 (42.4%) indicated that they were trained through the CPD regular meetings followed by 29 (20.1%) out of 144 responses that indicated that they had been trained through workshops in the college, while a frequency of 21(14.6%) said that they were trained through seminars conducted by Lead and Learn Centre and VVOB. The rest of the responses were as shown in the table. This entails that most common mode of training lecturers in formative assessment was the CPD regular meetings.

Areas covered by the Formative Assessment training for college of education lecturers

As regards to the areas that were covered by the training, Table 4.14 shows the frequency distribution of the respondents' responses.

Table 4.14: Areas covered by Formative Assessment training in for Colleges of Education lecturers

Areas covered	Frequency	Percent
Classroom based assessment strategies	69	35.2
Giving effective feedback to students	60	30.6
Giving learners multiple opportunities to demonstrate success	26	13.3
Designing rubrics or scoring guides with students	25	12.8
Using exemplars	13	6.6
None of the above mentioned	3	1.5

Table 4.14 shows that of the areas covered by Formative Assessment training for lecturers in Colleges of Education “classroom based assessment strategies” was the most common topic that was covered as shown by the frequency of 69(35.2%) responses. This was followed by the topic “giving effective feedback to students” as indicated by a frequency of 60(30.6 %) out of 196 responses. The topic “giving learners multiple opportunities to demonstrate success” was reported to be third as indicated by the frequency of 26 (13.3) respondents and “designing rubrics or scoring guides with students” as shown by 25 (12.8%) respondents and the least covered topic was “using exemplars” as indicated by 13 (6.6%) responses. The other responses were as shown in the table. This entails that training in formative assessment for the lecturers, as indicated by the frequency 69(35%), mainly covered classroom based assessment strategies.

Inclusion of Instruction based Formative Assessment in the Lesson Study programme in the college

When respondents were asked whether Formative Assessment had been included in college lesson study program. Their responses were as shown in Figure 4.2 below.

Figure 4.2: Inclusion of Formative assessment in college lesson study programme (n = 100)

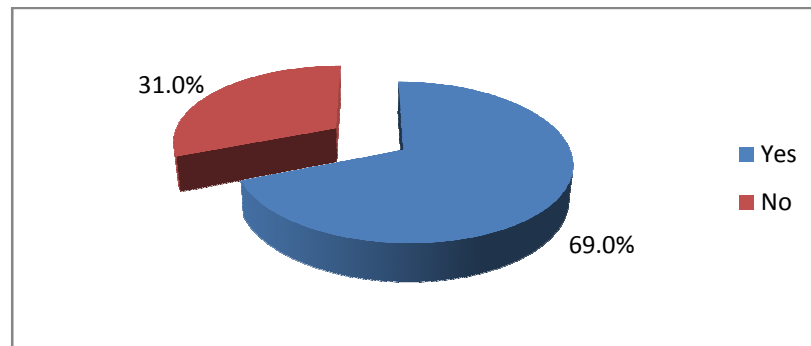


Figure 4.2 above shows that the majority 69 (69.0%) of the respondents agreed that Instruction based Formative Assessment was included in the college Lesson study programme while 31 (31.0%) indicated that it had not been included in the said program. This entails that, Instruction based Formative Assessment was included in the college lesson study program.

For the lecturers who responded positively that Instruction Based Formative Assessment was included in the lesson study programme, a further question was asked to them to rate the implementation of Formative Assessment in the lesson study program of the college. Their responses were as shown in Figure 4.3.

Figure 4.3: Rating of implementation of Instruction Based Formative Assessment in the lesson study programme (n = 100)

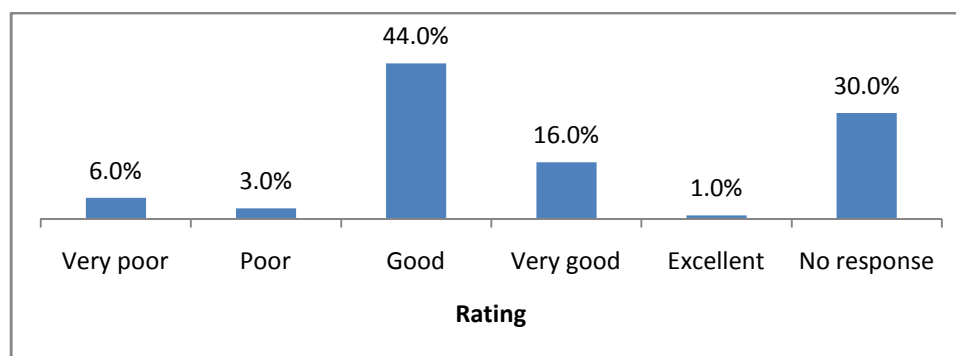


Figure 4.3 shows that the majority, 44 (44.0%) of the respondents rated the implementation of Instruction Based Formative Assessment in the lesson study programme as “good”, while 16 (16.0%) of the respondents rated the implementation as “very good”. Six (6.0%) of them rated the implementation as “very poor” while one (1.0%) respondent rated it as “excellent”. However, 30 (30.0%) of the respondents did not rate the implementation because the program was not included in the lesson study program. This entails that the implementation of Instruction Based Formative Assessment in the college lesson study program was good.

