

**THE USE OF QUALITY FORMATIVE ASSESSMENT TO IMPROVE  
STUDENT LEARNING IN WEST ETHIOPIAN UNIVERSITIES**

by

**FISSEHA MIKRE WELDMESKEL**

Submitted in accordance with the requirements  
of the degree of

**DOCTOR OF EDUCATION**

in the subject

**DIDACTICS**

at the

**UNIVERSITY OF SOUTH AFRICA**

**PROMOTOR: PROF. JM DREYER**

**NOVEMBER 2015**

## **ACKNOWLEDGEMENT**

First of all, I would like to forward my sincere appreciation and thankfulness to all individuals who contributed towards the successful accomplishment of my doctoral study at the University of South Africa (UNISA).

My study supervisor, Professor JM DREYER deserves the highest appreciation and thankfulness for the genuine advice, encouragement, suggestion, and guidance he offered to me. His contributions as well as reinforcement for the independent work had been inspiring and helpful to my learning.

Mrs CAROL JANSEN, I wish to express my gratefulness and sincere recognition to her for all contributions to this thesis.

My Family, Wife FANTU, Daughters Ruth and Martha, and Sons Tadael and Zerubabel for all the sacrifices they made when I was busy working on my thesis.

UNISA deserves my gratitude for providing me the chance to pursue my studies of excellence.

I sincerely appreciate the priceless contribution of Psychology educators and students of the three universities in which this study was conducted.

I also want to express my words of thanks to Jimma University and its management as well as the Ministry of Education (MoE) for full sponsorship of my study at UNISA.

Above everyone else, I am thankful to The Almighty God, for providing me the inspiration, well-being, and inner strength from the beginning to the end of my study.

## DECLARATION

I, FISSEHA MIKRE WELDMESKEL (45448388) declare that *“THE USE OF QUALITY FORMATIVE ASSESSMENT TO IMPROVE STUDENT LEARNING IN WEST ETHIOPIAN UNIVERSITIES”* is my own original work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references list.

\_\_\_\_\_

Date \_\_\_\_\_

Mr FISSEHA MIKRE WELDMESKEL

## **ABSTRACT**

The purpose of this study was to examine the ways by which student learning improvement and the self-regulation of learning are possible through the use of quality formative assessment in the teaching of a university course. In recent years, researchers in educational assessment are showing an increased interest to the improvement of learning resulting from the use of formative assessment. Formative assessment is generally recognised as an improvement oriented assessment. It is believed to result in instructional effectiveness. Quality formative assessment includes formative feedback, self-assessment and peer assessment. Previous studies show the contribution of each of these quality formative assessments to learning improvement. However, less attention has been given to studying the combined effect of quality formative assessments on learning improvement. On the other hand, the predominant use of summative assessment remains a challenge to the improvement in instruction. Thus, the question was to determine the extent to which the use of quality formative assessment improves learning. The literature review in this study show an over reliance upon summative assessment in the context of higher education classrooms. There is also recognition in that formative assessment improves learning and enhances self-regulation. This study followed a mixed-methods research design of the type partially mixed sequential and applied a quasi-experimental intervention, where the educators used quality formative assessment on lessons with the students in the intervention group. The quasi-experimentation was implemented with 378 (214 male and 164 female) first year students of three universities enrolled for “General Psychology” course and six educators who were teaching the course. The students in this study were taken from intact classes, because this is possible in quasi experimental research. Data for the quantitative part of the study were generated using a structured questionnaire and achievement tests. Interviews with the educators, focus group discussions with the students, and classroom observations were used to generate data for the qualitative phase of study. The pretest-posttest scores as well as the students’ perceptions on self-regulating learning were compared between the intervention (N =191) and the comparison (N = 187) groups. The quantitative analysis used different inferential statistics, which proved the presence of statistically significant variations between the intervention and comparison groups for the outcome measures (posttest achievement and perception about self-regulating learning). Although the qualitative study showed the presence of positive perceptions towards quality formative assessment, the practice was found to be inconsistent. Perhaps, this may be because of the predominantly summative assessment tradition and the reluctance to use quality formative assessment. Finally, recommendations were made to promote the use of quality formative assessment aiming at the improvement and the self-regulation on learning.

## **KEY CONCEPTS**

Quality formative assessment, formative feedback, self-assessment, peer assessment, learning improvement, self-regulation of learning, summative assessment, quasi-experiment, intervention group, comparison group

## LIST OF ABBREVIATIONS

AaL	Assessment as learning.
ADDIE	Analyse, design, develop, implement and evaluate. analysis.
ADRCs	Academic development and resource centres.
AfL	Assessment for learning.
AoF	Assessment of Learning
BEAR	The Barkley Evaluation and Assessment Research model.
Comp.	Comparison Group
EFL	English as foreign language students.
FDRE	Federal Democratic Republic of Ethiopia
HDP	Higher diploma programme
HERQA	Higher Education Relevance and Quality Agency for Ethiopia.
Interv.	Intervention Group
Mean diff.	Mean difference
MOE	Ministry of Education.
RPC	Reciprocal peer coaching
Sig	Significance
SRL	Self-regulated learning
TVET	Technical vocational education training
ZPD	Zone of proximal development

# **TABLE OF CONTENTS**

ACKNOWLEDGEMENT	i
DECLARATION	ii
ABSTRACT	iii
LIST OF ABBREVIATIONS	v
TABLE OF CONTENTS	vi
LIST OF TABLES	xii
LIST OF FIGURES	xiii

## **CHAPTER ONE**

### **ORIENTATION TO THE STUDY**

1.1	INTRODUCTION	1
1.2	THE CONTEXT	2
1.3	THE RATIONALE FOR AND MOTIVATION OF THE STUDY	3
1.4	BACKGROUND TO THE STUDY	4
1.5	PERSPECTIVES ON THE PROBLEM	9
1.6	STATEMENT OF THE PROBLEM	12
1.6.1	Aim and scope of the study	14
1.6.2	Specific research objectives	14
1.6.3	Main research question	15
1.6.4	Hypotheses	15
1.7	SCOPE OF THE STUDY	16
1.8	OPERATIONAL DEFINITIONS OF KEY TERMS	17
1.9	RESEARCH DESIGN AND METHODOLOGY	17
1.10	ETHICAL ISSUES	20
1.11	THE DIVISION OF CHAPTERS	20

## **CHAPTER TWO**

### **LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK OF THE STUDY**

2.1	LITERATURE REVIEW ON FORMATIVE ASSESSMENT	22
2.1.1	Introduction	22
2.1.2	Assessment	22

2.1.3	Formative assessment: Definitions and concepts	24
2.1.3.1	Definitions and concepts pertaining to formative assessment	25
2.1.3.2	The uses of formative assessment	28
2.1.3.2	Types of formative assessment	32
2.1.3.3	Elements of formative assessment	34
2.1.4	Self- regulated learning	41
2.1.5	Educators' and students' perceptions of formative assessment	44
2.1.5.1	Educators' perceptions of formative assessment	45
2.1.5.2	Students' perceptions of formative assessment	46
2.2	EVIDENCE FROM EMPIRICAL STUDIES	47
2.2.1	Introduction	47
2.2.2	Empirical evidence regarding formative assessment	48
2.2.3	Empirical evidence regarding feedback from educators	51
2.2.4	Empirical evidence regarding self-assessment	55
2.2.5	Empirical evidence regarding peer assessment	56
2.2.6	Empirical evidence regarding perceptions of educators and students	58
2.3	THEORETICAL VIEWS ON LEARNING AND ASSESSMENT	61
2.3.1	Behaviourist view on learning and assessment	62
2.3.2	Cognitive - constructivist views on learning and assessment	63
2.3.3	Socio-cultural view on learning and assessment	66
2.4	CONCEPTUAL FRAMEWORK OF THE STUDY	70
2.5	SUMMARY OF THE LITERATURE REVIEW	75

## **CHAPTER THREE**

### **RESEARCH DESIGN AND METHODOLOGY**

3.1	INTRODUCTION	80
3.2	THE RESEARCH PROBLEM	80
3.3	THE RESEARCH QUESTIONS AND HYPOTHESES	81
3.3.1	Research question 1	81
3.3.2	Research sub-question 2 and hypotheses 1	81
3.3.3	Research sub-question 3 and hypotheses 2	81
3.3.4	Research question 4:	82
3.4	RESEARCH PHILOSOPHY AND JUSTIFICATION	82
3.5	RESEARCH DESIGN AND JUSTIFICATION	85

3.5.1	The quantitative phase	86
3.5.2	The qualitative phase	87
3.6	JUSTIFICATION FOR DESIGN-BASED RESEARCH	89
3.6.1	Introduction	89
3.6.2	Instructional Design	91
3.6.3	The benefits of instructional design research	92
3.6.4	Origins of instructional design	93
3.6.5	Instructional design phases	94
3.7	VARIABLES OF THE STUDY	96
3.8	POPULATION AND SAMPLING TECHNIQUES	96
3.8.1	Population	96
3.8.2	Sampling techniques	97
3.9	DATA COLLECTION INSTRUMENTS	97
3.9.1	The questionnaire	97
3.9.2	Achievement tests	98
3.9.3	Individual interview guide	98
3.9.4	Focus group discussion guide	98
3.9.5	Classroom observations checklist	99
3.10	MEASURES TO ENSURE RELIABILITY AND VALIDITY	99
3.11	PILOT STUDY AND THE RESULTS	100
3.11.1	Introduction	100
3.11.2	Reason for the pilot study	101
3.11.3	Content validity and reliability estimation of the questionnaire	102
3.11.3.1	Content validity of the questionnaire	102
3.11.3.2	Reliability estimation of the questionnaire	103
3.11.4	Reliability of achievement tests	104
3.12	DATA COLLECTION PROCEDURES	104
3.12.1	Data collection procedures for the quantitative phase of the study	105
3.12.2	Data collection procedures for the qualitative phase of the study	105
3.13	DATA ANALYSIS PROCEDURES	107
3.13.1	Data analysis procedures for the quantitative phase of this study	107
3.13.2	Data analysis procedures for the qualitative phase of the study	108
3.14	ETHICAL MEASURES OF THE STUDY	110
3.14.1	Informed consent	110

3.14.2	Withholding information and deception	110
3.14.3	Credibility of the researcher	111
3.14.4	Confidentiality and anonymity	111
3.14.5	Study permission from institutions	111
3.15	SUMMARY OF RESEARCH DESIGN AND METHODOLOGY	111

## **CHAPTER FOUR**

### **RESULTS AND DISCUSSIONS**

4.1	INTRODUCTION	113
4.1.1	Presentation of biographical data	114
4.2	RESULTS OF THE QUANTITATIVE PHASE	116
4.2.1	Results of the baseline data	116
4.2.1.1	Self-regulated learning	117
4.2.1.2	Formative feedback	118
4.2.1.3	Self-assessment	118
4.2.1.4	Peer assessment	119
4.2.1.5	Pre-test achievement score	119
4.2.2	Analysis of post intervention quantitative data	120
	The post-test quantitative data are presented in the following sub-sections.	120
4.2.2.1	Results pertaining to the main research question	120
4.2.2.2	Research sub-question 1	122
(a)	Formative feedback	123
4.2.2.3	Research sub question 2	129
(b)	Biserial correlation for post-test achievement	132
4.2.2.4	Research sub question 3	133
(a)	Mean difference test	133
(d)	Effect size estimate (Cohen's d)	135
4.3	RESULTS OF THE QUALITATIVE PHASE	136
4.3.1	Introduction	136
4.3.2	Interpretation of the interview data	138
4.3.3	Summary of field notes from the focus group discussions	150
4.3.4	Summary of field notes for classroom observations	153
4.3.4.1	Use of formative feedback	153
4.3.4.2	Use of self-assessment	154

4.3.4.3	Use of peer assessment	155
4.4	DISCUSSION OF THE RESULTS	156
4.4.1	The practice of quality formative assessment	157
4.4.1.1	Formative feedback	158
4.4.1.2	Self-assessment	160
4.4.1.3	Peer assessment	162
4.4.2	Learning gains resulting from the use of quality formative assessment	164
4.4.3	Self-regulated learning resulting from the use of quality formative assessment	167
4.4.4	Perceptions on the use of quality formative assessment	169
4.5	SUMMARY	171

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

5.1	INTRODUCTION	173
5.2	SUMMARY	173
5.3	CONCLUSIONS	175
5.3.1	Research sub-question 1	175
5.3.1.1	Formative feedback	175
5.3.1.2	Self-assessment	176
5.3.1.3	Peer assessment	177
5.3.2	Research sub-question 2	178
5.3.3	Research sub-question 3	178
5.3.4	Research sub-question 4	180
5.3.5	Main research question	180
5.4	RECOMMENDATIONS	182
5.4.1	Recommendations in relation to the use of quality formative assessment	182
5.4.2	Recommendation for further research	185
5.4.3	Contributions of the study	185
5.5	LIMITATIONS OF THE STUDY	186
5.6	FINAL REMARK	186
	REFERENCES	188
	LIST OF ANNEXURES	i
	ANNEXURE 1	i

QUESTIONNAIRE FOR STUDENTS	i
ANNEXURE 2	vi
INTERVIEW SCHEDULE FOR EDUCATORS	vi
ANNEXURE 3	vii
FOCUS GROUP DISCUSSION GUIDE	vii
ANNEXURE 4	viii
CLASSROOM OBSERVATION SCHEDULE	viii
ANNEXURE 5	ix
SAMPLE LESSON PLAN TEMPLATE	ix
ANNEXURE 6	x
PRE-TEST ITEMS (FORM A)	x
ANNEXURE 7	xiv
POST-TEST ITEMS (FORM B)	xiv
ANNEXURE 8	xviii
CODING OF THE INTERVIEW DATA	xviii

### **LIST OF APPENDICES**

APPENDIX A	xxvi
APPENDIX B	xxvii
APPENDIX C	xxviii
APPENDIX D	xxix

## LIST OF TABLES

Table 2.1		
Conceptual framework of quality formative assessment		74
Table 4.1		
Biographical data of student respondents		114
Table 4.2		
Biographical data of the educators		115
Table 4.3		
Levene's equality of variances test		117
Table 4.4		
Mean perception ratings of formative feedback, standard deviations, and the percentages of true and not true responses.		123
Table 4.5		
Levene's equality of variance test		124
Table 4.6		
Students' mean perceptions of self-assessment		125
Table 4.7		
Comparison of self-assessment perception		127
Table 4.8		
Students' mean perception of peer assessment		127
Table 4.9		
Comparison of peer assessment perception		129
Table 4.10		
Achievement test score (post-test)		131
Table 4.11		
Perception of self-regulating learning (post intervention)		135

## LIST OF FIGURES

Figure 1.1 Map of Ethiopia	2
Figure 2.1 How constructivist learning informs this study	75
Figure 3.1 The steps on choosing the research philosophy, design and methods	84
Figure 3.2 Schematic diagram of the mixed-methods design	88
Figure 4.1 Pre-test achievement scores	120
Figure 4.2 A schematic diagram showing the research process that helped to answer the main research question in the study	121
Figure 4.3 Comparison of achievement test scores	130
Figure 4.4 Comparisons of self-regulation mean scores	134

# **CHAPTER ONE**

## **ORIENTATION TO THE STUDY**

### **1.1 INTRODUCTION**

This study project examined the effect of a quality formative assessment that was integrated with teaching to improve students' learning and self-regulation in a "General Psychology" course at three west Ethiopian universities. This chapter introduces the study. First, it presents the introduction and context of the study. Second, it discusses the rationale and motivation for the study. Third, it presents the background of the study and states the problem from the summative and formative assessment perspectives respectively. Next, the research problem is stated and the research questions and hypotheses are presented. Following that, the chapter describes the aim and scope of the study. After operational definitions of the main variables, the chapter gives a brief explanation on the research design and methodology followed in the study. Finally, the chapter discusses the ethical procedures followed and the division of chapter in the study.

In this study, quality formative assessment denotes the delivery of formative feedback by educators, peer-assessment and self-assessment, which contribute to the improvement and the self-regulation on learning and assessment. Learning improvement refers to differences in the students' test scores before and after the educators' use of quality formative assessment on lessons of the course. On the other side, self-regulation of learning refers to the students' perceptions on self-regulating their own learning before and after the period of instructional intervention in which quality formative assessment was used. The study implemented a mixed methods research of the type partially mixed sequential design where a main quantitative study was followed and supplemented by the collection and analysis of qualitative data.

The central objective of this study was to test the hypothesis stated as, "Quality formative assessment used in the teaching of a university course improves student learning." To test this hypothesis, the study used the approach of formative assessment suggested by Wiliam and Thompson (2007: 62) in a constructivist learning environment. The researcher collected data by using classroom observations, student-completed questionnaires and achievement tests. The educators who teach the course were also interviewed regarding their perceptions on the use of quality formative assessment. Besides, focus

group discussions were conducted to solicit the students' opinions on the practice of quality formative assessment in the teaching of the course.

## 1.2 THE CONTEXT

This study was carried out at three selected universities of west Ethiopia. Ethiopia is a country in the Eastern part of Africa. The country covers an estimated area of 1.25 million square kilometers with a population of over 75 million (The Federal Democratic Republic of Ethiopia [FDRE], 2007: 112). The country has a federal system of government. This federal system is comprised of nine regional states and two self-administration cities. There are thirty-one public universities in the country, which are spread throughout the nine regions and the two city administrations. Among these, six (6) of the universities are located in the western part of the country. Of the six universities, three of them were identified as the study area by simple random sampling technique.



**Figure 1.1 Map of Ethiopia**

Ethiopia has divided the education system into three levels. The first level is termed as general compulsory education. In total, the general compulsory education programme extends over ten years and subsumes eight years' primary and two years' general secondary education respectively. The second level is labelled as preparatory for higher education and the Technical and Vocational Education Training (TVET). The education and training at this level may last from two to three years.

The college preparatory education covers two years academic education before admission to a university study. The TVET programme lasts one to three years for vocational preparation in various fields such as nursing, teaching, construction and auto mechanics, to name a few. The third level is university education, which includes undergraduate and postgraduate study programmes in various fields. After attending a two year college preparatory education and passing the entrance examination for university admission, students enroll to study undergraduate programmes for a minimum of three years and/or a maximum of six years.

Ethiopia begun higher education programmes in the 1950s with the core mission of preparing a workforce, undertaking research and providing community services (Teshome, 2004: 4). However, before the past two decades, higher education in the country received scant attention in terms of expanding access and assure the quality and relevance of academic programmes (Ministry of Education [MOE], 1994). At present, the country is taking specific actions to ensure university education becomes responsive to both access and quality issues and contributes to the national strategy of economic growth and poverty alleviation (Ashcroft, 2004: 13). During the 2009 academic year, there were twenty-one universities nationwide. Currently, however, there are about thirty-one public universities and a few private universities in the country. Apart from expanding access, there are also endeavours to improve the quality of education programmes at the universities.

### **1.3 THE RATIONALE FOR AND MOTIVATION OF THE STUDY**

At present, the country accepts education and training as an instrument of development and poverty alleviation. To realize this, the country set educational objectives which reflect the needs of the society. Based on this, the country's Education and Training Policy that was stipulated twenty two years ago lists the following major objectives (MOE, 1994: 7-8).

- Develop the physical and mental potential and the problem-solving capacity of individuals by expanding education and in particular by providing basic education for all;
- Develop citizens who can take care of and utilise resources wisely, who are trained in various skills, by raising the private and social benefits of education;
- Educate citizens who respect human rights, stand for the well-being of people, appreciate for equality, justice, and peace, endowed with democratic culture and discipline;

- Develop citizens who differentiate harmful practices from useful ones, who seek and stand for truth, appreciate aesthetics and show a positive attitude towards the development and dissemination of science and technology in society; and
- Cultivate the cognitive, creative, productive, and the appreciative potential of citizens by relating appropriately education to environmental and societal needs.

In relation to university education, one of the specific objectives incorporated in the policy states: “To satisfy the country’s need for skilled human power by providing training in the various skills and at different levels” (MOE, 1994: 9). In line with this, the country is rapidly expanding higher education, and student enrolment is also increasing (Higher Education Relevance and Quality Agency for Ethiopia [HERQA], 2008). Moreover, there is a national concern and dedication to improve the quality and relevance of university education. On the other hand, the effects of formative feedback, peer assessment and self-assessment to the country’s university education had not been well studied and documented. Accordingly, research data on this particular area is lacking. Parallel to this, students in higher learning institutes have not been fully engaged in assessment practices, which can improve their learning (HERQA, 2008). For that reason, this study explored the ways by which quality formative assessment improves student learning and self-regulation on a university course. Thus, after the integration of quality formative assessment (formative feedback, self-assessment and peer assessment) on the lessons of a course, the study revealed the ways by which student learning and self-regulation on learning improves.

#### **1.4 BACKGROUND TO THE STUDY**

Researchers in educational assessment have realised the challenges on assessment practices (Stefani, 2005; Wilson & Scalise, 2006; Careless, 2007b). Specifically, formative assessment seems less practiced on teaching and learning. Michael Scriven was the first educator to coin the phrases “formative evaluation” and “summative evaluation” as used in training programmes by 1967 (Moodley & Potter, 2008: 3). Scriven labels formative, as an evaluation to be carried out to improve the effectiveness of a training programme. For instance, it helps to clarify learning objectives and provide feedback for the development of the programme. In contrast, Scriven describes summative evaluation as an evaluation carried out to recognise the worth of the training programme at the end. He also states, “Summative evaluation is more important than formative evaluation.” According to Scriven, formative evaluation targets at delivering information that facilitates continuous adjustment on an ongoing and

flexible educational programme. Later in 1969, Bloom changed the phrase from “formative evaluation” to “formative assessment” and used the concept along with mastery learning (Dunn & Mulvenon, 2009: 3).

In the article, named “Formative Assessment in Higher Education,” Yorke (2003: 479) applied certain functions to distinguish the techniques of summative and formative assessment. Thus, the function of summative assessment is to determine the extent the students attained curricular objectives. In contrast to this, the function of formative assessment is improving learning and performance by giving continuous information and feedback on the learning. For improving learning in the day-to-day teaching, the contribution of summative assessment may be relatively insignificant since educators mostly use it for the purpose of reporting final scores and grading (Elwood & Klenowski, 2002: 243). For example, Brown and Knight (1994: 30) forward the following point in relation to the limitations of summative assessment:

*... if the assessment is summative and infrequent; it encourages ‘surface’ learning that involves memorization and reproduction of information as opposed to “deep” learning that is characterised by a quest for understanding and an interaction with the new information, which is substantially rewarded in the learning process.*

On the other side, there are educators who argue for the improvement function of summative assessment (Shepard, 2000). In fact, it is well understood that formative assessment involves immediate feedback to improve learning and enhance achievement (Nicol & MacFarlane-Dick, 2006: 1). Therefore, it is sensible if educators collect quality evidence to prove that learning is indeed effective (IOWA, 2010: 6). Besides this, Brown and Knight (1994: 16) explain “formative assessment as provisional since educators discuss it and enter into negotiations about it as part of the process to improve future learning and performance.”

Elwood and Klenowski (2002: 244) and Clark (2011: 163) also make somewhat different distinctions based on assessment of learning and assessment for learning. In terms of this distinction, assessment of learning is used for final grading and reporting, which is similar to summative assessment. Opposite to that, assessment for learning is carried out to enable students improve learning and achieve the intended learning objectives, similar to formative assessment. Elwood and Klenowski (2002: 246)

suggest that assessment must be formative to improve learning and teaching, and must put the students at the centre of the learning and assessment practice.

At present conceptualisations on the subject of learning are changing from behaviourism to constructivism. Behaviourism was probably the dominant and long existing conceptualisation in systems of education. Many educators consider constructivism as a contemporary paradigm (Jonassen, 1991; Ertmer & Newby, 2013). In constructivism, the student is given a greater responsibility for learning and assessment (Nicol & MacFarlane-Dick, 2006). Parallel to this change of thought on learning and assessment, there may be a need to the use of quality formative assessment in teaching with the aim of developing and extending the learning in ways that are less likely to happen by summative assessment.

Assessment practices influence students' behaviour. In the early 1970s, researchers were reporting assessment as more influential on learning when compared to teaching (Gibbs & Simpson, 2005: 2). The way the student perceives assessment requirements determines how he/she attend, learn and study on the course. For example, studies about student teaching at prestigious universities on both sides of the Atlantic revealed that "students describe their learning and studying to be highly influenced by thier perceptions towards assessment demands." (Gibbs & Simpson, 2005: 4). There is also an assumption regarding the influences of assessment on what, how and how much students study (Elwood and Klenowski, 2002: 3). Students may assign their time for out-of-class activities in terms of assessment requirements. If students perceive the assessment task to be difficult, they may assign much of their out-of-class time for studying. Thus, it can be said that assessment considerably influences student learning at universities (Yorke, 2003: 495).

The literature on educational assessment (Black & Wiliam, 2004: 9; Careless, 2007b: 57) demonstrates the limitations on assessment practices in the context of higher education classrooms, showing the unreliability of assessment as a grading tool and raising serious questions on the over reliance to summative assessment. Consequently, since the 1990s, there has been an increasing attention towards the discussion on assessment practices in the context of higher education (James & Fleming, 2005: 32). This is important for university programmes because assessment is probably one of the key activities used by educators to actualise the improvement on learning (Brown, 2005: 81).

Therefore, because of the significance of assessment for the students' experience, it is important that educators understand the topic well (Careless, 2007a: 178). In the words of Jones (2010: 3), a major challenge to tertiary institutions is the task of preparing professionals for the world of work by ensuring graduates' capability when they begin professional practice. Because of this, the assessment practice for university courses delivery needs to be responsive to the improvement and the self-regulation of learning. In essence, universities must prepare students for a dynamic employment market that requires flexibility, adaptability and responsibility for one's own learning and development (Stefani, 2005: 57). In this case, quality formative assessment can play a significant role. To put this into practice, educators should not base assessment activities on tradition and what is easy to do (Brown, 2005: 83), because there is a strong conviction on the role of formative assessment to improve learning and achievement.

Quality formative assessment provides information to the students and the educator to evaluate and modify the instructional process. That means, it increases the educator's effectiveness to support student learning improvement (McMillan, 2003; Yorke, 2003). Similar to this, Black and Wiliam (2005:6) assert that formative assessment, if used as a learning evidence, will enable the educator to modify teaching techniques to satisfy learning needs, producing significant gains in student learning achievement and improvement. Thus, if university educators use quality formative assessment in the everyday instruction, student learning will improve. However, educators did not understand this concept or were reluctant to use formative assessment although they acknowledge its role in facilitating learning improvement (Yorke, 2003: 477).

Encouragingly, since the 1990s, assessment activities at universities are receiving increased attention. The attention mainly focuses on the philosophy and application of innovative practices to stimulate effective learning (James & Fleming, 2005: 32). Gibbs (1999: 370) believes that the practice and philosophy of assessment have changed over the last two decades. Gibbs explains that the change includes the use of performance assessments, portfolios and "authentic" assessments, which influence the improvement on learning positively. However, as James and Fleming (2005: 32) point out, there is still a culture of "traditionalism" even though the instructional advantages of quality formative assessment are recognised very well.

According to Stefani (2005: 51), assessment matters more than ever in the changing world of higher education as societal expectations from university graduates are also changing. It is essential to note that students at higher learning institutes should become reflective practitioners, and this concept of reflection is becoming a fundamental aspect of teaching and learning (Stefani, 2005). Besides, becoming reflective may have an effect on choosing the what and the *how* of learning assessment. Because of this, researchers in educational assessment suggest the use of quality formative assessment to enhance the opportunity for student learning improvement (Gibbs & Simpson, 2005; Careless, 2007b).

Based on the above points, the contribution of formative assessment to the preparation of reflective practitioners may require looking for alternative ways of classroom assessment practices. According to Yohannes (2005:9), one major challenge to the quality of education in Ethiopian higher learning institutes is the insignificant practice on formative assessment. As Stiggins (2001:22) states, educators still assess student learning (utilisation of assessment to check for learning than to benefit from learning) in ways their predecessors used to assess, because they lacked the chances of training concerning the use of innovative assessment practices.

At present, the constructivist paradigm of learning when compared to the behaviourists' view encourages students to acquire the necessary knowledge and skills for finding solutions to real world problems (Sun & Williams, 2004: 2478). The relationship of constructivist learning, which is characterised by students-centredness, goal-directedness and situated team learning activities to that of formative assessment lies in that both simplify self-regulated learning and the intellectual autonomy of the student (Brown & Knight, 1994: 32). In terms of both constructivist learning and formative assessment, the assumption is that the students negotiate their strengths and weaknesses with the educator by assessing, reflecting and taking responsibility for their own academic growth (Brown & Knight, 1994: 32). It is, therefore, important to study the extent of which learning improvement and the self-regulation on learning is possible by the application of quality formative assessment mediated within a constructivist learning environment.

Therefore, the intention of this study was to test the effect of quality formative assessment on the improvement of learning and assessment. The use of quality formative assessment requires integrating the assessment task within the learning task through formative feedback, self- assessment, peer

assessment and corrective measures (Careless, 2007a: 176). In addition, quality formative assessment may increase the autonomy and self-regulation skills of students. Following the presentation on the background of the study, perspectives on the problem in the topic of assessment are discussed in the section below.

## **1.5 PERSPECTIVES ON THE PROBLEM**

At present educational researchers are showing interest on researching the quality of instruction and assessment on university education (Yorke, 2003; Wilson & Scalise, 2006). The contribution of assessment to learning improvement is also recognised. In this regard, improvement oriented assessment techniques are being initiated. Suurtaman, Koch and Arden (2010: 400) state that the current approaches to classroom assessment are seen as shifting from a series of events to check knowledge acquisition towards a social practice giving recurrent insights to improve learning and influence instructional activities.

Black and Wiliam (1998a) indicate the presence of research evidence to the problems and limitations of current assessment practices. Some of the problems include the fact that assessment encourages rote learning and emphasises on the amount rather than the quality of learning. There is also an overemphasis on the grading function of assessment over the learning function. Diamond (2008:6) mentions two major problems on the assessment practices at higher education. The first is the lack of experience in using formative assessment. The second is the variation among learning targets, assessment techniques and the criteria educators use to assess student learning. Because of these reasons, since the past two decades assessment researchers given emphasis on investigating the theoretical and practical basis of assessment, which can enhance learning improvement (James & Fleming, 2005). As discussed under section 1.4 above, there are two major categories of learning assessment labeled as formative and summative respectively. While the former intends to provide information to improve future performance in learning, the later intends to determine the attainment of curricular objectives.

Educators argue that assessment information help not only to identify student misconceptions but also to show learning skills for improvement (Brown, 2005; Smith & Gorard, 2005; Careless, 2008). Perhaps, the connection between summative assessment and learning improvement is not always clear (Torrance & Pryor, 2001: 618). Summative assessment is not only a teacher led and a line-by-line

approach to curriculum implementation but also involves judgmental evaluation that makes weaker students feel stigmatised (Torrance & Pyor, 2001: 620). In summative assessment, the behaviourists' view of learning that stresses the association of stimulus and response, decomposability and de-contextualisation of knowledge informs student learning. As a result of this, assessing tends to become the sole responsibility of the educator. On the contrary, the conceptualisation on learning in line with cognitive psychology and the rise of the constructivist learning paradigm underscores the implication of formative assessment on student learning improvement (Klassen, 2005: 828).

Formative assessment aims at improving learning rather than just making judgmental evaluations (Brown & Knight, 1994: 7). Thus, educators should make formative assessment part of their classroom activities. In fact, there are arguments favouring formative assessment as learning improvement oriented (Smith & Gorard, 2005). Formative assessment can be applied in different settings, learning contents, types of knowledge and skill and education levels (Smith, 2009: 26). In comparison to summative assessment that is essentially measurement oriented, formative assessment simplifies to diagnose learning difficulties, give feedback and motivate students towards achieving the intended learning objectives (James & Fleming, 2005: 43). Likewise, formative assessment encourages the student to self-regulate learning (Nicol & MacFarlane-Dick, 2006). Careless (2008: 59) states that formative assessment that encourages self-regulated learning has the following three features:

- Assessment tasks as learning tasks, “when there is a constructivist association among the assessment, learning objectives and content”;
- Student participation in assessment to have the understanding of learning objectives, to involve standards and criteria setting, and to conduct self and peer-assessment; and
- Feedback as feed forward, to promote learning and envisage improvement in their future work and achievement.

Careless emphasises that, for the above stated features to happen; assessment tasks need to be integrated with instruction and focus on developmental aspects. In their article that discusses theoretical problems and empirical questions about formative assessment, Torrance and Pryor (2001: 615-616) identify two types of assessment, namely, convergent and divergent. According to their explanation, convergent assessment relies on pseudo-open questioning and assessment tasks, a linear view to curriculum, judgmental or quantitative evaluation, something given to the student by the

assessor. In contrast, divergent assessment relies on open-ended questioning and tasks, flexible views on the curriculum, descriptive rather than judgmental evaluation. Moreover, it focuses on how students think or whether they are right or wrong. Hence, Torrance and Pryor (2001: 622) label convergent assessment as summative, judgmental and divergent assessment as formative and diagnostic. In fact, both summative and formative assessments have their own functions in the curriculum practice. Regardless of this, several research outcomes seem to favour the formative one as a better assessment strategy to effect learning improvement (Yorke, 2003; Careless, 2007b). Moreover, there is a tendency to count on quality formative assessment matched to the contemporary constructivist paradigm of learning. Therefore, Frey and Overfield (2001: 6) suggest to educators to ask certain questions on their current assessment practices. Some of these questions are:

- How do I know if my students have learned?
- How do I assess whether students have achieved the learning objectives?
- How does assessment integrate with instruction in the classroom?
- How do feedbacks and comments on assessing work help students get better in their learning? How can I encourage and prepare students for peer and self-assessment?
- Moreover, how can students become main actors in instruction to enhance learning and explorations?

Bryan and Clegg (2006: 2) also forward the following question to educators: “Can you honestly claim that your assessment practice enhance learning experiences, provide useful and timely feedback, and help students to understand and recognise quality, and lead to improved performance?” To actualise student-learning improvement, students should learn actively rather than passively. Educators can accomplish this by using quality formative assessment. For instance, Mills, Bennet, Crawford and Gould (2009: 6) suggest the following activities concerning effective teacher support of learning by the use of formative assessment. These are, “set learning targets by involving students, use an ongoing and adaptive assessment activity, recognise curriculum changes that meet both students’ and public needs, and consider assessment as valuable when it changes educational practice to the desired educational objectives.” Quality formative assessment, when integrated with instruction brings about improvement in learning.

According to Yorke (2003: 478), the central aim on using formative assessment in instruction is learning improvement. However, Wilson and Scalise (2006: 643) report common problems in educational settings such as educators' disregard to practicing formative assessment practice. This problem may limit the purpose of assessment to rank-ordering of students rather than using it to scaffold learning. Similar to this concern, as classroom observations and research evidence reveal (Teshome, 2004: 14; Yohannes, 2005: 8), at the universities in Ethiopia, educators carry out assessment for a limited range of knowledge and skills by focusing on the memorisation and recognition of facts and rote learning. Such an assessment strategy may probably limit learning to the reproduction of facts and also reduce the probability of knowledge application in the future (Astin & Ontario, 2012: 15).

Researchers in educational assessment (Black & Wiliam, 1998a; Brown, 2005 & Careless, 2008) stress the need to base decisions about assessment more on evidenced best practice rather than on tradition and what is easy to do. In line with this understanding, this study attempted to examine the contribution on the use of quality formative assessment to the improvement of learning at a university course. The next section presents the problem statement of the study.

## **1.6 STATEMENT OF THE PROBLEM**

Students' active involvement in knowledge acquisition and application facilitates learning improvement. Educators can actualise this by the use of quality formative assessment in the teaching and learning process. Without formative assessment and feedback, students may spend time on practising incorrect skills, which might not enhance their learning. Black and Wiliam (1998a: 11) stress on the effectiveness of formative assessment for learning experiences, particularly when there are alignments of learning tasks with learning objectives and meaningful and timely feedback is present. For instance, effective formative assessment is a key to provide opportunities for the teacher to teach in Vygotsky's "zone of proximal development", where the teacher or a more experienced collaborating peer help the student to learn in the conceptual zone just beyond what he or she can reach alone (Torrance & Pryor, 2001: 624). This may have a positive implication for learning to improve.

The Education and Training Policy of Ethiopia promulgated in 1994 states that, as a curriculum component, assessment should receive greater attention at all levels of education (MOE, 1994:7). The policy document attaches greater significance to improvement oriented assessment. Regardless of the

intention on the policy document, the practice of formative assessment is almost non-existent to improve learning in the education and training sector of the country in general and in the higher learning institutes in particular (Teshome, 2004; Yohannes, 2005). For several reasons such as the lack on pedagogic skills, large class sizes and reluctance, educators tend to disregard applying formative assessment while teaching. Thus, the actual practice of formative assessment in courses is not in line with the stipulation on the policy document.

To produce competent graduates, educators at higher learning institutes should use quality formative assessment in instruction. Black and Wiliam (1998a) summarised an extensive number of studies demonstrating the importance of formative classroom assessment and feedback to learning improvement. Formative assessment contributes to learning because of the fact that it is learning-oriented, considers assessment tasks as learning tasks, involves students and provides continuous feedback to inform future learning (Careless, 2008: 1). However, assessment activities at present are by and large summative and dominated by assessing the development of lower level cognitions such as factual recall and recognition. Because of this, it is important to study the ways by which the use of quality formative assessment improves learning.

Even though researchers show that higher learning institutes have a call to examine assessment practices to support the improvement on learning (Boud & Falchikov, 2006; Hattie, 2009), the current practice reveal adherence to predominantly on the summative form of assessment. On the other hand, Williams (2008) reviewed studies focusing on the need to apply innovative assessment techniques both for their benefits to support learning and importance for lifelong learning and employment. Nonetheless, there is no indication of this change in the context of Ethiopian public universities. The quality of education in Ethiopian higher learning institutes is beset by many challenges (Teshome, 2004). Some of these are the limited application of formative assessment on lessons, reluctance and the change resistant behaviour of university educators and students (Yohannes, 2005). Because of the lack on the practice of formative assessment, a significant number of students achieve failing grades. As a consequence, learning improvement and quality learning remain at risk. Unless higher learning institutes introduce innovative assessment practices such as the integration of quality formative assessment, problem of quality education at the universities will remain a challenge.

To the knowledge of this researcher, no study was carried out with respect to the contributions of quality formative assessment to student learning improvement in Ethiopian universities. On top of that, the increased enrolment of students at higher education needs to be matched with a simultaneous improvement in the quality of learning. Therefore, this study was conducted with the intention of addressing the aim stated in the following section.

### **1.6.1 Aim and scope of the study**

The aim of this study was to examine the ways of improving learning by the integration and use of quality formative assessment in the teaching of a university course. The study used a constructivist-learning environment that integrates quality formative assessment in the instructional process. Quality formative assessment involves formative feedback, peer assessment and self-assessment. The study also examined the educators' perceptions with respect to the use of quality formative assessment and the impeding factors which influenced its application on lessons. The study attempted to discover the perceptions of the students and whether the use of quality formative assessment involved them in the self-regulation of their own learning and assessment. The study employed a partially mixed sequential research design in which the quantitative data were collected by questionnaire and achievement test administration before and after the use of quality formative assessment in a quasi-experimental intervention. The qualitative data were collected by means of classroom observations, interviews and focus group discussions. The study used this research approach to find empirical explanations pertinent to quality formative assessment's contribution to learning improvement. Therefore, the study set out to achieve the following specific objectives:

### **1.6.2 Specific research objectives**

- Devise an instructional design that uses quality formative assessment to improve learning;
- Examine how the use of quality formative assessment could improve student learning;
- Measure the independent and dependent variables to theorise and see the implications of quality formative assessment for improved learning;
- Study the university educators' perceptions on the use of quality formative assessment; and
- Find out the perceptions of students, whether the use of quality formative assessment influenced them on the self-regulation of learning and assessment.

In an attempt to achieve the above objectives, the study explored the extent of learning gains and improvements resulting from the use of quality formative assessment in the teaching of a university course. Hence, the study was guided by the following research questions:

### **1.6.3 Main research question**

The main research question formulated in this study was:

*“In what ways can the use of quality formative assessment improve student learning on university courses?”*

From the main research question, the following specific research questions were formulated:

- What is the present practice regarding the use of quality formative assessment in the teaching of ‘General Psychology’ course in Ethiopian universities?
- What is the extent of learning gain resulting from the use of quality formative assessment?
- To what extent can the use of formative assessment involve the students to self-regulate their own learning and assessment?
- What are the views the of educators on the use of quality formative assessment in the instructional process?

### **1.6.4 Hypotheses**

The hypotheses in this study were presented in the form of null hypotheses and alternative hypotheses. The null hypotheses symbolised by H<sub>0</sub> serve to test the state of the research variables on the population. The alternative hypotheses, which are symbolised by H<sub>1</sub>, serve to test the state of the research variables on the sample. While the alternative hypotheses were tested directly from the collected data, the null hypotheses were implicitly tested for in the results of the alternative hypotheses (Cozby, 2001). Therefore, the researcher stated the following hypotheses:

#### **Null hypothesis 1:**

There is no statistically significant difference in the learning gains between the students taught by the use of summative and formative assessment methods.

**Alternative hypothesis 1:**

There is a statistically significant difference in the learning gains between the students taught by the use of summative and formative assessment methods.

**Null hypothesis 2:**

There is no statistically significant difference between the intervention group and comparison group students in reporting their perceptions on self-regulating learning and assessment.

**Alternative hypothesis 2:**

There is a statistically significant difference between the intervention group and comparison group students in reporting their perceptions on self-regulating learning and assessment.