Type of Assessment used by lecturers during lectures

The respondents were asked the type of Formative Assessment that they used during lectures, their responses were as shown below in Table 4.15.

Table 4.15: Type of assessment used during lectures

Type of assessment	Frequency	Percent
Formative assessment	56	56.0
Summative assessment	30	30.0
Diagnostic assessment	7	7.0
not sure	7	7.0
Total	100	100.0

Table 4.15 reveals that the majority, 56 (56.0%) out of 100 lecturers used Formative Assessment during lectures, while 30 (30.0%) indicated that they used summative assessment during lectures. The rest of the responses were as shown in the table. This entails that type of assessment that the majority 56(56.0%) of the lecturers used during lectures was formative assessment.

Frequency of using the type of assessment

Respondents were requested to indicate frequency of how they used the type of Assessment that they used during lectures, their responses were as shown below in Figure 4.4.

Figure 4.4: Frequency of using type of assessment (n = 100)

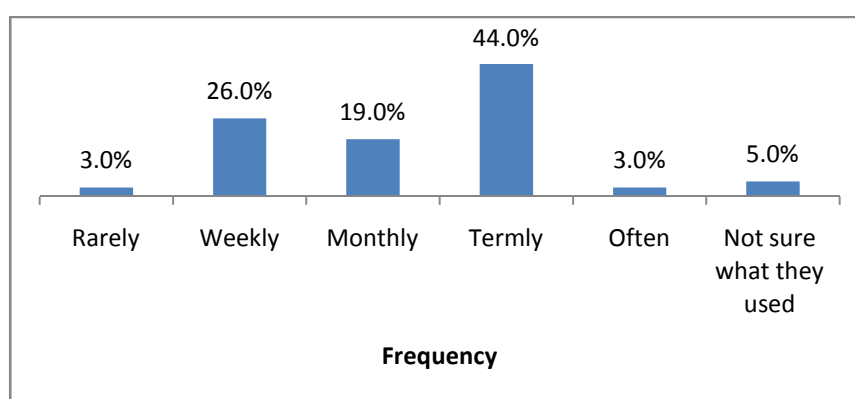


Figure 4.4 shows that the majority, 44 (44.0%) of the respondents indicated that they used them termly, while 26 (26.0%) of them said that they used weekly and 19 (19.0%) of the respondents used them monthly. Three (3.0%) of the respondents indicated that they used them rarely and another three (3.0%) indicated they used them often. However five (5.0%) of the respondents indicated that they were not sure how often they used them. This finding entails that formative assessment was used termly by the lecturers as indicated by the frequency 44(44.0%).

4.2.2 Predominant Instruction Based Formative Assessment Techniques used during lectures in Colleges of Education

Instruction Based Formative Assessment Strategies used during Lectures by Lecturers in Colleges of Education

When the lecturers were requested to indicate or choose any or as many Formative Assessment strategies as they used during lectures, the responses are shown in the table 4.16.

Table 4.16: Formative Assessment strategies used by lecturers during lectures in Colleges of Education

Type of assessment	Frequency	Percent
Providing feedback that moves learners forward in their learning	77	21.4
Activating or stimulating students as the owners of their own learning	60	16.7
Designing and engineering effective classroom discussions and other learning tasks that elicit evidence of student understanding	57	15.9
Activating or stimulating students as instructional(teaching and learning) resources for one another	55	15.3
Clarifying learning intentions and criteria	54	15.0
Allowing students share their understanding as owners of the learning intentions and criteria for success	53	14.8
I don't know	3	0.8
Total	359	100.0

a. Dichotomy group tabulated at value 1.

Table 4.16 shows that “providing feedback that moves learners forward in their learning” was the most used Instruction Based Formative Assessment strategy amongst the respondents as shown by the frequency of 77(21.4%) out of 359 responses. This was followed by the strategy “activating or stimulating students as the owners of their own learning” with the frequency of responses of 60 (16.7%).The strategy “designing and engineering effective classroom discussions and other learning tasks that elicit evidence of student understanding” came third as indicated by the frequency of 57 (15.9%) out of 359 responses, while the strategies “activating or stimulating students as instructional(teaching and learning) resources for one another”,, “clarifying learning intentions and criteria”strategy and“allowing students share their understanding as owners of the learning intentions and criteria for success”were the least used formative assessment strategies as indicated by the frequency of 55 (15.3%), 54 (15.0%) and 53(14.8%) out of 359 responses respectively.However the frequency of3(0.8 %) indicated that they didn’t know the type of formative assessment strategies that they used.These findings

indicate that the strategy of “providing feedback that moves learners forward in their learning” was the most used Instruction Based Formative Assessment strategy during lectures, amongst the lecturers in colleges of education.