**1.7 SCOPE OF THE STUDY**

This study compared the learning achievement of two groups of students from different intact classes by using pre-test and post-test achievement measures. It allowed the students from the intervention group attending “General Psychology” to learn in a learning environment in which quality formative assessment was used in instruction. This course was chosen because it was commonly offered to students of different intact classes and groups. As a result, obtaining the students in their intact classes for intervention and comparison groups was possible. The study examined whether there were statistically significant differences in learning gain between the students in the intervention and the comparison groups. The study also endeavoured to discover whether the use of quality formative assessment improved the role of the students as self-regulated learners and assessment users. In addition, it studied the perceptions of university educators on the integration and use of quality formative assessment in their teaching practice.

The target population for this study were students from three different universities in west Ethiopia enrolled to take “General Psychology” course at undergraduate level. Students from two intact classes of each university and their educators participated in the study. The three universities included in the study were named as university A, B and C to safeguard for anonymity. Apart from following a harmonised curriculum on course delivery, all the universities in the country share similar legislations and practices with respect to the assessment of student learning. A quasi-experimental intervention that involved the use of quality formative assessment on lessons of the course lasted six weeks in two

segments, namely, two weeks for piloting the use of formative assessment and the quantitative data collection instruments and the remaining four weeks on the data collection for the actual study.

## **1.8 OPERATIONAL DEFINITIONS OF KEY TERMS**

**Quality formative assessment:** An assessment practice for which the main concern of the design and practice is to serve the purpose of improving students' learning. It involves formative feedback, self-assessment and peer assessment, students as assessment users, and is practised to bring about learning gains and improvement in student achievement.

**Learning gains:** The mean score difference of the pre-test and the post-test achievement of students in the intervention and comparison groups.

**Self-regulated learning and assessment:** In this study, this refers to the students' perceptions with regard to experiencing self-regulated learning and assessment during the instructional intervention period of the study.

## **1.9 RESEARCH DESIGN AND METHODOLOGY**

In terms of research paradigm, the study followed the pragmatic paradigm, because the researcher planned to conduct this study using a mixed method approach. A mixed-methods design is advantageous since it uses the strengths of both quantitative and qualitative methods (Creswell, 2009: 216), and the mixed use of research methods allows an expanded understanding of the research problem. The study followed the partially mixed sequential method that gives more weight for quantitative data collection that would be followed and supplemented by qualitative data. In terms of specific methods, this study followed a quasi-experimental research to augment the quantitative data collection. Hence, data were collected before and after quasi-experimentation of an instructional design that involved the use of quality formative assessment. The quantitative phase took the form of a descriptive survey and relied on data collected using questionnaire and achievement tests. According to Gay and Airasian (2003: 12), a descriptive survey is an appropriate method for studying the perceptions of many study participants regarding a certain phenomenon for it describes the way things are.

For the qualitative phase of the study, the researcher collected data using interviews with educators, focus group discussions with the students and classroom observations. The data collected by means of these techniques were used to supplement the quantitative data collected through questionnaire and achievement tests. As Gay and Airasian (2003: 15) suggest, the collection of data using various methods helps to obtain education characteristics of a broad coverage which permit the triangulation of data.

To select the samples for this study, the researcher used simple random sampling technique. For instance, three universities out of the six which are located in the western part of Ethiopia were identified through lottery method. From each of the universities included, two intact classes of students that were enrolled to study “General Psychology” course were randomly selected for inclusion in the intervention group in which quality formative assessment was integrated and used on lessons. Another two intact classes which were taking a similar course like the intervention group were also included as comparison groups to supply the quantitative data for the study.

The Ministry of Education in the country categorises the public universities by geographic clustering method. Hence, in the western part of the country, there are six universities, which belong to one cluster. Accordingly, out of the six universities in the cluster, three were identified by means of simple random sampling (the lottery method) and were included in the study. The three universities included in the study were named as university A, B, and C to safeguard their identity. On the other hand, to obtain intact classes for the quasi-experimental intervention, the classes enrolled for ‘General psychology’ course were identified, and four intact classes of each university were chosen by the technique of simple random sampling.

From each of the universities, students of two intact classes attending the above mentioned course took part in the study as an intervention group. On average, the number of students in one intact class was 45 (consisting of 30 males and 15 females). Thus, the number of student participants in the study, both in the intervention and comparison groups was 464. Students from many academic programmes in the universities enroll for the above-mentioned course. Therefore, the researcher chose this course because it simplified access to more than one intact class taking a similar course at the universities, which is helpful in quasi-experimental research that was applied for the quantitative phase of the study.

In addition, other students taught by the same educator in a given intact class also took part in the study as comparison groups, and supplied quantitative data on the dependent variables, which are the achievement test scores and the students' perceptions on the use of quality formative assessment and the self-regulation of learning. The reason to chose students from intact classes was based on the assumptions underlying quasi-experimental studies, in which the researcher can use naturally formed groups (Creswell, 2009: 219). Before the actual research began, baseline data were collected from both groups of students. The baseline data included the students' perceptions concerning whether the practice of formative assessment was integrated on lessons of the course, whether the use of quality formative assessment (if present) enhanced their self-regulation on learning and assessment, as well as the achievement test scores (pretest) from a chapter of the same course.

To collect data on the perceptions of the students on the use of quality formative assessment, a self-report questionnaire with alternative responses on a four-point Likert scale ranging from *always not true* (=1) to *always true* (=4) was used. The contents of the self-report questionnaire (see Annexure 1) filled-out by the students included enhancement of self-regulated learning and assessment (13 items), the practice and use of formative feedback on lessons (17 items), self-assessment activities (15 items) and peer assessment activities (12 items).

The achievement test score data were collected using a test prepared in consultation with the educators of the course. After the instructional intervention period, the data collection was repeated for items of self-regulation on learning and for the learning achievement (post-test). To supplement the data collected using questionnaire and achievement test, a few students from each intact class were involved in the focus group discussions. The focus group discussions aimed at eliciting further information on the general views of the students regarding the quality formative assessment used, the effects on learning and the contribution to the enhancement of self-regulation on learning and assessment. After attending a one day orientation on how to prepare a lesson plan template to guide the activities and use of quality formative assessment on lessons (see Annexure 5), the educators taught the students in the intervention group by integreting quality formative assessments on lessons. The researcher followed a structured observation procedure to observe and take anecdotal notes on the activities of the educators and the students in the classrooms while quality formative assessment was used on lessons. The observations concentrated on the actions of the educators and those of the students at the beginning, in the middle and at the end of a given instruction of a lesson. The classroom

interaction and the type of formative assessments used on lessons were also closely observed and recorded on a notebook.

After the instructional intervention, individual interviews were conducted with the educators who taught the course. The interviews were aimed at obtaining information on the educators' perceptions towards the use of quality formative assessment to improve learning and the factors, which impeded the effective implementation of quality formative assessment in teaching a university course. Therefore, to collect the required data which could help to achieve the set research objectives the study was conceptually situated within the paradigm of constructivist learning and the model on the use of quality formative assessment that was proposed by Wiliam and Thompson (2007: 62). This study was fitting to the mentioned conceptual framework because the framework proposes the active involvement of the student on improvement oriented learning and assessment including self-assessment, peer assessment and reactions to formative feedback (see more details on pp 70-75).

## **1.10 ETHICAL ISSUES**

Since this study followed a quasi-experimentation approach with regard to quality formative assessment use in the classroom context, consideration to ethical issues on research practice was a necessity. Therefore, this study maintained research ethics in three ways. First, the researcher obtained official written permission from the academic programme offices of the respective universities. Second, the researcher discussed the objectives of the study with the research participants and obtained their informed consent. Third, the researcher promised to behave confidentially regarding the data collected from research participants and to make it public when they agree.

## **1.11 THE DIVISION OF CHAPTERS**

After describing the background of the study, perspectives on the problem, problem statement, the aim and motivation of the study, it is essential to briefing the reader with a detailed explanation on the rest of the chapters in the study.

The second chapter of the study is a review of the related literature. This chapter has five sections. The first section presents the different conceptualisations on formative assessment. It discusses assessment, definitions of formative assessment, formative feedback, self, and peer assessment, self-regulated learning, and the perceptions of educators and students on the use of formative assessment. The second

section discusses the existing empirical literature on the use of formative assessment as it contributes to learning gains and improvements. The third section discusses the theoretical explanations on learning and assessment. This section briefly presents the theoretical framework used to inform the study. The section discusses learning and assessment as conceptualised by the behaviourist, cognitive-constructivist and socio-cultural perspectives on learning. The fourth section presents the conceptual framework to which this study is fitting. Finally, the last section of the chapter presents a summary of the main findings of the reviewed literature.

Chapter three presents the research design and methodology followed in the study. First, the chapter identifies the research philosophical paradigm followed in the study. Second, it discusses the rationale to use mixed method approach. Then, it gives detail descriptions on the quantitative phase, the qualitative phase, the mixing of the two, sampling procedures, and the data analyses and interpretation procedures followed in the study. The chapter also explains the procedures followed to design the constructivist-learning environment that integrates quality formative assessment, the research instruments, and the instructional intervention procedures followed.

The fourth chapter presents results and discussions of the study. It presents the descriptive and inferential statistical analyses results of the main study. The chapter also presents the results from the qualitative data obtained from observations, interviews and focus group discussions. The mixing of findings from the two phases of the study was made in the results and discussion sections of the chapter. Then after, the chapter ends by discussing the findings of the study with reflections in relation to the hypotheses set at the beginning of the study. Chapter five is the last chapter in this study. It presents the summary, conclusions and recommendations of the study.

## **CHAPTER TWO**

### **LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK OF THE STUDY**

#### **2.1 LITERATURE REVIEW ON FORMATIVE ASSESSMENT**

##### **2.1.1 Introduction**

This chapter presents the review of related literature on the topic of quality formative assessment. There are five sections in the chapter. The first section discusses the significance of quality formative assessment to learning improvement. The second section discusses the existing empirical literature on the use of formative assessment. The third section presents the main theories that inform learning and assessment. And the fourth displays the conceptual framework that informs quality formative assessment as used in this study. Finally, the fifth section presents the summary on the literature review.

##### **2.1.2 Assessment**

In the teaching of a course, one essential activity is learning assessment. Assessment is a significant task in instruction to let educators find out whether particular sequences of instructions have resulted in the achievement of intended learning outcomes (William, 2011: 3). According to Taras (2005: 466), “assessment is of central importance in learning, even though there is no commonality in the definition of the terminologies linked to it.” Taras (2005: 467) describes assessment as a judgment, which can be justified in terms of specific weighted set goals, yielding either comparative or numerical ratings. In terms of this definition, justifying the data-collection instruments or criteria, the weightings and the choice of goals is necessary. In addition, Taras argues for the necessity of adding additional stage, that is explanation of the judgment based on the stated objectives and criteria.

According to Crooks (1988: 438) assessment is the most powerful feature on teaching and learning, influencing learning. Assessment influences the effort, and time that the students allocate to a course. It is a useful activity to strengthen learning and direct the students’ thinking about what is important to study. Crooks (1988: 441) underscores the influence of assessment on student self-efficacy and motivation in learning. In effect, assessment exerts considerable influence on the development of

lasting, learning approaches. These learning approaches help the students to adapt and respond to new learning experiences.

Assessment is described as a procedure of information collection to make decisions on learning, curricula and programmes, and educational policy (Brookhart & Nitko, 2014: 16). Educators make several decisions concerning students' learning. Some of these include managing classroom instruction, identifying the strengths and weaknesses on students' learning, remedying learning difficulties, assigning grades, and providing guidance and counselling. In assessing learning progress, the collection and use of relevant information is necessary. Several techniques such as informal and formal observations of students, paper-and-pencil tests, performance in assignments, laboratory works, projects, research papers and questioning help to collect information for the purpose of assessment.

An assessment could help to raise the learning standards and the levels of student achievement. However, there might be problems regarding the practice to the type of assessment that improves learning standards and achievement. For instance, Black, Harrison, Lee, Marshal and William (2004: 9) identify three main problems in relation to assessment practices. These are:

- The assessment methods that teachers use are not effective with regard to promoting better learning;
- Grading practices tend to emphasise competition rather than personal improvement;
- Assessment feedback often has a negative impact, particularly on low-achieving students, “who are led to believe that they lack ability” and so are not able to learn. These problems may also be evident in the context of higher learning institutes.

According to William (2011: 7), the word “assessment” was primarily used to pronounce the procedures of appraising the usefulness of instructional activities when the learning was finalised. Educators did not consider the activities in the learning process before the completion of the instruction as assessment procedures. In general, among educators, there was an emphasis on the summative form of assessment more than the formative form of assessment.

It was only about four decades ago that those scholars in the fields of educational assessment began to conceptualise assessment as having summative and formative forms. Here, Scriven (1967) made the

classic distinctions between the two in the context of course development and programme evaluation. Scriven envisioned two roles of evaluation, now termed as assessment. Formative evaluation is the process of assessing the merits of a curriculum when there is still a chance to its improvement (Scriven, 1967). In contrast, assessing the values of the final curriculum was termed as summative evaluation. Nevertheless, Scriven noted the uncertainty of differences between the two. After Scriven's formulation of the classic distinctions between summative and formative evaluation, a gradual separation of the two evolved based on their differences in function (Taras, 2009: 59).

After substituting the word "evaluation" for "assessment," Bloom, Hasting and Maduas (1971: 4), label summative and formative assessments as dichotomies. They coined the phrase "formative assessment" to denote the use of feedback on assessments of relatively short learning episodes which finally make up the basis for mastery learning to simplify individualised instruction (Taras, 2009:59).

According to Taras (2005: 466), the practice of formative assessment directs to summative assessment, which sums all assessment evidence up to a given point. Similarly, standards, goals, and criteria help to make a decision in the process of formative assessment (Taras, 2005: 467). However, besides the judgment, formative assessment involves a feedback that shows the presence of a "gap" between the expected performance standards and the actual learning assessed. It also provides direction to the educator and the students on how to improve the learning to reach the expected standard. The focus of formative assessment is assessing and using feedback and the focus of summative assessment is a learning product (Taras, 2005: 468; Popham, 2006: 3). For Sadler (1989: 120) formative assessment contrasts with summative assessment because the former involves feedback to show the gap in understanding and guide the student to use the feedback information to improve future learning.

### **2.1.3 Formative assessment: Definitions and concepts**

This sub-section of the literature review focuses on three major areas that relate to formative assessment. These are definitions and concepts, uses, types and elements of quality formative assessment. Regarding the definitions and the concepts, the views of different scholars are discussed. With respect to formative assessment use, the available literature shows several uses on "identifying the gap between what students have learned" (Taras, 2009: 59), and what they should learn, increasing student motivation, learning improvement, and adjustment on instruction. Formal and informal

formative assessments are also discussed as the major types of formative assessment. The elements of quality formative assessment known as formative feedback, self-assessment, and peer assessment are also discussed in detail. The self-regulation of learning as a consequence of using quality formative assessment is also briefly discussed under this sub-section.

### **2.1.3.1 Definitions and concepts pertaining to formative assessment**

Summative assessment provides a final judgment on students' learning achievement. And it also emphasises on the extent of the students' change in knowledge resulting from instruction. In contrast, formative assessment provides feedback on an ongoing instruction and focuses on how the students are changing in the learning process. Formative assessment is less formal and helps the educator to improve instruction by guiding students. Although educators collect the results of formative assessment, they seldom use the information to report official grades or achievement standards (Nitko, 2004: 12).

The more contemporary paradigms on learning consider assessment as part of the learning process rather than an end point in the learning episode (Careless, 2008: 3). According to these paradigms of learning such as constructivism, the situated nature of cognition and the social interactions in the learning environment influence the level of learning. The paradigms place different expectations on the students while learning (Rawlins, 2007: 62). The new paradigms regard the student as active participant in communities of practice rather than passive recipient of knowledge (Robbins & Aydede, 2009: 2). Consequently, the views on learning and the active role of the student provide prospects for assessment practices in line with the learning improvement agenda. Black (2004: 5) remarks the presence of a growing thoughtfulness to the interaction between learning and assessment, with expectations that learning improvement may happen by improving assessment classroom assessment activities.

Researchers in the field of educational assessment define formative assessment in many different ways. Most of the definitions indicate the existing conceptualisations on learning and assessment. For example, Shepard (2005b: 3) argues, "the official definition of formative assessment to be the one that best fits the research base from which one derives its claims of effectiveness." Correspondingly, as Shepard points out, there is a general agreement in that "What makes formative assessment, formative is its immediate use to make adjustments to form new learning" (p5).

An assessment carried out to improve instructional effectiveness and student learning is formative assessment (Shepard, 2005b: 3). Looney (2011: 21) defines formative assessment as “a frequent and interactive assessment of student progress and understanding to identify learning needs and adjust instruction appropriately.” Formative assessment is nothing more than the process a classroom teacher would use to monitor how well his/her students are grasping a particular lesson or standard and the feedback needed to adjust the lesson plan, so that all students can master the concept (s) being taught (Labay, 2011: 5).

Formative assessment is an assessment activity that supports learning through the provision of feedback information as a consequence of which the educator and the students improve instruction and learning activities (Black, *et al.*, 2004: 12). Here, the evidence obtained through assessment activities help to address the students’ needs by improving instruction. Popham (2006: 2-3), also holds a similar view. For him, an assessment is formative to the extent it assists in the adjustment of instruction with the aim of meeting the learning needs of the students assessed. Kahl (2005: 28) and Trumbell and Lash (2013: 5) describe formative assessment as the tool the educator use to identify the specific misconceptions and mistakes made by the students while the instruction is ongoing.

Black and Wiliam (1998a: 8) define formative assessment as an activity carried out to find evidence that can be used as feedback to adjust instruction. Assessment is a purposeful activity in which the evidence benefits the educators and the students to adjust the ongoing learning and instruction (Dunn & Mulvenon, 2009: 2). As Wiliam (2011: 12) explains, the evidence obtained from formative assessment provides information on the appropriate techniques of instruction, which possibly lead to learning improvement.

On the other side, Elwood and Klenowski (2002: 244) and Clark (2011: 163) conceptualised formative assessment by classifying it into two categories as “assessment for learning (AfL) and assessment as learning (AaL).” AfL centres the student and is used to examine the progress towards a desired goal, seeking to narrow the gap between the student’s level of learning and the desired learning outcomes. It involves activities such as discussing on the expected learning objectives, performance criteria, questioning and feedback which help in the attainment of the desired learning objectives. In contrast, assessment as learning supports autonomous learning and self-assessment as well as peer participation in learning and assessment. In assessment as learning, students have the

opportunity to plan and share each other's learning targets and criteria for success (Clark, 2011: 163). According to Clark, educators may design assessment for learning and assessment as learning "to encourage a real-time feedback loop between teacher and student and among peers." Hence, Clark (2011: 163), states that educators can design assessment for learning in such a way that:

*... the students are able to understand clearly what they are trying to learn and what is expected of them, given immediate feedback about the quality of their work and what they do to make it better, given advice about how to sustain improvement, fully involved in deciding what needs to do next, and aware of who can give help if they need it and have full access to such help.*

Furthermore, Clark (2011: 163) formulated the two key principles underlying assessment as learning. These principles state as follows:

*... the students should be able to build knowledge of themselves as students and become meta-cognition, and take more responsibility for their learning and participate more in the process of learning with their teacher as their advisor and with their peers in a climate of equality and mutuality.*

The definitions and discussions presented above help to comprehend the meaning of formative assessment as it is used in the present study. From the definitions and discussions, one can recognise the presence of both commonalities and differences in the conceptualisations of formative assessment. The definitions label formative assessment as an ongoing activity aiming at the identification of learning needs, "gaps" for improvement and student progress on the path to achieving learning objectives. There is also an emphasis on the importance of identifying student misunderstandings on learning and the provision of feedback information to modify instruction and improve future learning.

The definitions reveal the different conceptions on learning and assessment held by educators. For instance, the definitions by Kahl (2005) and Labay (2011) limit the practice of formative assessment as a teacher's activity, perhaps stressing on the behaviourist conception of learning and assessment. The definitions provided by Black & William (1998a), Black, *et al* (2004) and Popham (2006) consider the

interactive nature of formative assessment to involve students, which, in this case, corresponds to a constructivist conception of learning and assessment. In contrast, the definition of formative assessment by Shepard (2005b) belongs neither to the behaviourist nor to the constructivist paradigms of learning and assessment.

### **2.1.3.2 The uses of formative assessment**

In the context of higher education, assessment has many uses. Assessment provides information about learning progress, teaching effectiveness and programme and institutional accountability. Educators in higher education obtain information on the effectiveness of their teaching from assessment results (Yorke, 2003: 479). In their article entitled “Does your assessment support your student learning?” Gibbs and Simpson (2005: 4), refer to assessment as a means of providing information on how well students are learning and how they can improve performance in their future learning.

In particular, formative assessment plays a significant role in the improvement of student learning and achievement. For instance, Williams (2008: 398) believe in the power of formative assessment to produce unprecedented improvement in student learning and achievement gains. As Heritage (2007: 140) asserts, effective use of formative assessment can provide sufficient information to move learning forward. The use of formative assessment improves students’ knowledge and skills (Bennett, 2011). Nevertheless, there is a limited understanding and application of formative assessment in the context of higher education (Duckor, 2014: 29), despite the pressure on universities to enhance their teaching and the quality of student learning assessment (Hattie, 2009: 15).

The actions of the teacher (or student) based on formative assessment information may cause improvement in terms of knowledge and skills. While emphasising the significance of formative assessment in education, Dunn and Mulvenon (2009: 1) forward the following, an almost unchallenged belief in education is that research has conclusively demonstrated that the use of formative assessment simplifies improvement in instructional practices, identifies ‘gaps’ in the curriculum, and contributes to increase student performance. The literature on formative assessment reveals the presence of limited empirical evidence resulting in notable improvements on educational outcomes. As discussed earlier, assessment researchers categorise assessment into summative and formative assessments respectively. Leahy, Lyon, Wiliam and Thompson (2005: 21) describe the two categories of assessment as they relate to quality learning as follows:

*... traditional approaches to instruction and assessment involve teaching some given material, and then, at the end of teaching, working out who has and has not learned it, which is a quality control approach. In contrast, formative assessment involves adjusting teaching while the learning is still taking place, which is a quality assurance approach.*

Assessment is formative when the course teacher and the students use the information to make adjustment on the instruction to address the needs of students (Popham, 2006: 3). Shute (2008: 154) argues that the current assessment practices are problematic because the information from the assessment is not used, as teachers can and should do with respect to adjusting teaching. In formative assessment, teachers can use the assessment information promptly to make instructional adjustments and to inform new learning (Shepard, 2005a: 70). Yorke (2001: 478) also states the intention of formative assessment as the provision of necessary information to modify and guide teaching towards improving instructional effectiveness and benefiting student learning. Formative assessment becomes effective when timed, so that the teachers and the students use the information for immediate as well as for future learning.

After examining 250 studies regarding current classroom assessment practices, Black and Wiliam (1998a: 36) recognise that formative assessment has a more profound influence on student learning than other typical instructional interventions, producing effect sizes between 0.4 and 0.7. Specifically, the authors assert that the practice of formative assessment is advantageous for low-achieving students. The explanation for the latter finding may be that formative assessment assists to develop metacognitive skills and increases the motivation of low achieving students in a different way. Cognitive research also informs that, when students examine their learning and metacognition, the chance of improved achievement increases (Shepard, 2005a: 68). Labay (2011: 5) considers formative assessment practice effective, particularly for low achieving students. Black and Wiliam (1998a: 13) also recommend the use of formative assessment to narrow the gap between low and high achieving students while raising the overall level of achievement for all students.

More importantly, formative assessment increases students' motivation and involvement in the learning process. Looney (2011: 7) explains that when students are "motivated and actively involved in

the learning process,” their learning can be enhanced. In this regard, Labay (2011: 8) shows that student motivation and involvement provide clear information about what they know and can do, what still needs to be learned and how to reach the next steps on the pathway towards the learning objectives. Besides to this, quality formative assessment encourages students to become learning-oriented, motivated about more engagement in schoolwork, use more self-regulation skills and develop a deeper understanding of the subject matter they learn (Shepard, 2005b: 10).

Another important use of formative assessment is the identification of the gap between what students have learned and what they should learn. Sadler (1989: 120), for example, believes the identification of the gap between a student’s learning and some desired educational goals as one essential use of formative assessment. Recognition of the differences between what students know and need to know and where instruction will be most effective to meet the desired learning is the key in formative assessment practice (Brandt & Pinhok, 2009: 5). Formative assessment is helpful for students to compare their assessment performance with the standard performance (Brookhart, 2003: 158). In relation to this, Brookhart (2003: 162) suggests the following three preconditions that can help students benefit from the improvement of their learning because of formative assessment:

- First, students must understand the learning goals;
- Second, students must develop the ability to monitor their work and compare actual with desired performance;
- Third, students must develop the ability to act in such a way as to close the gap that involves setting their own learning goals. Here, the teacher’s role is “to identify and build on immature, but maturing structures and, through collaboration and guidance,” facilitate cognitive growth.

Therefore, effective formative assessment identifies what the student can achieve on his/her own, “and with the help of the teacher or experienced” peer. This may enable the teacher to adapt the teaching to bridge the gap between the student’s current state of learning and the desired state of performance (Heritage, 2007: 142).

Early behaviourist views on formative assessment assume that assessment is used by the teacher to adapt teaching (Rawlins, 2007: 12), while seeing the student as passive recipient of knowledge and not

user of assessment feedback to inform learning. In contrast, the current literature describes formative assessment as a pedagogical approach that promotes learning through the feedback to the teacher and to the student on present understanding and skill development. Certainly, the principal purpose of formative assessment is to guide both the teacher and the students in co-developing the next steps on the learning process through feedback information (Rawlins, 2007:14).

Effective feedback of teachers provides clear, descriptive and criterion-based information that shows students where they are in a learning progression. In the claim of Heritage (2007: 142), “effective feedback shows how students’ understanding differs with the desired learning goal, and how they can move forward.” As Heritage (2007: 141) explains further, because of the feedback, the teacher takes “steps to bridge the gap between the students’ current learning” and the intended learning by modifying instruction, assessing again, to provide further information about learning and modifying the instruction again.

Formative assessment improves learning when students are actively involved in their own assessment (Yorke, 2003: 478). It is possible, to make formative assessment supportive of the students’ active participation and regulation on learning. As a result of close connection between learning and assessment, helping the students to regulate their learning requires the effective use of quality formative assessment. Educators should use quality formative assessment to let students assume responsibility for learning and become more autonomous to regulate their own learning. Accordingly, assessment empowers students to develop self-awareness, self-motivation and self-regulated learning skills (Zimmerman, 2002: 66). In addition, when students are involved in formative assessment, they can develop self-and peer assessment skills, which in turn, enable them to acquire knowledge of their present cognition and develop expectations for future improvement. For this purpose, the students employ metacognitive processes, develop self-regulation tactics and adapt their learning techniques to meet their own learning needs (Heritage, 2007: 142). In relation to the student’s role, conceptualisations on pedagogical practices that encourage the use of assessment in making students autonomous are still in the process of development (Rawlins, 2007: 72). Popham (2006: 5) proposes four issues that can make a major difference in the educational payoff of formative assessment. These are:

*...involving students actively in the use of formative classroom assessments,  
distinguishing between formative assessments intended for teacher-use and those*

*intended for student-use, constructing formative assessments so that the information they provide is maximally informative to the intended recipients and, having formative assessment's locus of control situated as close to the classroom as possible.*

Similar to the above, to ensure its use in the improvement of learning, Leahy, *et. al* (2005: 21) describe the main uses of effective classroom formative assessment as follows:

*...effective formative assessment clarifies and shares learning intentions and success criteria, generates classroom discussions, questions, and learning tasks, provides feedback that steps students forward, activates students as owners of their own learning, and activates students as instructional resources for one another*

### **2.1.3.2 Types of formative assessment**

Education assessment scholars distinguish formative assessments as formal and informal. For example, Bell and Cowie (2001: 84) describe formative assessment as formal or planned and informal or interactive. Shevelson, Young, Ayala, Brandon, and Furtak (2008: 300) also explain formative assessment in a continuum from formal to informal. To label formative assessment as either formal or informal, the authors taken the extent of planning involved, the formality of the assessment information, “the type and quality of feedback given to students” into consideration. Accordingly, they locate three anchor points on the continuum, such as planned-for-interaction formative assessment, formal and “embedded- in- curriculum formative assessment and on-the-fly formative assessment. The following paragraphs discuss on formal formative assessment and informal formative assessment.

#### **(a) Formal formative assessment**

Formal formative assessment is a somehow planned assessment by the educator with a focus on obtaining information from a whole class. Planned-for-interaction formative assessment is a deliberate action by the educator. Here, the teacher may construct central questions on the learning goals to locate the level of student knowledge and future expectations to meet standards (Shevelson, *et al.*, 2008: 301). For example, the educator plans the questions he/she will ask during instruction to enable

the students explore ideas. The questions can help to elicit valuable assessment information for the educator as well as for the students (Heritage, 2007: 142).

The other form of formative assessment in the continuum is embedded-in-the-curriculum formative assessment that comes “ready-to-use.” Educators or curriculum developers place formal assessments in an ongoing curriculum to create goal-directed teachable moments. According to Shevelson, *et al* (2008: 301), “embedded assessments inform the educator about what students currently know, and what they still need to learn (that is ‘the gap’) so the teacher can provide timely feedback.” Heritage (2007: 141) divides curriculum-embedded formative assessment into two categories. The first is what happens to classroom routines, and the second is obtaining feedback on certain significant learning episodes.

### **(b) Informal formative assessment**

Informal formative assessment is an assessment in which the educator applies during everyday teacher–student interactions. It refers to the different procedures that educators use to collect information on the students’ understanding on a continual basis (Primo & Furtak, 2006: 230). As Dutch (2003: 45) argues, the educator can use informal formative assessment in the daily classroom talk, at any level of teacher-student interactions, whether one-on-one, small group or whole class. Informal or interactive formative assessment focuses on obtaining information about student learning whenever possible, in any student–teacher interaction. Shevelson, *et al* (2008: 300) label this form of assessment as “on-the-fly formative assessment that arises when a “teachable moment” requiring the correction of the students’ misconceptions unexpectedly occur in the learning process.” For instance, this may arise when a teacher observes students performing group tasks and listening to a student sharing an incorrect idea with the group. As noted by Heritage (2007: 141), on-the-fly formative assessment occurs spontaneously during instruction. Consequently, the assessment information requires the teacher to use a pop-up lesson that enables the clearing up of misconceptions before moving forward with the planned instructional sequences. On the other hand, the effectiveness of informal assessment practices can also be determined by diversity and relevance of the strategies (questions and type of statements) used by the teacher (Primo & Furtak, 2006: 230).

### **2.1.3.3 Elements of formative assessment**

According to the conceptualisations made in the present study, quality formative assessment elements include formative feedback, self-assessment and peer assessment, which contribute to learning improvement and the self-regulation of learning.

#### **(a) Formative feedback**

Formative feedback is a well-recognised element of formative assessment. Shute and Kim (2008: 1) define formative feedback as information given to the student with the intention of modifying his/her learning and behaviour. Hattie and Timperley (2007: 81) conceptualise formative feedback as an information delivered by an agent (for example, teacher, peer, parent, self and experience) about aspects of a student's understanding or learning performance. Researchers in educational assessment (Hattie & Timperley, 2007; Shute & Kim, 2008; Lipnevich, McCallen, Miles & Smith, 2014) acknowledge the importance of formative feedback on learning improvement, although it is the least understood feature in instructional design and learning process (Gamlem & Smith, 2013: 152). Sadler (1989: 135) regards feedback as a central feature of formative assessment, calling for teachers and students to have a clear understanding on the knowledge and skills needed, review current student progress, and clarify ways for the improvement of student performance. In Clark's (2011: 166) words, feedback supports the notion that students are given guidance on how to improve learning as a consequence of formative assessment practice. In fact, it is important to note that feedback is a crucial element of formative assessment with the strongest research base that is, the largest number of studies. However, unfortunately feedback is not always or even usually successful (Shepard, 2005b: 9).

The notion that says feedback improves learning had its origin in Thorndike's idea of the 'law of effect' (Kluger & DeNisi, 1996: 258). The 'law of effect' links positive feedback with reinforcement and negative feedback with punishment. However, as Kluger and DeNisi argue, the "law of effect" appears to be too broad to explain the empirical complexity associated with feedback interventions on student learning.

In the 1950s, following Thorndike's idea, the notion of "knowledge of performance" or "knowledge of results" was introduced, with the assumption that the knowledge of performance increases learning and the motivation to learn (Bird & Yucel, 2015: 510). According to these

authors, the effect of feedback intervention on performance have never been consistent or simple. There is also little theorisation concerning how feedback intervention might influence performance. To conceptualise how feedback works, Kluger and DeNisi (1996: 259) propose the feedback intervention theory underpinned by the following three basic assumptions:

- Behaviour is regulated by comparison of feedback with goals, standards and identification of gaps between the two;
- Attention is limited, and only those feedbacks-standard gaps that receive attention actively participate in behaviour regulation;
- Feedback interventions change the locus of attention and therefore influence behaviour.

Educational assessment researchers acknowledge the provision of feedback as an essential feature of effective teaching-learning in higher education (Hounsell, McCune, Hounsell, & Litjens, 2008). Specifically, feedback that participates the students actively in the process is effective. In line with this, Wilson and Lizzio (2008: 2) argue that simplifying the initiation of students' involvement with performance in, and response to feedback from assessment is a justified priority on both theoretical and practical grounds. According to research reports summarised by Shute (2008: 161), "non-evaluative, supportive, timely and specific" type of feedback is the one that helps to learning improvement. Shute (2008: 162) recommends the presentation of feedback as follows:

*...formative feedback is usually presented as information to a students in response to some action on the students's part. It comes in a variety of types (for example, verification of response accuracy, explanation of the correct answer, hints, and worked examples) and can be administered at various times during the learning process (for example, immediately following an answer, after some time has elapsed).*

Feedback is a useful tactic to bring about an improvement in learning. It may be effective if students act on the information given to improve future learning. Feedback from an educator is a source, which students could use to evaluate "their progress and check out their own internal constructions of goals, criteria, and standards" (Nicol & MacFarlane-Dick, 2006: 206). Feedback can also help to encourage self-regulated learning. Besides this, as Hattie & Timperley (2007: 92) propose, "an educator need to

make correcting judgments about when, how, and at what level that he/she could provide the right feedback to benefit teaching.”

Effective feedback benefits students to improve their learning. For instance, because of the feedback given after an assessment task, students may increase their efforts, particularly when such effort leads to do “more challenging tasks or appreciate higher quality experiences” instead of just doing “more.” (Hattie & Timperley, 2007: 90). As Kluger & DeNisi (1996: 260) assert, students are likely to increase their efforts when the intended goal “is clearer, when high commitment is placed upon it and when belief in eventual success is high.” Effective feedback may also help students develop self-feedback skills, which guide them towards achieving the learning objectives. The self-feedback skill is extremely powerful when the students’ information and understanding to direct and regulate their learning is insufficient (Hattie & Timperley, 2007: 100).

In their article entitled “The power of feedback,” Hattie and Timperley (2007: 88-90) propose three important questions in which students are expected to answer from effective feedback practice. The first question is “where am I going?” This refers to the information given to students about the learning task and achievement standards of the associated learning goals. According to these authors, answering such a question through feedback allows students and “their teachers to set further appropriately challenging goals.” The second question is “How am I going?” that refers to the aspect of feedback termed as the feedback dimension. Answering this question requires the provision of information on the task or performance goal, often relative to some expected standards, to prior performance, and to the success or failure of a specific part of the assessment task by the teacher or peer, task, or self. “Feedback is effective when it consists of information about student progress on how to proceed” (Hattie & Timperley, 2007: 89). The third question is, “Where to next?” This leads to the likely answer of “more” feedback and greater possibilities for learning. Factors that ease learning include enhanced challenges, greater self-regulation of the student over the learning process, greater fluency, more tactics, processes to work on the tasks, deeper understanding, and more information on what they do not understand.

In addition to what has been stated, the available literature divides assessment feedback into summative and formative types respectively. The summative type of feedback takes the form of a judgment on a piece of student work and a single statement about the quality of work (Randall &

Mirador, 2003: 518). In comparison to that, educators propose the formative type of feedback to help on the acquisition of information on how to advance towards achieving learning standards (Hattie & Timperley, 2007: 80). In Clark's (2011: 162) view, feedback becomes formative when it engages the students in metacognition, supports them to think about their thinking, helps them conceptualise the match among prior performance, present understanding, success criteria and activation as owners of learning.

In Clark's (2011: 162) explanation, feedback becomes formative when it reaches to the students with scaffold instruction or thoughtful questioning to serve as prompts for a sustained and deeper discussion. Such an approach to feedback helps to narrow the gap between the students' current level of cognition and the targeted goal of learning and understanding (Clark, 2011: 162). In relation to this point, Gibbs and Simpson (2005: 9-10) suggest the following idea:

*...this can happen if feedback is frequent, timely, sufficient and detailed enough, can be linked to the purpose of assessment task and criteria, is understandable given the students' level of sophistication, "focuses on learning rather than marks by relating explicitly to future work and tasks, communicates clear and high expectations, and focuses on performance rather than on students themselves.*

Further discussions on effective feedback relate to the focus of the feedback information either on the task performance or on the student as an individual. Formative feedback that focuses on the task performance rather than on the individual student is more effective. Based on the reactions by the student, educators classify formative feedback as task-oriented and ego-oriented (Careless, 2008: 5). Ego-oriented feedback is characterised by the provision of a numerical mark and judgment on the individual student. In contrast, task-oriented feedback is characterised by suggestions on how to improve the performance. Kluger and DeNisi (1996: 261) report the possibility of different learning gains by the application of the two types of feedback identified. Feedback was found to have little effect when it is ego-oriented than when it is, task-oriented. In a study with respect to feedback and the self-regulation of learning, Butler (1988: 4) argues for task-oriented feedback to improve student performance and ego-oriented feedback to discourage performance. Hattie and Timperley (2007: 96) also noted ego-oriented feedback as directed to the self, often unrelated to performance on a task, and rarely effective. In particular, this type of feedback has disadvantages for low achieving students.

According to Shute (2008: 175), useful and effective feedback is determined by three situations, namely, motive, meaning that the students needs it, the “opportunity when the students receives the feedback in time to use,” and the means, implying that the students are willing and capable of using the feedback.

On the usefulness of formative feedback, the large body of literature reveals conflicting findings and inconsistent results (Shute, 2008: 175). For instance, Kluger and DeNisi (1996: 274) noted a variety of feedback effects on student performance and learning, including negative findings. However, several meta-analysis studies reported that feedback generally improves learning with effect sizes ranging from about 0.4 SD to 0.8 SD and higher (Kluger & DeNisi, 1996: 275). Regardless of the presence in the variability of feedback effects, Hattie and Timperley (2007: 120) assert that, compared to the 100 factors known to predict student achievement, the effect size of feedback is in the top five to ten. Thus, they concluded, “Feedback is among the most influential factors in student learning improvement.” As the opinion by Hattie (2012: 18) shows the arguments underlying most of the researches conducted in the area are that good feedback can improve learning and student outcomes significantly if delivered correctly with only a few studies reporting that feedback has either no effect or has weakening effects on student learning.

### **(b) Self- assessment**

Self-assessment is an element of formative assessment that provides the students with the chance of self feedback to broaden their understanding and improve learning performance. According to Andrade’s (2010: 3) explanation, self-assessment is one element of formative assessment by which the student reflects on the quality of his/her own learning performance. In this explanation, there is an emphasis on the role of the student although proper guidance from the educator is also important. Self-assessment is different from self-evaluation because the former is not used to assign grades. Instead, it remains in draft form to inform the revision of work and improvement. When properly implemented, self-assessment significantly contributes to the improvement of student learning (Andrade & Valtcheva, 2009: 14; Andrade, 2010: 3).

Self-assessment facilitates for the active participation of students in learning (Black, 2014: 3). The participation of students in assessment prepares them to answer three important questions: Where am I

going, Where am I now, and How do I close the gap? (Sadler, 1989: 139). The teacher alone cannot “close” the gap for the students, because the students are partners in the learning and assessment activities. According to Andrade (2010: 5), “self-assessment is a crucial element of formative assessment because; it involves the students in thinking about the quality of their learning rather than depending on the educator for their assessment and feedback needs.”

Furthermore, self-assessment is helpful to identify the areas of strengths and weaknesses on students’ work to facilitate for learning improvement. When students identify their strengths and weaknesses, they might have a greater chance to regulate their learning. In the words of Andrade and Valtcheva (2009: 15), the purpose of self-assessment is to improve learning and achievement and to promote academic self-regulation. In general, the formative nature of self-assessment and the opportunity it gives to student involvement makes it one of the essential instructional activities to actualise learning improvement. Active involvement of students in self-assessment has been linked with marked improvements in performance (Andrade, 2010: 6).

Educators suggest several ways to engage students in self-assessment. For instance, Andrade and Valtcheva (2009: 14) and Andrade (2010: 5), suggest the following steps to engage students in effective self-assessment. The first step is articulation of expectations on the assessment task either by the students, by the educator, or both. The second step is criticism on the completed assessment work against the articulated expectations. Finally, the students use on the self-assessment feedback to guide the revision of their work.

There are only a few research reports about the benefits of self-assessment. For example, Andrade and Du (2007: 164-165) reported five main findings regarding the benefits of self-assessment.

- Students’ attitudes toward self-assessment tended to become more positive as they gain experience in it;
- Students felt they could self-assess effectively and were more likely to self-assess when they know what their educator expected;
- Self-assessment involved checking progress followed by revising and reflecting; and

- Students noticed multiple benefits of self-assessment as it helps them focus on key elements of the assignment, learn the task well, increase their effectiveness in identifying strengths and weaknesses of their work, increase their motivation, mindfulness, and self-confidence.