Instruction Based Formative Assessment activities used by lecturers during lessons

When the respondents were requested to indicate or choose the Formative Assessment activities that they used during lectures, their responses were as shown Table 4.17.

Table 4.17Formative Assessment activities used by lecturers during lectures in colleges of Education

Formative Assessment activities used	Frequency	Percent
Getting students to peer assess their work	51	26.3
Using exemplars (samples of student work) for feedback	43	22.2
Getting students to be involved in re-assessing their own work with rubrics	40	20.6
Designing rubrics or scoring guides with students when giving assignments	28	14.4
Posting marking rubrics (marking schemes)	19	9.8
Posting student exemplars(samples of student work with identities hidden)	13	6.7
Total	194	100.0

a. Dichotomy group tabulated at value 1.

Table4.17 reveals that “getting students to peer assess their work” was the most used Instruction Based Formative Assessment activity during lectures amongst the respondents as shown by the frequency of 51 (26.6%) out of 194 responses, this was followed by “using exemplars (samples of student work) for feedback” formative assessment activity with a frequency of 43 (22.2%)while the formative assessment activity “getting students to be involved in re-assessing their own work with rubrics” came third as indicated by the frequency of at 40 (20.6%) out of 194 responses.This was followed by “designing rubrics or scoring guides with students when giving assignments” formative assessment activity as shown by the frequency of 28 (14.4%) responses.The least used formative assessment activity during lectures in colleges of education

were “posting marking rubrics (marking schemes)” and “posting student exemplars(samples of student work with identities hidden)” as shown by the frequencies of 19 (9.8%) responses and 13 (6.7%) responses out of 194 responses. This entails that the most used Instruction Based Formative Assessment activity during lectures amongst the lecturers, was the activity involving “getting students to peer assess their work” as indicated by the frequency 10(23.3%).

Rating of lecturers’ effectiveness in using Instruction based Formative Assessment during lectures

When the respondents were requested to rate their effectiveness in using instruction based formative assessment during lectures, their responses were as indicated in Figure 4.5 below.

Figure 4.5: Rating of effectiveness of lecturers in using Instruction Based Formative Assessment during lectures (n = 100)

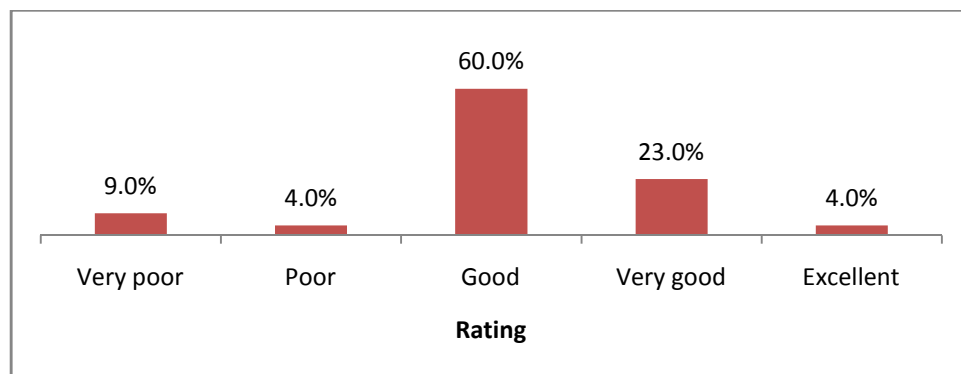


Figure 4.5 shows that majority, 60 (60.0%) of the respondents rated their effectiveness in using Instruction Based Formative Assessment as “good”; while 23 (23.0%) of them rated their effectiveness as “very good”; nine (9.0%) of the respondents rated themselves as “very poor” while four (4.0%) rated themselves as “poor” and another four (4.0%) rated themselves as “excellent”. This entails that the effectiveness of the use of Instruction Based Formative Assessment during lectures amongst the lecturers, in colleges of education was rated as good.

Rating of respondents' competence in using Instruction based Formative Assessment strategies and activities during lectures

When the respondents were requested to rate their competence in using instruction based formative assessment strategies and activities during lectures, their responses were as indicated in Figure 4.6.

Figure 4.6: Rating of competence of lecturers in using Instruction Based Formative Assessment strategies and activities during lectures in colleges of Education

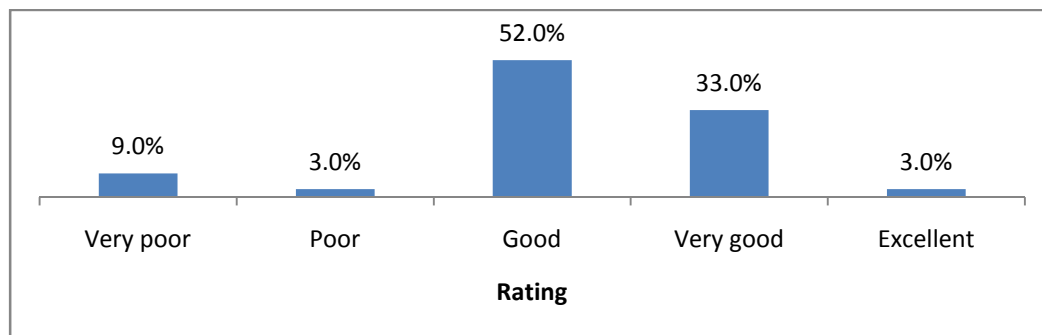


Figure 4.13 indicates that the majority of the respondents, 52 (52.0%) rated their competence in using Instruction Based Formative Assessment strategies and activities during lectures as “good” while 33 (33.0%) of the respondents rated their competence as “very good” and nine (9.0%) of them rated their competence as “very poor”. However, three (3.0%) of the respondents rated themselves as “excellent” and another three (3.0%) rated themselves as “poor”. This entails that the competence of the lecturers in the use of instruction based formative assessment during lectures was good.

4.2.3 Factors affecting the use of Instruction Based Formative Assessment in Zambia in Colleges of Education

When the lecturers were requested to indicate factors that affect the use of Instruction Based Formative Assessment during lectures, their responses were as shown in the table 4.18 below.

Table 4.18: Factors that affect the use instruction based formative Assessment during lecture

Factors affecting formative assessment	Frequency	Percent
Time limitation	54	34.6
Large class size	46	29.5
Student learning orientation	28	17.9
Inadequate training in formative assessment	24	15.4
Not sure	4	2.6
Total	156	100.0

a. Dichotomy group tabulated at value 1.

Table 4.18 shows that majority of the respondents pointed out “time limitation” as a major factor that affected use of instruction based formative Assessment during lecture as indicated by the frequency of 54 (34.6%) out of 156 responses, while the frequency of 46 (29.5%) responses of the indicated that “class size” was a factor. This was followed by “student learning orientation” factor indicated with a frequency of 28 (17.9%) out of 156 responses. and 24(15.4%) of the responses indicated that “inadequate training in formative assessment” was a least factor that affected the use of Instruction Based Formative assessment during lectures. However four (2.6%) of the responses indicated that they were not sure which factors affected Instruction Based Formative assessment during lectures. This entails that the major factor that affected the use of instruction based formative assessment during lectures among the lecturers was time limitation, as indicated by the frequency (15), followed by large class size with a frequency of 46(29.5)

4.3 Summary

This chapter covered presentation of the findings of the study on the use of Instruction based Formative Assessment in institutions of Higher Education in colleges of Education in Zambia. The chapter focused on the responses of the coordinators of CPD, coordinators of Open and Distant Education and Learning(CODEL) and lecturers in the Colleges of Education in Zambia. Presentation of the findings indicated that majority of the coordinators and lecturers were trained in classroom Formative Assessment and that the major mode of their training was regular CPD

meetings in Colleges of Education. Presentations also indicated that Formative Assessment had been included in the college's lesson study programmes and the implementation in the said programme was rated as good. The presentation further indicated that frequency of using Formative Assessment differed between lecturers and coordinators. On factors affecting implementation of Formative Assessment the presentation indicated time limitation and large class size as the significant factors.

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.0 Overview

This chapter discusses the findings of the study whose main aim was to evaluate the use of Instruction based Formative Assessment in Colleges of Education in Zambia. The findings of the study are discussed thematically with reference to the objectives of the study which were to evaluate the use of Instruction Based Formative Assessment, during lectures, in Colleges of Education in Zambia; to determine the predominant Instruction Based Formative Assessment techniques used during lectures; and to examine factors that were affecting the use of Instruction Based Formative Assessment in Zambian Colleges of Education.

5.1 Use of Instruction Based Formative Assessment during lectures in Colleges of Education in Zambia

Training and mode of training of coordinators (CPD & CODEL) and Lecturers in Instruction Based Formative Assessment

The findings on whether the respondents had been trained in Formative Assessment, revealed that the majority of the coordinators (19) and the lecturers (86) in colleges of Education in Zambia were trained in classroom based Formative Assessment. The study further revealed that the main mode of training in Formative assessment was Continuous Professional Development (CPD) regular meetings for both coordinators (15) and lecturers (42) in colleges of Education in Zambia. This mode of training for both coordinators and lecturers was followed by in-house training workshops in college. The findings of the study further revealed that the main area covered by the training in Formative Assessment for both coordinators and lecturers was “*classroom based assessment strategies*”. This topic was followed by “*giving feedback to students*”.