Self-assessment may have short-term and long-term effects. In the short-term, it influences students' performance in a given assignment or assessment task. Andrade and Valtcheva (2009: 15) encourage educators and researchers to take advantage of the current knowledge under which self-assessment likely succeeds to improve learning. Ross (2006: 8) also suggests the following activities in implementing self-assessment. These are, defining "the criteria by which students assess their work," teaching how to apply the criteria, giving feedback on their self-assessment and supporting in using self-assessment information. Besides the above-mentioned situations, Andrade and Valtcheva (2009) recommend sufficient revision time after the use of self-assessment.

### **(c) Peer assessment**

Different forms of assessment have been receiving attention in the last decades (Sluijsmas, Dochy, & Moerkerke, 1999: 301). Educators consider peer assessment as one element of self-assessment (Sluijsmas, *et al.*, 1999: 300). For instance, by commenting and judging on the performance of other students, a student might gain insight into his/her own learning and performance. Bostock (2000: 1) defines peer assessment as a student assessing the performance of another student to benefit the learning of both. For Topping (1998: 250), a student assesses another student's work to consider the amount, level, value and worth of the performance. Peer assessment is an assessment technique that aims at empowering students and improve the quality of their learning (MacDowell & Mowl, 1996: 132).

To further the discussion, peer assessment is an effective means to develop the competencies needed by students because its exercise results in the integration of instruction and assessment at higher education. In stating the benefits of peer assessment, Sambell and McDowell (1998: 392) emphasise on its significance "in the development of autonomous, responsible, and reflective" students. According to Sluijsmas, *et al* (1999: 300), peer assessment is not only a grading activity but also it is a learning activity that promotes the students' learning skills development.

Peer assessment has several advantages in connection with learning improvement. Bostock (2000: 1-2) mentions the following advantages of peer assessment for student learning. These are a sense of ownership on assessment, students' responsibility and autonomy, consideration on assessment as a feature of learning, long-term transfer on assessment skills and encouragement on deep learning.

After examining the effectiveness of an experimental arrangement on peer assessment practice, Keaten and Murphy (1993: 1) state peer assessment as an important aspect of the group grading process. Besides to this, peer assessment encourages high levels of responsibility among students. However, the students must be fair and accurate in the judgments they make on the performance of their peers (Raes, Vanderhoven & Schellens, 2013: 182). For instance, there should not be a great deviation on the information from the peer assessment and the educator assessment. Sluijsmas, *et al* (1999: 300), report the presence of high levels of agreement between the marks given by peers and those given by educators. According to these authors, experience showed that peer assessment is supportive because students can have a greater chance of involvement in learning and assessment.

#### **2.1.4 Self- regulated learning**

Self-regulated learning can be taken as one outcome on the use of quality formative assessment in teaching. Over the last twenty years, the ways researchers write about learning and assessment in higher education have been changing (Nicol & MacFarlane-Dick, 2006: 201). Researchers tend to propose different approaches to learning and assessing, which can help with the improvement on learning. One proposed approach that forms the basis for "student-centred learning" is the self-regulation on learning. Andrade (2010: 2) proposes that there is a need to expand an understanding of the students' role in learning, as well as the practicable tactics of scaffolding self-regulated learning and assessment. Although self-regulation has received little attention in the literature of formative assessment (Andrade, 2010: 3), researchers perceive the self-regulation on learning as a set of meta-cognitive, motivational and behavioural tactics which benefit the student to control and manage learning outcomes actively (Pintrich 2000: 454).

Conceptually, self-regulated learning is a method by which a student sets goals for learning and then attempt to monitor, regulate and control his/her cognition, motivation, and behaviour to achieve the learning goals (Pintrich, 2000: 456). For Zimmerman (2002: 65), "self-regulated learning is a self-directed activity by which a student transforms his/her mental abilities into academic skills" and show the initiative in the learning activity. Formative assessment plays a key role to increase the self-

awareness and the self-regulation skills by students. For example, formative assessment guides student judgments about what is important to learn, and influence the perceptions on competence (Shepard, 2005b: 7). Hattie and Timperley (2007: 93-94) also discuss self-regulation as follows:

*...self-regulation involves interplay between commitment, control, and confidence. It addresses the way students monitor, direct, and regulate actions toward the learning goal. It implies autonomy, self-control, self-direction, and self-discipline. Such regulation involves “self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals” and can lead to seeking, accepting, and accommodating feedback information.*

Self-regulated learning focuses on the management of learning by students. While students actively involve in the self-regulation of learning, they take part to set achievement targets, stick to study schedules, and maintain the motivation to achieve the targets. The self-regulation on learning is a key activity in the implementation of quality formative assessment that contributes to learning improvement. As Wilson and Lizzio (2008: 2) argue, “Self-regulation is particularly salient in the higher education context because of the (often-implicit) expectation of independence placed on the students.” However, self-regulation on learning received little attention in the literature of formative assessment (Andrade, 2010: 3).

In self-regulation, learning can result from self-generated thoughts and behaviours that are systematically oriented towards the attainment of learning goals (Johansson & Felton, 2014: 12). The students’s role here is significantly important. For instance, Nicol & MacFarlane-Dick (2006: 199) underscore on the proactive role of the student in generating and using feedback that support learning. Educators at higher education can empower students as self-regulated learners by the continuous use of formative assessment and feedback. According to Zimmerman (2002: 66), self-regulated students tend to become proactive concerning their efforts to learn because of understanding strengths and weaknesses. In this case, the goals the students set for themselves and the task-related tactics guide their actions.

Pertinent to self-regulation skills, it is common to observe differences among students. Wilson and Lizzio (2008: 3) point out three influential factors in relation to the students’ capacity on self-

regulating their own learning. The first is, the students' meta-cognitive conceptions or beliefs about learning and knowledge (for example, "whether abilities are fixed or malleable or whether knowledge must be certain or can be contested") that may exert influence on the depth and focus of their learning tactics. The second is the students' academic efficacy, which means the expectations on accomplishing the learning task successfully. The third is the students' levels of achievement motivations, which can influence their level of task engagement and persistence. These variations on self-regulation skills among the students significantly predict the extent of learning and achievement gains.

As noted by Zimmerman (2002: 65), a new perspective on students' individual differences also began to emerge from the late 1970s and the early 1980s onwards. For instance, students who set specific types of learning goals for themselves, and who self-record their effectiveness in achieving the goals tend to display superior achievement and personal efficiency (Zimmerman, 2002: 65). Educators also tend to attribute many of the individual differences in learning to the level of students' self-regulation. Winne (2001: 158) also regards self-regulated learning as a significant condition for the improvement of academic achievement. Zimmerman (2002: 66) believes the self-regulation of learning to require different skills. These are:

*...(a) setting specific proximal goals for oneself, (b) adopting powerful strategies for attaining the goals, (c) monitoring one's performance selectively for signs of progress, (d) restructuring one's physical and social context to make it compatible with one's goals, (e) managing one's time use efficiently, (f) self-evaluating one's methods, (g) attributing causation to results, and (h) adapting future methods.*

Thus, Zimmerman (2002: 66) contends that the use of quality formative assessment "may help students develop the mentioned self-regulated learning skills." In essence, then, self-regulated learning and effective feedback lead to improved learning gains (Nicol & MacFarlane-Dick, 2006:210). According to Zimmerman (2001: 66), students who self-regulate their learning are more effective in learning their subjects. These students show persistence, resourcefulness, confidence and high achievement. When students set superior goals proactively, monitor learning intentionally, use strategies effectively, and respond to personal feedback adaptively, they not only attain mastery but also sustain their efforts in the learning (Zimmerman, 2013: 137). Students who self-regulate

their own learning demonstrate different skills. These skills include interpretation and definition of learning and assessment tasks, selecting tactics, monitoring progress, using feedback to reflect on the appropriateness of actions and skillful meta-cognition. For instance, as Shepard (2005b: 8) states, cognitive research maintains that “having students become self-aware in monitoring their own learning, which educators refer to as meta-cognition, improves achievement.” Self-regulated students tend to actively interpret the feedback they receive from external sources relative to the internal feedback they generate (Nicol & MacFarlane-Dick, 2006: 211). To bring a difference pertaining to student learning achievement, self-regulated learning and feedback should follow certain guiding principles. By referring to the self-regulation research literature on assessment, Nicol & MacFarlane-Dick (2006: 205) propose seven principles of good feedback practice, which can promote self-regulated learning. The principles of good feedback practice are to:

- Help “clarify what good performance is (goals, criteria, expected standards)”;
- Facilitate the development of self-regulation and self-assessment/reflection in learning;
- Deliver “high quality information to students about their learning”;
- Encourage teacher and peer dialogue around learning;
- Encourage positive motivational beliefs and self- esteem;
- Provide information the teachers can use to shape teaching.

In fact, to increase the students’ skills on the self-regulation of learning, educators should guide assessment activities in line with the above mentioned principles. Formative assessment, when used in instruction, may increase the student’s experience of self-regulation, which in turn, improves their learning achievement. As Wiliam (2011: 13) puts it, “during the 1990s several studies explored the attention given to assessment as an integral aspect of instruction and as a means to improve learning outcomes.” At the same time, attempts were made to connect classroom practices to research, notably feedback, motivation, attribution, and the self-regulation on learning.

### **2.1.5 Educators’ and students’ perceptions of formative assessment**

Perceptions of the groups involved may largely determine the use of quality formative assessment in instruction. In particular, classroom implementation of formative assessment remains an ongoing challenge despite many well-recognised facts in its favour (Black & Wiliam, 1998b). Yorke (2003:

486) avers that the perceptions and interpretations of educators and students about formative assessment are among the major challenges for the implementation. As the educator is a key mediator, improvements in formative assessment implementation depend largely on his/her perceptions on the principles and practices of formative assessment (Careless, 2007a: 172). In the same way, students are also the key actors in the implementation of formative assessment mainly in terms of assuming increased responsibility for the regulation of their own learning and self-reflection (Cowie, 2005: 139). Perceptions are central to the effective implementation of quality formative assessment. The following paragraphs then discuss on the perceptions of educators and students towards the use of quality formative assessment.

### **2.1.5.1 Educators' perceptions of formative assessment**

Educators' perceptions and knowledge of assessment may have an impact on the type of assessment they use, how they integrate it in the instructional process, and, whether their practices provide opportunities to learning improvement. Black and William (1998b: 20) recognise the use of formative assessment as insignificant due to the educators lack of understanding of it. Other than the lack of understanding, changing the current common practice might be problematic for many educators. Prospects for the integration of formative assessment are even more discouraging from various international contexts where direct instruction and summative assessment have dominated characteristically (Careless, 2007a: 173). In particular, large class size and heavy workload of teachers often present barriers to the use of formative assessment. As Careless explains, large class sizes and heavy workloads might lead to believe that formative assessment, while having a solid and convincing theoretical base, may be impractical, too time-consuming and incompatible with the demands of schooling.

In the context of higher education, though formative assessment is recognised as influential to learning improvement, its theorisation is not sufficient and it is not really understood (Yorke, 2003: 478). Knight and Yorke (2003: 33) demonstrate the increasing student-staff ratio and well-practiced summative assessment as limiting factors to the use of formative assessment in the teaching of university courses. Moreover, within universities, educators take summative forms of assessment for granted and ignore developments in formative assessment (Pryor & Crossroad, 2005: 2). According to Careless (2007a: 174) "formative assessment is unlikely to be a priority for undergraduate teaching" at research-intensive universities. The educators' perceptions on formative assessment determine the

extent of its integration and use in teaching. Nonetheless, as the research by Pryor and Crossroad (2005: 2) on four higher learning institutes including universities reveals, “educators were likely to perceive assessment as focused primarily on aiding teaching and learning.”

### **2.1.5.2 Students’ perceptions of formative assessment**

Students are also stakeholders in the instructional process. The way students perceive learning and assessment determines the quality of learning. Specifically, students’ understanding of formative assessment has implication on their activities relative to their understanding on the learning tasks. Similarly, perceptions and experiences on formative assessment influence whether students use in future learning and the extent to which they develop skills to become self-assessors and self-regulated lifelong learners (Boud & Falchikov, 2006: 402).

Perceptions represent a phenomenon concerning the reality of one’s mental schema (Thompson, 1992: 127). Perceptions clarify the complex and difficult categories of individual experiences such as the students’ perceptions on assessment. The students’ perceptions on educational processes are important because they influence learning. Entwistle (1991: 203) argues that when compared to the actual educational experiences, the students’ perceptions on the educational environment at higher education influences their learning more. Furthermore, students’ perceptions towards assessment are significant because assessment exerts a greater influence on the quality of their learning.

Brown and Hirschfeld (2008: 3) argue that students perceive assessment in at least three different ways. They perceive assessment in terms of improving achievement, a means for making students accountable, and making lessons relevant and enjoyable. Amongst these perceptions, the first one in the list pertained to making a positive contribution to learning achievement. Perera and Morgan (2006: 2) studied the perceptions of students towards formative assessment in Writtle College and found that over 95 percent of the students perceived formative assessment positively. For instance, the students reported that formative assessment simplified their understanding on the expectations of the learning task, and what they did either correctly or incorrectly on the learning task. Moreover, they declared that formative assessment helped them to develop confidence, academic skills and a way of improving performance.

Students often show a need to negotiate assessment demands that may lead to subsequent actions. According to Maclellan (2001: 307), “if students perceive a need to understand the material” to negotiate the assessment task, they tend to engage in deep learning successfully. However, if they perceive the assessment demands only simple fact recalling, they may fail to concentrate on higher cognitive skills. The study of Gijbels and Dochy (2006: 405) also reveals that students generally shift between surface and deep approaches to “learning to suit the assessment demands of their courses.”

Pertinent to individual differences, students’ perceptions towards assessment vary, so that the quality of learning varies for individual students, not only through the perceptions of the assessment demands but also through the students’ actions regarding their perceptions. Entwistle and Tait (1990: 187), report that students who describe themselves as “surface” learners preferred teaching and assessment procedures that support this learning approach. Opposite to this, students who describe themselves as “deep” learners preferred the courses that are intellectually challenging and assessment procedures that allow them to demonstrate their understanding.

More specifically, differences in assessment preferences seem to correlate with differences in the students’ approaches to learning. In their study of students’ assessment preferences and approaches to learn, Gijbels & Dochy (2006: 406) found a significant correlation between a deep approach to learning and a preference for higher-order thinking tasks, integrated formative assessment, and non-conventional assessment, respectively. With respect to feedback, Hattie, and Timperley (2007: 101) show that students tend to “perceive feedback as the responsibility of someone else, usually teachers, whose job is to provide information by deciding for the students how well they are going, what the goals are, and what to do next.”

## **2.2 EVIDENCE FROM EMPIRICAL STUDIES**

### **2.2.1 Introduction**

The preceding section of the chapter presented the literature review on formative assessment. This section presents the empirical evidence from studies, which emphasise on the use of formative assessment to improve learning. At present, there is a general conviction on formative assessment practice to have positive effect on the improvement of learning. As Black (2014: 1) asserts, formative assessment is the “heart of effective teaching.” Nonetheless, in the context of higher education, there is limited scientifically-based evidence regarding learning improvement resulting from formative

assessment (Dunn & Mulvenon 2009: 1). Furthermore, some of the existing empirical evidence apparently contain methodological flaws either in the sampling, experimentation and controlling of variables (Dunn & Mulvenon, 2009: 5). Since it is essential to link this study with previously documented research evidence, this section on the literature chapter presents the empirical evidence, which corroborate the effectiveness of formative assessment to the improvement and the self-regulation on learning.

### **2.2.2 Empirical evidence regarding formative assessment**

In practising formative assessment, educators should find out the extent to which students achieved the stated learning goals, plan for subsequent learning and consider how to facilitate for future improvement (Harlen, 2007: 11). Several studies report the significance of formative assessment to improve learning. For instance, Brown and Knight (1994: 28) summarised studies which show the importance of using different assessment methods that are improvement-oriented and valued by students. The studies summarised demonstrate that students favour assessments which are reasonable, broad, involving immediate and constructive feedback, and with a relative absence of emphasis on formal examinations.

According to Black and Wiliam (1998a), there are studies showing the significance of formative assessment in raising the academic performance and especially for low-achieving students. These authors analysed 250 studies, which compared classrooms with and those without the integration of formative assessment on lessons. The results of the analyses showed that students whose teachers used formative assessment outperformed in test score similar students whose teachers did not use formative assessment. One of the studies that Black and Wiliam analysed was conducted by Martinez and Martinez (1992) using a two-by-two quasi-experimental research design involving 120 college algebra students. The research project participated a novice teacher and an experienced teacher. Each of the teachers taught one class of students by giving one test per chapter and another class by giving three tests per chapter including the provision of formative feedback on the assessment tasks. Importantly, the results showed statistically significant test score difference for the students who were taught only by the novice teacher. This might imply that the use of formative assessment is more advantageous when courses are taught by novice teachers than by experienced ones. However, Dunn & Mulvenon (2009: 6) point out that due to methodological flaws, this study “might not be appropriate to make a

conclusion on the improvement to student achievement” as a result of applying formative assessment during instruction.

Black (1999) also documented a meta-analysis of 21 studies which used formative assessment and compared the learning gains of students quantitatively. These studies compared the learning gains of intervention and comparison group students using pre- and post-test measures. The results of the analyses showed an average effect size of 0.7 (that is, the size difference in mean scores between the intervention and comparison groups was about 70 percent of the standard deviation estimated from the spread in the scores of either group). This could imply that applying formative assessment predicts meaningful learning gains for students. Furthermore, of the 21 studies analysed, most of them reported the greatest learning gains for the low-achieving students.

Wilson and Scalise (2006: 660) used the BEAR (the Barkley Evaluation and Assessment Research) model, so-called “embedded assessment,” to enhance the acquisition of higher cognitive skills in computer science classes at a higher education level. According to Wilson and Scalise (2006: 659) the benefits of the formative assessment model reside in the fact that this model:

- Helps students recognise the criteria according to which they would be judged, and to examine assessment tasks aligned with learning goals and the desired interpretations;
- Provides students with a clear idea of where they stand on key measures;
- Shows progress maps based on quality assessment data and inferences generated;
- Provides teachers with strengthened feedback signals to tailor future lectures;
- Identifies exemplary student answers at different levels of progress variables that the educator could select during the moderation process as useful supplements to expert solutions.

Similar to the above a research project named the School-Based Alternative Embedded Assessment project conducted by Dori (2003) in Israel showed significant learning gains by the students for high school chemistry and biology courses when educators use formative assessment on their lessons. The assessment methods used included portfolios, individual projects and projects done in teams, written and oral tests, class and homework assignments, self-assessment, field trip, inquiry laboratory activities, concept maps, scientific article reviews and project presentations. Concerning the results

obtained and the significance of the embedded assessment in this research project, Dori (2003: 47) comments that,

*....when assessment is integrated into the learning process and embedded in it, meaningful educational goals are achieved. Given an adequate school and system-wide supporting environment, students develop higher-order thinking skills. In addition, their learning is more meaningful than the learning that takes place with traditional learning and assessment methods.*

Even though the researcher conducted this study on chemistry and biology courses, the students expressed themselves in favour of extending the assessment project to other courses, inspite of recognition of the demands of increased time and intellectual efforts (Dori, 2003). McDowell, Wakelin, Montegomera and King (2011: 749) conducted a study that asked the question, “Does the assessment for learning make a difference?” In this study, the researchers’ objective was the construction of a questionnaire that could be used to examine students’ reactions towards the use of formative assessment. According to the study’s results, students who experienced formative assessment in their lessons reported to experience their learning positively. In particular, what was learnt from the report was an appreciation for the experience of being involved in the learning process associated with deeper approaches to learning, staff support, active engagement and peer learning. As the study result showed, the questionnaire disclosed the sensitivity of the students towards assessment matters. For instance, the students respond more positively to courses involving formative assessment in comparison to courses without formative assessment. The difference in reaction was statistically significant. More specifically, when educators use formative assessment in the teaching of courses, students tend to take a deep approach to learning that could lead to quality learning (McDowell, *et al.*, 2011).

Finally, McDowell, *et al* (2011: 762) summarised the students’ perceptions on formative assessment in terms of three aspects. The first is staff support and feedback that paved the way for an alignment of teaching, learning and assessment. The second is active participation of students that made the assessment valid and relevant. Finally, deep learning is beneficial to the improvement in learning. McDowell *et al* (2011: 762) conclude “The features of formative assessment are, however, strongly interrelated suggesting that it should be seen as an overall approach from a set of techniques, which

can be dropped into different teaching and learning contexts.” In the same way, The study conducted by Fisher, Cavanagh and Bowles (2011: 225) examined the effectiveness of a formative assessment intervention in a first-year core business subject involving 465 graduate and 101 undergraduate students studying teacher education at an Australian university. This study followed a mixed-methods approach requiring the collection and analysis of both quantitative and qualitative data. As the findings showed, the use of formative assessment produced significantly higher marks while improving learning in general.

Asghar (2010) also studied reciprocal peer coaching (RPC) as a formative assessment technique to enhance learning. The purpose of the study was to elicit the perceptions of first-year students in the RPC process. After analysing the interview data from a phenomenological perspective, the author identified three important themes pertinent to student motivation, learning in groups and context of learning. The students who participated in the study reported time pressure, emotional pressure and feedback as motivating factors to improve learning through the RPC practice. Most of the students described the formative assessment as beneficial in terms of motivating and helping them to learn and manage their time in efficient ways. They also acknowledged the positive role of feedback in confirming their knowledge and understanding (Asghar, 2010: 412). These students accepted RPC as enhancing their convictions regarding the achievement of competent and professional practice. However, Asghar (2010: 407) comments, “Students demonstrated great sensitivity and empathy about providing feedback to one another although some thought that this was difficult, saying ‘who am I to say what is right and what is wrong’.” The students reported that giving feedback while trying not to be overly critical and undermining a peer’s confidence and thereby disrupting social cohesion within the group remained a challenge. However, they did acknowledge that it was a necessary part of the learning process.

### **2.2.3 Empirical evidence regarding feedback from educators**

Feedback is one effective way of providing an opportunity to enhance the learning gains by students (Ellery, 2008: 425). Accordingly, several studies emphasise the need to the practice of quality feedback on learning assessment (Brown, 2007: 28; Li & Luca, 2014: 381). Feedback is essential for promoting learning and motivating students to advance in thinking and self-assessment, as well as in highlighting errors, deficiencies and problems (Case, 2007: 287).

Importantly, the provision of immediate and constructive feedback is a key aspect to support learning and sustain student efforts. When educators provide formative feedback, assessment becomes a learning opportunity for the students (Tang & Harrison, 2011: 584). According to Lipnevich (2007: 34) educators can be effective to facilitate learning if they provide feedback relative to the learning task and the students' different conditions. The assessment feedback practised in this way may bring considerable learning gains to students.

To examine the influence of feedback, Lipnevich and Smith (2007: 53) conducted an experimental study on 464 college students working with an authentic learning task under three conditions. The three conditions were the no feedback condition, detailed feedback from the educator, and detailed feedback generated by a computer. The result of the study showed that students who received detailed feedback from either the educator or the computer achieved significantly higher test scores than students who did not receive feedback (Lipnevich & Smith, 2007: 22). The study also recorded positive effect sizes on the quasi-experimentation ranging from 0.30 to 1.25 between the no feedback condition group and the two feedback condition groups. In short, as the students' performance showed, the feedback strongly influenced their subsequent achievement. The importance of descriptive feedback specific to student work on improving learning is the overriding conclusion reached by the researchers.

Furthermore, in a case study pertaining to the effective use of feedback by Ellery (2008: 427), majority of the students who participated on the study witnessed that feedback helped them assess how well or badly they had done in assessment tasks. In the study, the educators gave to the students an opportunity to write a test twice. The students wrote the follow-up test after receiving the first feedback. When the students' scores between the two test administrations were compared, 52% of the students failed the first test with the average grade of the class being 45.4%, (n=75). However, in the second test, only 33% of the students failed, and the average score was increased to 53.7%, (n=75). Even though the grade increase was not statistically significant, it did show some improvement resulting from improved learning and understanding attributable to the provision of formative feedback in instruction (Ellery, 2008: 425). As a result of this experience, most of the students in the study preferred a combined provision of verbal and written feedback. The students liked the verbal feedback for it highlighted problem areas. They also valued written feedback for its usefulness to read the model solution in their own time and at their own pace.

On the other hand, Orsmond and Merry (2011: 125) evaluated the feedback styles of educators who focused on giving praise and correcting students' misunderstandings. These authors recommend that since praise and correcting misunderstandings alone do not address the developmental aspects of learning, educators "need to provide more guidance, examples, and explanations to students concerning the use of feedback," (Orsmond & Merry, 2011: 125), perhaps by introducing better scaffolding tactics in the feedback provided.

Hendry, Bromberger and Armstrong (2011: 4) also used a mixed-methods study and examined students' perceptions on the convenience of various types of feedback to guide them when finishing assessment tasks. The study identified five themes, namely the convenience of individual feedback, the usefulness of whole-class feedback, the convenience of exemplars, the convenience of the marking sheet and the students' perceptions on feedback and exemplars. In the study it was known that the students tend to prefer individual feedback to whole-class feedback, for the former was more detailed and generally explained a student's error by providing information on how to improve for future learning. Whole-class feedback explains common issues and errors and how to correct them. The students also find whole-class feedback informative and stimulating because of the structure and clarification of the assessor's expectations (Hendry, *et al.*, 2011: 5). Moreover, realising that they are not the only students to make errors, is comforting to students, and knowing that others have made a mistake, which they have not, is reassuring their progression on learning. In summary, the study demonstrated the usefulness of both individual feedback and whole-class feedback together with praise to increase the students' self-esteem and confidence in the learning process.

Another qualitative focus group study on students' perspectives of feedback effectiveness at an undergraduate level at the University of Sydney was carried out by Poulos and Mohany (2008). The thematic analysis in the study highlighted three key perceptual dimensions on feedback, the impact of feedback and the credibility of feedback. According to the study's report, the students' perceptions on feedback are influenced by the individual meanings attributed, such as whether educators are accessible to give them feedback, the relationship of feedback to marks, comments and assessment criteria. For instance, students usually judge feedback as helpful when the educator gives them individual written feedback (Poulos & Mohany, 2008: 145).

The second dimension of feedback identified by the study was the influence of feedback to the students. The significant changes reported in the study were first-year experience, timeliness and significance of feedback. For example, the students who participated in the study needed assessment feedback as quickly as possible. Poulos and Mohany (2008: 145) report the views the students hold towards the significance of feedback as follows:

*..a number of students expressed particular issues with the first year of university study, and the role played by feedback. These particular issues related to the need for more communication in the first year because of the differences between university and school, the role of feedback as a method of adjustment, feedback relating to understanding expectations, difficulties with approaching educators and the devastating effects of negative feedback and failing in the year 1.*

On the other hand, the credibility of feedback related to the students' perceptions on their educators, whom the perceived bias and general ability are influential regarding the credibility of the feedback they provide. Effective educators can provide useful feedback. According to Poulos and Mohany (2008: 148) the overall perceived ability of educators relates to the feasibility and impact of the feedback provided, while the bias of educators detracts the credibility resulting in the students' view that the feedback is less effective. Finally, the students who participated in the study expressed a strong preference for the following issues concerning feedback and assessment practices at universities:

- Consistent assessment practices;
- Transparent assessment practices;
- Clear criteria and referencing to a grade;
- Early feedback, including exams, marks and grades together;
- Seminars for new students on feedback and assessment practices (Poulos & Mohany, 2008: 153).

Torrance's (2007: 281) study of assessment as learning reported the possibility of student learning improvement when there is clarity on assessment criteria and procedures, "widespread use of coaching, practice, and provision of formative feedback to students." The study explained the practice on assessment as moving from the "assessment of learning, through assessment for learning, to

assessment as learning, with assessment procedures and practices dominating learning experiences” (Torrance, 2007: 281).

#### **2.2.4 Empirical evidence regarding self-assessment**

Recent literature on formative assessment in higher education is increasingly showing the significance of feedback and the role of the self on the learning and the assessment tasks. When proposing the seven principles of good feedback practice, Nicol & MacFarlane-Dick (2006: 199), acknowledged students as self-regulatory and proactive, rather than reactive in response to formative feedback. Arguments have been put forward that self-assessment is considered a *sine qua non* for effective learning and also an effective instrument for learning after university education (Taras, 2001: 605). Moreover, educators relate self-assessment with moves towards developing greater autonomy and responsibility to learning particularly, self-regulated learning (Lew, Alwis & Schimdt, and 2010: 136). Since it includes both reflection and evaluation of one’s work, self-assessment facilitates for the preparation of responsible and autonomous students who are capable of regulating their own learning (Kraayenoord & Paris, 1997: 525). Importantly, effective formative assessment requires active involvement of the students in the feedback process (Sadler, 1989: 125). Therefore, efforts to apply formative assessment in the learning process should consider self-assessment as one notable alternative.

Educators conceptualise the purpose of self-assessment in different ways (Ross, 2006: 2). For instance, Andrade and Du (2007: 159) describe self-assessment as giving chance to the students grade themselves. Others regard self-assessment as the contribution of students in making evaluations of the outcomes of their learning and achievement (Boud & Falchikov, 2006: 409). The defining characteristics of self-assessment, as identified by Boud, (1995: 4) are (1) identifying standards and criteria to apply to student work and (2) making an evaluation on the extent to which the students met the criteria and standards.

Boud (1995: 5) argues that self-assessment incorporates the self-grading aspect as well. Nevertheless, mere self-grading cannot be considered as self-assessment. Boud also points out that teachers and students emphasise on the second characteristic and that engagement with the standards and criteria determines the learning process. Thus, a clear understanding of self-assessment and its aspects is essential for the effective application. Self-assessment can benefit students by enhancing their learning,

which includes deep and lifelong learning, and by preparing them for roles in a democratic society (Andrade, 2010: 2).

In a research article entitled “Accuracy of students' self-assessment and beliefs about its utility,” Lew, *et al* (2010: 136) evaluated the accuracy of students’ self-assessment abilities. The intention of their study was to examine whether these abilities improve over time and whether self-assessment is more accurate when students believe in its contribution. The first of these studies examined the self-assessment experience of 3588 first-year students who were enrolled at a postsecondary institution during one semester when each student made about 80 self-assessments on his/her own learning activities. Then, the results correlated with the assessments of the peers and the educators. The correlation results revealed that the self-assessment abilities of the students ranged from weak to moderately accurate. The findings revealed that the students who were judged more “competent were able to self-assess with higher accuracy than their less competent peers were.”

The second study by the same authors showed that students who believed in the advantages of self-assessment acted accordingly and learnt more from it. After reflecting on their learning, the students became more aware of their strengths and weaknesses, which eventually enabled them to take steps to improve even further. Because of this, their learning and performance improved. Oppositely, the students who did not believe in the significance of self-assessment tended to take it less seriously and, consequently they did not learn from the process of assessing themselves. Perhaps, these students were less likely to improve their learning and performance as a consequence of self-assessment exercise.

### **2.2.5 Empirical evidence regarding peer assessment**

Constructive peer assessment and feedback to students may help them to learn more effectively. Emphasising the significance of peer assessment, Boud (1991: 19) makes the following point:

*...one of the most valuable contributions anyone can make to another person's learning is constructive feedback. Whether as a student or a teacher each one of us has the capacity to provide useful information to other people, which will help them to learn more effectively.*

McMahon (2010: 223) state that peer assessment encourages critical reflection, helps students develop autonomous learning skills and provides feedback that takes account of individual learning needs. In particular, peer assessment facilitates for the weaker students to benefit from the talents of the stronger peers. As a result of peer assessment practice, students develop the ability to plan, monitor, and assess their learning activities in a way that significantly increases their motivation and academic achievement. Moreover, in the middle of the course when students are asked about the main benefits of using peer assessment, they mention the following points (McMahon, 2010: 230-231). These are:

- The immediacy of the peer assessment system increases motivation;
- The use of peer-assessment prompts greater consistency in the application of standards within the programme;
- The assessment regime helps candidates to better understand the criteria (standards) against which their work will be judged;
- The use of structured peer-assessment enhances the quality of learning from promoting the supportive sharing of ideas, perspectives, experiences and knowledge;
- The use of structured peer-assessment prompts the identification of the group of acceptable practice and its adoption by individual members of the group.

McConlogue (2012: 117) also notes that students value peer assessment positively, although many of them complain about the unfairness of peer assessment exercise. While justifying the reasons for their complaints, they are concerned about their peers' understanding of the content of the assessment task and differences in the level of efforts by different peer assessors. McConlogue (p117) reports some of the comments forwarded by the students as in the following:

- The peer assessment is helpful. However, I think that some of the markers did not understand certain sections, as well they may have needed. It appears that some needed to read a few more times to understand;
- Some people have lengthy and very useful comments, while some other people have just one or two sentences, and I was not even sure if they had read my report; and
- Some people just took this course to work easily ... comments about some of them did not make much sense, because they wanted to submit the course work when possible.

The above study found that the students doubt about the practicality of peer assessment and comment. The students considered the peer assessors' marking unreliable (McConlogue, 2012: 113). Particularly, they viewed comments, which lacked clear understanding of the report topic and assessment criteria as untrustworthy.

Sivan (2000: 193) also conducted a study on the implementation of peer assessment at higher education. The study conducted followed an action research approach and demonstrated how student participation contributes to applying assessment criteria in the learning process. Thus, Sivan recommended the introduction of peer assessment that includes students in the "process of criteria setting and making the method relevant to student learning and future careers."

### **2.2.6 Empirical evidence regarding perceptions of educators and students**

Educators should adopt new teaching techniques and new ways of collecting evidence about students' understanding and what can influence the improvement of learning and achievement (Black & Wiliam, 2005: 3). According to Offerdahl and Tomanek (2011: 782), examining the complex relationships between the educator's practices and perceptions is crucial to understanding and promoting changes in teachers' assessment practices. Thus, studying the perceptions of educators is valuable for understanding how to support the use of different formative assessment techniques. For instance, feedback is a key element in effective teaching and learning (Tang & Harrison, 2011: 583). Hence, educators' perceptions of the role of feedback significantly influence their practice.

In line with the above assumption, Tang and Harrison (2011: 583) studied the perceptions of 50 university educators regarding assessment feedback and identified three types of perceptions. With regard to the first type, educators consider the score as the most relevant feedback to students and are ambivalent about the value of feedback and discussions with other colleagues over the marking. The literature labels this type of attitude towards assessment feedback as traditional-autonomous-global. Tang and Harrison (2011: 589-591) describe educators that have a "traditional" and "global" viewpoint in that they assert that students only care about the scores and they are skeptical on the usefulness of formative feedback. They are also "autonomous" in that they hold the view that they can mark well as long as the marking criteria are provided. They see no need for individual guidance. They also do not think their marking needs to be checked out and moderated.

In contrast, Educators of the second type are student-centred and maintain that good feedback provides more than a score to improve learning. They believe that both slow and fast students need feedback and feel that they can trust the motivational value of formative feedback. Furthermore, they tend to provide constructive suggestions for improvement. They are also positive towards the students' use of assessment feedback. Tang and Harrison label educators of the third type as traditional-local. These groups of educators are traditional because, similar to the traditional-autonomous-global educators, they see little relationship between assessment feedback and students' improvement in their subsequent performance.

On the other hand, in a case study of students' views regarding assessment in project-led engineering education by Fernandes, Flores and Lima (2012), the researchers organised an engineering course taking into account the interactions among teachers and students, and among the students themselves. The students received feedback and were given opportunities to participate in several group presentations. These became important learning experience for the students. Fernandes *et al* (2012: 170) report, not only were the students given the opportunity to see what other students were doing and what solutions they had come up with, since they all had a similar starting point, but also able to acquire new information and learn from their peers. In general, this case study showed the students' perceptions on the advantages and the usefulness of feedback and group presentations, namely that they felt the provision of feedback improves learning outcomes in a more effective way (Fernandes, *et al.*, 2012: 170).

Another study by Lizzo and Wilson (2008: 263) revealed three dimensions in the structure of students' perceptions on assessor's feedback. The dimensions reported were *developing*, *encouraging* and *fair feedback*. While there is a positive correlation between all three, the dimension shown with ratings of feedback effectiveness, development feedback was most strongly associated with the students' evaluation of effective feedback.

The *development* dimension of feedback refers to the students' perceptions that they can make use of the feedback provided to improve future learning. The *encouragement* dimension refers to the extent to which the students feel encouraged, acknowledged, or supported by the provision of feedback. Finally, the *fairness* dimension of feedback is meant for transparency, student opportunity to have a voice, clarity of feedback and justification for the given mark. According to Lizzio and Wilson (2008: 266),

these dimensions of feedback are common criteria to influence the students' perceptions on the quality of assessment feedback.

Hodgson and Pang (2012: 215) show the potential of formative assessment process at universities to engage students to reflect on and take greater ownership of their learning. Formative assessment can also increase student satisfaction with learning. These researchers examined the reports of learning experiences of students when using formative assessment. The results showed high levels of satisfaction on the part of students with the process of formative assessment, particularly about how this contributed to a change in learning approaches (Hodgson & Pang, 2012: 221). The students' perception and satisfaction with the formative assessment practice centres on three key issues. The first is the interaction among the students. In the study, the students were allowed to discuss their work with peers when working on the formative assessment tasks. In terms of their responses, about 70% of the students agreed or strongly agreed that the formative assessment task simplified peer discussions, 22% were neutral, while 5.9% disagreed or strongly disagreed. While some of the students perceived that they could benefit from peer learning, others thought that there was a mutual benefit. Moreover, many students stated that peers supported them in terms of clarifying misunderstandings and recognising that reciprocity and cooperation among students were conducive to their learning improvement (Hodgson & Pang, 2012: 221).

On the other hand, the researchers asked the students, whether the tasks related to formative assessment reinforced their understanding of the concepts taught in the class. The majority (that is, 90.2%) agreed or strongly agreed that they achieved an in-depth understanding while working on the assessment tasks. The study revealed that almost all of the students agreed to the statement that formative assessment had reinforced both learning and the retrieval of knowledge. Furthermore, about 82% agreed or strongly agreed that students could evaluate their level of understanding because they could view the results of all assessment tasks attempted (Hodgson & Pang, 2012: 223). In summary, the students who participated in the study reported to experience improved learning after using weekly formative assessment tasks in their classes. Most students put a lot of effort into the formative assessment tasks, while some reported that they made considerable effort to carry out the tasks, although this could be a result of the formative assessment contributing 20% of the marks to their overall grade.

## **2.3 THEORETICAL VIEWS ON LEARNING AND ASSESSMENT**

Learning entails a change in behaviour or the capacity for behaving that result from practice and experience (Ertmer & Newby, 2013: 44). The literature reveals various views on learning. These views govern the discussions and the approaches towards learning and assessment. The views the educators hold on education influences their practice on learning and assessment. In the words of Yorke (2003: 483), assessment and learning are reasonably linked each other. As Rawlins (2007: 18) puts it, there is an increased acknowledgement to the relationship of assessment and classroom learning. Hence, assessment and learning are viewed as inseparable.

The twentieth century was known for the contributions of thinkers on the explanation of learning. Thorndike at Colombia University was famous in the understanding of learning (Shrock, 1991: 12). According to him, learning should emphasise on pre-specified, socially worthwhile goals. Thorndike also advocated the significance of learning assessment (Shrock, 1991: 13). The objective movement of education was also popular in the 1920s. For instance, the notion of individualised instruction and educational objectives was familiarised by Franklin Babbit. Therefore, schools should provide skills definitely linked to the activities expected from citizens by the society (Shrock, 1991: 13). Thus, educators could develop the objectives of education from the analysis of the skills necessary for successful living. Later in the 1930s, the specification of learning objectives in terms of student behaviour was introduced by Ralph, W Taylor. The learning objectives and the corresponding assessment procedures help in improving the curriculum until students achieve the expected standards of performance (Shrock, 1991: 14). Though the phrase would “not be coined for almost thirty-five years” until the time of Michael Scriven (Shrock, 1991: 17), instructional designers regarded this practice as formative assessment.

The idea of task analysis and programmed instruction was famous in the 1950s through the contribution of B.F. Skinner, who advocated the improvement of learning by the presentation of reinforcement to desirable behaviour. Therefore, “clearly stated behavioural objectives, small frames of instruction, self-pacing, and active students” responses to assessment task and prompt feedback on the correctness characterise programmed instruction (Shrock, 1991: 14). Hence, learning is viewed as a change in behavior shaped by selective reinforcements.

On the other hand, the view on learning has undergone a major revolution since the 1950s (Jonassen, 1991: 5). Theories and models of learning from cognitive psychology are becoming common to explain the process on learning (Ertmer & Newby, 2013: 53). As Jonassen (1991: 6) states: “cognitive psychology regards learning as concerned not so much with behavioural responses, but rather with what students know and how they come to acquire it.” As a result of this view and the rise of constructivist paradigm, the conceptualisations on learning and its assessment are changing faster.

As a consequence of the points discussed above, the understandings towards learning and the implication to assessment are becoming complex. Thus, it is essential to recognise and discuss the major theories which guide learning and assessment. This section of the chapter discusses three major theories on learning and assessment. The literature labels them as the “behaviourist,” “cognitive - constructivist” and the “socio-cultural” theories respectively. Therefore, discussion is made below to give explanation on how the various theories inform quality formative assessment use to contribute for the improvement on learning and the self-regulation of learning by students.

### **2.3.1 Behaviourist view on learning and assessment**

The behaviourist view of learning became known since the beginning of the twentieth century and was dominant until the 1970s. This view explains learning as the connection of events called stimulus and response. The focus on the learning process according to this view is the determination of objectives and the observation of the students’ behaviour in assessment (Jonassen, 1999: 226). Until the students achieve to the expected level of performance, the objectives and assessments are continually linked (Shrock, 1991: 14). Psychologists and educators used to call this “mastery learning.”

In line with the behaviourist view, university courses are usually offered by the transmission mode of instruction. The students’ participation on the learning and assessment activities is usually passive. The role of the educator is to present the learning content and construct assessment questions to let the students respond based on the contents presented. Ertmer & Newby (2013: 60) label this type of learning as behavioural outcomes learning, where there is little attention to the mental operations by the students. This type of learning is also called didactic learning (Cronje, 2006: 389). Surprisingly, this view does not recognise the individuality and the experiences of the students very well. The objective view of learning assumes that educators can effectively transmit knowledge to be acquired by

all students (Jonassen, 1999: 217). Learning occurs when the students demonstrate correct responses following the presentation of a stimulus or a learning content (Ertmer & Newby, 2013: 47).

On the other hand, the bond between the stimulus and the response can be strengthened by repeated practice, instructional cues, and reinforcement. However, as Schunk (1991: 208) puts it, the learning of higher-level cognitions such as critical thinking, problem-solving, and inference generating and language is not well clarified by this view of learning. Assessment is regarded as the actions of the student in exercising proper responses to the learned stimuli (Ertmer & Newby, 2013: 53). As a consequence of this, the student may lack the chance to advance in alternative knowledge constructions. The focus of assessment is to evaluate the observable responses of the student as evidence for the attainment of the intended learning objectives. The assessment emphasises on facts and events recognition rather than on the conceptual development of the student. Assessment tasks seem to function as instruments for checking whether the student received, absorbed and memorised the presented content during instruction (Harlen, 2006: 209). The marking of assessment questions focuses on the correctness and incorrectness of the student responses. Feedback is usually limited to show an incorrect answer or the correct answer with little guidance on how to inform learning improvement (Rawlins, 2007: 5). Because of the insignificant recognition to the active role of the student's mind by the behaviourist view, cognitive and constructivist views appeared in the discussion with respect to the occurrence of effective learning and assessment.

### **2.3.2 Cognitive - constructivist views on learning and assessment**

The behaviourist view to learning gives little emphasis to the mind or the human cognition in the learning process. Learning is, by and large a behavioural disposition of a student that can be modified by selective reinforcements. As Jonassen (1991: 6) argues, this little emphasis to the human cognition by the behaviourist view was a major theoretical reason for the paradigm movement in the psychology of learning. Cognitive view of learning gives emphasis on “what students know and how they acquire knowledge” rather than probabilistic observable responses (Ertmer & Newby, 2013: 51). With respect to the change in view of learning, Ertmer and Newby (2013: 50) point the following out:

*...in the late 1950s, learning theory began to make a shift away from the use of behavioral models to an approach that relied on learning theories and models of the cognitive sciences. Psychologists and educators began to de-emphasise a*

*concern with overt, observable behavior and stressed instead more complex cognitive processes such as thinking, problem solving, language, concept formation, and information processing.*

The cognitive view acknowledges the active involvement of the student to acquire knowledge and skill. Nevertheless, it has limitations due to the inconsistent arguments regarding the meaning of the mind. In fact, whether the mind is something spiritual or a material entity that controls the actions of the individual was inconclusive (Jonassen, 1991: 7). Later, cognitive psychologists considered the mind or mental constructions as representations of the real world that the student assimilates or accommodates regarding information (Bruner, 2004: 691). As stated by Ertmer and Newby (2013: 51), the cognitive view labels learning as discrete changes in conceptual knowledge rather than the probability of responses.

For cognitive psychologists, learning occurs when the memory stores information in a meaningful and organized way. Because of this, the assessment on learning focuses more on checking the ability to retrieve information and also use the information in a different context (Ertmer & Newby, 2013: 52). Cognitive view of learning also underscores the importance of practice and corrective feedback in the learning process.

On the other hand, since the cognitive view gives emphasis only to the objective reality, it was challenged by contemporary thinkers (Jonassen, 1991: 8). These theorists suggest an individually constructed version of reality. This conceptualisation led to the viewing of learning through the lens of constructivism. In this regard, Murphy (1997: 4) postulates that

*...whether we see knowledge as absolute, separate from the knower, and corresponding to a knowable, external reality or whether we see it as part of the knower and relative to the individual experiences with the environment, have far-reaching implications for learning and assessment.*

The constructivist view assumes, reality to “dwell[s] in the mind of the knower and also interpreted and constructed in line with the view of the individual.” (Jonassen, 1991: 10). Piaget describes such constructions of knowledge as assimilation and accommodation respectively. Jonassen (1991: 11) also

indicates the presence of a strong association between innovative instructional techniques and the constructivist view on learning. Moreover, in this view of learning, “knowledge is neither passively absorbed nor reinforced; but, occurs by sense making and active involvement by the student.” (Shepard, 2000: 16).

Furthermore, good learning possibly occurs when a student is exposed to new experiences and attempts to change his/her cognitive structure by the process of assimilation and accommodation (Ray, 2002: 319). Learning is said to be occurred by the interpretation of information rather than by simple recording of information (Cronje, 2006: 393). This means, instead of passive assimilation and rote memorization of information, knowledge is said to be acquired by the active involvement of the student (Even & Tirosh, 2002: 203). Therefore, knowledge is considered in terms of conceptual structures, which the student adapts to the range of his/her experiences rather than a representation of an independently existing objective world (Anthony & Walshaw, 2003: 3). With respect to this point, Colliver (2002:50) asserts the following:

*...constructivism shifts the view of knowledge from historical, eternal truths-which would seem to focus curricula on current knowledge, the truth, and the real-to historical,cultural inventions-that are changing and evolving, making the meaning of current knowledge more dependent on where we have been.*

Therefore, in constructivist view, learning occurs by conceptual growth and change in cognition which lead the student to the tactics of problem solving, metacognition and self-efficacy skills (Alt, 2015: 56). However, as asserted by Ray (2002: 319), translating the propositions of constructivist view of learning into actual instructional techniques becomes challenging. Jonassen (1991: 13) also affirms the limitations of this view of learning in establishing the implication well enough to support a prescriptive theory of learning and assessment. In fact, it has challenged current activities of instruction and learning assessment.

The educator’s role in constructivism is limited to coaching and guiding with the intention of encouraging the student to grow from novice to expert. The educator is expected to guide the student in self-regulating his/her own learning. To realize this, self-assessment by the student, self-reflection, peer assessment, self-regulation skills and useful feedback can be used as assessment techniques

(Jonassen, 1991: 13). In addition to the evaluation of the student's current level of knowledge and understanding, educators could design assessments to scaffold future learning (Rawlins, 2007: 22). According to Wilson, Teslow and Jouchoux (1995: 153-154),

*...in constructivist learning environments, student assessment incorporates assessment into the teaching product, analyses and discuss products grounded in authentic contexts, evaluates processes as well as products, and utilise informal assessments within classrooms and learning environments.*

A constructivist view on learning generally focuses on learning at the individual level. Thus, there is little explanation regarding the social processes that simplify learning and assessment. Nevertheless, currently there is a growing interest to explain learning and assessment as a social process. Hence, the following sub-section discusses the socio-cultural view on learning and assessment.

### **2.3.3 Socio-cultural view of learning and assessment**

The constructivist outlook discussed above focuses mainly on the individual student. However, constructivism leans towards treating various outlooks (Wilson, *et al.*, 1995: 142). Since constructivism is not a single design model, recent thoughts start to consider the impact of social processes on learning (Shepard, 2000: 19). The early conceptualisation on constructivism, which has its origin in Piaget's idea of assimilation and accommodation emphasises thinking at an individual level (Wilson *et al.*, 1995: 142). On the other side, the socio-cultural conception of constructivism incorporates more ideas about culture, social learning, and cooperation. Shepard (2005b: 18) states the advantages of a cooperative learning as follows: "cooperative learning contributes to students' active engagement and helps to develop valuable peer and self-assessment skills."

According to the description of Merrill (1991: 49), the main characteristics of the social constructivist view on learning are, "experience as a source of knowledge, learning as a personal and active interpretation of the world, collaboration and the incorporation of assessment tasks." Moreover, Wilson *et al.*, (1995: 141) added other points to characterise the socio-constructivist view on learning and assessment. These are "reflection as a key component of learning to become an expert, like instruction, assessment should be based on multiple perspectives, and the students should participate in establishing goals, tasks, and methods of instruction and assessment." However, it has to be noted

that the socio-cultural view of constructivism may also involve several understandings. For instance, regarding the multiple understandings of socio-cultural learning, Wilson *et al.*, (1995: 147) state the following:

*....not all students share the same learning goals; not all students' learning goals converge completely with instructional goals; students have different styles of learning, different background knowledge. Rather than ignore these differences, instruction should acknowledge the evolving nature of knowledge and encourage students to engage in a continuing search for improved understanding. This plurality of content, strategies, and perspectives typifies postmodern approaches to instruction.*

The socio-cultural view of constructivism regards human cognition as situated and inherently social. Accordingly, the students' cognitive skills qualitatively change because of the social interaction which may facilitate the tryout of language and reasoning practice (Shepard, 2005b). Even and Tirosh (2002: 232) strongly suggest the main concern of the socio-cultural view to be the design of stimulating learning environments. In contrast to the decontextualisation and decomposition of knowledge promoted by behaviourism, it is difficult to understand any aspect of knowledge separate from the whole or separated from its social and cultural context (Shepard, 2005b). Educators generally regard both peer assessment and formative feedback as social activities, which may contribute to the improvement in learning as a group and individually. As Shepard (2005b: 12) puts it:

*... socio-cultural theory presents an understanding of how students learn and at the same time how they develop identities as capable students. When implemented by experienced teachers, formative assessment practices further cognitive goals and at the same time draw students into participation in learning for its own sake.*

To further the discussion, learning and assessment are seen as social practices. The socio-cultural theorist Lave (1988: 92) sees the student as a member of the "community of practice." As a consequence of becoming a member, the student is both shaping and being shaped by the community of practice. Accordingly, learning is regarded as a cooperative and a social practice by which students advance their thoughts together (James, 2005: 87).

Assessment is integrated with the learning process according to the social-constructivist view of learning (Rawlins, 2007: 179). This means, assessment is a dynamic process that can provide both prospective measures of performance including competencies that are developing, and is predictive of how the student might perform independently in the future (Silver, Duncan & Chinn, 2007: 101).

Vygotsky's socio-cultural perspective and the socio-cultural school assume the origins of consciousness as socially situated. This means, the student's interaction with the learning community is highly influential for learning, conceptual growth and identity formation (Pryor & Crossouard, 2005: 7). Learning and identity are therefore not separate, because learning involves the construction of identity (Robbins & Aydede, 2009: 4). However, identities are multiple, performed and continually developed by involvement in the community of practice (Pryor & Crossouard, 2005: 7). This view of learning recommends integrating the assessment tasks within the learning tasks, which itself is embedded in the socio-cultural practices of the classroom. In fact, quality formative assessment is a central feature to understand the assessment practice within the context of socio-cultural learning view.

According to this view of learning, students participation in collaborative activities and discussions with the group are basic to metacognitive development which in turn, is crucial to the students' involvement in the practice of formative assessment (Wood, 1998: 175). As Wood added, when students integrate and participate in collaborative learning, they will be more confident to think about their understanding, planning, organizing and assessing learning individually and collectively. Gibbs (1999: 377) also describe assessment in a social situation as it can be practised by assessing students in collaborative group activities in which they contribute to a task and help their class mates. According to Gibbs (1999: 377), "the advantage of such a socially situated assessment is that it encourages the students to develop and question their definitions of competence." In addition, Gibbs asserts that such view of assessment encourages educators to reconstruct their relationship with students by sharing the responsibility and involving them as partners in the instructional process.

Furthermore, when formative assessment is seen from a socially situated view, it may lead to understanding assessment as a dynamics of student-teacher and student-student relations (Ross, Gray & Ralhiester, 2002: 45). Effective learning and development of competencies normally occur when experts (teachers, outstanding peers) and novices (students) have a chance "to converse as they work together on a common goal or product." (Rogoff, 1990: 28). As a consequence, the teacher

participates in the learning so that the relationships between the teacher and the students are developed in a less hierarchical way (Rawlins, 2007: 172). Thus, assessment information is usually used between the student and the teacher and among the peers, to help the students on the regulation of their own learning (Torrance & Pryor, 2001: 616). Hence, quality formative assessment (formative feedback, self-assessment and peer assessment) can be a key social process that mediates among the development of cognitive abilities, construction of knowledge and student identities (Shepard, 2000: 4).

More specifically, the notion on the zone of proximal development (ZPD) that was forwarded by Vygotsky (1978) provides a clear insight on situating and understanding the social constructivist perspective of learning (Gibbs, 1999: 375). The ZPD focuses on the gap between what the student can achieve without help and what he/she can achieve with proper guidance from an educator or an experienced peer. The ZPD approach limits the role of the educator in setting learning goals and in which the student achieves the goals by means of formative feedback (Black, 2007: 20). This may simplify the application of formative feedback to encourage and lead the student into the ZPD and actively react to the feedback given (Rawlins, 2007: 173).

In summary, the social-constructivist view on learning shows clear implications for thinking about possibilities of learning improvement in collaborative actions. The view also encourages the increased use of alternative assessment techniques, which take account of the social and cultural context in which learning occurs (Rawlins, 2007: 175). Researchers in educational assessment (for example, Bourke, 2000; Ruthven, 2002), list several techniques of formative assessment such as formative feedback, self-assessment, peer assessment, observations, portfolios, practical assessment, investigations and small group projects as valid techniques of collecting information on student learning achievement and improvement. In fact, practical implementation challenges to these alternative types of formative assessment techniques are acknowledged very well (Watson, 2006: 289). The present study used quality formative assessment approaches, which are formative feedback, self-assessment, and peer assessment to promote student self-regulation on learning and contribute to learning improvement. Thus, the following section of the chapter gives detail explanations on how the study situates itself within the conceptual frameworks of constructivist learning and formative assessment.

## 2.4 CONCEPTUAL FRAMEWORK OF THE STUDY

The current literature in educational assessment favours formative assessment as a fundamental practice to improve learning when used in instruction (Black & Wiliam, 2009: 2). However, in the context of Ethiopian higher education institutions, the measurement oriented form of assessment (Summative) is more dominant than the improvement oriented form of assessment (formative) (HERQA, 2008: 3). As a consequence, the assessment practices on course delivery were not only separated from everyday instruction and learning but also dominantly measurement oriented or summative in approach. Continuous assessment practice, if at all it is implemented, was not formative and it was also not oriented towards the improvement on learning, for it lacked the students' active involvement and timely feedback to inform subsequent learning.

The the internal education quality assessments conducted at Jimma University and other universities in the country in the years 2007 and 2009 as well as the external quality audits carried out by the Higher Education Relevance and Quality Assurance (HERQA) in the year 2008 confirmed the assessment practices in university courses to have limited success in bringing learning improvement. Therefore, there may be a felt need to examine the extent to which the use of quality formative assessment improves student learning at the Ethiopian higher learning institutes. Because of that, this study used a quality formative assessment integrated within a constructivist-learning environment to find out if this would improve student learning. Thus, an instruction that involved the three key elements of quality formative assessment namely formative feedback, self-assessment and peer assessment was designed to teach students enrolled for a “ General Psychology” course at three universities.

The formative assessment of the proposed designed instruction includes formative feedback, student self-assessment, and peer assessment. The intention of this study was to examine the contribution of formative assessment on the improvement of learning and the promotion of the students' self-regulated learning skills. The following paragraphs, then, give detail account on the conceptual framework that informs the study. The conceptual framework is composed of the constructivist learning paradigm and the formative assessment strategies proposed by Wiliam and Thompson (2007: 62).

The constructivist learning paradigm was central to inform this study because the study examined the contribution of quality formative assessment on the improvement of learning. Even though there is no a single theory that informs the practice of formative assessment, researchers derive the theoretical

positions underlying it, either from the behaviourist, cognitive-constructivist, or socio-cultural learning perspectives (Torrance, 1993: 335). As discussed before, since the behaviourist perspective tends to encourage mastery of learning, it may have little contribution on the day-to-day improvement to learning (Elwood & Klenowski, 2002: 243).

Quality formative assessment has positive implications for the promotion of student growth and can ease student learning to become self-regulated and autonomous (Brown & Knight, 1994: 6). Thus, regarding this conception of assessment, the constructivist learning paradigm informs the explanation made about the ways by which quality formative assessment improves learning. Constructivist learning environment makes significant contribution to the improvement of student learning.

According to the discussion by Hyslop and Strobel (2008: 81-84), the constructivist-learning paradigm follows two main approaches. These are Dewey's pragmatism and Vygotsky's social constructivism. Dewey's pragmatism, also called radicalism focuses on creating learning environments that allow the student to pursue independent objectives based on his/her own experiences, interests, and concerns. In terms of this approach, the educator's role is providing guidance and facilitation to help the student as an autonomous agent to design own learning experiences in response to personal priorities and objectives. In contrast, Vygotsky's social constructivism states knowledge as a socially negotiated product. The educators's role is creating activities which direct the student towards subject mastery to promote a certain level of cultural assimilation. Moreover, Vygotsky argues that students acquire knowledge through two kinds of activities, which are inter-psychological activities, or among people and intra-psychological activities or within the individual. When the authors conclude their discussion, they suggest that both radicalism and social constructivism approaches enrich the application of constructivist classroom practice. Hence, constructivist learning environments should be designed based on design principles.

For instance, Jonassen (1991: 11-12) lists four design assumptions to create learning environments based on the constructivist paradigm of learning. Wilson and Cole (1991: 56) also describe cognitive teaching models, which "embody" constructivist concepts that entail "embedding learning in a rich authentic problem-solving environment, providing both authentic and academic contexts for learning, a chance for the student to control, and utilise errors as mechanisms to provide feedback on his/her understanding."

In terms of constructivist learning paradigm, assessment practice becomes more student-centred and the teachers' formative feedback complements peer and self-assessments. This is essential to the social process that mediates the development of intellectual abilities, the construction of knowledge and the formation of student identities (Shepard, 2000: 8). Gibbs (1999: 371) suggests a shift in focus towards a broader assessment for learning, enhancement of learning and involvement of the student in the process. According to Brown and Knight (1994: 38), a theory of formative assessment depends on assumptions about the student, the learning task and the role of the educator. In this regard, Black (1998: 41) suggests that a fully developed theory of formative assessment would include:

- A learning theory with an emphasis on constructivism.
- Models for the epistemology of each subject and of learning progress.
- Analysis of self- and peer assessment of the particular learning process and the interaction of these.
- Study of the effects of feedback on self-esteem, self-attribution, and readiness to learn.
- Student – teacher, and student- student interactions in learning as a case of social discourse.

Despite the fact that there is little theorisation concerning formative assessment (Yorke, 2003: 477), this study, in addition to informing the use of quality formative assessment with the constructivist learning paradigm, situates quality formative assessment within the conceptual framework proposed by Wiliam and Thompson (2007: 62). A description of this conceptual framework is included in the following definition of formative assessment provided by Black and Wiliam (2007: 11).

*...practice in a classroom is formative to the extent that evidence about student achievement is elicited, interpreted, and used by teachers, students, or their peers, to make decisions about the next steps in instruction that are likely to be better, or better founded than the decisions they would have taken in the absence of the evidence that was elicited.*

Wiliam (2007: 37) considers that formative assessment in the classroom context encompasses five major activities such as sharing success criteria with students, questioning, giving comment/“feedback, peer and self-assessment, and the formative use of summative tests.” These activities, together with the three key processes of learning and teaching articulated by Liu and Careless (2006:

282) form the basis for Wiliam and Thompson's (2007) conceptualisation of formative assessment and the development of the five strategies of formative assessment practice. The three processes of learning and teaching were namely, establishing where the "students are in their learning, establishing where they are going and establishing what needs to be done to get them there." To actualise the key processes, the teacher, the students and their peers have their own roles. For instance, the teacher is responsible for the design and implementation of an effective learning environment. The students and peers are also responsible to actively involve within that environment (Black & Wiliam, 2009: 5).

By considering the five major activities of formative assessment in the classroom context mentioned by Wiliam (2007: 37), the relationship among the three processes of teaching and learning articulated by Lui and Careless (2006) and the stakeholders in learning (teachers, students and peers), Wiliam and Thompson (2007: 62) conceptualise the practice on formative assessment in terms of following the five key techniques listed below.

- Clarifying and sharing intentions and criteria for success.
- Engineering effective classroom discussion
- Providing feedback/comment that moves students forward.
- Activating students as instructional resources for one another.
- Activating students as owners of their own learning.

These five techniques pertaining to formative assessment implementation in the classroom, together with the constructivist learning environment, were used as a conceptual framework in situating the quality formative assessment used in this study. The conceptual framework is presented in the following table:

**Table 2.1: Conceptual framework of quality formative assessment adapted from Wiliam and Thompson (2007: 62)**

<b>Actors and roles</b>	<b>Where the student is going</b>	<b>Where the student is right now</b>	<b>How to get there</b>
Teacher	1. “Clarifying learning intentions and criteria for success”	2. “Engineering effective classroom discussions and other learning tasks that elicit evidence of student understanding”	3. ”Providing feedback that moves students forward”
Students	Understanding learning intentions and criteria for success	4. Activating students as the owners of their own learning (for example, enhancing self-regulated learning & self-assessment)	
Peer	Understanding and sharing learning intentions and criteria for success	5. Activating students as instructional resources for one another (for example, peer assessment and feedback)	

The above table depicts the conceptual framework on the quality formative assessment as used in this study. For instance, at the start of a lesson, the teacher is responsible for clarifying learning intentions and success criteria and communicating that to the students. While teaching, the teacher needs to create a learning environment involving discussions, questioning and other learning tasks to obtain evidence on student understanding. Moreover, he/she needs to provide formative feedback or comments to the students to enable them to achieve the success criteria and the learning intentions. Correspondingly, the students and peers are expected to understand learning intentions and criteria for success at the start of a lesson. Furthermore, there should be sufficient activation and motivation of the students for self-assessment and the regulation on their own learning. The learning environment can be facilitated so that the students collaborate in their learning, assess each other’s work, share feedback and comments to reach the success criteria and achieve the learning intentions.

Accordingly, the figure below shows the framework regarding how this study aligns itself to constructivist paradigms of learning and to the above conceptual framework of formative assessment strategies proposed by Wiliam and Thompson (2007).

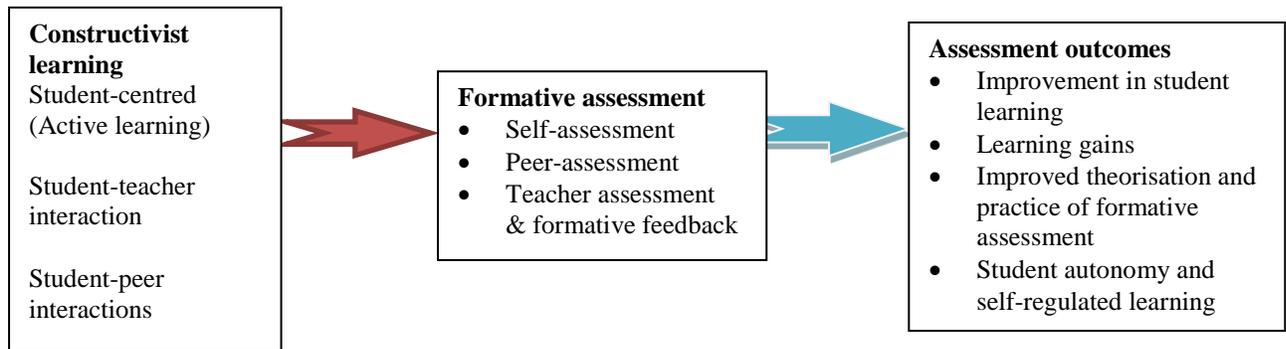


Figure 2.1: How constructivist learning informs this study  
(Adapted from Yorke, 2003: 482)

Active student involvement and social discourse among students and teachers are characteristics of constructivist learning. Students make sense of new knowledge by mapping it to their existing knowledge and they see instruction not only as the transmission of knowledge but also as an intervention in an ongoing knowledge construction process (Gibbs, 1999: 362). Moreover, with regard to constructivist approaches to learning, there is an opportunity that the students are involved in the assessment process as self- and peer-assessors. In addition, the continuous practice on effective feedback from the educator and the peers contributes to learning improvement. As a result, educators consider formative assessment as an essential curriculum component and regular classroom work that is influential to student-learning improvement (Shepard, 2005b: 22). Hence, the following statement explains the logic for the theoretical alignment of this study with the constructivist learning approach. “A quality formative assessment that is integrated with instruction, involving the students as self-assessors, peer assessors, and when accompanied with the provision of formative feedback improves student learning and the self-regulation on learning”

## 2.5 SUMMARY OF THE LITERATURE REVIEW

The literature review and the theoretical perspectives which inform learning and assessment explained the importance of quality formative assessment to the improvement on student learning. Research in

educational assessment describes formative assessment in different ways. These differences emanate from the available differences on the conceptualisations of learning and assessment. Formative assessment is an assessment carried out during instruction to improve teaching and learning. In other words, assessment becomes formative when educators and students use the assessment information to inform new learning. The literature reviewed divided formative assessment into formal-informal, assessment for learning (AFL) and assessment as learning (AaL). Assessment for learning is mainly a teacher-initiated practice. On the contrary, assessment as learning is student-initiated practice.

It is important to note that formative assessment plays a crucial role in the improvement of student learning and achievement. Nevertheless, there is an extensive body of research, which discloses the over-reliance on the summative forms of assessment in the context of higher education classrooms. Consequently, this reduces the practice on formative assessment and limits the educator to rely on a predominantly transmission pedagogical approach in teaching.

On the other hand, there is a growing body of research showing the instructional advantages on using formative assessment. “Formative assessment has a more profound effect on learning” than other instructional interventions producing significant effect sizes of achievement (Careless, 2007a: 176). It is particularly useful to improve the learning of low-achieving students. Formative assessment also has many advantages such as helping with the identification of the gap between what students have learned and what they should learn, make possible the metacognition in students, and increasing the motivation and participation of students in the learning process (Careless, 2007a: 175).

As seen in the reviewed literature, there are several approaches to formative assessment. Among these, one is formative feedback that is at the centre of the formative assessment practice. Formative feedback is useful to have a clear idea on the knowledge and skills needed, review current student progress, and make the ways of improving learning clear to students. Much of the research on effective feedback practice assumes that the feedback helps to identify learning difficulties. However, there is shortage of research on the range of approaches that engage the student with feedback, especially in line with the constructivist and socio-cultural learning perspectives (Yorke, 2003).

Other forms of formative assessment reviewed in the literature include self-and peer-assessment. Self-assessment requires the student to reflect on the quality of his/her own work, judge the achievement of

learning goals and revise the work accordingly. In peer-assessment, which educators consider as one aspect of self-assessment, a student comments and judges the work of another student to gain insight into his/her own learning and performance. Self- and peer assessment increase the student's metacognition or thinking about thinking, understanding of assessment criteria and active involvement in the process. However, existing research demonstrates that self- and peer assessment are not common formative assessment practices (Andrade, 2010: 5).

Self and peer assessment encourage self-regulated learning. With regard to self-regulation, after the student set goals for learning, attempt to monitor, regulate and control his/her cognition, motivation and behaviour to achieve the set learning targets. In fact, there are differences among students in self-regulating learning, while there are evidence to show self-regulated learning as effective (Zimmerman, 2002: 69).

In addition to what has been said, the perceptions of educators and students on formative assessment influences its use and effectiveness. The research literature recognises perception as a major challenge to the use of formative assessment in the classroom context. For instance, the perception of an educator is extremely important because he/she is a key guide to the classroom instructional activities. The perception of the student is also important, mainly because in the practice of formative assessment, the student assumes an increased responsibility to regulate and self-reflect on learning.

The literature with respect to the empirical evidence clarified the contribution of formative assessment to learning improvement. In fact, the effect of innovative assessment practices on the student learning experience in higher education is a neglected research topic (Bevitt, 2015: 103). From the literature, it was learned that students value improvement-oriented assessment methods. There are also recorded evidence which assert formative assessment as a powerful technique to improve academic performance. Moreover, some of the research evidence discussed in the chapter show significant differences with respect to average effect sizes in the learning gains of an intervention and comparison groups, where assessment feedback was used with the lessons of the intervention group.

The empirical evidence show the advantage of immediate and corrective feedback provision for learning improvement. Importantly, feedback provision has a strong impact on students' subsequent learning and performance. As the review of the empirical evidence shows, students think both

individual and whole class feedback as beneficial to learning. Furthermore, the research evidence substantiates the significance of peer assessment to bring about critical reflection and the development of autonomous learning skills for students. In some of the studies, students perceived peer assessment positively, despite complaints on the unfairness and lack of accuracy in peer markings.

On the other hand, there was an emphasis on the development of greater autonomy and responsibility to self-regulate learning by students. As the evidence reveal, there are differences in the interpretation of the concept of 'self-assessment.' For instance, many educators and students think self-assessment is self-grading. However, self-assessment does not only involve self-grading, it also includes self-reflection and the development of important learning skills. Importantly, students who have a firm belief in the significance of self-assessment, benefit in their learning.

The educators' perceptions on formative assessment influence their practice. They tend to use formative assessment when they have a positive perception. Similarly, when students believe in the significance of formative assessment, they tend to participate in learning more actively and experience improved learning.

Another section of this chapter discussed the major theories that inform learning and assessment. To begin with, the behaviourist theory that was known since the first decades of the twentieth century, assumes the occurrences of learning when there is a systematic association between events called stimuli and responses. In terms of this theory, assessment is the provision of opportunities for the students to practise the proper responses by answering questions. Because of this, exploration and construction of alternative response procedures and learning by the student are extremely limited. In contrast, the cognitive theory of learning regards learning as a discrete change in the states of the mind rather than changes in the probability of responses. Based on this, the assessment procedures rely more on checking the students' ability to retrieve the learned information and to use it in a new context (Jonassen, 1991: 8).

Furthermore, the other theories of learning discussed in this chapter are the constructivist and the socio-cultural learning theories. In this regard, Ertmer and Newby (2013: 61) explain that for constructivists, learning occurs "by an active process of sense making by the students." Here, the assessment involves self-reflection by the students as self-assessment, peer assessment, self-regulation

skills and useful and timely formative feedback from the educator. In contrast, the socio-cultural theory, “acknowledges the influence of social processes” on learning and assessment (James, 2005: 87). Accordingly, learning and assessment are intrinsically socially situated. Therefore, according to this theory, students learn through social interactions. Besides, formative feedback and peer assessment are good ways of assessment within the socio-cultural view on learning (Shepard, 2000: 12).

While the constructivist and socio-cultural theories of learning promote the use of alternative assessment practices such as formative feedback, self- and peer assessment, in practice, educators tend to prioritise summative examinations. Apart from the educators’ reluctance to use the alternative assessment techniques, there is a limited research base regarding how these practices can be used formatively in constructivist and socio-cultural learning frameworks in the context of Ethiopian higher education institutions. Moreover, in this context, there is no research on how students use alternative assessment individually and in groups respectively, as suitable opportunities for improving their learning.

As discussed in the first chapter of this study, to improve the learning and quality of university programmes is a national concern in Ethiopia. Nevertheless, the contribution of quality formative assessment to the country’s higher education has not been examined thoroughly. As classroom assessment activities are rarely informed on the outcomes of empirical evidence, conducting research in the area of formative assessment is necessary. Therefore, this study examined the ways by which the use of quality formative assessment improves student learning in a “General Psychology” course at three west Ethiopian universities.

After the presentation of the related literature on formative assessment, empirical evidence of formative assessment to improve learning and the self-regulation of learning, theoretical conceptualisation on learning and assessment and conceptual framework of the study, the next chapter focuses on the research design and methodology that was followed in the study.

Thus, in this study it was the intention of the researcher to examine if the use of quality formative assessment could improve student learning at the universities located in west Ethiopia.

# **CHAPTER THREE**

## **RESEARCH DESIGN AND METHODOLOGY**

### **3.1 INTRODUCTION**

The previous chapter presented the literature review, empirical evidence on formative assessment, theoretical views on learning and assessment and the conceptual framework of the study. The chapter discussed the diverse approaches as well as the principal theoretical views on formative assessment. It also presented the empirical literature with respect to learning improvement resulting from the use of formative assessment. This chapter presents the research design and the procedures of data collection and analyses followed by the study.

The chapter focuses mainly on the following sub-topics:

- The research problem;
- The research questions and hypotheses;
- The research philosophy and its justification;
- The research design and justification;
- Justifications for design research;
- Data collection instruments and procedures;
- Measures that the researcher took to ensure the reliability and validity of research instruments;
- Ethical measures; and
- Summary of research design and methodology

### **3.2 THE RESEARCH PROBLEM**

The problem area in this study relates to the absence on the use of quality formative assessment in the teaching of courses at Ethiopian universities. The none use of formative assessment is a challenge to the quality of education. The extent of which quality formative assessment contributes to learning improvement and self-regulation on learning was not researched and documented. Thus, the researcher undertaken this study to examine the ways by which quality formative assessment could improve student learning in a university course. As shown in section 3.3 (p81) below, the main research

question and the specific data level research questions are formulated to guide the research activities. The researcher took the necessary care to make sure that the research questions were clearly formulated, academically important, researchable, and useful to guide the research activities from broad to specific (Cozby, 2009: 21).

### **3.3 THE RESEARCH QUESTIONS AND HYPOTHESES**

As indicated in the first chapter (section 1.6.3, p15) of this study, the main research question is:

*“In what ways can the use of quality formative assessment improve student learning on university courses?”*

From this main research question, the following specific research questions and hypotheses were formulated and presented:

#### **3.3.1 Research question 1**

- What is the present practice regarding the use of quality formative assessment in the teaching of ‘General Psychology’ course in Ethiopian universities?

#### **3.3.2 Research question 2 and hypotheses**

What is the extent of learning gain resulting from the use of quality formative assessment?

##### **Null hypothesis 1:**

There is no statistically significant difference in the learning gains between students taught by the use of summative and formative assessment methods.

##### **Alternative hypothesis 1:**

There is a statistically significant difference in the learning gains between the students taught by the use of summative and formative assessment methods.

#### **3.3.3 Research question 3 and hypotheses**

- To what extent can the use of formative assessment involve the students to self-regulate their own learning and assessment?

**Null hypothesis 2:**

There is no statistically significant difference between the intervention group and comparison group students in reporting on their perceptions on self-regulating learning and assessment.

**Alternative hypothesis 2:**

There is a statistically significant difference between the intervention group and comparison group students in reporting on their perceptions on self-regulating learning and assessment.

**3.3.4 Research question 4:**

- What are the views of the educators on the use of quality formative assessment in the instructional process?

**3.4 RESEARCH PHILOSOPHY AND JUSTIFICATION**

A researcher needs to identify the overarching philosophical paradigm that guide the study before making a detailed plan on the research activities. Teddlie and Tashakori (2009: 20) describe research paradigms as systems of beliefs and practices, which guide how the researcher identifies the research procedures to be followed to answer the research questions. For Blanche and Durrheim (2004: 6), research paradigms are all-encompassing systems of interrelated practice and thinking, which define the nature of inquiry along three dimensions, namely ontology, epistemology and methodology. The conceptualisation of these dimensions exert a considerable influence on the research activities.

Ontology relates to the nature of the reality that is to be studied and what can be known about it. For instance, positivist ontology is concerned with a stable external reality. In contrast to this, an interpretive ontology is concerned with the internal reality of an individual experience. Ontology embodies an understanding of reality (or what is), and epistemology attempts to understand what it means to know (Litchman, 2010: 5). Epistemology offers a philosophical background for deciding the legitimacy and adequacy of knowledge. Blanche and Durrheim (2004: 6) point out that a positivist epistemology regards knowledge as objective and obtained by a detached observer. In contrast, an interpretive epistemology acknowledges the observer's individuality on knowing reality. Blanche and Durrheim (2004:6) relate positivist epistemology to experimental, hypothesis testing, and quantitative study designs, while interpretive methodology is linked with qualitative study designs.

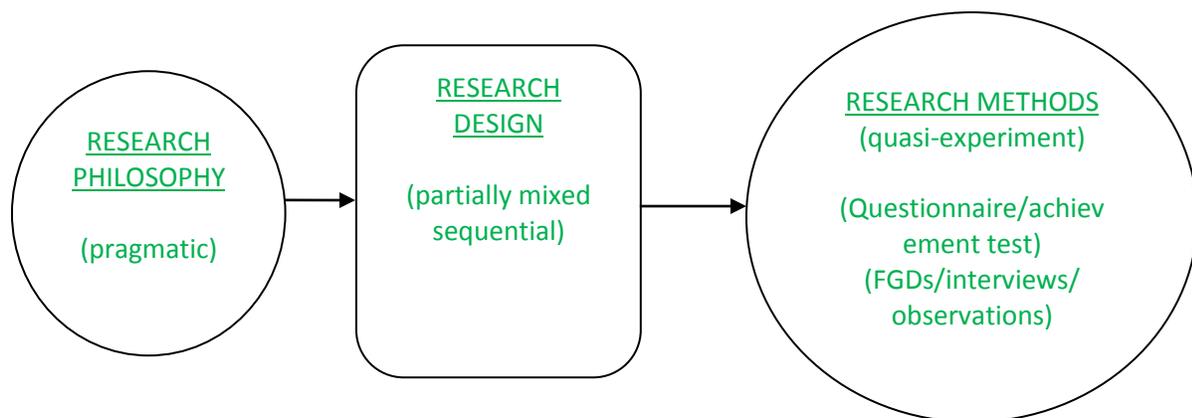
A positivist outlook views reality as external to the observer and waiting for discovery. Reality exists regardless of whether it is being observed. This means, different observers could possibly discover identical realities. On the contrary, the interpretive outlook considers reality as something, individually and socially constructed. According to this view, there could be possibilities for the presence of multiple realities on a given phenomenon.

The independence of reality in a positivist stance implies the possibility of discovering and explaining the realities in human behaviour (for example, learning and assessment) and the relationships to produce factual statements about them. However, from an interpretive perspective, subjective experiences of the research participants and the researcher are crucial to explain the behavior under study. Since this study followed a mixed methods design, it positions itself within the pragmatic paradigm of research to examine the behaviour of students and educators with respect to the use of quality formative assessment in classrooms.

Pragmatism is a paradigm of research that attempts to amalgamate the conceptualisations of research present in positivist and interpretivist orientations. Pragmatic approach has advantages and limitations. Some of the advantages as outlined by Johnson and Onwuegbuzie (2004: 18) are its recognition to objective reality as well as peculiar social and psychological phenomenon of a given society; and the positive regard placed to the influence of the inner world of individual members of society in their action. The limitations of pragmatic research philosophy include giving much emphasis to applied research than basic research and the promotion of incremental changes rather than fundamental, structural changes in societal practice (Johanson & Onwuegbuzie, 2004: 18).

A clear understanding and discussion on the ontological, epistemological and methodological perspectives are useful to undertake scientific research. According to Crotty (1998: 6), there is always an interrelationship between the theoretical stance that the researcher follows and the researcher's views of epistemology and research methodology. The researcher's epistemological stance influences the theoretical perspectives such as pragmatism, positivist or interpretive. The theoretical perspective, in turn, influences the choice of methodology (such as survey, experimental, phenomenology). Finally, the research methodology influences the choice of data collection techniques and instruments (Litchman, 2010: 8).

In the present study, the choice of research paradigms, methodologies, and data collection procedures are the following. First, the study situated itself within the pragmatic paradigm because the research questions set (see section 3.3, p81) call for both objective (such as data from questionnaires and achievement test scores) as well as subjective types of data, such as the personal experiences of individuals and groups involved in the study as obtained by interviews, focus group discussions, and classroom observations. Second, with respect to the research methodology, the pragmatic paradigm requires the mixing of quantitative and qualitative methodologies. The quantitative methodology is useful because the study followed empirical methods of data collection, analysis and interpretation of research variables with quantitative characteristics. Moreover, the study intended to answer the research question: “What is the extent of learning gain resulting from the use of quality formative assessment?” Similarly, the qualitative methodology is useful to look into the complexity of research participants’ views and to account for qualitative data collected through interviews and focus group discussions. Particularly, the qualitative methodology is a useful method to find an answer for the research question that reads “What are the views of the educators on the use of quality formative assessment in the instructional process?” The following figure 3.1 demonstrates the steps followed on how the research philosophy (pragmatism) guides in the choice of the research design (partially mixed sequential mixed method) and how the research design leads to the selection of the specific research methods.



**Figure 3.1: The steps on choosing the research philosophy, design and methods**  
*Partly adapted from ( Creswell, 2007: 19-23)*

### **3.5 RESEARCH DESIGN AND JUSTIFICATION**

Research design is a framework that guides the research activity to make a connection between the research problem and the relevant data. It is a comprehensive plan that helps to find an answer to the central research question. It shows the overall structure of procedures the researcher applies during the data collection and analysis phases of the study (Leedy & Ormrod, 2001: 91). According to Creswell (2009: 3), a research design includes the detailed steps of the study, guidelines for data collection decisions, instruments to be used, the sample size and sampling techniques. In addition to this, a research design includes a tactical framework of action that serves as a connection between research questions and the execution of the research (Creswell, 2009: 4).

As outlined in the first chapter, the purpose of this study was to (1) examine the ways of improving student learning by the use of a quality formative assessment in the teaching of a university course in west Ethiopian universities, (2) determine the extent of learning gains resulting from the use of quality formative assessment, (3) study the perceptions of the educators on the use of quality formative assessment and the impeding factors on the teaching of courses, and (4) examine the extent on which the use of quality formative assessment involves the students as self-regulated learners and assessment users. Therefore, it was necessary to collect data from the groups, who experienced the effect of the use of quality formative assessment in the teaching of a university course. To achieve the above research objectives, the study followed a mixed methods research design. Creswell, Clark, Gutman and Hanson (2003: 265), describe a mixed method as a research design that integrates quantitative and qualitative research data either concurrently or sequentially at one or more stages of the research process.