These findings on the training and mode of training of coordinators and lecturers in colleges of education seem to confirm the approach taken by Lead and Centre (USA), VVOB (Belgium) and MOESVTE (Zambia) in their partnership to improve the Quality of Education in Higher Institutions of Learning in Zambia. The training approach by the MOESVTE to train lecturers in

colleges of education in Zambia has been through the Continuous Professional Development (CPD) structures. CPD meetings are held regularly, in most Colleges of Education they are held at least weekly. The frequency of the meetings and low cost budget seems to account for why they have become a preferred mode of training as opposed to the high cost budget workshops and seminars.

The face value analysis of the mode of training used to train both coordinators and lecturers in formative assessment, reveals that CPD regular meetings was a preferred and more effective mode of training than in-house workshops and seminars in the Colleges of Education in Zambia. This can be deduced from the fact that both lecturers and coordinators were trained in formative assessment through the CPD regular meeting mode in the Colleges of Education and their competence to use it was rated as good. This finding is line with Kapambwe (2010) who observed, in his study of the Continuous Assessment (CA) pilot project in Zambia, that workshops and seminar used for capacity building in the project were not very effective in preparing teachers to implement the formative assessment in the pilot project. Some of the insightful factors contributing to this effectiveness phenomenon of the CPD training mode was that the CPD meetings are conducted more frequently than the workshops and seminars. This regular frequency of CPD meetings provides opportunities for the development of formative assessment skills competency.

Inclusion of Formative Assessment in the College Lesson Study programmes

On whether Formative Assessment was included in the Lesson Study programmes in the Colleges of Education, findings revealed that the majority of the coordinators and the Lecturers indicated that it had been included. Both Coordinators and Lecturers rated the implementation of Formative Assessment under the lesson study programme as “good”. This finding shows that Lecturers and Coordinators in colleges of Education were not only trained in Formative Assessment through the Continuous Professional Development (CPD) but that attempts to entrench it further, into the lecture planning and delivery cycle, were made by including it in the College Lesson Study programme. However the significance of the inclusion of Formative Assessment in the college lesson study programme and its impact on the delivery effect of the instruction-learning process in colleges of education in Zambia is still not yet clear, it still needs

to be fully appraised. Lesson study, is a regular professional programme where academic members of staff meet and demonstrate practical classroom pedagogy in order to ensure quality classroom practices when delivering lessons.

Type of Assessments and how frequently are used by Coordinators (CPD & CODEL) and Lecturers in Colleges of Education

The findings on the type of assessment mostly used by Coordinators and Lecturers during lectures, revealed a similarity of trends between the coordinators and the Lecturers. The findings revealed that the majority of both coordinators and the Lecturers used Formative Assessment during lectures. This was followed by “summative assessment” and the least used type of assessment was “diagnostic assessment” for both coordinators and Lecturers

The findings of the study further revealed that there was a disparity between coordinators and lecturers on how they frequently used Formative Assessment during lectures. The majority of the Coordinators reported that they used it weekly, while majority of the Lecturers indicated that they used it termly. From this disparity in the frequency of using Formative Assessment it be deduced that while both coordinators and lecturers reported that they used formative assessment, there was discrepancy in their understanding of the concept of Instruction Based Formative Assessment. This finding is consistent with Hanna and Dettmer (2004) who seem to imply that generally, most teachers and educators tend to mix up continuous assessment (an aggregate of several summative assessments) with Instruction Based Formative Assessment. Similarly Kamm (2011) also observes that to most educators, the term “assessment” tends to translate into summative product rather than the formative learning process.

In the Zambian context Kapambwe (2010) in his review of the continuous assessment (CA) pilot project in Zambia, observes that formative assessment in the project was linked to the CA scheme of assessment as such formal formative assessment techniques were used either weekly, Termly even annually to contribute to the cumulative CA of the learner. This seems to explain why the majority of both coordinators and lecturers indicated that they used Instruction Based Formative Assessment weekly and termly and not daily during lectures.

5.2 Predominant Instruction Based Formative Assessment techniques and activities used during lectures in Colleges of Education in Zambia

The findings on Instruction Based Formative Assessment strategies and activities used during lectures revealed that majority of both coordinators and lecturers mostly used the Formative Assessment strategy of *“providing feedback that moves learners forward in their learning”* during lectures. The findings further revealed that the majority of both coordinators and lecturers mostly used Formative Assessment activities that involved *“getting students to peer assess their work”*. From these findings it can be concluded that the most widely used Instruction based Formative Assessment strategy in colleges of education is *“providing feedback that moves learners forward in their learning”* and the most widely used Instruction based Formative Assessment activity during lectures was that which involved *“getting students to peer assess their work”*. These findings are in line with the study conducted by Lindsey (2013) on formative assessment practices in Africa. In the study it was observed that in most African countries the type of Formative Assessment strategies frequently used in the classroom were informal assessment strategies such as providing feedback to students while working on their tasks.

In most Zambian schools it's a common practice to request learners to exchange and compare their work in the classroom context. Especially in subjects like creative and technology studies the learner's work are sometimes displayed on the board. It must be noted that although these practices are used widely most times, there seems be a lack of empirical evidence to indicate that teachers consciously use these techniques as specific formative assessment techniques. This is so because teachers seem to rarely use the information from these practices to inform their instruction learning process orientation.

When the coordinators and lecturers were requested to rate their effectiveness and competency in using Instruction Based Formative Assessment during lectures in colleges of Education, the findings revealed a similarity in rating trends: majority of the both coordinators and lecturers rated themselves as *“good”* similarly both coordinators and lecturers rated their competency in using Instruction Based Formative Assessment during lectures as *“good”*. This indicates that the

competency and effectiveness of Lecturers and coordinators was good. This finding is in line with studies that examined formative assessment training conducted in Malawi(Miske, 2003), in Cameroon (Kanjee, 2009) in South Africa (Akom, 2010)and in Zambia (Kapambwe, 2010). The studies covered projects that trained teachers in general formative assessment. The findings of the said studies indicated that there were positive changes in the instruction process of the trained teachers. This entails that the teachers acquired skills and knowledge in formative assessment practices which made them rate their competency and effectiveness as good. Although the coordinators and the lecturers seem have acquired skills and knowledge in formative assessment which made them rate their competency and effectiveness as good, the significance of these competency levels were not evaluated by this study. However, Lindsey (2013) in her review of formative assessment training in Africa argues that there was a lack of concrete evidence on the impact of formative assessment training on the instruction-learning process. The observations of Lindsey (2013) could be attributed to the following: firstly, it was not clear from the studies and the reviews conducted, how significant was the impact of the training in formative assessment on instruction learning process orientation of the teachers. Another aspect that was not clear was whether there was a co-relationship between the training in formative assessment and the changes that were observed in the studies, which was not covered by this study.

5.3 Factors affecting the use of Instruction Based Formative Assessment during lectures by coordinators and lecturers in Colleges of Education

Findings on factors that affect the use of Instruction Based Formative Assessment during lectures in the Colleges of Education in Zambia revealed that the main factor cited by both coordinators and lecturers was the “time limitation”. Other factors included class size, student learning orientation and inadequate training in Instruction Based Formative Assessment. From the above findings it can be concluded that the significant factors affecting the use of Instruction Based Formative Assessment during lectures in colleges of education are time limitation and large class size. These findings concur with the observations made by the Ministry of Education, Science, Vocational Training and Early Education that large class size and time spent in school were among the several other factors that affected the delivery of quality education in Zambia. Similarly, Lindsey (2013) observed that large class size and time limitation, were some of the significant challenges that affected the implementation of Formative assessment in Africa

Zambia included. Time limitation was a factor in that most teachers had a fear that they would not complete the syllabus as they perceived formative assessment to be time consuming as compared to summative assessment (Kapampwe: 2010 and Lindsey:2013). This could be attributed to the traditional instruction-learning assessment orientation of most teachers and lecturers that focused on cumulative summative assessment of the Continuous Assessment (CA) paradigm as general formative assessment. Large class size was another factor affecting the use of formative assessment, in that in most African countries the classes were large this meant increased class workloads.

In the Zambian context in the primary, secondary and tertiary education levels it was not uncommon to find overenrolled classes. This implies that the teachers and the lecturers had a huge instruction work load. This workload tended to cause them to seek ways of lightening it even if it meant adopting teacher centered methodologies or adopting assessment of learning instead of assessment for learning techniques or summative assessment at the expense of formative assessment.

5.4 Summary

This chapter focused on the discussion of the findings of the study. The findings were that majority of the coordinators and the lecturers were trained in classroom Formative Assessment and the major mode of their training was regular CPD meetings in Colleges of Education. The findings revealed that lecturers were not only trained in formative assessment, but that efforts were made to entrench it in the college lecture planning and delivery cycle by including it in the college lesson study program. On the extent to which it was used, the findings revealed that Formative Assessment had been included in the college's lesson study programmes. The implementation, of instruction based formative assessment, in the said programme was rated as good by both coordinators and Lecturers. The findings further revealed that the frequency of using Formative Assessment differed between lecturers and coordinators. This implied that there was a disparity in understanding the concept of instruction based formative assessment between coordinators and lecturers in colleges of education. The findings also revealed that time limitation and large class size were the significant factors that affected implementation of Formative Assessment in Colleges of Education in Zambia.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.0 Overview

This chapter focuses on the conclusion and recommendations of the study on the Evaluation of the use Instruction Based Formative Assessment in institution of higher Education in Zambia. It also explores area of possible further research.