Mixed methods research is acknowledged as a third major research paradigm along with quantitative and qualitative research (Johnson & Onwuegbuzie, 2007: 113). This design of research is advantageous because it uses the strengths of both quantitative and qualitative methods (Creswell, 2009: 206), and their combined use provides an expanded understanding of the research problems. A mixed-methods approach is also useful since it compensates the weakness of one by the strength of the other. The other advantage of mixed methods research is the acknowledgement it gives to quantitative and qualitative methods and the possibility of a powerful third paradigm that often provides a complete, balanced, informative and useful research results (Johnson, Onwuegbuzie & Turner, 2007:129). In the present study, to supplement the quantitative data, qualitative data was collected

based on a sequential explanatory strategy. The researcher chose this method because it is relatively easy to implement and it falls into clear and separate stages (Creswell, 2009: 212).

Specifically, the study followed a mixed method research design of the type partially mixed sequential dominant status in which a main quantitative study was sequentially followed by a qualitative study (Leech & Onwuegbuzie, 2007: 470). This method involves conducting a study on two phases that occur sequentially. This type of mixed method design is useful when the researcher intends to conduct the study by giving emphasis on the quantitative methodology. According to Creswell, *et al* (2003: 171), partially-mixed sequential design is used when there is an intention on examining a large sample first to test the relationship of research variables and then to investigate in more depth with a few cases in the qualitative phase. The implementation of this mixed method design is easy since the steps fall into clear separate stages.

The Partially mixed and sequential approach is a good choice for research studies with a strong quantitative orientation. In this approach, the collection and analysis of qualitative data usually follows and supplements the collection and analysis of quantitative data (Creswell, 2009: 211). According to Teddlie and Tashakori (2009: 26), in a sequential mixed design, the researcher can follow the quantitative and qualitative phases of the study one after the other. In fact, the major disadvantage of this design is the time it consumes to design and conduct the study (Driscoll, Yeboah, Salib & Rupert, 2007: 22). In the present study, the researcher first collected and analysed the quantitative data, collected and analysed the qualitative data, and then mixed the two in the interpretation and discussion phases of the study (Creswell, *et al.*, 2003: 178). Therefore, the following two paragraphs of this section explain the mixed quantitative and qualitative phases of the study one by one and show how the mixing of the two was done figuratively.

### **3.5.1 The quantitative phase**

Quantitative methodology is regarded as an empirical science. Empirical science regards the reduction of all phenomena to empirical indicators, which represent the truth. Quantitative method studies an objective reality existing independent of the human perception. Thus, the researcher studies about a phenomenon without influencing it or being influenced by it (Creswell, 2009: 145), and the goal of research is to measure and analyse causal relationships between variables within a value-free framework. Therefore, the methods commonly used to realise the goal of research include careful

randomisation, highly structured protocols and written or orally administered questionnaires with a limited range of predetermined responses.

The quantitative method usually involves the collection and interpretation of numerical data (Lichman, 2010: 9). As Driscoll, *et al* (2007: 25) state, quantitative research is confirmatory in nature and the theories and present state of knowledge about the research phenomenon guides it. Furthermore, quantitative research encompasses investigations to test propositions that have conceptual framework or theory as bases. For instance, one of the alternative hypothesis in this study state, “There is a statistically significant difference in the learning gain between the students taught by the use of summative and formative assessment methods.”

Quantitative methodology uses reasoning or deductive logic that argues from the general conceptual framework to the data collected (Teddlie & Tashakori, 2009: 5). In quantitative studies, researchers have well-defined research procedures such as survey, correlation, experimental, and quasi-experimental. Among these, a quasi-experimental procedure is advantageous to study the association between variables (such as, what is the relationship between the use of a quality formative assessment and learning gains by students?), when a random assignment of research participants to treatment conditions is not feasible.

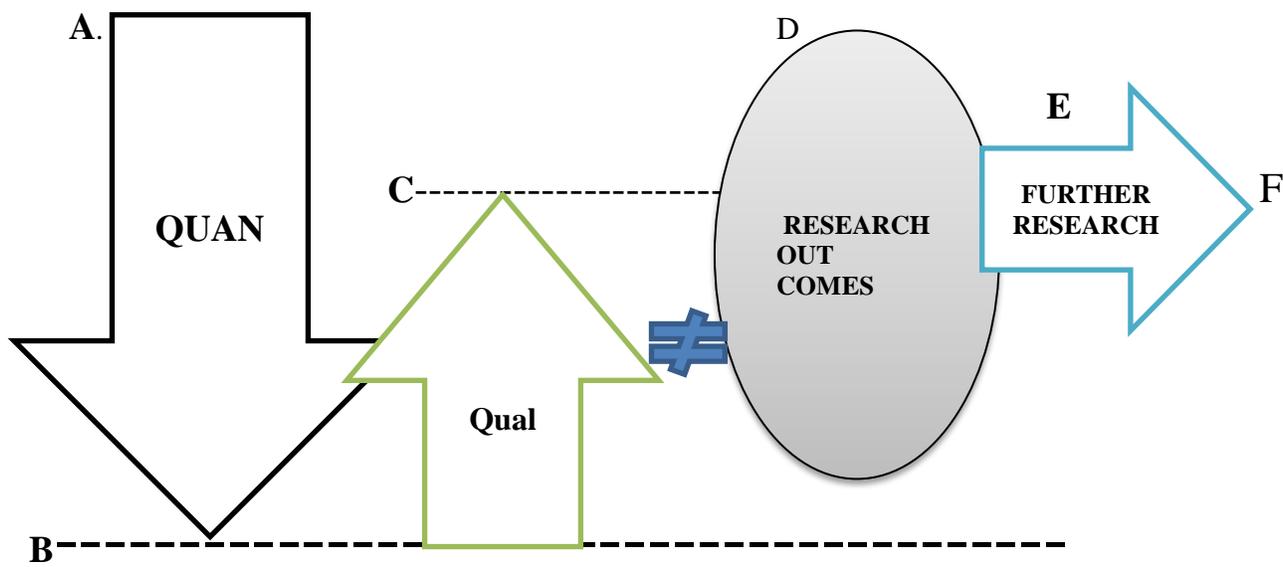
Quasi-experimental procedure is a useful method when it is not possible to use a true experiment (Gay & Airasian, 2003; Stess, Coertjens, & Petegem, 2013). One major advantage of this procedure is control on sources of invalidity when a random assignment of research participants to groups is not feasible (Gay & Airasian, 2003: 22). There are three alternative designs of quasi-experimental research such as the non-equivalent control group, comparison group time-series and the counterbalanced designs. Of these alternatives, the comparison group time-series quasi-experiment design was used in the quantitative phase of this study because a random assignment of intact groups (all students in a given class) to either the intervention or to the comparison group was an advantage of such a method.

### **3.5.2 The qualitative phase**

Qualitative methodology is a useful research procedure when the researcher believes in the existence of multiple realities of a phenomenon based on individual’s thinking. This methodology usually uses interviews, focus group discussions and observations as major procedures of data collection. In a

qualitative study, researchers collect data as observations or as written texts and spoken utterances to record and analyse by identifying and classifying themes. Leedy and Ormrod (2001: 101) explain that researchers typically use a qualitative study to answer questions pertaining to the complex nature of a phenomenon, often with the anticipation to describe and understand the phenomenon from the perspectives of the study participants.

In a qualitative study, researchers collect an extensive amount of verbal data amongst a limited number of participants, organise those data into some form which give coherence to them and use verbal descriptions to reveal the situation they investigate. In this study, the researcher used a qualitative method of the explanatory type. Explanatory studies seek to answer research questions of the type “why,” “how” and ‘what’ (Litchman, 2010: 12). For example, one of the research questions in this study asks, “What are the views of the educators on the use of quality formative assessment in the instructional process?” Thus, the following schematic figure displays the mixing of the quantitative and the qualitative research methodologies on the study.



**Figure 3.2: Schematic diagram of the mixed-methods design**

As shown in the above figure, the quantitative data collection process began at point A (including the collection of base line data). The wider downward arrow symbolises the quantitative procedure that is the overarching method on the present study, and the positivist stance in testing a theory (a top down

and deductive in approach). Point B shows the results of the quantitative research, and the sequence that shows the start of qualitative data collection. The upward (inductive) arrow symbolises the qualitative research design (interpretive standpoint) that contributed to the research outcomes from point C to the direction of D. Point D indicates the research outcomes discussed in the next chapter (Chapter 4), where the quantitative and the qualitative methods are mixed in the interpretation and discussion of the study results. Point E and F indicate the future. Point E denotes the need for further research on the integration and use of quality formative assessment to benefit the improvement of learning at higher education institutes. Point F represents the far future on the significance of instructional design research to inform the science of teaching and learning and advance the quality of education and training provision at universities.

## **3.6 JUSTIFICATION FOR DESIGN-BASED RESEARCH**

### **3.6.1 Introduction**

Currently, researchers in education (Akker, Gravemeijer, McKenney & Nieven, 1999; Collins, Joseph & Bielaczyc, 2004) regard education as a “design science,” emphasising its interdisciplinary approach and problem orientation. From experience, traditional research approaches such as survey and correlation analysis, since they focus on descriptive knowledge, tend to divorce the field of education research from issues of everyday practice and problem. Traditional research approaches are judged as ineffective for providing useful solutions to a variety of designs and development problems in instructional processes (Baumgartner, Bell, Brophy, Hoadley, His, Joseph, Orrill, Puntambekar, Sandoval & Tabak, 2003: 5). At present, researchers show interest to study about learning because of two aspects of knowledge acquisition that may pose a challenge to students. These aspects are (1) inert knowledge, when students acquire factual knowledge that they cannot transfer, access, or make use of it, (2) passive learning, when students do not readily engage on intentional and self-regulated learning (Collins, *et al.*, 2004: 18).

As discussed by Baumgartner, *et al* (2003: 5), design-based research that combines empirical research with a theory-driven design of learning environments is an emerging methodology to understand how, when, and why innovative instructional techniques work in practice. Design-based research is a way of explicitly exploiting design processes as opportunities to advance researchers’ understanding of teaching, learning and educational processes (Edelson, 2002: 107). Edelson also points the advantages

out of design-based research in terms of offering opportunities to learn unique lessons, practical experiences applied directly and engaging researchers in the field of education in the improvement of educational practice.

Importantly, design-based research has two essential purposes (Akker & Plomp, 1993: 2). One of the purposes is supporting the development of “prototypical products” including the “provision of empirical evidence” for effectiveness. The other purpose is the development of methodological and theoretical guidelines for the design and use of such products. In terms of such an approach, the scientific contribution that adds to the fund of knowledge in the field may be equally desirable as the practical contribution and experience that is an instructional design improvement.

Baumgartner *et al.* (2003: 8) identify four areas of promise resulting from design-based research in education. These are exploring possibilities for creating new learning environments, developing contextually based theories of learning and instruction, advancing and consolidating design knowledge and increasing the capacity of educational innovation. This study, therefore, examined the first area of promise by attempting to find ways of improving learning by the use of a quality formative assessment integrated on the teaching of a university course.

Design research intends on carrying out formative research to check and refine the effectiveness of educational designs based on formulated principles and theories (Collins, *et al.*, 2004: 18). Design-based research applies best to investigate curricula, learning improvement and instructional design, teacher education and didactics, instructional media and technology. This research project accepts design research as it applies to the improvement of learning, instructional design, and teacher professional development and didactics. In the teacher professional development, for instance, design research takes the form of action research with practical inquiries where teachers, in collaboration with researchers and designers, reflect on the effectiveness of their own teaching and on the students’ learning.

Regarding the didactics, design research tends to emphasise on interactive, cyclic process of development and research on which theoretical ideas and the design of instruction are tested in classroom settings. This eventually leads to theoretically and empirically founded instructional products, learning processes, assessments, and instructional theories. Therefore, in the present study

the researcher designed a constructivist learning environment that integrated quality formative assessment to examine the contribution from the use of quality formative assessment to learning improvement and the self-regulation on learning.

### **3.6.2 Instructional Design**

Instructional design is a scientific approach that is used to develop education and training programmes. Merrill (2007: 336) describes knowledge and skill acquisition as a goal-directed process. For the acquisition of knowledge and skills, cognitive activities and abilities are necessary. The initiation and maintenance of knowledge and skill acquisition requires instruction, that entails “the deliberate arrangement of learning conditions to promote the attainment of some intended objectives” (Driscoll, 2000: 347). According to Merrill (2007: 335), instruction is an activity intended to promote the purposeful cognitive processes, which lead to learning, that is, the modification or extension of existing knowledge and skills. In the classroom context, instruction involves communication between a student (usually a novice in the subject matter) and a teacher (typically an expert in the subject matter). The procedures and the rules with respect to the design and development of such communications are labelled as instructional design (Collins, *et al.*, 2004: 20).

Instructional design involves the process of analysing learning problems and needs, setting instructional objectives, determining content, designing materials to reach the objectives, and trying out and revising the learning programme in terms of student achievement (Merrill, 2007: 347). In the same way, Kember (1991: 297) describes instructional design as the entire process involved with the learning needs analysis and “the goals and the development of a delivery system to meet the needs.” The delivery system may include developing instructional materials and learning activities and trying out and revising all instruction and assessment activities.

The design of instruction involves the analysis, design, development, field testing, revision and implementation (Sullivan, Ice, & Niedremeyer, 2000: 87). According to Voerman and Gustafson (2004: 70), the need for instructional design and research begins with the assumption that existing practices are inadequate or may, at least, need improvement, so that new practices are necessary. Hence, design research emphasises studying learning problems and improvements as a result of designing unique instructional interventions (Collins, *et al.*, 2004:21). As pointed out earlier, design research contributes to three main types of outputs such as the principles of design, participants’

professional development and design products (Akker, Bannan, Kelly, Nieveen & Plomp, 2007: 20). However, the attainment of each of the outputs presupposes a set of assumptions to shape the instructional design research activity.

The first assumption as Akker, *et al* (2007: 6) indicate is rigorousness. If instructional design research is to yield useful knowledge in the form of design principles, it must comply with rigorous standards. For this to happen, the research should address issues concerning internal validity, external validity, reliability and utilisation. Internal validity refers to the extent to which causal relationships of variables can be based on the research findings. External validity refers the extent to which findings are transferable to some broader domains. Reliability means the extent to which the study can be replicated with the same results. Finally, utilisation refers to the extent to which actions can be taken based on the findings. The second assumption of instructional design research is relevance. This refers to the benefits of the instructional design for educational practice. To realise this benefit, the instructional design must be “carefully examined to benefit the context in which it is implemented.” Such an examination should be informed by research skills and a working knowledge of intact classrooms (McKenney & Akker, 2005: 46). The third assumption of instructional design research is collaboration. Design research activities which are conducted in collaboration with the participants’ are beneficial to professional development and improved learning.

### **3.6.3 The benefits of instructional design research**

The major benefits of empirical research have been described as knowledge creation, understanding and prediction. The same is true to instruction based design research. Richey and Klein (2005: 23) describe the benefits of instruction based design research as the explanations of the design effectiveness and the formulation of a theory that can be generalisable to new problems. Instruction based design research intends to generate knowledge from empirical data derived systematically from classroom practice (Richey & Klein, 2005: 24). As these authors argue, design research either creates a generalisable conclusion or statement of laws or produces a context-specific knowledge that serves a problem-solving function. Furthermore, instruction based design research helps to establish new tools, techniques, and procedures based upon a methodological analysis on specific cases.

### 3.6.4 Origins of instructional design

Principles of several disciplines such as educational psychology, cognitive science and communication inform the design of instruction. For instance, from the behaviourist perspective of learning, the application of operant conditioning to programmed instruction was the basis for the modern concept of instruction (Skinner, 1953). Schramm (1962: 2) describes the set of principles of programmed instruction design as an ordered sequence of stimulus items, to each of which a student responds in some specified way, responses being reinforced by the immediate feedback (knowledge of results). Therefore, the student moves in small steps, making few errors and providing mostly correct responses, from what he/she knows, by a process of successively closer approximations towards what he/she is supposed to learn from the designed instruction. However, due to the accumulation of research evidence and practical experiences, the generality of many of these principles came into question (Molenda, Reigeluth, & Nelson, 2003: 475).

Beginning the 1960s, principles drawn from cognitive psychology have been informing the design of instruction (Molenda, *et al.* 2003: 476). The cognitive perspective on instruction expects students to use their thought processes and memory in generating the strategies for learning as well as storing and manipulating the mental representation of knowledge. From the cognitive theory of information processing, Gagne formulated prescriptive theories about instructional methods, which he called external conditions of learning. He also proposed nine instructional events, which became influential in the design of instruction. The nine instructional events proposed by Gagne are “gaining attention, informing the objectives to students, stimulating to recall of prior knowledge, presenting the content, providing learning guidance, eliciting performance, providing feedback, assessing performance, and enhancing retention and transfer” (Gagne & Medsker, 1996: 140).

The other prescriptive theory of instruction derived from cognitive psychology is the schema theory. Schema theory emphasises on the schematic structure of knowledge. A schema provides ideational scaffolding containing slots that can be initiated into particular cases (Ausubel, 1980: 402). The schemata help students to organize the learned information into meaningful units. The schema theory implies that the students’ cognitive structure is the most important factor of successful learning (Molenda, *et al.*, 2003: 477).

In recent times, new instruction theories which emphasise the significance of concepts produced by the students themselves came into existence. The generation of ideas by the students influences the success of instruction (Molenda *et al.* 2003: 478). Generations are then the mental activities performed by students, such as discussions, analogies, pictures and summaries (Molenda, *et al.*, 2003: 478). This emphasis on the generation of ideas, characterise constructivism that regards knowledge as a social and individual construction based on the students' interpretation of prior experiences (Jonassen, 1999: 217). Accordingly, Driscoll (2000: 382-383) lists five prescriptive principles of instruction derived from constructivism, namely, "embedding learning in complex, realistic and relevant environments, provide for social negotiation as an integral part of learning, support multiple perspectives and the use of multiple modes of representation, encourage ownership in learning and nurture self-awareness on the knowledge construction process." The instructional intervention that integrated the use of quality formative assessment on lessons of the course in the present study was designed and implemented following a standard procedure of design to help in the attainment of the study objectives.

### **3.6.5 Instructional design phases**

Since this study examined the use of quality formative assessment used to improve student learning and promote the self-regulation on learning, the instructional design process followed the principles derived from the constructivist learning perspective and the five strategies of formative assessment proposed by Wiliam and Thompson (2007: 62). It also followed the standardised instructional design process of ADDIE. ADDIE stands for Analyse, Design, Develop, Implement and Evaluate. Analysis, which aims at exploring the problem and its context, is the first phase in the instructional design process. The analysis phase usually results in a problem definition (Voerman & Gustafson, 2004: 75). This analysis comprises needs assessment, determination of the need to solve the problem and determination whether an instructional intervention would solve the problem. When the needs assessment confirms the needs as stated above, then the identification of users, user environment, content and learning tasks follows (Smith & Ragan, 1998: 4). In the present study, the analysis phase involved the collection of baseline data from classroom observations, pre-test questions, and questionnaire administration. Correspondingly, there was a discussion involving the educators and the students on the joint planning for the instructional intervention period.

Based on the results of the analysis phase, a solution was sought to overcome the problem under study. The design phase emphasises the generation and evaluation of alternative solutions that would deliver

a promising blueprint for the solution. In many of the ADDIE processes, the design phase focuses on identifying instructional objectives- what specific knowledge and skills the students will obtain from the instructional intervention and identifying outcomes- how will the researcher and the educators know that the students have achieved the instructional objectives. In this case, the present study used a lesson plan template that indicated the instructional tasks which the educators and the students accomplish while using quality formative assessment to improve student learning and to promote the self-regulation on learning.

The third phase of instructional design is the development phase. During this phase, the researcher identified the instructional strategies that facilitated student learning improvement. The development phase involves the communication of learning objectives in a lesson, the integration with and the use of quality formative assessment in the learning task and the provision of feedback and comments to the students. This was applied to the respective quality formative assessment types (formative feedback, peer assessment and self-assessment). Each of the quality formative assessments were applied in at least three lessons of a course to make certain that they were used to fulfil the intended purposes, which were the students' self-regulation on learning and the facilitation to learning improvement.

The implementation phase is the fourth step of instructional design. During this phase, the educators implemented each of the quality formative assessment type based on the lesson plan template they prepared. In the implementation phase, the educators clarified and shared the learning objectives of their lessons and criteria for success to the students. Moreover, the educators attempted to create effective classroom discussions to elicit evidence on student understanding. Furthermore, they provided feedback/comments that helped the students to make meaningful progress, activated them to own their learning and become resources of instruction for one another through peer learning and assessment.

The final phase of the instructional intervention is the evaluation phase. The evaluation phase was intended to answer questions such as: What is the extent of learning gain resulting from the use of quality formative assessment? Was the implementation of the designed instruction interesting and engaging for the students? What are the perceptions of the educators towards implementing the designed instruction? What should the researcher, the educators and the students change the next time? In this study, this evaluation phase followed the formal data collection procedures using post-test

achievement, student questionnaires on the perception to the self-regulation on learning, interviews with educators, focus group discussions with the students and classroom observations.

Beside to following the instruction design phases the required quantitative and qualitative data for the study were collected during and after the implementation of the designed instruction. The data were collected using observation checklist, student questionnaires, achievement tests, focus group discussions with the students and interviews with the educators. The observation checklist was used to collect data on the extent of use of quality formative assessment on the lessons. In addition, the students filled out a self-report questionnaire that measured their perceptions on whether the quality formative assessment involved them in the self-regulation of learning and assessment. Furthermore, the post-test administered to both the intervention and comparison groups measured the presence of differences in learning achievement. Interviews were conducted with the educators to collect data on their perceptions on the advantages, problems, and the potential factors impeding the use of quality formative assessment in classroom instruction. The focus group discussions were used to collect data on the students' perceptions and values regarding the use of quality formative assessment.

### **3.7 VARIABLES OF THE STUDY**

According to Gay and Airasian (2003: 20), the independent variables frequently manipulated and used in education research include methods of instruction, types of reinforcement, arrangement of the learning environment, types of learning materials and length of treatment. Thus, independent variables in this study were the use of quality formative assessment, students' experience on self-assessment, peer assessment and formative feedback. The dependent variables were learning gains in terms of raw and mean scores, the students' reports on involvement in the self-regulation of learning and assessment, and the educators' reflections on the instructional advantages to using quality formative assessment in the teaching of the course.

### **3.8 POPULATION AND SAMPLING TECHNIQUES**

#### **3.8.1 Population**

When conducting research, researchers take a sample from a defined population. Defining the population is helpful to know the type of information, which will be collected in the study. A population in any study is defined as a group upon which the researcher intends at generalising the

study results (Muijs, 2004: 37). A population is an entire set or subset of entities, which include the group whose behaviour researchers intend to study (McQueen & Knussen, 1999: 81). The population of this study includes six public universities in south west Ethiopia and all first year students at the universities enrolled for a “General Psychology” course.

### **3.8.2 Sampling techniques**

A sample is a section of the population of the study. Gay and Airasian (2003: 16) describe a sample as the group of population elements, which have some representative relevance to the study. In selecting a sample for this study, the researcher used simple random sampling techniques to identify students of intact classes for the quasi-experiment procedures. For instance, the selection of three universities to take part in the study was made by the lottery-draw method. From each of the universities included in this study, two entire classes of students who were enrolled for “General Psychology” course were randomly selected for inclusion in the intervention group. Two other classes taking a similar course to that of the intervention group were also identified as comparison groups to supply the quantitative data for the study. Therefore, the number of students who participated in the study was 464 including both the intervention and the comparison groups, of which only 378 (81.46%) filled out the questionnaire completely and sat for the post-test achievement test. The sample size of the students (n= 378) is representative of the student population (N = 6500) enrolled for “General Psychology” course at the six west Ethiopian universities.

## **3.9 DATA COLLECTION INSTRUMENTS**

The value of a study largely depends on the measurement quality of the variables. The measurement of variables in turn depends on the quality of the research instruments used to collect the data. As discussed earlier, this study used five different types of data collection instruments, namely the questionnaire, achievement test, focus group discussion guide, personal interview guide and classroom observation checklist. The sub-section below briefly discusses each of the data collection instruments on the study.

### **3.9.1 The questionnaire**

Questionnaire is a useful instrument to collect sufficient data intended for quantitative surveys. When constructed and used properly, a questionnaire is an effective research instrument for measuring different variables (Shaughnessy, Zechimister, & Zechimister, 2009: 159). A questionnaire is a good

research instrument to collect data about attitudes, perceptions, thoughts, feelings, and behaviour (McQueen & Knussen, 1999: 15). Accordingly, a four point Likert Scale response questionnaire (see Annexure 1) was used to measure the students' perceptions on whether there was a use of quality formative assessment that involved them in self-regulating learning and assessment before the instructional intervention period to see the extent of variation between the intervention and comparison group students, which is a necessary precondition in quasi-experimental studies. With a critical analysis of the literature review, the researcher constructed the questionnaire with the response characteristics having the following values: 1=always not true, 2=mostly not true, 3=mostly true, 4=always true. Moreover, negative wording was used and reverse scoring of some items in the questionnaire was applied during the data analysis stage.

### **3.9.2 Achievement tests**

A 20- item multiple-choice achievement test (see Annexure 6 and 7) prepared by the researcher in consultation with the educators was used before and after the instructional intervention on the course. The students in the intervention group, as well as those in the comparison group, sat for both the pretest and post-test to facilitate examining whether achievement differences between the two groups was present or not.

### **3.9.3 Individual interview guide**

Semi-structured interviews were conducted with the six educators who took part in this study by teaching the "General Psychology" course. Accordingly, in this study, the researcher used interviews for collecting information on the perceptions of educators on the use of quality formative assessment and the major impeding factors to implement in the teaching of the course. The interview schedule (see Annexure 2) focused in particular on the educators' perceptions on the advantages, limitations and the factors impeding the effective implementation of quality formative assessment in teaching.

### **3.9.4 Focus group discussion guide**

A focus group discussion is an interview for a group of about six to ten individuals (Cozby, 2009: 134). The selection of focus group discussants was made on the basis of their knowledge of or interest in the topic under discussion. A focus group discussion provides a researcher with excellent insight into the values, beliefs, fears and aspirations of the respondents pertaining to most perceptions (McQueen & Knussen, 1999). The questions in the focus group discussion were open-ended (see

Annexure 3) and were presented to the whole group. As a data collection method, a focus group discussion has certain advantages to group interactions and variety of responses elicited and perceptions reported. In this study, the researcher conducted one focus group discussion (with 6 to 10 students) for each intact class of students who were participated in the study. The advantage of conducting a few (four to six) focus group discussions was to make sure that the information collected was not unique to one group of students only (Cozby, 2009: 135). The researcher worked with the groups both to simplify communication and to deal with any problem that might arise.

### **3.9.5 Classroom observations checklist**

This study employed classroom observation checklist to collect data on the formative assessment practices of the educators and the students. The primary goal of observation method is to describe behavior. Observation is a rich source of information to know why individuals behave the way they do (Shaughnessy, *et al.*, 2009: 68). In this study, observation method was used to collect information on the ways the educators use quality formative assessment on the lessons. In short, the classroom observations focused on the following issues:

- The activities the educators and students engaged at the start, during and at the end of a given lesson with respect to the practice of formative assessment;
- The types and frequencies of formative assessments used in a given lesson; and
- Whether or not students individually and in groups participated actively in the assessment during the lesson.

### **3.10 MEASURES TO ENSURE RELIABILITY AND VALIDITY**

By its inherent nature, quasi-experimental research may encounter internal and external threats to experimental validity. Internal validity threats are those related to experimental procedures, treatments or participants' experiences, which affect drawing correct inferences from the data (Creswell, 2009: 219). Other internal validity threats mentioned by Shaughnessy, *et al* (2009) are contamination, maturation and the novelty effects of the intervention. However, in the case of truly comparable groups, both groups might experience many of the threats so that the threats might not account for group differences in post-test measures.

Since departments randomly assign students to the respective intact classes, both the intervention and comparison group students might have experienced the mentioned internal validity threats in the same way. As a result, there might not be a threat to internal experimental validity. If both groups experienced the threats in the same way, the threats might not account for group differences in post-test measures. Therefore, these threats no longer compromised the internal validity of this study (Shaughnessy, *et al.*, 2009).

On the other hand, external threats to experimental validity occur when researchers make incorrect predictions about other groups that are not in the sample. The best solution to overcome the threats to external validity is replication, which is repeating the experiment with different types of participants at different times and places (Shaughnessy, *et al.*, 2009). On the other hand, the researcher took the necessary care with respect to the validity and reliability of the instruments in the study. The instruments' validation process followed the use of a table of specification, the multitrait-multimethod approach, and the judgment of items by experienced experts. The researcher decided that the inter-rater and internal consistency (the Cronbach alpha coefficient) reliability estimation was sufficient to check the reliability of instruments during the pilot test phase (see the results in the following section).

### **3.11 PILOT STUDY AND THE RESULTS**

This section of the chapter presents the rationale for the pilot study and the results obtained.

#### **3.11.1 Introduction**

In executing a study plan, a researcher may encounter several challenges pertinent to the quality of data collection instruments and procedures. McQueen and Knussen (1999: 111) comment on the misunderstandings concerning the questionnaire instruction, the misperception of the researcher's intent and refusal to co-operate, amongst others to jeopardise the best conceived study. The simplest solution to this is conducting a pilot study in which the researcher does a trial run on the instruments with a smaller number of participants than will be used in the main study (Cozby, 2009). In this study, the researcher pilot tested the study instruments with two department students of one college at University E which was not included in the main study.

### **3.11.2 Reason for the pilot study**

Before conducting research on a full scale, it is advisable to try the data collection instruments and methods out first. In this regard, a pilot study plays a significant role. A pilot study is a research procedure that involves conducting a preliminary study prior to a full-scale study (Shaw & Gould, 2001: 115). A researcher can conduct a pilot study in either one of two ways. The first is a simple tryout on an element of the research procedure (for example, testing the data collection questionnaire). The second is a complete run-through by following the procedures planned for the main study. In this study, the researcher used the first option to pilot test the data collection instruments used on the quantitative phase of the study.

Researchers conduct a pilot study for several reasons. For instance, in quasi-experimental design research, a pilot study may help to identify flaws and weaknesses in the experimental procedures, check the consistency of items in a questionnaire, and allow researchers to gain experience in the procedures involved to manipulate predictor variables and measure outcome variables (Shaw & Gould, 2001: 115). Moreover, a pilot study can help to predict if a worthwhile result is likely to occur to the main study.

According to the assumptions discussed above, a pilot study aiming at the improvement of the quasi-experiment procedures and research instruments was conducted. The pilot study was conducted on two intact classes of first year community psychology students whom an educator had taught. The total number of students in the two classrooms were 121 (male=90 and female=31). Of these, only 99 (male=81 and female=18) filled out the questionnaire and sat for an achievement test after the use of quality formative assessment in one of the classes. Out of the ninety-nine students, forty nine (49) of them were in the intervention group, where the educator used quality formative assessment in teaching and the remaining fifty (50) were in the comparison group, where the educator used summative assessment in teaching.

Before the start of the pilot study, the researcher offered a one day orientation to the educator on how to use the designed instruction that integrates quality formative assessment on lessons. Furthermore, after a short discussion on the significance of this study to improve learning, the students gave their consent for voluntary participation in the study. Next, the researcher collected baseline data from the students with a questionnaire and an achievement test. The questionnaire had a five-point Likert scale

response and included items, which asked the student regarding the practice on quality formative assessment and the extent of self-regulation on learning resulted from the use of quality formative assessment.

After the collection of the baseline data, the educator used quality formative assessment while teaching students in the intervention group. The researcher also observed the lessons using an observation checklist focusing on the actions of the educator and the students. After the implementation of the quality formative assessment, the students from both the intervention and the comparison groups sat for an achievement test and filled out a questionnaire on their perceptions whether their self-regulation on learning was enhanced.

### **3.11.3 Content validity and reliability estimation of the questionnaire**

The following two sub-sections of the pilot study report deal with content validity and reliability estimation of the questionnaire used in the study.

#### **3.11.3.1 Content validity of the questionnaire**

Content validity is the extent to which individual items in a questionnaire are relevant and representative of the target variables in the study (Kaplan & Saccuzzo, 2001: 118). The content validity of a questionnaire involves the validation and refinement of items. Hence, in this study, three (3) individuals who have a masters degree level of training in educational measurement and evaluation and a minimum of eight (8) years of teaching experience at a university level checked out the content validity of the questionnaire. These experts judged the overall content of the questionnaire positively in terms of measuring the independent variables on the study. Nevertheless, they suggested complete cancellation and refinement of some of the items in the questionnaire. For instance, with regard to the fourteen (14) items on the self-regulated learning measure, two of the experts suggested the complete cancellation of item number 6 that read “There was more emphasis on the teacher’s teaching than the students’ learning.” In addition, the assessment experts suggested reformulating some of the items. For example, the item that states “you have greater control over your own learning.” needs to change to “you have been given a chance to control your own learning.” The item that read “you had managed your learning outcomes actively.” was refined as “you have been given a chance to manage your learning outcomes actively.”

The total time to fill-out the questionnaire was between 35 and 40 minutes. Furthermore, two of the experts who participated in the validation of the questionnaire content suggested changing the Likert scale response to a four-point scale with always not true=1, mostly not true=2, mostly true=3, and always true=4. The reason for this change was the concern that the rating of neutral=3 would create difficulties in the interpretation of results and therefore, for such type of research projects a forced choice selection was rather advisable. As a result of this suggestion, the researcher used the recommended four point Likert scale on the questionnaire for the main study.

### **3.11.3.2 Reliability estimation of the questionnaire**

The research questionnaire was pilot-tested on ninety nine students (49 in the intervention and 50 in the comparison group). Checking the internal consistency of questionnaire items to measuring the intended variables is useful before collecting data on a large scale (Gay & Airasian, 2003: 22). Accordingly, the coefficient alpha that shows the minimum possible reliability index of research instruments was used to estimate the reliability of the questionnaire in the study (Kaplan & Saccuzzo, 2001:119).

The values of the reliability estimations (alpha coefficients) for the questionnaires used in the study were 0.94 for the complete questionnaire (51 items), 0.93 for the peer assessment sub-questionnaire (12 items), 0.92 for the self-assessment sub-questionnaire (15 items), 0.90 for the self-regulated learning sub-questionnaire (14 items), and 0.83 for the formative feedback sub-questionnaire (24 items). However, it was found that the deletion of some items (items 6, 26, 30, 31, 34, 35, 36, and 47) from the complete questionnaire would result in the highest alpha coefficient value of 0.96. The deletion of item 6 from the self-regulated learning questionnaire would result in an alpha coefficient of 0.92. Regarding the formative feedback questionnaire that consisted of 24 items, the deletion of seven items (for example, items 30, 31, 32, 33, 34, 35, and 36) would increase the coefficient alpha value from 0.83 to 0.93. On the other hand, the deletion of items from the self-assessment and peer assessment questionnaires would not result in any significant improvement on the coefficient alpha values.

Hence, based on the statistical results obtained, the researcher improved the questionnaire for use to the main study. Therefore, there was a reduction of the complete questionnaire items from fifty- one (51) to forty three (43) items. There was also a reduction of the formative feedback questionnaire items

from twenty four (24) to seventeen (17) items. Furthermore, there was a reduction in the self-regulated questionnaire from fourteen (14) to thirteen (13) items. The self-assessment and the peer assessment questionnaires remained the same for the final research project.

#### **3.11.4 Reliability of achievement tests**

Reliabilities of the achievement tests administered to students (the first test was administered before the use of quality formative assessment in lessons and the second test was administered after the use of quality formative assessment) to check for the consistency of test items in measuring the learning achievement of the students. The results were found to be almost equivalent. That means, the split-half method of reliability estimation that divides each of the scores into two halves as odd and even numbered scores produced a reliability coefficient of 0.65 for the pretest items and a reliability coefficient of 0.64 for the post-test items. This result made the score distributions from the two tests comparable.

### **3.12 DATA COLLECTION PROCEDURES**

The collection of data for this study was carried out in two rounds. The first round data collection involved the collection of baseline data before the quasi-experimental intervention period on the use of quality formative assessment. The baseline data included determining the students' perceptions on the practices of quality formative assessment and finding out whether this (if present) enhanced their self-regulation on learning and assessment skills. Besides, the baseline data included the pretest achievement scores of the students from a chapter of the course. During the second round data collection, data were collected by means of classroom observations, questionnaire administration, interviews, focus group discussions and a post-test on learning achievement.

As discussed in the earlier sections of this chapter, in terms of research paradigms, this study followed the pragmatist paradigm. The researcher conducted the study with a mixed-methods approach consisting of a main quantitative survey sequentially followed by qualitative data collection and analysis. The study was conducted at three of the six universities located in the western part of the Ethiopia. For each of the three universities, students of two intact classes (entire class of students) who were taking the "General Psychology" course participated as intervention groups. Students from many academic programmes at universities enroll for the above mentioned course. The researcher chose this course because access to students of more than one entire class was possible, which was helpful in

quasi-experimental studies. Other students who were taught by the same educator of a given intact class also took part in the study as comparison groups and supplied quantitative data for the dependent variables of the study, which were achievement test scores and perceptions on the self-regulation of learning and assessment. The reason for the inclusion of students from an entire class is the principle of quasi-experimentation, which allows for convenient sampling through the use of naturally formed groups. The two subsections below briefly present the procedures of data collection for the quantitative and the qualitative phases of the study respectively.

### **3.12.1 Data collection procedures for the quantitative phase of the study**

The quantitative phase on this study took the form of a descriptive survey and relied on data collected using questionnaires and achievement tests. According to Gay and Airasian (2003: 25), a descriptive survey is an appropriate method of studying the perceptions of a large number of respondents regarding a certain phenomenon because it describes the way things are. In terms of specific methods, the study applied a quasi-experimentation approach for the quantitative phase of the study. To collect data on the students' perceptions on the use of quality formative assessment, a self-reported questionnaire with alternative responses to a four-point Likert scale ranging from "always not true (=1)" to "always true (=4)" was used. The content of the self-report questionnaire completed by the students included the enhancement of self-regulated learning and assessment (13 items), the practice and use of quality formative feedback on the course (17 items), the practice on self-assessment (15 items), and the practice on peer assessment (12 items). All questionnaire items were prepared by making reference to the literature reviewed in the second chapter of the study. Achievement test score data were collected using tests prepared by the researcher in consultation with the educators of the course (form A & B, see annexure 6 & 7). The data collection entailed using the self-report questionnaire (for the perception of self-regulating learning) and the achievement test (post-test) was repeated after the instructional intervention in which quality formative assessment was integrated and used on the lessons of the course.

### **3.12.2 Data collection procedures for the qualitative phase of the study**

The research questions for the qualitative phase of the study were carefully set to determine the perceptions of the research participants on the use of quality formative assessment in the instructional process. Hence, the researcher executed the qualitative data collection by preparing questions that elicited the relevant information to answer the research questions. The qualitative data for this study

were collected by means of focus group discussions conducted with few students from the intervention groups, interviews with the educators who taught the course and classroom observations.

To supplement the results obtained in the quantitative data collection and analysis phase, the researcher carried out key informant interviews with the educators who participated in the teaching of the course by the integration of quality formative assessment on lessons. The interview data were captured by taking written notes of the main ideas raised by each interviewee. The purpose of the interview was to answer research sub question 4 and to examine:

- The educators' personal perceptions on the advantages of quality formative assessment on the improvement on the students' learning;
- The experiences and difficulties they faced while applying quality formative assessment in the lessons of a course;
- The reactions of the students while quality formative assessment was used on the lessons.

In addition, the researcher facilitated six focus group discussions (ranging between six and ten students per FGD) with the students who were in the intervention group. The objective of the FGDs was to examine perceptions and experiences of the students towards the practice and role of formative assessment in advancing the self-regulation of learning and improvement. The researcher took written notes on the key ideas raised by the focus group discussants and in case of unclear ideas the discussants were asked for clarification. The researcher limited the number of FGDs to six because after the fifth one, data saturation was noted and new idea was hardly emerging from the focus group discussants next.

Furthermore, during the implementation of the instructional intervention that integrated the use of quality formative assessment on lessons, the researcher sat in on the lectures and acted as a complete observer on the activities of the educators and the students when using quality formative assessment in lessons. Each educator was observed five times and structured notes were taken on the activities of the educator and the students, the type and frequency of quality formative assessment used and on the activities of the students during assessment. More specifically, the observations focused on the actions of the educators and the students at the start of, during, and at the end of a given lesson, the classroom interactions as well as the type of formative assessment used on the lessons observed.

The researcher used the data collected from the above-mentioned participants in the study (educators and students) to find out the ways they perceived the use of quality formative assessment's contributions to learning improvement and enhancement of self-regulated learning. Moreover, the researcher asked the participants to reflect on their perceptions of the major impeding factors and the difficulties to implement quality formative assessment while teaching the course. To promote the success of this intervention, the researcher attempted to secure the trust and cooperation of the study participants to obtain the required data, and set out to create good rapport that could enhance the reliability and validity of the study results. This was made possible by the discussions carried out with the research participants before scheduling the actual data collection time. Furthermore, the researcher showed formal letters, which granted him the permission to conduct research at the universities (see letters on Appendices B, C, & D).

### **3.13 DATA ANALYSIS PROCEDURES**

This section of the chapter briefly presents the procedures of data analysis for the quantitative and the qualitative phases of the study respectively.