6.1 Conclusion

Following the interpretation and analysis of the study, the study shows that Instruction Based Formative Assessment is used by both coordinators and lecturers during lectures in colleges of education in Zambia. The study revealed that the frequency at which this type of assessment is used during lectures varied among coordinators and lecturers, in that coordinators indicated that they use it weekly while lecturers indicted that they used it termly. The disparity between ideal use of Instruction Based Formative Assessment which should be daily or during every lecture and that which educators actually used (which was weekly even termly) suggests that there is a general misconception of Instruction Based Formative Assessment. The study also shows that attempts to entrench formative assessment in the teaching learning process were made by including it in the college lesson study. Lesson study is a regular professional meeting where academic members of staff demonstrate practical classroom pedagogy

The findings of the study also showed that the predominant Instruction Based Formative Assessment technique used in Colleges of Education (by both coordinators and lecturers) was the technique that involved providing feedback that moves learners forward in their learning and the predominate Instruction Based Formative Assessment activity was that which involved getting students to peer assess their work.

On factors that affect the use of Instruction Based Formative Assessment in Colleges of Education in Zambia, the study showed that the predominant factors were time limitation and

class size. This finding on factors concurs with MOE who observe that time limitation and class size were among the several other factors that affect the delivery of quality education in Zambia.

6.2 Recommendations

- Administrators of colleges of education should ensure that lecturers in the college are given in-service training in student centred Instructional and assessment Strategies, which includes instruction based formative assessment, to equip them reorient a for High Institutions of Learning
- The Administrators of colleges of education in collaboration CPD coordinators should establish CPD policy of training and orientation of new lecturers in student centred Instructional and assessment strategies which emphasis instruction based formative assessment.
- Ministry of Education, Science, Vocational Training and Early Education-Teacher Education and Specialised Services, in collaboration with the administrators of colleges of education, should ensure that learner centred Instructional and assessment strategies, with an orientation towards instruction based formative assessment, is included as a specific component of the teaching methods training curriculum. This aspect should also be included in the school experience student appraisal monitoring tool.

6.3 Suggestions for further Study

- The study did not look at the correlation between instruction based formative assessment and learning effect in Colleges of Education in Zambia. There is need for a future comparative and correlation study on the effect of current instructional strategies and the Instructional Based Formative assessment strategies on learning effective in Colleges of Education.
- There is need for a future study on the effect of teacher training in formative assessment on the orientation of the lecturers and teachers in the instruction learning process of Teacher Education in Zambia.
- There is need for a future study on evaluation of the use of instruction based formative assessment during lessons in primary school education.

- There is need for a future study on evaluation of the use of instruction based formative assessment during lessons in secondary school education.
- There is need for a future study on instruction based formative assessment practices the primary and secondary school education

References

Ainsworth, L., & Viegut, D. (2006). *Common Formative Assessments*. Thousand Oaks: Corwin

Akom, G. V. (2010). *Using formative assessment despite the constraints of high stakes testing and limited resources: A case study of chemistry teachers in Anglophone Cameroon*. (Doctoral dissertation). ProQuest Dissertations and Theses database. (UMI No. 3470394).

Black and William (1998). Assessment and Classroom Learning. *Assessment in Education: Principles, Policy and Practice*, 5(1), 7-74.

Black, P., Harrison, C., Lee, C., Marshall, B., & Wiliam, D. (2003). *Assessment for learning: Putting it into practice*. Buckingham: Open University Press.

Bloom, B. (1968). Learn for Mastery, *Evaluation Comment*, 1(2), 1-12

Brown, A. L., & Campione, J. C. (1996). Psychological theory and the design of innovative learning environments: on procedures, principles, and systems. In L. Schauble, & R. Glaser (Eds.), *Innovations in Learning: New Environments for Education* (pp. 291–292). Hillsdale, NJ: Lawrence Erlbaum Associates.

Cauley K.M, McMillan J.H. (2010). *Formative Assessment Techniques to Support Student Motivation and Achievement*. The Clearing House. Washington: Vol. 83, Iss. 1; pg. 1, 6 pgs

Cowie, B. & Bell, B. (2001). The characteristics of formative assessment in science education. *Science Education*, 85, 536–553.

Dweck, C. (2000). *Self-theories: Their Role in Motivation, Personality, and Development*. Philadelphia: psychology press.

Greenstein, L. (2010). What teacher really to need to know about formative Assessment. ASCD
1703 North Beaveragard st

Guskey, T. R. (2007). Using assessment to improve teaching and learning. In Reeves, D. (ed)
Ahead of the curve: the power of assessment to transform teaching and learning.Bloomington
Solution tree press.