#### **3.13.1 Data analysis procedures for the quantitative phase of this study**

The quantitative data were analysed using the SPSS version 16 (Statistical Package for Social Sciences 16). The statistical outputs comprised both descriptive and inferential statistics. Descriptive statistics were used to present the biographical data of the research participants, their average ratings to perceptions on formative assessment practice and the self-regulation of learning, as well as pretest and post-test achievement scores.

The inferential statistics such as t-test, biserial correlation, and effect size estimate were used to determine the differences between the students in the intervention and in the comparison groups on the measures of the dependent variables such as the perception on self-regulating learning and post-test achievement scores resulting from the instructional intervention to one of the groups. In fact, before this, analysis of the baseline data was done to establish the precondition for applying the quasi-experiment procedures in the form of instructions using quality formative assessment on lessons taught for the intervention group students.

### 3.13.2 Data analysis procedures for the qualitative phase of the study

Data analysis is one of the key steps in the qualitative research process (Leech & Onwuegbuzie, 2007: 489). Data analysis in qualitative research is a systematic search for meaning (Hatch, 2002: 148). This author also explains data analysis in qualitative research as follows:

*...analysis means organizing and interrogating data in ways that allow researchers to see patterns, identify themes, discover relationships, develop explanations, make interpretations, mount critiques, or generate theories. It often involves synthesis, evaluation, interpretation, categorisation, hypothesizing, comparison and pattern finding (p, 148).*

Qualitative research is a useful method to obtain a proper and complete understanding of behaviour in context (Leech & Onwuegbuzie, 2007: 477). It is also convenient for gaining insight about permanent or problematic experiences and the meanings, which individuals or groups attach to their experiences. Hence, the researcher must consider the multiple realities and perceptions experienced by the research participants to understand a complex phenomenon (Corbin & Strauss, 2008: 14). Moreover, qualitative data strengthens the findings of quantitative data in general and intervention study designs such as quasi-experiment in particular (Leech & Onwuegbuzie, 2007: 479). In addition, qualitative data analysis is practicable for answering “why” and “how questions” in research. For example, “What are the views of the educators on the use of quality formative assessment in the instructional processes of university courses?”

Since, it is mostly concerned with the complex nature of human behaviour in a social context, qualitative data can be analysed in different ways ( Punch, 2005: 5). The qualitative data for this study were analysed in line with the type of data collection instruments used. The collected data were classified as interview transcripts, focus group discussion notes, and structured classroom observation notes. Thus, the researcher followed the procedures below for analysing the qualitative data on the study..

First, the data generated by the different methods were organised and numbered for individual respondents and groups. After that, the data on the various sources, namely, interviews, FGDs, and classroom observations, were saved in different files. Following the organisation of each of the data in

the files, each of them passed through the following three major steps proposed by Flick (2006: 215-218).

- (1) Data display (organising for meaning): helps to summarise the data in tables.
- (2) Data reduction (coding): is reducing the original text by paraphrasing, summarising, or categorising. The purpose of data reduction is to code the data onto interpretable themes.
- (3) Interpretation of themes (explaining the findings): this step helps the researcher to find out the meaning of the data as well as written up conclusions, which can answer the specified research questions.

Following the above mentioned steps, an English language transcription of the data was made because data transcription is a necessary step on the way to interpretation (Flick, 2006: 219). Accordingly, the transcribed interview data were sent to the interviewees for feedback to check if there were mistakes or unrecognised inclusions in the transcriptions.

Then the data collected using each of the techniques underwent data reduction or coding (Flick, 2006: 220; Leech & Onwuegbuzie, 2007: 490). In this regard, the coding steps involved reading the data repeatedly and asking the relevant “why” and “how questions” which can make answering the research questions possible. After that, the researcher picked up the emerging themes from the data sources and displayed the themes in summary tables (see Annexure 8 ).

Specifically, during the coding of the interview data, the researcher underlined the key words, phrases and descriptions to find the emerging themes. Moreover, to keep consistency on the coding process, two colleagues of the researcher who had the knowledge and experience of qualitative data analysis took part and coded the interview transcripts. Finally, the codes were given names and interpreted as they reflect the perception of interview participants. After the coding process, the emerged themes were interpreted in line with the research questions raised in the study. In the case of inconsistent perceptions and themes, the researcher relied on his own judgment in an attempt to answer the research question.

The specific method of qualitative data analysis the study followed was the constant comparison method, for its relevance and simplicity when applied to several types of data, such as interviews and

observations (Leech & Onwuegbuzie, 2007: 486). The constant comparison analysis method is a commonly used type of analysis for qualitative data. It is also useful in identifying the underlying themes emerging from the research data set. The researcher read through all the data before applying the constant comparative method of qualitative data analysis. After that, the data were organised into smaller chunks. Subsequently, every chunk of data was given a label with a describing code. After all the data had been coded, the codes were grouped in terms of similarity, and themes were distinguished based on each grouping (Leech & Onwuegbuzie, 2007: 491). Finally, the themes were used for interpretation based on how they related to the research questions during the qualitative phase of the study.

### **3.14 ETHICAL MEASURES OF THE STUDY**

Ethical concerns have paramount importance when planning, conducting and evaluating research (Cozby, 2009: 38). Researchers need to determine whether a study fulfills the ethical standards of conducting research. In this study, the researcher has given the necessary attention to the required ethical standards while conducting research.

#### **3.14.1 Informed consent**

Informed consent refers to the provision of all information to potential participants about the planned study so that they can make their own decision regarding whether to take part in the study. The researcher provided sufficient information to the study participants with respect to the aims of the study, the procedures to be followed, the advantages for participating and the credibility of the researcher. Accordingly, this information helped individuals to participate in the study on voluntary basis.

#### **3.14.2 Withholding information and deception**

The researcher purposefully withheld some information that would not influence the study participants' decision. Hence, after completion of the study, there was a debriefing session to present the withheld information. For example, the researcher avoid telling the alternative hypotheses on the study to the study participants purposefully.

However, deception is not acceptable in terms of research activity and is a purposeful misrepresentation of information (Cozby, 2009). According to Shaughnessy, *et al* (2009: 74),

deception in research occurs when researchers withhold or intentionally hide information required by the study participants. Deception is an unethical practice as it violates the principle of informed consent. In this study, the researcher avoided any attempts of deception particularly about information that could influence the decision of participants to take part in the study.

### **3.14.3 Credibility of the researcher**

The researcher took all the necessary precautions to conduct a study of a high standard.

### **3.14.4 Confidentiality and anonymity**

The researcher kept all information obtained from study participants confidential. The researcher withheld the names and other data about study participants unless they gave their permission that would allow the information to be passed to a third party. Moreover, to guarantee the confidentiality of information about respondents, the researcher kept the names of the participants from whom the data had been collected.

### **3.14.5 Study permission from institutions**

Securing permission from the relevant institutions is necessary to conduct research at the particular institutions. The researcher obtained formal permission from the university officials in the different structures; from quality assurance offices up to the department where the relevant academic course was offered before conducting the study (see Appendices B, C and D).

## **3.15 SUMMARY OF RESEARCH DESIGN AND METHODOLOGY**

Based on the pragmatist paradigm of knowing a phenomenon, this study followed a partially mixed sequential design where the quantitative methodology was dominant. The researcher applied quantitative and qualitative data collection and analyses, which are mixed in the specific research question writing, presentation of the research findings and discussion phases of the study. Mixed-methods research is advantageous because the strength of one method compensates for the weakness of the other. This study applied the partially mixed sequential approach to mainly collect quantitative data during the first phase of the study followed by the collection and analysis of qualitative data to supplement the findings on the quantitative study. The specific procedure applied for the quantitative phase of the study was a quasi-experimental procedure. A quasi-experimental procedure is the preferred method when random assignment of research participants to the intervention and comparison

groups is not methodologically practical. Moreover, quasi-experiment is a useful procedure when complete control over extraneous variables is difficult.

The next chapter (chapter 4) presents the study results and discussions.

## **CHAPTER FOUR**

### **RESULTS AND DISCUSSIONS**

#### **4.1 INTRODUCTION**

The main research question in this study was:

*In what ways can the use of quality formative assessment improve student learning on university courses?*

From the main research question, the following specific research questions were formulated:

- What is the present practice regarding the use of quality formative assessment in the teaching of ‘General Psychology’ course at Ethiopian universities?
- What is the extent of learning gain resulting from the use of quality formative assessment?
- To what extent can the use of formative assessment involve the students to self-regulate their own learning and assessment?
- What are the views of the educators on the use of quality formative assessment in the instructional process?

This chapter presents and discusses the findings.

In the first section of the chapter, the biographical data of the sampled students and educators are presented. The next section presents the results of the quantitative phase. In the section, the results are presented according to the specific research questions indicated above.

Following this, the findings from the qualitative data are presented and interpreted to supplement the findings from the quantitative data. The final section of the chapter discusses the results of the study by mixing the findings from the quantitative and qualitative phases of the study from the perspectives of the theoretical knowledge and empirical evidence, which are related to the knowledge and practice of quality formative assessment at the higher education context.

#### 4.1.1 Presentation of biographical data

**Table 4.1: Biographical data of student respondents**

Variable		Frequency	Percentage (%)
Gender:	Male	214	56.6
	Female	164	43.4
Total		378	100
Age:	19 – 21	316	83.6
	22 – 24	62	16.4
	25 and above	0	0
Total		378	100
Group:	Comp.	187	49.5
	Interv.	191	50.5
Total		378	378

Table 4.1 displays the biographical data of the student respondents. From a total of 378 students, more than half of them were males (N= 214, 56.6%), while females made up the rest of the sample (N=164, 43.4%). This shows that, the number of male students at the sampled universities and programmes is greater than the number of female students.

The frequency distribution of student respondents in terms of age indicates that the majority (N=316, 83.6%) fell within the age group of 19 to 21 years. The students who belong to the age group of 22 to 24 years were in the minority (N=62, 16.4%). There were no student respondents above the age of 25. This shows that the students who participated in this study were relatively young, and their age corresponds to the age cohort of the education level.

**Table 4.2: Biographical data of the educators**

<b>Variable</b>	Frequency	Percentage (%)
<b>Gender:</b> Male	6	100
Female	0	0
<b>Age:</b> 23 – 26	2	33.33
27 - 30	2	33.33
31 – 35	2	33.33
<b>Level of education:</b> BA/BSc	0	0
MA/MSc	6	100
PhD	0	0
<b>Field of specialisation:</b>		
Educational measurement and evaluation	2	33.33
Counseling psychology	2	33.33
Developmental psychology	1	16.67
Social psychology	1	16.67
<b>Lecturing experience in years:</b> 1 – 4	2	33.33
5 – 8	2	33.33
9 - 12	2	33.33

Table 4.2 shows the biographical characteristics of the educators who participated in the study. As the data show, all the educators who took part in the study were males. Female educators were either very few in number or there were no female educators in many of the departments at the universities. This is, to a large extent, the situation at many of the universities in Ethiopia. With respect to the age of the educators, the six educators were divided among each of the age categories equally. Two (2, 33.33%) of the educators fell within the age category of 23 to 26 years, the other two (N = 2, 33.33%) were in the age category of 27 to 30 years, and the remaining two (N = 2, 33.33%) were in the age category of 31 to 35 years. This shows that many of the educators were relatively young. The highest level of education attained by all the educators was MA/MSc degree in the various sub-fields of psychology such as educational psychology, counseling psychology and social psychology. On the other hand,

their teaching experience ranges from one to twelve years. This means, two of the educators had teaching experience at universities ranging between one to four years. The other two had teaching experience at universities ranging between five to eight years. The remaining two had teaching experience at universities ranging from nine to twelve years. This shows, the educators' teaching experience at the universities was relatively short. This situation is common to many of the universities in the country, because about 70% of the universities were established recently. This might have implications on the instructional and assessment skills and practices of the educators.

## **4.2 RESULTS OF THE QUANTITATIVE PHASE**

This section of chapter four presents the results of the study from the quantitative phase. The section is divided into two, namely, the results from the baseline data and the analysis of the post intervention quantitative data.

### **4.2.1 Results of the baseline data**

Quasi-experimental research calls for the establishment of preconditions for instructional interventions to use quality formative assessment on the lessons of the course. After assigning the students from the intact classes to the intervention and comparison groups, baseline data were collected using questionnaire prepared from the reviewed literature and achievement test (pretest) prepared from a chapter taught in the course. Thus, the baseline data included the students' perceptions on their experience of self-regulating learning, the practice on quality formative assessment (feedback, self-assessment, and peer assessment) and the pre-test achievement scores for both group of the students. Based on this, Leven's (1998) test of the equality of variance was computed to check whether the intervention and comparison groups were sampled from a homogenous population and were also equally dispersed for the variables collected on the baseline data.

Table 4.3 (see p117) shows the results on the Leven's test of equality of variances, where the null hypothesis is that the two groups are sampled from a homogenous population. As shown in the table, the F-ratios, which show equality of variances between the comparison and intervention group students for the respective variables were all less than the table value ( $F = 3.84, df = 1 \text{ \& } 376$ ). Thus, this is a sufficient pre-condition to accept the null hypothesis that states "the comparison and the intervention group students were sampled from a homogenous population with respect to their characteristics in the measured variables."

**Table 4.3: Levene's equality of variances test**

Variable	Mean	SD	df	F- ratio Table value	F- ratio	Level of significance
Self-regulated learning, perception: Comparison Intervention	32.73 32.09	4.31 3.89	1 & 376	3.84	.65	.05
Formative feedback, perception: Comparison Intervention	42.03 42.87	4.29 5.38			2.13	
Self-assessment, perception: Comparison Intervention	35.76 35.02	4.64 4.91			.01	
Peer assessment, perception: Comparison Intervention	29.17 28.81	4.58 5.52			3.81	
Pre-test achievement score Comparison Intervention	10.27 10.30	3.72 3.66			.08	

#### 4.2.1.1 Self-regulated learning

The active role of students has implications for learning improvement. This can be made possible by the advancement of self-regulated learning. Self-regulated learning involves the students' metacognitive, behavioural and motivational tactics to attend their learning progress actively. One of the outcome variable (dependent variable) in this study was the students' perceptions on self-regulating their own learning before and after the implementation of the designed instruction that integrated the use of quality formative assessment. There is also a firm belief that formative assessment enhances the student self-regulation on learning. In this study, a thirteen (13) items questionnaire that measured the students' perceptions on self-regulating their own learning on the general psychology course was administered to both the intervention and comparison group students before and after the instructional intervention period.

As the data in Table 4.3 above reveal, the mean rating perceptions on self-regulating learning was 32.73 with a standard deviation of 4.31 for the comparison group students and 32.09 with a standard deviation of 3.89 for the intervention group students respectively. These mean ratings are less than 39

on the scale measure. Thus, it can be said, according to the perceptions of the students there was little or no advancement on the self-regulation of learning on the lessons of the general psychology course before the instructional intervention.

The Levene's test for equality of variances on the perceptions of self-regulating learning yield no statistically significant difference between the two groups ( $P = .65 > .05$ ,  $df = 1 \text{ \& } 376$ ). This can be taken as a satisfactory pre-condition to implement a quasi-experimentation, where quality formative assessment was integrated with instruction and used on the lessons taught for the students assigned in the intervention group.

#### **4.2.1.2 Formative feedback**

In the context of educational assessment, feedback refers to the knowledge of results and success in assessment tasks. In the present study, a seventeen (17) items questionnaire that examined whether the students perceived the practice on formative feedback on the lessons of the course was completed by both groups before the instructional intervention period. As the data in Table 4.3 above show the mean ratings on formative feedback perception were 42.03 with a standard deviation of 4.29 for the students who were assigned in the comparison group and 42.87 with a standard deviation of 5.38 for the students who were assigned in the intervention group respectively.

The Levene's test computed to check for the equality of variances revealed that the groups were equally homogenous on their perceptions to the practice of formative feedback on the course before the instructional intervention. The observed F-ratio was 2.13 where the critical F-value was 3.84 with degrees of freedom 1 and 376 ( $p = .15 > .05$ ). Since 3.84 is greater than 2.13, the researcher cannot reject the null hypothesis that states the two groups of students are sampled from a homogenous population in respect of their perceptions on formative feedback practices on lessons of the course.

#### **4.2.1.3 Self-assessment**

The data on the self-assessment perception show nearly equal mean ratings for the comparison and the intervention group students. The mean rating of the comparison group was 35.76 with a standard deviation of 4.64 and for the intervention group; it was 35.02 with a standard deviation of 4.91. The Levene's test for equality of variances show an F ratio of 0.01 that is by far less than the table value ( $F = 3.84$ , at 1 & 376 df and  $p = .99 > .05$ ). Similar to the variables discussed above, the two groups of

students were equally homogeneous with respect to their responses regarding the self-assessment practice on the lessons of the course. This again strengthens the pre-condition for applying a quasi-experimental study.

#### **4.2.1.4 Peer assessment**

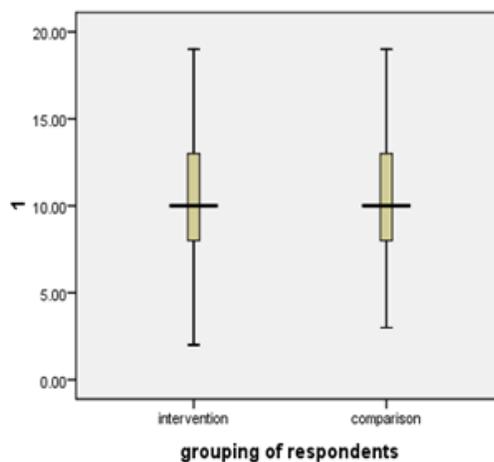
The data for the peer assessment perception show a mean rating of 29.17 with a standard deviation of 4.58 for the comparison group students and a mean rating of 28.81 with a standard deviation of 5.52 for the intervention group students. The Levene's test for equality of variances between the two samples show an F ratio of 3.81 that is closer to the table value ( $F = 3.84$ , at 1 & 376 df and  $p = .51 > .05$ ). In fact, similar to the variables discussed above, the two samples were equally homogeneous on the peer assessment perception variable.

#### **4.2.1.5 Pre-test achievement score**

One of the outcome variables in this study was the test score of the students after the application of the designed instruction that integrated quality formative assessment in the form of formative feedback, self-, and peer assessment. Therefore, as a requirement for the quasi-experimental intervention of the designed instruction to one of the groups, administering pre-test achievement questions for both groups was desirable. Based on this, the students from both groups sat for an achievement test of twenty (20) multiple-choice questions (see annexure 6) constructed from the lesson content to establish a pre-condition for homogeneity of variations between the two groups.

The Levene's test for equality of variances between the two groups show homogeneity with reference to the pre-test score. The observed F ratio was by far smaller than the critical F ratio for the specified degrees of freedom and level of significance. The test between the two variances resulted an F ratio of 0.08, where the critical value is 3.84 (df = 1 & 376 and  $p = .78 > .05$ ). Thus, the researcher can accept the null hypothesis that states the two groups are sampled from a homogenous population in terms of their pre-test score (Aron, Aron & Coups, 2009). It is methodologically appropriate to conduct an instructional intervention in one of the groups and administer a post-test achievement questions on the same content to both groups to test out whether the instructional intervention resulted in a statistically significant variation between the two score distributions. Figure 4.1 below shows the equality of the two groups in terms of the pre-test score achievement before the instructional intervention that

integrated quality formative assessment in teaching the lessons of the course for the intervention group students.



**Figure 4.1: Pre-test achievement scores**

## **4.2.2 Analysis of post intervention quantitative data**

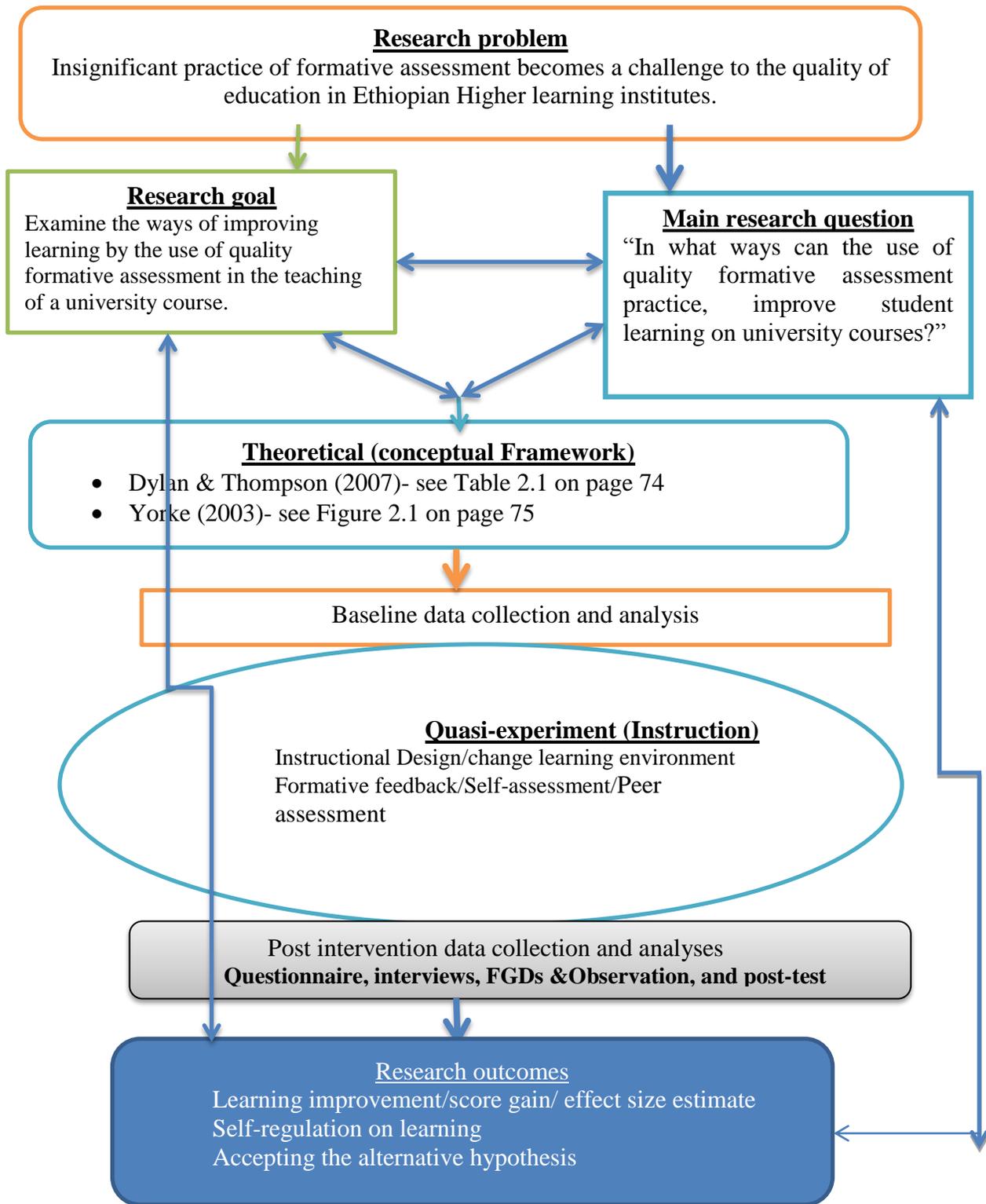
The post-test quantitative data are presented in the following sub-sections.

### **4.2.2.1 Results pertaining to the main research question**

After the establishment of the standardised condition between the two groups before the application of quasi-experiment intervention, the instructional intervention was implemented with one of the groups. The figure and the summary following it explain the result of the main research question. The main research question on the study was:

*In what ways can the use of quality formative assessment improve student learning on university courses?*

See figure 4.2 (p121) on the extent and how the study answered the main research question.



**Figure 4.2: The research process that helped to answer the main research question in the study**

As shown in Figure 4.2 (p121), this study began from the observation of the challenges on the quality of higher education courses because of the insignificant use of formative assessment on lessons. Thus, the study aimed at examining the ways of improving learning by the use of quality formative assessment in the teaching of a university course. From this broad aim of the study, the following main research question was formulated “*In what ways can the use of quality formative assessment practice improves student learning at a university course?*” After the formulation of the research question, a comprehensive literature was reviewed to come up with the theoretical (conceptual) framework that informed the study processes (Yorke, 2003; Wiliam & Thompson, 2007). Then after, baseline data were collected from the students placed in the intervention and comparison groups respectively. The baseline data were useful to establish the pre-condition for the execution of quasi-experimental intervention. The post intervention data collection and analyses showed whether a statistically significant contribution occurred to the improvement and the self-regulation on the students’ learning when quality formative assessment was applied in the teaching of lessons for the intervention group students.

#### **4.2.2.2 Research sub-question 1**

- What is the present practice regarding the use of quality formative assessment in the teaching of ‘General Psychology’ course at Ethiopian universities?

In answering research sub question 1, for the sake of clarity on the interpretations, the four scale responses such as *always not true* (=1), *mostly not true* (=2), *mostly true* (=3), and *always true* (=4) were reduced to two categories as *not true* (=1) including response 1 and 2, and *true* (=4) including responses 3 and 4. In addition, the analyses on the data were carried out question by question for some of the key items in the questionnaire.

In the first chapter of this study, quality formative assessment was conceptualised as the provision of formative feedback, self,-and peer-assessment to facilitate the improvement and the self-regulation on learning. Thus, to answer research sub question 1, the students’ responses on their perceptions to practicing each of the quality formative assessment elements are presented in the tables below. Moreover, the students’ responses on their perceptions to self-regulate their own learning are also presented in the section. The analyses and interpretations of the quantitative data focused on the mean perceptions of the students to individually selected items as examples.

(a) **Formative feedback**

Table 4.4 shows the mean perception ratings on formative feedback practice, standard deviations and the percentages of true and not true responses by the students.

**Table 4.4: Students' perception of formative feedback**

No	Items	N	Mean	SD	True (%)	Not true (%)
1	There were plans to improve learning	378	2.59	.49	59.3	40.7
2	The educator communicated the expected knowledge and skills with regard to the course	378	2.60	.49	61.1	38.9
3	The educator communicated information that could improve your learning	378	2.53	.49	53.4	46.6
4	You received plenty of feedback on what you were doing	378	2.39	.48	38.4	61.6
5	You often received timely feedback	378	2.41	.49	42.6	57.4
6	The feedback given helped you understand things better	378	2.56	.49	56.4	43.6
7	The feedback you received had an explanation regarding the correct answers	378	2.50	.50	50	50
8	The feedback you received was supportive of your learning	378	2.56	.49	56.2	43.8
9	Your motivation to learn increased due to the feedback given to you by the course educator	378	2.56	.49	56.7	43.3
10	You acted upon the feedback to improve your learning	378	2.58	.49	58.5	41.5
11	The feedback you received from the educator encouraged you to self-regulate your learning	378	2.56	.49	56.4	43.6
12	The feedback you received helped you apply more effort with regard to dealing with challenging learning tasks	378	2.53	.49	53.9	46.1
13	The feedback received is linked directly to the success criteria	378	2.48	.50	49.5	50.5
14	The feedback given focused on your learning task performance	378	2.50	.50	50	50
15	There is hardly any feedback	378	2.41	.49	40.2	59.8
16	The feedback showed you how to do better next time	378	2.51	.50	51.8	48.2
17	The feedback you received included worked out examples	378	2.45	.49	44.7	55.3
	Mean perception rating		2.50	.49	51.78	48.22

The data on table 4.4 above show the mean perception ratings on the practice of formative feedback, and the percentage of the students' who selected either *true* or *not true* for the individual items. As the data reveals, the average ratings of the students' perceptions to the practice of formative feedback was

around midway between true and not true ( $N = 378$ , mean = 2.50,  $SD = .49$ ). This means, the students' perceptions on the practice of formative feedback was divided and not consistent. The frequency analysis to some of the items on the questionnaire substantiated this description. For instance, for an item that states, "The educator communicated the expected knowledge and skill with regard to the lesson," about 231 (61.1%) respondents checked out true and the remaining 147 (38.9%) checked out not true. On the other hand, for the questionnaire items, which state, "you received plenty of feedback" and "you received timely feedback," more than half of the students 233 (61.6%) and 217 (57.4%) checked out *not true* for the two items respectively. According to the students' perceptions, in terms of the amount and timeliness, the formative feedback practiced in the course did not meet the expectations of the majority. However, for an item that asks, "there is hardly any feedback", significant number of the students, 226 (59.8) witnessed not true. This means as a considerable number of the students perceived, there was some practice of formative feedback on the lessons of the course. The limited years of teaching experience and pedagogic skills on the part of the educators might be related to the unsatisfactory practice on formative feedback as reported by some of the students in the study.

Researchers in educational assessment often judge formative feedback as effective when it matches to the success criteria. Concerning this, about 191 (50.5%) of the students checked out *not true* and the remaining 187 (49.5%) checked out *true* for the presence of a match between the success criteria on the assessment task and the formative feedback offered to them. On the other hand, clear examples on the formative feedback practice may have a potential benefit to clarify the misconceptions encountered by the students. In this study, more than half, 209 (55.3%) of the students confirmed the absence of clear examples on the formative feedback offered to them. The remaining 169, (44.7%) reported the presence of worked out examples on the formative feedback offered. Furthermore, the Levene's test for equality of variances that assumed equal variations between the two groups of students showed homogeneity of variances concerning their perception to the formative feedback practice on the lessons on their course ( $F = 2.09 < 3.84$ ,  $df = 376$ ,  $p = 0.15$ ).

**Table 4.5: Comparison of formative feedback perceptions**

Group	Mean scores	SD	Mean differ.	t-value (table value = 1.96)	df	Assumption	Sig. (p = .05)	Remark
Comp.	42.87	5.38		1.59	376	Equal variances	.15	There is no statistically significance difference.
Interv.	42.03	4.79	.83					

Table 4.5 compares the data between the two groups with respect to their average perceptions on the practice of formative feedback. As the data show there was no statistically significant difference between the two groups' perceptions on the practice of formative feedback before the instructional intervention period ( $t = 1.59$ ,  $df = 376$ ,  $p = .15 > .05$ ).

(b) **self-assessment**

**Table 4.6: Students' perceptions of self-assessment**

	Items	N	Mean	SD	True (%)	Not true (%)
1	There were plenty of self-assessment opportunities to improve your learning	378	2.47	.67	50.7	49.3
2	Self-assessment helped you revise your work	378	2.62	.64	59.7	40.3
3	You received guidance from the educator with regard to your self-assessment activities	378	2.47	.68	50.5	49.5
4	The self-assessment helped you understand the learning goals	378	2.55	.67	56.1	43.9
5	The self-assessment helped you to know the extent you have achieved the learning goals	378	2.57	.64	56.4	43.6
6	The self-assessment helped you know what to do to achieve the stated learning goals	378	2.60	.66	57.7	42.3
7	The self-assessment helped you assess the quality of your learning	378	2.56	.69	58	42
8	The self-assessment helped you identify your strengths in learning	378	2.62	.63	58.9	41.1
9	The self-assessment helped you identify your weaknesses in learning	378	2.53	.68	56.4	43.6
10	The self- assessment helped you manage your learning	378	2.60	.67	60	40
11	The self-assessment enhanced your self-regulation of the learning	378	2.48	.70	49.5	50.5
12	The self-assessment increased your motivation to learn	378	2.61	.67	57.9	42.1
13	You often use the self-assessment information to improve your performance in learning	378	2.56	.66	55.2	44.8
14	The self-assessment helped you become a reflective students	378	2.43	.66	46.1	53.9
15	The self-assessment helped you become an autonomous students	378	2.44	.70	46.6	53.4
	Mean perception rating		2.54	.67	54.65	45.35

The data in Table 4.6 depicts the mean perception scores on the practice of self-assessment and the percentage of students who respond either “*true*” or “*not true*” to the individual questionnaire items. As the data reveals, the average rating of the students' perception was around midway between true and not true ( $N = 378$ ,  $mean = 2.54$ ,  $SD = .69$ ). This means, the students' perceptions on the self-assessment activity in their course were divided and inconsistent. Although more than half of the students (54.65%) reported to percieve the practice of self-assessment, a considerable number of them reported it was *not true* (45.35%).

The frequency analysis on the individual questionnaire item responses supports this finding. For instance, for an item that states, “There were plenty of self-assessment opportunities to improve your learning,” about 189 (50%) reported *true* while the remaining 189 (50%) of them reported not true. Learning can be improved if the students understand and take actions so that the objectives of learning can be achieved. In this case, a higher proportion of the students, 213 (56.3%) perceived that the self-assessment activity in the course supported their understanding of the expected learning objectives. This again facilitated to know what to do next, and the extent to which the intended learning objectives were achieved. In this regard, the students’ perceptions leaned towards *true* for items such as “The self-assessment helped you know the extent you have achieved the learning goals,” 215 (56.9%) and “The self-assessment helped you know what to do to achieve the stated learning goals,” 222 (58.7%).

As discussed by Andrade (2010: 5), one crucial advantage of self-assessment is its contribution to identifying the strengths and weaknesses of the student by him/herself. Accordingly, a little more than half of the students perceived self-assessment as helpful for identifying strengths, 224 (59.3%) and weaknesses, 211 (55.8%) respectively. On the other hand, self-assessment helps the student get motivated, manage and self-regulate his/her own learning. In this case, as the response from significant number of the students show, the self-assessment was motivating to them to learn, 218 (57.7%), to manage to learn, 227 (60.1%), and to self-regulate learning, 185 (48.9%).

Self-assessment also paves the way to increase the students’ autonomy and reflection on learning. This contributes to the improvement of learning and achievement. Nevertheless, a large proportion of the students selected *not true* regarding the contribution of self-assessment activities to their autonomy and reflection on learning. The students’ responses to autonomy and reflection resulting from self-assessment revealed that significant numbers, namely, >206 (> 54.5%) reported that the self-assessment was not supportive to exercise autonomy and reflection on their learning. That means, according to the majority’s response, the self-assessment activities on their lessons did not pave the way to become reflective and autonomous in their learning. The Levene’s test for equality of variances that assumes equal variations between the two groups showed homogeneity for the perceptions on the self-assessment practice ( $F = 0.01 < 3.84$ ,  $df = 376$ ,  $p = 0.99$ ).

**Table 4.7: Comparison of self-assessment perception**

Group	Mean scores	SD	Mean differ.	t-value (Table value = 1.96)	df	Assumption	Sign. (.05)	Remark
Comp.	35.76	4.64		1.52	376	Equal variances	.13	There is no statistically significance difference
Intern.	35.02	4.91	.75					

The data in Table 4.7 provide a comparison of the two groups with respect to the average perceptions on self-assessment practices. As seen in the data there was no statistically significant difference between the two groups' perceptions before the instructional intervention period ( $t = 1.52$ ,  $df = 376$ ,  $p = .13 > .05$ ).

(c) **Peer assessment**

**Table 4.8 : Students' mean perception of peer assessment**

No	Item	N	Mean	SD	True (%)	Not true (%)
1	There were opportunities when your work was assessed by another student	378	2.36	.72	44.8	55.2
2	There were opportunities when you assessed other students' work	378	2.41	.73	48	52
3	You have gained knowledge while assessing other students' work	378	2.49	.73	50.9	49.1
4	The peer assessment motivated you in your studies	378	2.46	.73	51	49
5	The peer assessment helped you become a reflective students	378	2.45	.72	50.6	49.4
6	The peer assessment helped you become an autonomous students	378	2.44	.71	46.9	53.1
7	The peer assessment encouraged deeper learning rather than surface learning	378	2.46	.73	49	51
8	The peer assessment increased your responsibility to learn	378	2.5	.72	52	48
9	Assessment done by your peers was fair	378	2.37	.73	44.6	55.4
10	Assessment done by your peers was accurate	378	2.39	.70	43	57
11	The peer assessment has given you more chances of learning	378	2.42	.66	46.9	53.1
12	The peer assessment has given you more chances to do the assessment	378	2.47	.63	48.2	51.8
	Mean perception rating		2.43	.71	47.8	52.2

Peer assessment is one element of formative assessment in which students assess each other's work to benefit from learning. Sluijsmas *et al* (1999: 300) consider peer assessment as one element of self-assessment because by commenting and judging the performance of another student, a student might gain insight into his/her own learning and performance. As the data in Table 4.8 show, a little more than half (>52%) of the students chose "not true" regarding the practice of peer assessment on the lessons of the course. For instance, when the students were asked whether there were opportunities to assess each other's learning performance, a significant number of them (>52%), reported that it was not true on the lessons of the course.

Most importantly, by judging and offering comments on the performance of another student, a student may gain insight into his/her own learning and assessment performance. As one element of quality formative assessment then, peer assessment plays salient roles to learning improvement, because it facilitates for the students' acquisition of knowledge and motivation as they compare their peers' work with their own. In line with this, the students who took part in this study perceived this point in almost equally different ways. A little more than half (197= 50.9%) of the students chose "true" with regard to the motivation and knowledge acquisition resulting from peer assessment activities. Contrary to that, the remaining (191= 49.8%) reported that they did not benefit from the peer assessment to knowledge acquisition and motivation to learn.

In addition to what has been discussed in the previous paragraphs, peer assessment empowers students to develop as reflective, autonomous, and responsible learners. It is also considered as one form of self-assessment since it fosters high levels of responsibility among students to learn and assess progressions on learning. Significant number of the students in this study reported to perceive peer assessment to be helpful in terms of being reflective (50.6%), autonomous (46.9%), and responsible (52%) on the learning process. This means, the peer assessment in the "General Psychology" course, as perceived by majority of the students, was useful to develop desirable learning skills such as reflection, autonomy, and responsibility, which in turn have implications for the improvement of student learning and the promotion of deep rather than surface learning.

On the other hand, educators propose using peer assessment that is fair and accurate. Students are expected to comment on and judge their peers' tasks as fairly and accurately as possible. In the present study, more than half (> 215= 55.4%) of the students reported the lack of fairness and accurateness on

assessment comments and judgments given by their classmates. Similarly, a considerable number of them (> 206 = 53.1%) also reported that peer assessment did not provide a greater chance of learning and assessing themselves. The Levene's test for equality of variance that assumed equal variance between the groups, showed a homogeneous perception on peer assessment activities in the lessons ( $F = 3.81 < 3.84$ ,  $df = 376$ ,  $p = 0.06$ ).

**Table 4.9 : Comparison of peer assessment perception**

Group	Mean scores	SD	Mean differ.	t-value (Table value = 1.96)	df	Assumption	Sig. (p = .05)	Remark
Comp.	29.17	5.52		1.31	376	Equal variances	.48	There is no statistically significance difference.
Interv.	28.81	4.58	.36					

The data in Table 4.9 provide a comparison of the two groups concerning the average perceptions on peer assessment activities on lessons. As seen in the data, there was no statistically significant difference between the two groups' perceptions before the instructional intervention period ( $t = 1.31$ ,  $df = 376$ ,  $p = .48 > .05$ ).

In summary, quality formative assessment was not fully implemented on the course. In spite of its many advantages pointed out by the students who took part in the FGDs, the existing practice was not found to be promising. Moreover, in the interviews conducted, the educators disclosed their limited practice on quality formative assessment because of several impeding factors such as teaching many students in a class, teaching multiple courses and the lack on the required skills to implement.

#### 4.2.2.3 Research sub question 2

- What is the extent of learning gain resulting from the use of quality formative assessment?

#### Null hypothesis 1:

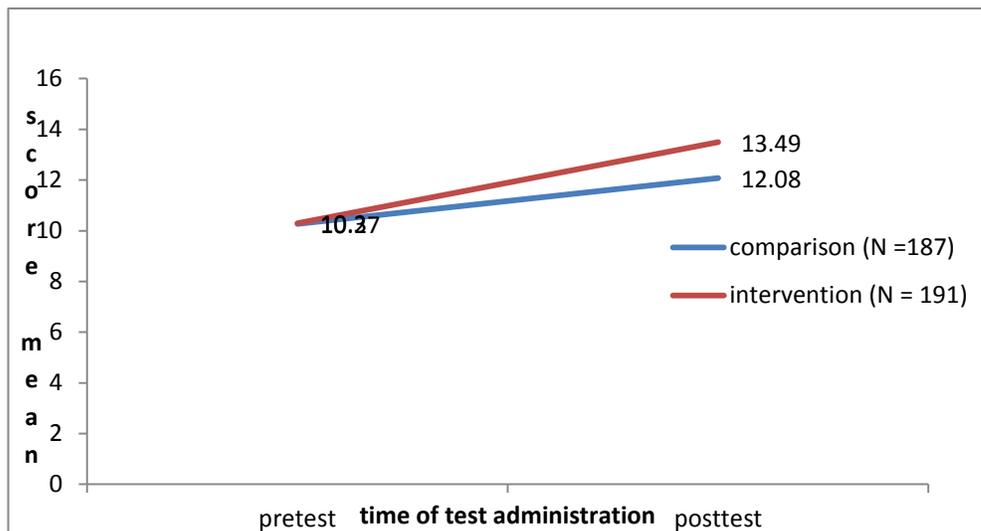
There is no statistically significant difference in the learning gains between students taught by the use of summative and formative assessment methods.

### Alternative hypothesis 1:

There is a statistically significant difference in the learning gains between the students taught by the use of summative and formative assessment methods.

#### (a) Mean difference test

As shown in the research question and the above hypotheses, this study compared the learning gains between the students in the intervention and comparison groups after the former attended instructions designed to integrate the use of quality formative assessment. Moreover, as described in chapter one, this study has a predictor variable, which was quality formative assessment (formative feedback, self-assessment, and peer assessment) used in lessons to teach the intervention group students. In addition, there are outcome variables, which were the students' post-test achievement scores and the perceptions on self-regulating learning in the specific course. The figure below shows the mean difference in the achievement test scores of the comparison and intervention group students after the application of quality formative assessment on lessons.



**Figure 4.3: Mean differences in the achievement test scores of the comparison and intervention groups of students**

After the use of quality formative assessment on the lessons of the course, an achievement test was administered to both the comparison and intervention group students. An increase in the mean achievement test score was observed for both groups (see Figure 4.3, p130). For instance, the mean

score of the comparison group students (N=187) was 10.30 with a standard deviation of 3.65 and the mean score of the intervention group students (N =191) was 10.27 with a standard deviation of 3.73. This increased to 12.08 with a standard deviation of 3.11 and 13.49 with a standard deviation of 3.65 for the comparison and intervention group students respectively. The independent samples mean difference test (t- test) that assumed unequal variances (because of the instructional intervention to one of the groups) between the two score distributions, resulted in a statistically significant difference ( $t = 4.01, df = 376, sig. < 0.00$ ). This reveals the presence of significant achievement variation between the two groups after the use of quality formative assessment. This was considered to be a satisfactory condition for accepting the alternative hypothesis that states “there is a statistically significant difference in the learning gain between the students taught by the use of summative and formative assessment approaches respectively.”

**Table 4.10: Achievement test score (post-test)**

Group	Mean scores	SD	Mean differ.	T-value (table value = 1.96)	df	Assumption	Sig. (p =.05)	Remark
Comp.	12.08	3.11		4.01	376	Unequal variances	.000	There is a statistically significant difference.
Interv.	13.49	3.65	1.40					

Even though the mean scores in the post-test significantly vary, the dispersion of the two score distributions (pretest and post-test), decreases for both the groups. For instance, the standard deviations of test scores before and after the intervention for the comparison group students were 3.65 and 3.11 respectively. The dispersion of scores for the intervention group also showed a decrease between the pretest and the post-test. The standard deviations of the scores before and after the intervention were 3.73 and 3.65 respectively. This might happen when the scores of both high achieving and low achieving students in the comparison as well as in the intervention group came closer to the average score. In fact, this might partly resulted from the test retest practice effect, which is usually a major limitation in quasi-experimental interventions.

In summary, the use of quality formative assessment in instructions can make a salient contribution to the improvement of student learning and achievement. As the test score data after the use of quality formative assessment revealed, there was a statistically significant difference between the mean score of the comparison group (mean=12.08) and the intervention group (mean=13.49), ( $t = 4.01, df = 376, \alpha. < 0.00$ ).

#### **(b) Biserial correlation for post-test achievement**

The biserial correlation is an appropriate statistic to estimate the presence of significant relationships when one variable is continuous and the other variable is dichotomous (Kaplan & Saccuzzo, 2001:80). The biserial correlation coefficient was computed between the achievement test scores of students as a continuous variable and the students' placement in the comparison or the intervention group as a dichotomous variable. This correlation was computed to check out whether there was a statistically significant relationship between placement in the intervention group in which the students were taught by the use of quality formative assessment and the corresponding test score results. Therefore, in this study, the biserial correlation was found to be considerably higher ( $r_b = 0.26$  with degrees of freedom = 376), where the expected biserial correlation coefficient table value at  $\alpha = 0.05$  is less than 0.19. This shows, there was a statistically significant relationship between placement in the intervention group where quality formative assessment was used in instruction and the students' score from the achievement test.

#### **(c) Effect size estimate (Cohen's d)**

Effect size estimate is a more robust statistic used to compare the value of variables in quasi-experimental studies. Effect size helps to measure how much something, for example, (student scores) changes after a specific instructional intervention. The index shows the extent to which two populations do not overlap in a measure, or how much they are separated because of the quasi-experimental intervention (Aron, *et al*, 2009: 205).

The common ways of reporting effect size of quasi-experimental study designs are the raw score mean difference, the standardised mean difference and the odd ratio. For the sake of simplicity and convenience, effect size estimate methods of the first two (raw score difference and standardized mean difference) were used in this study. In the first case the estimated effect size resulted from the

intervention was 1.41 score points. In the second case, the effect size estimate for standardised mean differences was 0.41, which means according to Cohen (1988) and the convention about the estimates of effect size, this value is judged as a medium result for a quasi- experimental intervention where the random assignment and control of study participants was hardly possible (Aron, *et al*, 2009). In this study, therefore, the instructional intervention that integrated the use of quality formative assessment on its implementation produced positive gains on the students' learning and achievement. This positive effect size index shows the intervention group outperforming the comparison group on a positive outcome measure (for example, post-test scores).

Furthermore, as the data in the qualitative phase of the study show, the educators who took part in the present study had positive perceptions towards using quality formative assessment in their teaching. They also confirmed the opportunities on student learning improvement when quality formative assessment was used. The educators preferred to use formative assessment because of its advantages in contributing to the quality of instruction, student active participation and understanding, and the development of learning skills by the students.

#### **4.2.2.4 Research sub question 3**

To what extent can the use of formative assessment involve students with self-regulating learning and assessment?

##### **Null hypothesis 2**

There is no statistically significant difference between the intervention group and comparison group students in reporting on their perceptions on self-regulating learning and assessment.

##### **Alternative hypothesis 2**

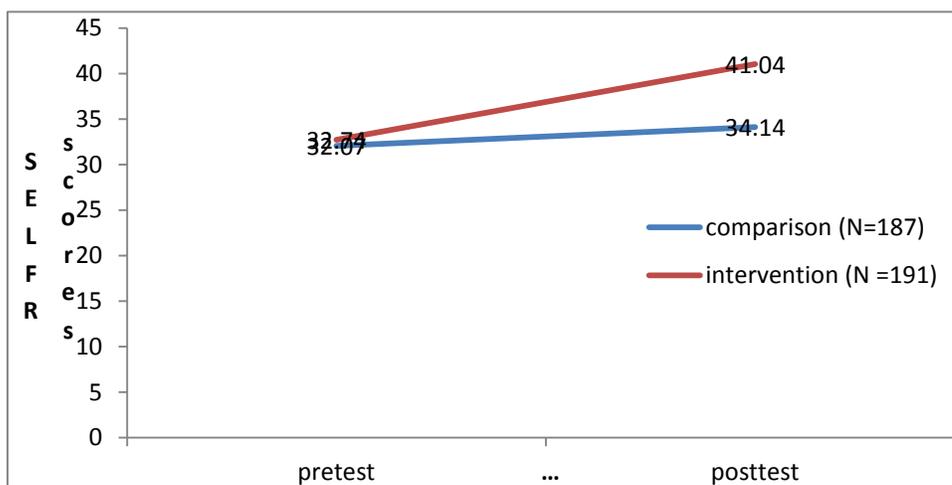
There is a statistically significant difference between the intervention group and the control group with regard to reporting their involvement with self-regulated learning and assessment.

##### **(a) Mean difference test**

Research sub-question 3 and the accompanying hypotheses deal with the advantage of quality formative assessment to self-regulate learning. After the use of quality formative assessment in a class of students, the thirteen (13) items-questionnaire which elicited the perceptions on self-regulating

learning was re-administered to both the comparison and intervention group students. A change in the mean perception of self-regulated learning was reported in both groups. For instance, the mean perceptions of self-regulating learning for the comparison group students (N=187) was 34.14 with a standard deviation of 5.11 and the mean perceptions of self-regulating learning for the intervention group students (N =191) was 41.04 with a standard deviation of 3.94. According to this data, there was an increment in the mean perceptions on self-regulating learning for both groups. The mean perception of self-regulating learning before the instructional intervention was 32.07 with a standard deviation of 3.89 for the comparison and 32.74 with a standard deviation of 4.31 for the intervention group of students respectively.

The independent sample mean difference test (t-test) that assumed unequal variances between the two mean perceptions resulted in a statistically significant difference ( $t = 14.72, df = 376, a. < 0.00$ ) between the intervention and the comparison group, where the intervention group of students perceived their self-regulated learning as improved. In this case, the mean difference showed a higher t- statistic after the use of quality formative assessment. The greater difference on the perceptions of self-regulated learning might be because of the use of quality formative assessment in instructions. This is a satisfactory condition for accepting the alternative hypothesis that states “There is a statistically significant difference between the intervention and comparison group students in reporting on their perceptions on self-regulating learning and assessment.” The diagram shown in Figure 4.4 and the statistical information on Table 4.11 clarify the difference in perceptions to self-regulate learning after one of the groups was taught by the use of quality formative assessment.



**Figure 4.4: Comparisons of self-regulation mean scores**

**Table 4.11: Perception of self-regulating learning (post intervention)**

Group	Mean scores	SD	Mean differ.	T-value (Table value = 1.96)	df	Assumption	Sig. (p = .05)	Remark
Compa.	34.14	5.11		14.72	376	Unequal variances	.000	There is statistically significant difference.
Interv.	41.04	3.94	6.9					

**(b) Biserial correlation**

Similar to the post-test achievement scores, the biserial correlation coefficient was computed between the self-regulating learning perception score as a continuous variable and the students' placement in either the comparison or the intervention group. This correlation was computed to check whether there was a statistically significant relationship between placement in the intervention group where quality formative assessment was applied and the perceptions of students on self-regulating their learning as a result of the use of quality formative assessment. Therefore, in this case the biserial correlation was found to be considerably higher ( $r_b = 0.61$  with degrees of freedom = 376), where the expected correlation coefficient table value at  $\alpha = 0.05$  is less than 0.19. This shows, there was a statistically significant relationship between placement in the intervention group where quality formative assessment was used on lessons and the students' perceptions on self-regulating their own learning.

**(d) Effect size estimate (Cohen's d)**

Similar to the achievement test scores above, effect size of the perception on self-regulating learning was estimated using the raw score mean difference and the standardised mean difference. The raw score mean difference between the intervention and the comparison group students on perceiving on the self-regulation of learning resulted in a difference of 6.90 score points. The effect size estimate on standardised mean difference was 0.77, which means according to Cohen (1988) and the convention about estimates of effect size, this is judged as close to a higher result from a quasi-experimental intervention where random assignment and control of study participants was not practical (Aron *et al*, 2009). In this study, therefore, the instructional intervention that integrated the use of quality formative assessment produced a positive result on the students' perception of self-regulating their learning. This

positive index shows that the students in the intervention group perceived self-regulating learning in a more positive way than the students in the comparison group.

### **4.3 RESULTS OF THE QUALITATIVE PHASE**

As discussed in the previous chapter (chapter 3), this study followed a mixed-methods research where the quantitative phase was followed by the qualitative phase. Thus, data were collected for the qualitative study through key informant interviews on the perceptions of formative assessment, focus group discussions and classroom observations. Therefore, this section of the chapter presents the data analysis and interpretation of the qualitative study along with the research questions raised. The qualitative study relies on the interpretive paradigm of research, where the ontological position assumes the existence of multiple realities based on the individual's construction of reality. Moreover, according to the interpretive view, there is a possibility for the social construction and changing of reality. The following are the results of the qualitative study. In some instances, the findings from the quantitative phase of the study are reflected on the analysis of the qualitative data.

#### **4.3.1 Introduction**

In this study, six educators took part by implementing the designed instruction that integrated the use of quality formative assessment. The educators also took part in the interviews regarding their perceptions on quality formative assessment. The use of formative assessment is influenced by the educators' lack of concern about it (Wiliam, 1998), and the prospects of using formative assessment are also discouraging (Careless, 2007b: 56). On the other hand, there is a basic assumption that the perceptions of educators can have implications to the practice of quality formative assessment in the instructional process. Therefore, for a better understanding of the situation in terms of this study, the researcher set a research question that read: "What are the views of the educators on the use of quality formative assessment in the instructional process?"

To answer the above research question, six (6) educators, namely two (2) from each university were assigned to implement the instructional design that included the use of quality formative assessment, and were interviewed on what they perceive regarding the use of formative assessment and the factors impeding its effective implementation. The researcher planned formal interview sessions that were convenient for each interviewee. Thus, the researcher conducted a series of interviews with the use of

structured interview procedures and the interview transcriptions that were coded, are displayed in tables (see Annexure 8), and were interpreted with reference to the research question.

The organisation, analysis and interpretation of the interview data followed the three steps of qualitative data analysis outlined by Flick (2006: 283) which were discussed in the methodology chapter of the study. These are: (1) coding (identification of themes), (2) data display (organisation for meaning), (3) and interpretation of the themes (explanation of the findings) respectively. The researcher followed these steps because they assist with finding an answer to the set research question in the qualitative phase of the study. In fact, the qualitative methods literature point out as there is no one fixed method of qualitative data analysis (Flick. 2006: 218). Punch (2005: 196) confirms that "... there is no single methodology framework or prescription for the analysis of qualitative data." Other scholars, such as Flick (2006) also hold the same view. The above-mentioned steps are explained below shortly:

- **The coding process**

The coding process took place to each set of qualitative data collected by the three different methods, such as interviews, focus group discussions and classroom observations. During this stage, the researcher read through the information in the data set critically, underlined important phrases, and assigned words/phrases to identify the themes that emerged.

- **Data display**

Following the coding process, the researcher brought similar codes together to facilitate easy organisation and interpretation of data.

- **Interpretation of data**

The researcher interpreted the themes produced from the interview data to answer the research question set out above.

### 4.3.2 Interpretation of the interview data

The researcher read through the interview transcription of each individual respondent repeatedly. The coding step was appropriate to get manageable chunks of themes to present, and explain the data to answer the research question. The interpretation of the interview data was done by displaying the interview extracts and by giving explanations to every question. Thus, it emerged that the educators expressed their personal perceptions on the use of formative assessment as follows.

*...[I] have a positive perception towards formative assessment even though it does not go with the introduction of course modularization practice because of students characteristics (many slow students) and [the] shortage of [the] block course duration. I am trying to implement it (with some hesitation) even though it seems ineffective with modularization and the blocking of courses.*

*... is that using some forms of assessment (such as questioning, unplanned quizzes, tests, examples and feedback) in the middle of a lecture with the aim of improving student learning and progress in a course.*

*... is a means to check students' learning progress throughout the course of instruction.*

*... is a very crucial process of identifying weak strong side of student learning in a lesson/course, which aims at improvement or progress of learning, and based on assessment results there can be possibility of giving remedial instruction to improve student understanding and learning.*

*It is checking students' learning progress frequently with the intention of diagnosis, and after the assessment, giving feedback and improving teaching methods may follow.*

*...formative assessment, if implemented consistently, it is good for giving student feedback and encouraging student participation in learning. Moreover, it benefits students because of the high retention possibility of the learned content in lessons and the step-by-step improvement in their learning.*

The educators' perception and understanding of formative assessment is significant for its implementation (Black & Wiliam, 1998a: 20). The perception of an educator is a causal factor, because

he/she is a key person in the use of formative assessment. The interview extracts above reveal that, despite all the limitations, the educators seemed to perceive the use of quality formative assessment positively. In their responses, they described formative assessment as a procedure for using some form of assessment such as questioning, quizzes and tests in the middle of a lecture by the combination of instruction and assessment activities. As the presentation of data in the quantitative phase of the study revealed, quality formative assessment significantly contributed to learning improvement and achievement gains. In similar way, the interviewed educators perceived the purpose of quality formative assessment as the diagnosis of learning difficulties, checking student learning progress and understanding, giving feedback, improved teaching methods, high retention of the learned content and a step-by-step improvement in learning. Nonetheless, as one educator emphasised, the implementation of formative assessment seems to be ineffective at universities with the introduction of course modularisation (blocking of courses), because of the short duration of courses that stretch over 15 to 20 days at the most. In fact, in spite of the challenges hindering the implementation, the educators showed positive perceptions towards the use of quality formative assessment that improves learning.

After obtaining responses to the general perceptions of the educators on the subject of formative assessment, the researcher asked the extent to which formative assessment provides an opportunity in learning improvement. The following are the interview excerpts and their interpretations.

*... has a great implication for the improvement of learning.it prepares both the teacher and students to do something next in order to improve the learning and achievement of objectives.*

*If consistently implemented for sure it improves the teaching learning process, student understanding and performance, and quality of education.*

*... Provides opportunity for student learning improvement, but due to shortage of time and material, class size... its implementation is highly challenging.*

*If practically implemented for sure it improves the teaching learning process, student understanding and performance, and quality of education.*

*... Provides opportunity for student learning improvement, but due to shortage of time and material, class size... its implementation is highly questionable.*

*Quality formative assessment for students self-assessment, assess one another, improves students learning skill. Theoretically, it has big contribution to strengthen student-teacher relationship. It helps to check the learning progress. Timely indication of understanding of the subject matter. Moreover, the teacher checks the extent to which learning objectives are attained by students.*

In the quantitative phase of the study, the numerical data analysed showed the presence of statistically significant variation between the learning gains of students in the intervention and comparison groups. Improved learning gains on the side of the intervention group was confirmed by the medium effect size statistic reported (Cohon's  $d = 0.41$ ). The interviewed university educators also confirmed that the use of quality formative assessment provide an opportunity for learning improvement. They gave several examples of these opportunities. First, formative assessment prepares both the educator and the students to think what they will do the next time to improve the achievement of learning objectives. Moreover, if applied consistently, formative assessment can improve the teaching and learning process, student understanding, and the quality of instruction. In addition, formative assessment is supposed to improve students' learning skills and student-teacher relationship. All the above mentioned ideas positively supplement the findings from the quantitative phase of the study. However, two of the interviewed educators expressed their concern as follows. As a consequence of many impeding factors such as many students in a class, teaching multiple courses, resource limitations, lack of skills and preparation, implementing quality formative assessment at present is highly challenging. The impeding factors mentioned, might also lead the educators to think that formative assessment, while having a convincing theoretical and empirical bases in predicting learning improvement as seen in the present study, may be impractical and time-consuming to implement (Careless, 2007a: 173).

Despite their present perceptions on the use of formative assessment and the impeding factors influencing its implementation, the researcher asked the educators about their preference to the type of assessment on their teaching practice.

*Despite the many impeding factors to implement formative assessment such as workload, teaching multiple courses, large class size, resource limitations, lack of skill and preparation, and the lack of training, the educators preferred to practise*

*formative assessment for it has a salient contribution to the improvement of student learning in the course.*

*Both of them felt that because formative assessment is helpful for giving remedial instruction, to check students' progress in attaining the learning objectives and in knowing the levels of students. It also help the teacher and the students how to proceed to next lessons. In what ways to teach them and learn how to learn. On the other hand the summative helps to check students' competence and attainment of course goals.*

*Both, formative assessment to improve learning, because it benefits students to practice and for high retention of the learned material. Summative assessment, because it ascertains the development of students' competence in the learned material.*

*...use both of them. To know the progress of students I use FA mostly in a non-graded form such as question-answer, class activities, quizzes because they are more supportive to student learning improvement. To evaluate whether objectives have been achieved, I use SA such as graded tests, quizzes, assignments, final exams.*

*Both, formative assessment helps to identify the position of students in the learning series and summative assessment to give mark and grade students' performance.*

*... prefer to use formative assessment because if conditions are fulfilled. For immediate and timely interaction...you will see how progressing the students in the course are. FA gives a greater opportunity for self-reflection & interaction with the students. SA is only for the next course (gives lesson).*

Almost all the educators interviewed revealed a preference for both formative and summative assessment techniques for distinct reasons. They preferred to implement non-graded and supportive formative assessment because it makes a salient contribution to learning improvement, helps the educator and the students to know how to proceed with the next lessons in a course, and promotes the skills of learning how to learn. On the other hand, they preferred summative assessment such as graded tests and examinations to determine the development of students' competence in terms of the intended course objectives. While formative assessment aims to provide information on how to improve

performance in the future lessons of a course, summative assessment intends to make final judgments about the achievement of course objectives.

Formative assessment is characterised by the diagnosis of learning problems, progression, feedback and motivation to the student (James & Fleming, 2005: 44) and summative assessment is characterised more by the grading function than by the learning function. In addition, as Torrance and Pryor (2001) state, the connection between summative assessment and student learning improvement is not always clear. However, in practical terms, both of these approaches have their own roles in the instructional process. In fact, research evidence emphasise the significance of formative assessment for the progress of student learning within a given course (Yorke, 2003: 482; Careless, 2007a: 174). Therefore, keeping the role of summative assessment in mind to determine the achievement of course goals, educators should prefer formative assessment when their intention is to improve learning, learning skills and when they expect the active participation of students in the learning process.

The use of different innovative instructional techniques requires good preparation and training for those carrying it out. In this study, almost all the interview participants reported that little or almost no training was given to them on the subject of quality formative assessment. The responses from the interview participants concerning experiences of training opportunities are shown in the interview extract below.

*... not any formal training. In the higher diploma programme emphasis is given to other instructional skills rather than assessment skills.*

*Yes, a little in Higher Diploma Programme training.*

*... learned about it as a topic in a course. I can know what it is but not how to implement (lack the skill).*

*Yes, in my undergraduate course as one topic.*

As the responses reveal, some of the educators attended formative assessment training in the Higher Diploma Programme (HDP) and some others received training on the subject matter of formative assessment as a topic in their undergraduate course with an emphasis on what it is, rather than on how to use it practically. Still others did not receive any training. Because the educators did not receive proper training and preparation on how to implement formative assessment, they hardly used it in teaching. As one of the interview participants mentioned, teacher professional development trainings at

universities focus on other instructional skills than assessment skills. This means, there is little consideration for assessment skills' training at the higher education institutes.

In the opinion of the interview participants, there are many factors that play a role on the use of formative assessment. The major factors are classified as facilities, the behaviour of the groups involved and the learning environments. The following interview excerpts show the major factors that influenced the implementation of formative assessment in lessons as perceived by the educators.

*Materials and existing facilities such as copy[ing], print[ing] and the like are often lacking or inadequate in many instances.*

*Student readiness, less participation, resources (readings, books, reference materials and other facilities).*

*Because it takes time against course content coverage, lack of planning and preparation, resistance from the student side (they consider it as an extra workload to them).... I offer training for other educators but I myself have difficulties to implement.*

*There can be many barriers to mention such as lack of skill and knowledge, negative attitude because the implementation of FA requires much time and effort, it increases teacher's load, and the size of the students in a class is also a problem, students' lack of readiness & language skill limitation.*

*Class size, workload /how busy I am in teaching multiple courses (3-4 courses in a semester).*

*For reasons of heavy workload, time pressure for preparing, tendency to resist change, and the tendency to believe that the conventional practice or summative type of assessment as right.*

Some of the factors influencing the use of formative assessment in lessons relate to the lack of facilities such as printing services, photocopying, and time pressure to cover course contents. The other factors mentioned were related to the group behaviour. The behavioural factors pertain to the students' as well as the educators' behaviour. For instance, the students' lack of readiness, absence of participation, resistance, passivity, thinking of formative assessment as an extra workload, language

and learning skills limitations are the major impeding factors to use quality formative assessment in lessons. This might relate with the students little exposure to study at university classrooms in which some of the instructional techniques applied are new to them. The biographic information collected from the students in this study reveal that the students are in their first year of education at the universities. Some behavioural factors on the part of the educators were also found to impede the proper implementation of formative assessment. These include the lack of knowledge and skills on how to implement, a “negative” attitude, for it increases their workload, the lack of planning, training and preparation and the thinking that summative assessment is the only appropriate method of learning assessment. The barriers mentioned in relation to learning environments are large class sizes, heavy workloads and the teaching of multiple courses.

On the other hand, the educators interviewed reported that they faced the following problems while using quality formative assessment. The first problem mentioned was motivational problems. This means the educators reported that they lacked the motivation to implement formative assessment because the students were often passive and non-challenging. In the educators’ opinion the students’ learning capacity, preparation and learning skills were extremely limited. Moreover, students seemed to resist the implementation of formative assessment. For example, they failed to complete an assessment task, if it is not graded. In addition, the relationship between the educators and the students, to a large extent is grade oriented rather than learning oriented. Furthermore, in the opinion of the interview participants, there was a shortage of time to implement formative assessment and give assessment feedback when coverage of the volume of course content was considered. In fact, there was also little understanding on formative assessment.

In addition to the identified impeding factors and the problems faced with the implementation of formative assessment, the researcher asked the educators to explain how they had used formative assessment in lessons (see the interview extracts given below).

*I use questions and answers in the middle of my lectures, incidental quizzes, observations in group work, informed tests + mid-term exam, individual and group assignment presentation and comment to presentations (individual or whole class feedback).*

*... using a question and answer method, class activities, take home activities, reading assignments for portions not covered in lecture time, feedback after tests and quizzes, whole class feedback after an assessment (test, mid-term exam) and also individual feedback.*

*... use by asking a single question for discussion, and also non-graded quizzes and assignments.*

*...use assignments (individual + group), question and answer, short-tests on weekly basis + discussion on the test results and feedback. Establish forum for discussions... what it means... debate... argument.. mostly non-marked and for the purpose of improving learning.*

The interview extracts show the educators used formative assessment in their teaching in different ways. Some of the methods they used were individual and group presentations followed by feedback (individual and whole class feedback), reading assignments, feedback after quizzes and tests, non-marked assignments, and questions for discussion and debate for improving learning. However, from the ways they mentioned; one can assume that most of the ways were teacher dominated assessment activities. Here, it might not be clear how students get involved in self-assessment and peer assessment apart from completing assessment tasks given by the educator and receiving comment and feedback to improve. For effective outcomes to happen, quality formative assessment needs to involve the students actively during its implementation.

The use of an innovative instructional technique will be effective when there is encouragement of those involved in the implementation. In line with this, the researcher asked the educators, whether they received encouragement from their respective departments. The following interview extracts show their responses.

*So far there is not any. However as announced by the quality assurance office of our university there will be best teacher's award coming soon for those who use innovative teaching and assessment methods in their courses including formative assessment.*

*Almost nothing because it seems they do not have enough knowledge and awareness about formative assessment.... They only focus on graded assessments*

*for example-summative continuous- want to see timely reported grades to make supervision of the teaching learning process.*

*None at all. Didn't recognise it very well. No one makes follow up about it. No consideration on the essence of formative assessment. No any reinforcement.*

According to the perceptions of the educators, since the focus of the university management was on graded assessments, there was no real encouragement and reinforcement for those implementing formative assessment in their teaching. It seems that there was inadequate knowledge and understanding of the instructional advantages and the benefits of formative assessment on the side of the universities' management. Moreover, there was no follow up and recognition on its use.

In one of the above interview excerpts, the educators complained about the students' lack of preparation and resistant behaviour as an obstacle to the implementation of formative assessment. Thus, understanding the actual reactions of students during the use of formative assessment was found to be important. Based on this, the researcher asked the interview participants to report their perceptions on the students' reactions, while carrying out formative assessment. The following interview extracts sum up the responses received.

*Some believe it is beneficiary for the improvement of their learning. Others misunderstand the value of formative assessment--- they think it as continuously adding up marks to students or as a means/mechanism of safeguarding them from achieving failing grades.*

*They react as tiresome of assessment practices (frequent assessment) tide up for many courses as all demand continuous assessment (not identified whether formative or summative).*

*Most of the time students are found to be passive. This also demotivates teachers to use formative assessment... and other innovative instructional techniques.*

*... students are not willing to do non-graded assessment tasks. They are also mostly passive, to make me not enforce myself to implement formative assessment.*

*Some students have negative attitudes towards formative continuous assessment. They often complain saying we have another assessments to keep us busy.*

*When... implement formative assessment /with all the constraints/ try to let them believe in the advantages. When I appreciate, encourage and give feedback they feel happy. They understand the style of teaching... you see students becoming interested in the learning process... they show positive reactions and like the course.*

As the responses show, the educators reported different reactions from the students' side. For instance, some students were found to believe in formative assessment as beneficial for learning improvement. During the implementation of formative assessment, when the educator expressed appreciation and gave encouragement and feedback regarding their attempts, they felt happy, became interested in learning and also showed positive reactions towards the course. The educators felt that there were also other students who misunderstood the essence of formative assessment. They tended to believe that it entailed the continuous adding of marks to protect students from receiving failing grades. Other students intimated that they were exhausted by continual assessment practices. These types of students were also often passive in the process of learning, exhibited a negative attitude to formative assessment and were unwilling to complete non-marked assessment tasks. The interview participants reported that educators felt discouraged about using formative assessment. Consequently, educators tended to continue using summative assessment as the only appropriate assessment procedure.

Regardless of their positive perceptions on the use of quality formative assessment and its importance to learning improvement, educators are still reluctant to implement it. The interview extract below reveals several factors mentioned by the educators.

*... the main reasons may be lack of motivation, lack of skills and also the lack of training in practising formative assessment. Encouragement is missing from the academic system awareness creation and increase is important.*

*... majority have no clear understanding about formative assessment. Status quo oriented. The orientation they have is about marking or pass and fail.*

*... formative assessment increases workloads/burdens. It takes time to plan and prepare the lesson. Lack of planning ahead of time.*

*Lack of training on how to implement. Lack of follow up from department head. And also large class size is impeding the implementation of formative assessment.*

... believe in the importance and yet they may lack the knowledge and skill. They also lack sufficient understanding and what the tactics are. Moreover there is not enough time to cover contents of the course; management and class size are also not encouraging to implement formative assessment.

As the responses from the educators showed, the major factors that impeded the implementation of formative assessment were the lack of encouragement, lack of skills and appropriate training in practising formative assessment, class sizes, the *status quo* orientation of the academic staff, lack of sufficient understanding and a shortage of time for covering course content.

In line with the above, the researcher asked the educators what they recommended and whether the effective use of formative assessment could contribute to the improvement of learning. Their responses are presented in the following interview summary.

Motivating teachers and students, professional skills training for teachers.  
*Teaching-learning process in the globe is changing. Most teachers want to leave. There is absence of incentive and staff drainage.*

*Continuous formative assessment is very good for the teaching learning process. All teachers should apply for quality of learning to occur. Independent learning improves students' learning skills and self-confidence. There seems a need to increase the awareness of teachers and students through orientation and short skill training.*

*There is a need to change the attitude of educators and students. Providing training for teachers on what and how to implement formative assessment is essential for its effective implementation.*

Provision of training on how to implement. Lack of follow up from department heads has to be improved. And also large class size is impeding the implementation of formative assessment; thus arranging manageable class size will contribute for the implementation of formative assessment.

Problems affecting the implementation of formative assessment should be resolved first. Moreover there is a need on the part of teachers to be committed for the

*implementation. Their knowledge and skill should be upgraded. There is also a need to orient students about the benefits of formative assessment. Mechanisms should be devised on how to handle formative assessment in lessons.*

The importance on the continual use of formative assessment was emphasised, since it made salient contributions to effective instruction, advance the quality of learning, and promote students' self-regulation on learning. Moreover, it was also learned that the formative assessment helped to improve the students' learning skills and self-confidence. Therefore, with reference to the importance of formative assessment, the need to resolve those aspects impeding its use, such as class sizes, attitudes of educators and students, and problems of teacher commitment were underscored. The educators also pointed out the importance of increasing the awareness and understanding of students and educators and the training of educators on what formative assessment is and how to use it to increase the effectiveness of instruction.

Finally the researcher gave a chance to each interviewee to add further points to the issues discussed. The suggestions made are presented below.

*The system should enhance the awareness of students towards formative assessment, its purposes and benefits to the improvement of learning. Most students assigned/admitted to universities are underprepared, they lack motivation, they have [a] low capacity to learn and they are not prepared to put effort towards their study “ they often say why should I bother myself, I will score C, the passing grade thanks for continuous assessment it will safe guard me from achieving a failing grade.*

*The skills of learning how to learn are very important for the implementation of formative assessment and student learning improvement. Both teachers and students should get training and the 1-5 peers learning and team teaching has to be strengthened towards implementation of formative assessment. Short-term, periodic trainings for teachers will change the situation positively.*

*Blocking of courses brings a challenge to the implementation of formative assessment. Updating teachers' skills is important. The teaching method is still lecture dominant. Formative assessment is known and yet not understood very well.*

*The perception of teachers towards formative assessment and student-centred method of teaching is not that much practiced.*

*Very important to prepare standard guideline on how to implement. Motivation and incentives for teachers and follow up whether formative assessment was implemented or not is important at initial stages.*

The points they added, can be categorised into three groups, namely, concerning student behaviour, the organisation of learning environments and guideline concerns. With respect to the students' behaviour, the need to train them the skills of learning “how to learn” and preparing them as assessors of their own learning progress to become assessment users, were emphasised. The learning environment could also be designed to make use of the already established one in five (1 in 5) peer learning and team teaching groups at the respective universities as opportunities to improve the use of quality formative assessment. Here, the educators suggested the initiation of assessment moderation and frequent reporting by the learning and teaching teams to contribute to the implementation of formative assessment to a large extent. With respect to providing guidelines, the suggestion given was to prepare standard guidelines on how to use quality formative assessment, train educators to practice formative assessment on their teaching and strengthen the follow up process with guidance at the initial formative stage until the use of quality formative assessment became an instructional culture at the universities. According to the perceptions of the educators, although the academic community was quite familiar with formative assessment, it did not understand it very well yet. Consequently, in the context of this study, the teaching methods of university courses were still lecturing and dominated by summative assessment procedures.

### **4.3.3 Summary of field notes from the focus group discussions**

The focus group discussions with the students placed in intervention group were aimed at finding additional answers to the research question that read: “To what extent can the use of quality formative assessment involve the students to self-regulate their own learning and assessment?” This section of the qualitative data analysis presents a summary on the focus group discussion results.

With respect to the general views on formative assessment, the students perceived it as an activity that makes learning and assessment more interactive. They also expressed formative assessment as a

positive and encouraging activity in the learning process. In the discussions, the students mentioned many advantages of formative assessment for learning. According to them formative assessment:

- Contributes to the quality of learning;
- Helps with the improvement of learning and achievement;
- Enhances student self-confidence;
- Helps to broaden the students' knowledge;
- Promotes retention of the learned content;
- Encourages self-regulated learning;
- Helps the student to recognise the strengths and weaknesses in learning;
- Makes students play an active role in the learning process.

As noted from the results of the quantitative phase of the study, the use of quality formative assessment on the lessons of the course increased the students' role on the self-regulation of their own learning and assessment. More specifically, as the numerical data on the students' perceptions on the self-regulation of learning and assessment showed, there was a statistically significant variation between the intervention and the comparison group of students. Moreover the estimated effect size that showed the extent of which the two groups were different in their perceptions on self-regulating learning and assessment was considerably higher (Cohen's  $d = 0.77$ ). To supplement this by the data from the qualitative study, the researcher guided the focus group discussants to raise ideas on the uses and effects of formative assessment on their learning and also on the self-regulation of learning. The students pointed out that quality formative assessment had a favourable effect in terms of changing the students' attitudes to be more positive towards learning and assessment as well as to self-regulate their own learning and assessment. As raised in the discussion, the use of quality formative assessment positively influenced the motivation and the active participation of the students in the learning process.

In terms of the usefulness of the three types of quality formative assessment, the students' perceptions were found to be optimistic although these forms of assessment were contrary to the course content coverage because of the amount of time they consumed. For example, the use of formative feedback encouraged more learning to occur. The uses of self and peer assessment were also advantageous

because they were motivating to promote the active attention and involvement of the students in learning and assessment. According to the opinion of the focus group discussants, self-assessment made them relatively independent on their learning. They also reported that peer assessment activities were conducive to student motivation and competition. Nonetheless, as the findings from the quantitative phase of this study showed, a considerable number of the students reported an absence on the practice of the three elements of quality formative assessment on the lessons of the course.

On the other hand, significant number of the students expressed the usefulness of formative assessment to acquire more knowledge in the field, obtain clarity concerning the learning objectives, and also self-confidence on their learning. The students also witnessed that the information given regarding the learning objectives on the lessons were stimulating to them. Moreover, they reported that the use of formative assessment contributed to feeling confident and actively participate on the learning process.

The students in the focus group discussion showed a preference to “deep learning” above the “surface learning.” They also said that the formative assessment used on the lessons of the course contributed for the actualisation of “deep learning” with examples. For instance, formative assessment helps the student to collect more information about the learned content. The alignment of formative assessment with that of “deep learning” also encouraged the students to make more of an effort to satisfy the need to know and understand. Deep learning when accompanied by the use of quality formative assessment activities encourages students to be inquisitive and to like learning more. Nevertheless, the shortage of time for course content coverage always worked against the effective use of quality formative assessment to promote deep learning.

In the focus group discussions, the students were directed to discuss whether the implemented formative assessment promoted “surface” or “deep” learning. In the discussion, the majority of the discussants confirmed that the implemented formative assessment promoted both types of learning. For instance, it promoted surface learning where the students are expected to master definitions of key terms and concepts on the course they learn. However, if used practically, in most cases, formative assessment facilitates the promotion of “deep learning.”

Finally, the students who participated in the focus group discussions were given a chance to express ways in which the quality formative assessment allowed them to demonstrate their understanding. In

reference to this, the discussants mentioned the following points to explain how formative assessment helped them to understand their lessons:

- The introduction of the lesson objectives and the assessment criteria were helpful;
- Learning from mistakes was useful and motivating;
- The introduction of lesson objectives and the assessment criteria were helpful;
- Learning from mistakes was useful and motivating;
- It helped to reduce errors in learning;
- It promoted greater accuracy in the learning of difficult concepts;
- Ensured the credibility of learning, achievement;
- Self and peer assessment, in particular, made salient contribution to understanding.

#### **4.3.4 Summary of field notes for classroom observations**

The classroom observations were pre-scheduled and focused on the actions of the educators, the students and the types of formative assessments used on the lessons. During the observations, the researcher focused on determining if students participated actively individually and in groups, and how they interacted when quality formative assessment was used. What emerged during all the observations was that the number and extent of active participation of male students were mostly greater than that of female students.

##### **4.3.4.1 Use of formative feedback**

The classroom observations undertaken showed almost the same results except that two of the educators overlooked the introduction of lesson objectives and assessment criteria at the start of the instruction. During most of the observations, the educators followed standard procedures based on the prepared lesson plan template. The educators first introduced the lesson objectives, type of formative assessment and the assessment criteria. After that, they proceeded with the revision on the previous lesson and introducing the new lesson in context. Then, lecturing followed with the use of examples for about fifteen (15) to twenty (20) minutes before raising questions for assessment purposes. Next, the educators asked questions, either orally or by writing on the chalkboard. In the first instance of questioning, in many of the observed classes, it was a common practice to observe the students to remain silent. In addition, some of the educators did not allow enough time for the students to think after posing the questions, but gave the answers themselves immediately and proceeded either to the

next question or continue lecturing. Some other educators were observed while attempting to clarify the questions and trying to motivate the students to actively participate and give answer to the questions. Whenever, the students attempted to answer any question, the educators gave recognition to the responses and continued either by providing individual or whole class feedback, or by giving a detailed explanation on the answer, and by asking another question, or by continuing lecturing.

In many of the classes observed, the type of formative assessment used was whole class feedback, except that one or two educators were trying to provide individual feedback to the students. The major limitations found during the observations were the failure to introduce instructional objectives by some of the educators, the passivity and the limited participation on the part of the students, the unsuitability of the seating arrangements and the large number of students in the classrooms.

During these observations, the students were seen to be exhibiting different reactions ranging from silence to active involvement and competitive behaviours depending on the assessment task given. For instance, in many of the observed lessons, the students' actions were characterised by silence and note-taking at the beginning, while these improve in the middle and at the end of the instructional time. The major actions of the students were listening attentively to lectures, reading through handouts, taking lecture notes, active involvement in an assessment task given to a group, competitive behaviour, and seeking a chance to respond to a given assessment task.

#### **4.3.4.2 Use of self-assessment**

The second phase classroom observations were carried out to see how self-assessment was used and to observe the actions of the educators and the students at the beginning, in the middle, and at the end of the instructional time. Even though, there were individual differences among the educators to let the students' self-assess, the general steps were almost the same. Most of the educators attempted to revise the previous lesson by means of questioning before starting the new lesson. In the meantime, some students attempted to answer questions while the others listened attentively. During this observations, the educators introduced the lesson content, instructional objectives, the type of formative assessment to be used and also the assessment criteria. Then, lecturing lasting roughly fifteen (15) to twenty (20) minutes followed. During the lessons, some educators were using an assessment task involving questioning (oral or written) and short quizzes written on the chalkboard. Others only wrote a few questions on the chalkboard.

In many of the classes, the majority of the students were observed while taking notes. Some students were also listening attentively to the lecture without taking notes. Whenever the students attempt to fulfill the assessment criteria, the educators motivate them to a large extent. Largely, whole class feedback and students' self-reflection methods were used as feedback after the assessment process. Only a few individual instances of feedback were received. On the time of observation for self-assessment practice, the students' active participation and involvement were somehow improved when compared to the previous lesson observations. The students were also given a chance to mark their own performance using standard answers prepared by the educators and were given time to reflect on the assessment task against the introduced instructional objectives and assessment criteria. The major limitations identified on many of the lessons observed were the difficulties on the applications of individual feedback because of the large number of students in the classes and the unsuitability of the seating arrangements for easy movement of the educators in the classrooms.

#### **4.3.4.3 Use of peer assessment**

The third classroom observations, which were intended to observe the actions of the educators and the students while implementing peer assessment were conducted in four classrooms.

Similar to the observation results of the self-assessment, there were individual differences among the educators in letting the students' involve on peer assessment. The general steps followed by the four educators observed were almost the same. First, they revised the previous lesson by means of questioning before starting the new lesson. During that time, some students attempted to answer questions while the others were attentively listening.

During this time, all the educators introduced the lesson content, the instructional objectives, the type of formative assessment and also the assessment criteria on the peer assessment task. Then, the lecturing continues for about fifteen (15) to twenty (20) minutes. During the lessons, all four educators used an assessment task using short quizzes written on the chalkboard.

In all the classes, majority of the students were observed taking notes. Some of the students were attentively listening to the educator without taking notes. Whenever the students attempt to fulfil the assessment criteria, the educators motivate them enthusiastically. Peer feedback, reflections and discussions as well as whole class feedback methods were used to obtain feedback after the

assessment. Similar to the previous observations, the students' active participation, involvement in learning, and also in the assessment process had improved when compared to the first classroom observations. The students were given a chance to mark their peers' assessment tasks and were given time to comment and give feedback on the performance of their peers against the instructional objectives and the assessment criteria introduced. The usual limitations identified in the observed classrooms were difficulty with using individual feedback because of the large number of students in the classes and the unsuitability of seating arrangements for easy movement of the educators in the classrooms. Moreover, some of the students in the observed classes were found to be reluctant and unwilling to mark and give feedback and comment on their peers' assessment performance.