Hacker, D. J., Dunlosky, J., &Graesser, A. C. (Eds.) (1998).*Metacognition in educational theory
andpractice*. Mahwah, NJ: Erlbaum.

Harlen, W. (2006).On the relationship between assessment for formative and summative
purposes.In J. Gardener (Ed.) *Assessment and learning* (pp. 103-117). London: Sage Publications
Ltd.

Hattie, J., &Temperley, H. (2007).The power of feedback.*Review of Educational Research*,
77(1), 81–112

Hidi, S., &Harackiewicz, J. M. (2000).Motivating the academically unmotivated: A critical issue
for the 21st century.*Review of Educational Research*, 70(2), 151–179.

Jack, R. F., & Norman, E. W. (2003).*How to Design and Evaluate Research in Education*,
(5thed.). Boston: McGraw Hill Publishers.

Kamm, C. (2011).*Exploring Assessment as Process and Product*, The Leadership and Learning
Center www.LeadandLearn.com

Kanjee, A. (2009). Enhancing teacher assessment practices in South African schools: Evaluation
of the assessment resource banks. *Education as Change*, 13, 73–89.

Kapambwe, W. M. (2010). The implementation of school based continuous assessment (CA) in
Zambia. *Educational Research and Reviews*, 5(3), 99–107.

Kombo, D.K. and Tromp, D.L.A. (2006). *Proposal and thesis writing: An introduction*. Nairobi: Paulines publishers Africa.

Lindsey, P. (2013). Review of Formative Assessment use and training in Africa, *International Journal of School & Educational Psychology*, 1:2, 94-101.

Miske, S. (2003). *Proud pioneers: Malawian teachers implement continuous assessment in primary school classrooms*. Washington, DC: American Institutes for Research.

Popham, W. J. (2008). *Transformative assessment*. Alexandria, VA: Association for Supervision and Curriculum Development

Rogoff, B. (1995). Observing sociocultural activity on three planes: Participatory appropriation, guided participation, and apprenticeship. In J.V. Wertsch, P. del Rio, & A. Alvarez (Eds.), *Sociocultural studies of the mind*, (pp.139-164.) Cambridge: Cambridge University Press.

Sadler, D.R. (1989). Formative Assessment and the design of Instructional System. *Instructional Science*, 18, 119-144.

Scriven, M. (1967). The Methodology of Evaluation. In R.W. Tyler, R.M. Gagne & M. Scriven (Eds.) *Perspectives of curriculum evaluation* (pp.39-83). Chicago IL: Rand McNally.

Shepard, L. (2005). Linking formative assessment to scaffolding. *Educational Leadership*, 63(3), 66-71.

Sherpard, L., Hammerness, K., Darling-Hammond, L., Rust, F., Snowden, J.B., Gordon, E., Gutierrez, C., (2005) Assessment. In L. Darling-Hammond and J. Bransford (Eds.), *Preparing teachers for a changing world: What teacher should learn and be to do* (pp. 275-326). San Francisco: Jossey-Bass.

Shepard, L., Hammerness, K., Darling-Hammond, L., Rust, F., Snowden, J.B., Gordon, E., Slavin, R. E., Hurley, E. A., & Chamberlain, A. M. (2003). Cooperative learning and achievement. In W. M. Reynolds & G. J. Miller (Eds.), *Handbook of psychology, vol 7: Educational psychology* (pp. 177–198). Hoboken, NJ: Wiley.

Sternberg, R. J. (1994). Allowing for thinking styles. *Educational leadership*, 52(3), 36-40.

Stiggins, R. J. (2007) Assessment for learning: An Essential Foundation of Production Instruction. In Reeves, D. (ed) *Ahead of the curve: the power of assessment to transform teaching and learning*. Bloomington Solution tree press.

Stiggins, R. J. (1999). *Evaluating classroom assessment training in teacher education programs*. Educational measurement: issues and practices, 18 (1), 23-27.

Tuckman, B. W. (1994). *Conducting educational research*, (4thed.) New York: Harcourt Brace College publishers

Venture, S. (2011). *Formative Assessment*, The Leadership and Learning Center
www.LeadandLearn.com

William, D. (2007). Keeping learning on track: classroom assessment and the regulation of learning. In F. K. Lester Jr. (Ed.) *Second handbook of mathematics teaching and learning* (pp. 1053–1098). Greenwich, CT: Information Age.

William, D., & Thompson, M. (2007). Integrating assessment with instruction: What will it take to make it work? In C. A. Dwyer (Ed.), *The future of assessment: Shaping teaching and learning* (pp. 53–82). Mahwah, NJ: Erlbaum.

Yorke, M. (2003). Formative assessment in higher education: Moves towards theory and the enhancement of pedagogic practice. *Higher Education*, 45, 477-50.