#### **4.4 DISCUSSION OF THE RESULTS**

The purpose of this study was to examine the ways of improving student learning by the integration and use of quality formative assessment on the teaching of a course at west Ethiopian Universities. Hence, the researcher outlined a main research question and four specific research questions as follow:

Main research question

*In what ways can the use of quality formative assessment improve student learning on university courses?*

Specific research questions

- What is the present practice regarding the use of quality formative assessment in the teaching of 'General Psychology' course in Ethiopian universities?
- What is the extent of learning gain resulting from the use of quality formative assessment?
- To what extent can the use of formative assessment involve the students to self-regulate their own learning and assessment?
- What are the views of the educators on the use of quality formative assessment in the instructional process?

This section of the chapter presents a discussion on the study results. The discussion was based on the specific research questions and the reviewed literature on the second and third chapters of the study.

#### **4.4.1 The practice of quality formative assessment**

In this study, the students, who experienced the use of formative assessment in their course, reported positive learning results. When the educators used quality formative assessment, the students tended to follow a deep approach to their learning that would lead them to improved learning (McDowell, *et al*, 2011: 761). Similar to the present finding, Fisher, *et al* (2011: 235) also reported a formative assessment intervention that resulted in significantly higher marks on assessment and overall grades, while improving student motivation and learning in general. McDowell *et al* (2011: 762) noted that students respond more positively to courses involving the use of formative assessment in comparison to courses without the use of formative assessment. As the data from the focus group discussions on the present study revealed, the students reported to perceive the use of quality formative assessment on lessons as an encouraging activity in the learning process. They also viewed formative assessment positively since it made learning and assessment in a more interactive way. The students also mentioned many advantages to using quality formative assessment. Some of these were contribution to quality of learning, enhancement on student confidence, encouragement on the self-regulation of learning and recognition to strength and weakness on learning. However, from the classroom observations conducted on the study, it was noted that the active participation of male students was by far greater than that of the female students. This happens to become a common trend in most higher education classrooms in the country. Because of their passivity, female students in general benefit less from newly introduced instructional techniques such as the use of quality formative assessment.

Based on the discussions made in the first chapter of the study, quality formative assessment was conceptualised as an assessment activity in the classroom, involving formative feedback, student self-assessment and peer assessment. The analyses of several studies showed the effectiveness of these forms of assessments to acquire professional competencies by students (Sluijsmans, Dochy, & Moerkerke, 1999: 294). In the present study, the students in both the intervention and comparison groups filled out a questionnaire to report the extent on which quality formative assessment was used on the lessons of their course before the instructional intervention period. According to the report from significant number of the students, the practice on quality formative assessment was inconsistent and almost the non-existence on the lessons of the course. This finding strengthen the claim made by (Yorke, 2003: 484) and Ducker (2014: 30) on the limited understanding and application of formative assessment in the context of higher education regardless of its instructional benefits to learning

improvement. In contrast, the students who participated on the FGDs perceived quality formative assessment for its value to support them clarify learning objectives; acquire more knowledge and develop self-confidence in the learning tasks. Black and Wiliam (1998a: 14) emphasise on the usefulness of quality formative assessment particularly for low achieving students. Out of 21 studies on the use of formative assessment analysed by Black (1999), most of them revealed the greatest learning gains for low achieving students when formative assessment was used in the teaching of a course. Hence, the study findings for each type of formative assessments are discussed below.

#### **4.4.1.1 Formative feedback**

Students' learning and motivation increases because of knowing the results of their learning (Kluger & Densi, 1996: 275). Feedback is information offered by a teacher; peer or the self, concerning one's learning performance or understanding (Hattie & Timperley, 2007: 80). Shute (2008: 153) states feedback as the information communicated to the student with the intention of modifying his/her behaviour or cognition. Feedback makes it possible for achievement gains by students to take place (Ellery, 2008: 427). It also supports learning through sustained student effort. Besides, the information obtained from feedback is beneficial for student performance. Moreover, feedback supports self-regulated learning by activating the students with strategically useful information (Drowns, Kulik, Kulik, & Morgan, 1991: 217). There is also a confirmation on the centrality of formative feedback to learning improvement, although it is the least understood (Black & Wiliam, 1998a; Hattie & Timperley, 2007).

As the students who participated on the FGDs revealed, the formative feedback practice implemented was powerful to promote the occurrences of more learning. According to the students' perceptions, feedback increased the chances on learning improvement and achievement. The same results were reported by (Tang & Harrison, 2011: 586). However, the quantitative phase of this study showed the students' perceptions on formative feedback practice on lessons to be midway between true and not true. That means, almost half of the students who filled out the questionnaire perceived the absence of formative feedback on the lessons of their course. For instance, significant number of the students in this study reported the lack of sufficiency on the formative feedback given to them while learning the course. As Gamlem and Smith (2013: 151) state, the importance of formative feedback to good learning is well recognized although it is the least understood subject of instruction design and the learning process.

Apart from the above, the other problem on feedback according to the perceptions of the students who took part in the present study is the lack of timeliness. Students often need assessment feedback as quickly as possible (Poulos & Mohany, 2008; Bayerlein, 2014). In the meta-analysis of fifty eight (58) feedback studies by (Drowns, *et al* 1991: 218), feedback was given either immediately after each assessment task, immediately after an entire assessment was completed, or after a delay of a day or more. However, the feedback that was given to the students often lacked consistency. In similar ways, the findings of Kluger and DeNisi (1996: 277) revealed that feedback intervention has never been consistent and simple. Besides these shortcomings, there is also little theorisation regarding how formative feedback influences students' learning performance (Yorke, 2003: 484). Shepard (2005b: 68) also asserts that despite the large number of studies about it, feedback is not always or even usually successful.

Feedback is said to be effective when it corresponds with the success criteria as perceived by the students. In the view of Clark (2011: 162), feedback becomes effective when it allows the students to understand the success criteria on the assessment task and activate them as owners of their own learning. In a qualitative study conducted by Paulos and Mohany (2008: 152), students were found to positively value formative feedback that is clearly linked to assessment criteria. In relation to this, Torrance (2007: 278) discusses the possibility of learning improvement when there is clarity on the assessment procedures and the success criteria of the assessment task. Feedback is effective when it identifies success and failure against the set learning objectives and assessment criteria, and offers advice on corrective actions (Hattie & Timperley, 2007: 100). In the present study, significant number of the students reported absence of relationships among the practice on the formative feedback, the learning objectives and the success criteria.

In addition to what has been discussed above, another important characteristic of feedback is the use of clear examples and explanations, because examples have the power to clarify misconceptions. Orsmond and Merry (2011: 129) propose that the provision of feedback must be accompanied by clear examples, detailed explanations and appropriate guidance from the educator. When feedback is limited to the mere correction of student misunderstandings, it will fail to address the developmental aspects of learning. The findings on the present study showed that, according to the perceptions of the majority students, the feedback activities on lessons of the course lacked examples and explanations. Similar to the finding of the present study, a meta-analysis of studies regarding the instructional effect of

feedback showed the following. Out of the fifty eight (58) studies analysed, only nine (9 = 15.52%) of them involved feedback with examples and detailed explanations (Drowns *et al.*, 1991: 220). In the majority of the studies, namely 39 (67.24%), the simple correction of student misunderstandings characterised the feedback provision. Formative feedback as one form of quality formative assessment was used in the present study. From the classroom observations made, it was noted that the educators were giving feedback to individual students or to the whole class after the students attempt to give answer for the assessment tasks. Nevertheless, many of the feedbacks provided were lacking clear examples, explanations and corrective actions to be taken by the students. On the other hand, the large number of students in the classrooms was a bottleneck for the effective application of formative feedback that includes examples, explanations and possible corrective actions.

#### **4.4.1.2 Self-assessment**

Self-assessment is one element of formative assessment that offers greater opportunities of assessment to the students. It is regarded as the contribution of the student with regard to assessing the outcomes of his/her own learning and achievement (Tan, 2008: 116). Andrade (2010: 4) emphasises on the significant contribution of student learning improvement as a result of self-assessment activities. Since it encourages the student to think on the quality of his/her learning, self-assessment is a key element in quality formative assessment (Andrade, 2010: 5). Boud & Falchikov (2006: 409) regard self-assessment as a student's contribution to determine the outcomes of learning. Similar to the findings for the formative feedback practice, the students' perceptions on the self-assessment practice in the present study was divided and inconsistent. While self-assessment is considered as the *sine qua non* for effective learning, the findings of this study showed inconsistent practice as perceived by significant number of the students involved in the study. Considerable number of the students in this study perceived the absence of self-assessment activities on the lessons of the course. Tan (2008: 15) regard self-assessment as the active involvement of the student to assess the outcomes of his/her own learning and achievement.

According to Andrade's (2010: 5) suggestion, the understanding of learning expectations and assessment tasks are the basic steps in the self-assessment practice. In the present study, a little more than half of the students rated the self-assessment practice as helpful to understand the expected learning objectives and assessment tasks clearly.

One major purpose of self-assessment is the identification of the strengths and weaknesses of students. In the study by Lew, *et al* (2010: 152), students who identify their strengths and weaknesses in learning better, learn more. These students, when reflecting on their learning, become aware of how to proceed next. This enables them to take steps to improve learning and performance. As Clark (2011: 168) points out, self-assessment when focused on the identification of one's own strengths and weaknesses contributes to learning improvement and provides a basis for life-long learning. In the present study, a little more than half of the students perceived the self-assessment activities on the lessons as useful to identify their strengths and weaknesses in learning and achieving the intended objectives. Based on the findings by Lew, *et al* (2010: 135), when students are given the chance to reflect on their strengths and weaknesses, they usually tend to take steps for improvement. They also consider self-assessment as a means of encouragement to improve learning. Moreover, the focus group discussants confirmed the independence on learning as another major advantage of self-assessment. Similar to this finding, Segers and Dochy (2001: 339) found that students' positive perceptions and practice on self-assessment stimulate both critical thinking and deep level learning. Nevertheless, considerable number of students in the present study did not perceive the importance of self-assessment to identify their strengths and weaknesses on learning.

The self-assessment also plays a significant role to motivation and the self-regulation on one's learning. Self-assessment raises students' self-regulation skills and stimulates them to achieve better learning (Birjandi, 2010: 217). In the present study, more than half of the students reported to perceive self-assessment as motivating and helpful for the self-regulation of their own learning. The result is similar to the one found by Sambell and McDowell (1998: 398), where students reported that they are motivated, able to self-regulate their learning, and learn in different ways as a result of self-assessment activities. Andrade (2010: 4) also noted the association of the active involvement of students in self-assessment, motivation, self-regulation of learning and marked improvement in learning achievement.

As noted by (Sluijsmas, Dochy & Moerkerke, 1999: 313) autonomous learning and reflective thinking are important learning goals in higher education. Student autonomy and reflection are important outcomes of self-assessment in learning. Importantly, self-assessment increases student autonomy and reflection. It produces responsible and autonomous students who can self-regulate their own learning (Kraayenoord & Paris, 1997: 525). Lew, *et al* (2010: 155) associate self-assessment with movements towards increasing greater autonomy and responsibility of the student. The findings of the present

study showed that more than half of the students expressed the opinion that self-assessment did not contribute to their autonomy and reflection on learning. Moreover, the perceptions of self-assessment by the students from the intervention as well as from the comparison groups were similar. That means, the statistical analysis (mean difference t-test) showed the absence of a statistically significant difference between the two group's perceptions on the contribution of self-assessment to learning autonomy and reflection. Contrary to this, the students who took part in the FGDs reported the usefulness of the self-assessment practice to make them relatively independent and autonomous on their learning.

#### **4.4.1.3 Peer assessment**

Peer assessment is one type of self-assessment (Bostock, 2000: 1; Sluijsmas, Dochy & Moerkerke, 1999: 300). It has been applied mostly as an alternative type of assessment for teaching courses at higher education (Wen & Tsai, 2006). Commenting on and giving feedback to another student's work is helpful for learning improvement. Peer assessment not only improves the quality of learning but also empowers students (McDowell & Mowl, 1996). In the words of Sluijsmas, Dochy & Moerkerke (1999: 301) the usefulness of peer assessment lies on the chance of greater involvement it gives to students in the learning and assessment process. A student may gain insight into his/her own learning and performance when assessing other student's work. Peer assessment enables students to self-assess their own learning better (Lui & Careless, 2006; Lu & Law, 2012). When a student explains the benefits of a peer assessment experience, she said, "assessing peers' work means assessing oneself" (Papinczak, Young, & Groves, 2007: 178). According to Wen and Tsai (2006: 27) and Nicol, Thomson and Breslin (2014: 119), students like and appreciate peer assessment activities, because peer assessment provides opportunities to compare performances. Students in this study also witnessed peer assessment as a useful activity to create implicit motivation and competition among classmates. In the present study, however, a greater number of the students (more than half) perceived the absence of peer assessment practice on their course before the use of quality formative assessment as intervention in the "General Psychology" course lessons. This is a common problem with many of the courses offered at university classrooms.

Peer assessment has also motivational value for the student; because it helps the student become motivated as he/she compares his/her work with that of the peer. McMahon's (2010: 229) research shows that peer assessment is motivating for critical reflection. Immediacy and clarity of the feedback

are also the motivational advantages from peer assessment practice (McMahon, 2010: 230). In fact, empirical evidence regarding the effects of peer assessment on learning is scarce (Strijbos & Sluijsmans, 2010: 266). Nevertheless, the result of the present study showed that large number of the students (about half of them) perceived the absence of peer assessment's motivational value.

Student autonomy, reflection and responsibility are also considered as advantages from peer assessment activities. Peer assessment is significant to produce autonomous, reflective and responsible students (Sambell & McDowell, 1998: 396). Peer assessment, in particular, fosters a high level of responsibility for students (Keaten & Murphy, 1993: 4). A qualitative research study by Papinczak, *et al* (2007: 181) revealed the increased responsibility of students concerning others, positive perceptions, and improved learning resulting from peer assessment. McMahon (2010: 223) states that peer assessment encourages critical reflection, autonomy and responsibility in students. Significant number of the students in the present study (a little more than half) perceived peer assessment as a suitable method of developing essential learning skills such as reflection, autonomy and taking responsibility on their learning and assessment. Similarly, as Raes, *et al* (2013: 189) report in their study, students were highly encouraged to take responsibility on their learning and assessment when peer assessment was regularly applied on the lessons of the courses they were taking. This has a direct implication for learning improvement and achievement. Nonetheless, during the classroom observations on the present study, some students were observed to be unwilling and doubtful to assess and give feedback on their peers' assessment task. Unless students show self-encouragement and participate on the learning and assessment tasks, learning improvement remains under threat. In this respect, increasing the awareness of the students on the instructional advantages of peer assessment and helping them develop the skills of assessing and giving feedback is desirable.

Effective peer assessment also requires students to be fair and accurate when assessing their peer's assessment tasks (Keaten & Murphy, 1993: 4). The present study's results show that the majority of students perceived the lack of fairness and accurateness on the assessment comments and feedback given by their peers. Similar to this, a study by McConlogue (2012: 113) reflects students' skepticism on the fairness and accurateness for the assessment comments and feedback given by some of their peers. As the study by McConlogue (2012: 117) reveal, students complain on their peers' assessment lack of fairness and accuracy; as a result of which they develop a sense of doubt on the practicality of peer assessments and comments.

#### **4.4.2 Learning gains resulting from the use of quality formative assessment**

Research in the science of instruction compares the learning gain resulting from interventions applied to the process (Black, 1999). In the present study, one of the outcome variables considered was the students' post-test score after the instructional intervention. From the formative assessment research database, it is difficult to find the combined effect of quality formative assessments on learning gains. Studies in the database often focus on reporting specific findings for feedback, self-assessment, and peer assessment respectively. As presented in the result section, the present study used three different statistics to test whether the post-test achievement score distribution significantly differ between the students placed with the intervention and comparison groups respectively. The three different types of statistics used to verify the hypothesis were the independent samples mean difference test (t- test), the biserial correlation, and effect size estimate (Cohen's d).

Educators and policy makers at higher education are interested on the assessment processes that can improve student learning (Banta, Graffin, Flataby & Khan, 2009). A number of study reports show limitations on the current classroom assessment practices (Black & Wiliam, 1998a). The reports contend that current assessment practices encourage rote and superficial learning and overemphasise the grading function of assessment at the expense of the learning function (Black, 2000: 408). In contrast, the literature indicates formative assessment as a major way of raising learning standards. Formative assessment plays a significant role in bringing learning gains. It produces remarkable improvement in learning achievement (Williams, 2008: 408). In the words of Heritage (2007: 140), effective use of formative assessment provides relevant information to move learning forward. Substantial learning gains can be achieved when educators use quality formative assessment in their classroom practice (Black, 2000: 408). Nevertheless, the practice and understanding of formative assessment at the higher education context are still limited (Yorke, 2003: 485).

Education research regarding formative assessment has gained a great deal of momentum in recent years as data indicate that classroom assessment practices can lead to improved students achievement and reduce the achievement gap between high and low achievers. As Harlen (2007: 11) asserts, the use of formative assessment could help students attain the learning goals better and also show ways of future learning improvement. In the present study, the learning gains of the students whose teaching included quality formative assessment and those whose teaching did not include quality formative assessment achieved statistically significantly different test scores. The independent samples mean

difference test (t-test) that assumed unequal variations between the two samples' scores showed a significant mean difference between the two groups in the study (see Table 4.10). This means the post-test achievement mean score for the intervention group students was found to be significantly higher than the post-test achievement mean score for the comparison group students. Other studies have also shown similar results. A study by Tesfaye (2012: 193) at Addis Ababa University (Ethiopia) indicates that students who were taught by the application of feedback intervention on lessons outperformed those taught by the conventional lecture method on a first year physics course. There are also several empirical studies witnessing the objectivity of this phenomenon (Black & Wiliam, 1998a).

In similar ways, Black and Wiliam (1998a) also analysed 250 studies, which compared classroom teaching with and without the use of formative assessment and the results showed that the students taught by the integration of formative assessment on lessons scored higher on tests than those taught without the integration of formative assessment. A study undertaken by Bangret, Kulik, and Kulik (1991: 89) also show that, students who experienced frequent testing and formative assessment on lessons, on average scored 0.5 standard deviations higher than those who did not experience frequent testing and formative assessment. Another study by Fisher, *et al* (2011: 225) showed an instruction using formative assessment to result for a significantly higher marks on assessment and overall grades while contributing to good student grades in general.

On the other hand, to confirm the presence of significant differences in the learning gains between the students in the intervention and comparison groups, the biserial correlation coefficient is a robust statistic (Kaplan & Saccuzzo, 2001: 80). The biserial correlation coefficient was computed between the post-test achievement scores of the students as a continuous variable and their placement either in the intervention or comparison groups as a dichotomous variable. Hence, when compared to the table value of biserial correlation for the given degrees of freedom, the result showed a statistically significant relationship between the students' post-test achievement scores and their placement in the intervention group where quality formative assessment was applied on the lessons of the course.

Furthermore, understanding the extent of a quasi-experimental intervention effect provides more clarification on the research evidence obtained. Hence, the effect size estimates (Cohen's *d*), that is, a common statistical analysis in quasi-experimental study designs was used in the study. This effect size estimation resulted in an acceptable size of the difference in the post-test achievement score variation

between the intervention and comparison group students. Effect size estimates help to measure how much something (an achievement score) changes after the implementation of a specific instructional intervention. Effect size shows the extent to which two populations do not overlap in a measure or how much they are separated because of the effect of the quasi-experimental intervention (Aron, *et al*, 2009: 205). In this study, as shown in the results section, the instructional intervention that involved the application of quality formative assessment on the lessons of the course produced positive achievement gains on the students' post-test scores. This was confirmed by the effect size of 0.41 that can be judged as a medium effect size for quasi-experimental intervention. The effect size of true experiments runs from -1.1 to + 0.4 and for quasi-experiments, it runs from -0.4 to + 1.6 (Norman, 2003: 184). Lipsey and Wilson (1993: 1192) summarised the effect sizes of a number of meta-analysed studies and came up with an average effect size of 0.46 (N =74) for randomised comparison designs and an average effect size of 0.41 (N =74) for non-randomised comparison designs such as quasi-experiments. Black (1999: 124) also reported an average effect size of 0.7 for 21 studies, which used formative assessment interventions to compare the learning gain of students quantitatively. This is a much higher effect size index when compared to the result of the present study. The relatively smaller index of effect size in the present study when compared to other studies might be attributable to the limited experiences of the educators and the students who participated in the study. The educators, on average had few years of teaching experience at universities. The students had also their first year experience on university course learning.

Even though there are other criteria to judge the indices of effect size such as the methodological quality of the research and the type of research design (Lipsey & Wilson, 1993: 1192), the effect size result of the present study was acceptable to a medium level, where there can be a moderately low overlap between the two populations in terms of the post-test measure (Aron, *et al*, 2009). According to the convention and suggestions of Cohen to determine the magnitude of effect size, the range between 0 and 0.20 shows a weak effect, the range from 0.21 – 0.50 shows a medium effect, the range from 0.51 to 1 shows a moderate effect, and an effect size estimate > 1 shows a strong effect (Cohen, Manion, & Morrison, 2007: 124).

Lipsey and Wilson (1993: 1195) also demonstrate the influence of the study sample size on the results of the effect size estimate. The results showed the average effect size of thirty nine (39) studies to be +0.35 for sample sizes of greater than one hundred. According to this report, the estimated effect size

of the present study ( $= +0.41$ ) was above the mean value. In fact, as reported by Lipsey and Wilson (1993: 1180-1187), there are other quasi-experimental studies that have yielded an effect size estimate higher than the present study. For instance, in a study with respect to instructional cues, student participation and corrective feedback by Lysakowski and Walberg (1982: 566), an average effect size of 0.97 (N= 94 comparisons, 15 689 students) was reported. Feedback on correct answers in computerised and programmed instruction with adult students resulted an effect size of 0.47 (N=15 comparisons), Schimmel (1983: 14). And studies on computer based instruction effects on achievement by Gillingham and Guthrie (1987: 195), reported an average effect size of 1.05 (N=13 comparisons). Bangret-Drons, Kulik, Kulik, and Morgan (1991: 224) also analysed the effect sizes of fifty-eight studies. On average, the feedback resulted on a positive, but a small contribution to the achievement (ES = 0.26), equivalent to raising achievement scores from the 50<sup>th</sup> percentile to the 59<sup>th</sup> percentile. However, out of these fifty-eight studies, eighteen (31%) resulted in negative effect sizes, which is counterintuitive to the effects of feedback. In fact, the effect of feedback on learning can be either positive or negative (Hattie & Timperley, 2007: 81). The effect size result of the current study indicated medium, but positive effect on the learning gain for students, and can be raised by following a more rigorous (with a long duration) quasi-experimental intervention and through the professional development of the educators.

#### **4.4.3 Self-regulated learning resulting from the use of quality formative assessment**

The self-regulation on learning is central to “student-centred learning,” and it is a significant feature of learning. It is predictive of improved academic outcomes and motivation, enhanced involvement in the learning process and the subsequent successful performance (Clark, 2011: 170). Students can play a significant role in self-regulating learning and assessment (Andrade, 2010: 9). Pintrich (2000: 454) conceptualises self-regulation as a set of metacognition, behaviour and motivational tactics that the student applies to manage his/her learning outcomes actively. Self-regulation then refers to self-generated thoughts, feelings and behaviours that are directed towards achieving the intended learning objectives (Zimmerman, 2002: 65).

According to Schunk (2005: 85), “part of the impetus for finding self-regulated learning came from research showing students’ skills and abilities did not explain student achievement.” Therefore, factors such as self-regulation and motivation are important (Zimmerman, 2001: 6). Students who self-regulate their own learning focus on how they activate, alter and sustain specific learning activities. In

a situation where such essential qualities of learning are absent in many students, coaching students to develop self-regulated learning skills is especially relevant (Zimmerman, 2002: 70). Despite this conception, many academicians remain reluctant to train and prepare students with the skills on self-regulating learning. To resolve this, quality formative assessment can play a key role in the development of self-regulation learning skills.

Student self-regulation has salience in the context of higher education because of the need for relative independence of the student (Wilson & LizzIo, 2008: 2). Research evidence show the teachability and usefulness of self-regulation learning skills for enhancing student motivation and achievement (Zimmerman, 1998: 8). Thus, researchers suggest that educators in higher education should use formative assessment and feedback to empower student self-regulation and independence in learning and assessment. Zimmerman (2002: 66) argues that a self-regulated student displays superior achievement gains and personal efficiency. Self-regulated students are characterised by personal initiation, perseverance and adaptive skills (Zimmerman, 1998: 14). They are also capable of monitoring, directing and regulating actions towards the learning objectives (Hattie & Timperlay, 2007: 93). It is also understood that the effective use of quality formative assessment paves the way for motivation and self-regulation to learning and assessment. As Zimmerman (1998: 5) noted, self-regulation can lead to increases in student motivation and achievement.

In the present study, the students who were taught by the use of quality formative assessment on the lessons of the course reported a better perception on self-regulating their learning and also outperformed in terms of post-test score. The effective use of quality formative assessment improves the experience of student self-regulation and achievement (Wilson, 2011). An almost similar study by Pintrich and De Groot (1990: 36) showed that students who self-regulate their learning are those who achieve significantly higher grades than those who achieved lower grades. According to Schunk (2005: 85) self-regulated learning is seen as a mechanism to help explain achievement differences between students and as a means to improve achievement. Thus, it can be concluded that the scaffolding of self-regulated learning and assessment enhances the students' active role to learning and assessment (Andrade, 2010: 2).

In the present study there was a statistically significant mean difference in perceiving the self-regulation of learning between the students in the intervention group and those in the comparison

group. The result showed that the students in the intervention group reported an improved experience of and perceptions on self-regulating their own learning. The greater and significant variation in the perception of self-regulation between the students might be attributable to the application of quality formative assessment with the intervention group students. The students' use of self-regulated learning techniques made a distinctive contribution to their academic achievement. On the contrary, the research finding by Mahmoodi, Kalantari and Ghaslani (2014: 1066) on the relationship between self-regulated learning and the academic achievement of English as foreign language students (EFL) was not consistent with the findings of the present study. The results of their study showed no significant relationship between the students' utilisation of self-regulated learning techniques and learning achievement.

On the other hand, the point biserial correlation and the effect size estimate (Cohen's *d*) confirmed the presence of a significant variation between the students in the intervention and the comparison groups. The biserial correlation coefficient that was 0.61 shows the presence of a significant relationship between placement in the intervention group where quality formative assessment was used on lessons and the students' perceptions on self-regulating their learning. The effect size estimate also showed the presence of a small overlap between the two groups in the outcome variable. The index of effect size that was 0.77 showed a higher estimate, which means the two groups were drawn from a relatively varied population for the measure of perceiving self-regulated learning after the instructional intervention of quality formative assessment in one of the groups. This variation among the students in the intervention and comparison groups, was explained by the application of quality formative assessment with the intervention group students. On the other hand, in an attempt to self-regulate learning and assessment, students direct their thoughts and behaviours towards achieving the set learning goals (Johansson & Felton, 2014: 13). As a result, the students motivation and effort to achieve high scores in tests increased. This was clearly seen in the present study. The students who were placed in the intervention group outperformed the students who were placed in the comparison group on the measure of self-regulating learning.

#### **4.4.4 Perceptions on the use of quality formative assessment**

Perceptions are determinant for the effective use of instructional interventions. Perceptions refer to one's understanding about reality (Thompson, 1992: 128). Perceptions and the interpretations made by the educators and the students are among the major barriers to the use of formative assessment on

lessons (Yorke, 2003; Deneen & Boud, 2014). For instance, educators' perceptions on the principles and practices of formative assessment influence the implementation (Careless, 2007a: 180). The students' increased perceptions of responsibility for regulating their own learning can also determine the effective use of formative assessment (Zimmerman, 2002: 69).

The educator is a key actor in the use of quality formative assessment. Positive perceptions contribute in prioritizing formative, and improvement oriented assessment on lessons (Gebriel & Brown, 2013: 19). Black and Wiliam (1998a) argue on the insignificant use of formative assessment to result from the lack of sufficient understanding by educators. In a study report by Pryor and Crossouard (2005: 1), the educators' perceptions on formative assessment focused primarily on improving teaching and learning. In the present study, the educators showed positive perceptions towards the use of formative assessment irrespective of several impeding factors against the implementation. Nevertheless, because of course modularisation and the shortage of course coverage time, the use of quality formative assessment on lessons was found to be ineffective. As noted by Careless (2007a: 173), many educators regard formative assessment as impractical because of several impeding factors. In addition, the result from the present study indicated large class size, teaching multiple courses and the lack of skills and preparation of educators as challenges to the use of quality formative assessment.

Furthermore, as noted by Yorke (2003: 486), the insufficient theorisation and the lack of understanding about formative assessment influence its effective implementation. The well-practised summative assessment was also perceived as a potentially impeding factor to the use of quality formative assessment. Because of the dominance of direct instruction and summative assessment, the use of formative assessment is often discouraged in various international contexts (Careless, 2007b: 56). According to Pryor and Crossouard (2005: 13), many educators at universities are reluctant to use and develop formative assessment, and took summative assessment for granted. Concerning this point, Careless notes (2007b: 58) the following:

*...educators who favour a formal and planned approach to assessment believe that they do not have the time to conduct formative assessment, while those with a more constructivist orientation consider formative assessment as an essential part of good teaching.*

Correspondingly, the students' perceptions on learning and assessment determine the quality of learning. Struyven, Dochy and Janssens (2005) reviewed research evidence indicating a strong relationship between students' perceptions about assessment and the learning approach they follow. Positive perceptions relate to reflecting and taking greater ownership of learning (Hodgson & Pang, 2012: 14). In the present study, the students perceived formative assessment as an activity that makes learning and assessment more interactive. Significant number of the students also reported that formative assessment has a favourable influence on motivation, active participation and learning. For example, they said feedback encourages more learning to occur. They also witnessed that self-assessment is facilitative for independent learning. In addition, peer assessment was perceived to be an appropriate assessment activity to induce motivations and competition among the students.

Furthermore, according to the reports on the perceptions of the students in this study, formative assessment contributes to the actualisation of deep learning with examples. The occurrence of deep learning encourages the students again to put greater effort in the learning process to satisfy their curiosity with regard to knowing and understanding more. It was also learned that formative assessment encouraged the students to be inquisitive and to look for ways to learn more on their course. However, the students perceived that the shortage of time for content coverage was a serious threat to the effective use of quality formative assessment and the promotion of deep learning. Moreover, the students suggested that a reasonable workload was one pre-condition for the effective use of quality formative assessment. This is similar to the findings by (Struyven, *et al*, 2005).

## **4.5 SUMMARY**

This chapter dealt with the study results and discussions. Both the results and the discussions were presented with reference to the formulated research questions and hypotheses. Hence, the results and discussions showed:

- The inconsistent use of quality formative assessment by university educators on the lessons of the course;
- A statistically significant achievement gain and variation between the students who were taught by the use of quality formative assessment and those taught without the use of formative assessment on their lessons;

- A statistically significant variation on the perceptions of self-regulating learning between the students who were taught by the use of quality formative assessment on lessons and those taught without the use of quality formative assessment on their lessons;
- The educators' show positive perceptions on the instructional advantages of formative assessment, and yet reluctance to apply it because of the lack of understanding, lack of skills, training and preparation, heavy workloads, class size and the students' passivity and lack of encouragement.

Thus, the next chapter presents the summary, conclusion and recommendations of the study.

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 INTRODUCTION

The intention of this study was to answer the main research question raised in the first chapter of the study. It was:

*“In what ways can the use of quality formative assessment improve student learning on university courses?”*

The specific research questions formulated from the main research question were the following:

- What is the present practice regarding the use of quality formative assessment in the teaching of ‘General Psychology’ course at Ethiopian universities?
- What is the extent of learning gain resulting from the use of quality formative assessment?
- To what extent can the use of formative assessment involve the students to self-regulate their own learning and assessment?
- What are the views of the educators on the use of quality formative assessment in the instructional process?

In the previous chapter the result interpretations and discussions on the data were presented. In this last chapter, the summary of findings, the conclusions drawn from the findings and the recommendations forwarded are presented.

#### 5.2 SUMMARY

The biographic data collected in this study show the majority students’ age to range from 19 – 21 years. This shows that the students who participated in the study were relatively young, and their age corresponds to the age cohort of the education level. This might relate to their lack of sufficient exposure to university courses in which quality formative assessment was used on lessons. On the other hand, all of the six educators who took part and interviewed on the study were males. Female educators were either very few in number or there were no female educators in many of the departments at the universities. This is, to a large extent, the commonly existing situation at many of

the universities in the country. On the other hand, The educators' had relatively shorter years of teaching experiences at the level of a university which might influence to limit their pedagogic skills in general and the use of quality formative assessment in particular.

As the baseline data from the quantitative phase of the study revealed, before the use of quality formative assessment on the lessons of the course, the students placed within the intervention and those placed within the comparison group did not show significance difference for the measures of the independent variables on the study (perception on the practice of formative feedback, self-assessment and peer assessment). They also did not show significant difference for the measures on the dependent variables (learning achievement and perceptions on the self-regulation of learning). This paved the way for implementing the quasi-experimental intervention that integrated the use of quality formative assessment on the teaching of the course.

From the students' responses it was learned that the use of quality formative assessment on lessons was not consistent. Considerable number of students who participated on the study reported either an absence or insignificant practice on formative feedback, self-assessment and peer assessment in the teaching of the "General Psychology" course. This had negative implications on the contributions of quality formative assessment to the improvement and the self-regulation of learning and assessment.

After the students' placement in the intervention and comparison groups and the implementation of quality formative assessment on the lessons offered to the former, comparison of score distributions and correlations show statistically significant variations for the dependent variables, which are learning achievement gains and the students' perceptions on the self-regulation of learning and assessment respectively. The effect size estimates reported are found to be evident signs to the instructional advantages of using quality formative assessment on the lessons of the university course.

In spite of several challenges anticipated against the use of quality formative assessment in the teaching of the course, the interviewed educators hold positive perceptions to the instructional advantages of using quality formative assessment. The justifications they gave to their perceptions were the opportunities that the use of quality formative assessment provides for instructional effectiveness, student learning improvement, achievement gains and the self-regulation on learning. In fact, apart from their positive perceptions as a consequence of the convincing theoretical and empirical

evidence on quality formative assessment and its prediction to learning improvement, the educators judged the state of formative assessment implementation on the course as impractical and time consuming. They mentioned several factors like large number of students in a class, heavy workload, lack of the skill and passive tendency of the students as the major impediments to the effective application of quality formative assessment in the teaching of university courses. On the other hand, as perceived and reported by the students, the use of quality formative assessment on the lessons of the course encouraged them to change their point of view towards learning, assessment and the self-regulation on learning.

Appropriate use of quality formative assessment in the teaching of the course proofed to show improved results on the students' learning and also on the self-regulation of learning and assessment. This can be seen from the effect size estimates reported in the study. That means, the teaching of the course by the integration and use of quality formative assessment on lessons significantly predicted the outcome measures on learning gain and the self-regulation of learning by the students. Nevertheless, as noted in the study's finding the use of quality formative assessment on the lessons of the university course was not encouraging.

## **5.3 CONCLUSIONS**

The major conclusions of the study are presented for each of the specific research questions raised in the study along with the research hypotheses (when applicable). Then after, it is indicated that how the answer to the specific research questions leads to answer the main research question on the study.

### **5.3.1 Research sub-question 1**

What is the present practice regarding the use of quality formative assessment in the teaching of the General Psychology course at Ethiopian universities?

#### **5.3.1.1 Formative feedback**

Feedback centres on suggestions for improvement in behaviour and learning. Formative feedback is regarded as beneficial to the future performance of students. There was also much verification and advocacy about the significance of feedback for learning improvement. In the present study, the result from the use of formative feedback on lessons of the course shows inconsistency in practice. For instance, considerable number of students perceived the absence of communication about the expected

knowledge and skill at the beginning of a lecture. In terms of the amount of formative feedback practice and the timeliness, the majority of the students who participated on the study reported that was below their expectations.

Formative feedback by the educators, if at all practiced was lacking clear examples and a match to the success criteria of the assessment task as perceived by the majority. Hence, for the improvement of learning the significance of transforming the educators' practice on formative feedback requires attention.

#### **5.3.1.2 Self-assessment**

It is argued that self-assessment could help in the development of competencies required as a professional. In fact, research evidence on self-assessment underscores its significance to stimulate deep level learning and critical thinking. However, similar to the formative feedback, the present study showed inconsistent practice on self-assessment; because many students who took part in the study perceived the absence of self-assessment practice on the lessons of their course. Though the practice of self-assessment was inconsistent, more than half of the students in the study expressed the support of self-assessment in (1) comprehending the expected learning objectives on lessons, (2) giving the chance of knowing what to do next and (3) checking whether they achieved the intended learning objectives. Nevertheless, significant number of the students also reported their perception contrary to the above mentioned benefits.

Self-assessment helps to identify one's strengths and weaknesses in achieving the learning objectives. In this study, only about half of the participants perceived the self-assessment practice as helpful to identify their own strengths and weaknesses towards achieving the learning objectives on the course. Another important finding of the study was the usefulness of self-assessment to student motivation, self-regulation and management of learning as perceived and reported by the students.

A learning environment that advances the activities on self-assessment contributes to the preparation of responsible, autonomous and reflective students. Nevertheless, majority of the students who participated in this study confirmed the failures of the self-assessment activities to promote responsibility, autonomy and self-reflection for all students.

Besides, according to the views of the constructivist and social-constructivist paradigms of learning, students should take responsibility to learn and assess their own performance. The literature on formative assessment also puts emphasis on the essentiality of self-assessment to the self-regulation and learning improvement. In the present study, self-assessment was not perceived in the same way by a majority of the students. It seems the practices were not uniform by all educators and across the universities.

### **5.3.1.3 Peer assessment**

Peer assessment is one form of formative assessment. Its potential for improved learning is well-documented. There is also a general belief that peer assessment fosters high levels of student responsibility on the learning and assessment. As majority of the students in this study perceived, the practice of peer assessment was absent on the lessons of the course. For instance, for a little more than half of the students, the opportunity of assessing each other's work did not exist. However, those who perceived the presence of peer assessment judged its usefulness to knowledge gain and increased motivation to learn.

On the other hand, the literature emphasises on the significance of peer assessment in nurturing high levels of responsibility, autonomy and reflection skills in students. A considerable number of the students, albeit not the majority, confirmed the effectiveness of peer assessment with regard to developing desirable learning skills of reflection, autonomy and responsibility, which in turn positively influence learning improvement and the self-regulation of learning by the students.

Furthermore, educators are often concerned about the fairness and the accurateness of peer assessment and whether it was used for learning improvement or for marking. In the present study, more than half of the respondents reported the lack of fairness and accurateness on the practice of peer assessment. There seems to be a necessity to provide the students with the skills to promote the values of peer assessment with respect to its effective contribution to learning improvement.

In summary, the practice of quality formative assessment was not consistent as perceived by majority of the students who took part in this study. The students' reported mixed perceptions regarding the presence of quality formative assessment practice to self-regulate and improve learning.

### 5.3.2 Research sub-question 2

- What is the extent of learning gain resulting from the use of quality formative assessment?

**Null hypothesis 1:** There is no statistically significant difference in the learning gains between students taught by the use of summative and formative assessment methods.

**Alternative hypothesis 1:** There is a statistically significant difference in the learning gain between the students taught by the use of summative and formative assessment methods.

The above research question and the corresponding hypothesis require a comparison on the learning gain of the students placed with the intervention group where quality formative assessment was integrated and used on lessons of the course and the comparison group, where quality formative assessment was not integrated and used on the lessons of the course. As shown in figure 4.3 the post-test achievement score between the two groups was statistically significantly varied. The independent samples mean test (t-test) that assumed unequal variation between the two groups' score distributions because of the instructional intervention for one of the groups, indicated a statistically significant mean score difference for the post-test achievement. Thus, the researcher has a satisfactory reason to reject the null hypothesis and accept the alternative hypothesis that states "There is a statistically significant difference in the learning gain between the students taught by the use of summative and formative assessment methods." The result confirms that the students who were taught by the use of quality formative assessment outperformed those who were not taught by the use of quality formative assessment. The use of quality formative assessment can make a salient contribution to the improvement of student learning and achievement. Therefore, it can be concluded that placement in the intervention group, where quality formative assessment was integrated and used on lessons found to significantly relate to the students' post-test score with a magnitude of medium effect size resulting from the executed quasi-experimental condition.

### 5.3.3 Research sub-question 3

- To what extent can the use of formative assessment involve the students to self-regulate their own learning and assessment?

## **Null hypothesis 2**

There is no statistically significant difference between the intervention group and comparison group students in reporting on their perceptions on self-regulating learning and assessment.

## **Alternative hypothesis 2**

There is a statistically significant difference between the intervention group and comparison group students in reporting on their perceptions on self-regulating learning and assessment.

The above research question and the accompanying hypothesis need comparing the perceptions of the students towards the self-regulation of learning and assessment. As shown in Figure 4.4 (p134), the mean perception score on self-regulating learning for the two groups varied significantly. The independent samples mean test (t-test) that assumed unequal variation between the two groups because of the instructional intervention to one of the groups, resulted in a statistically significant mean difference between the two groups' perceptions on self-regulating learning as a consequence of the use of quality formative assessment on the lessons of the course. Thus, the researcher has a satisfactory reason to reject the null hypothesis and accept the alternative hypothesis that states, "There is statistically significant difference between the intervention group and comparison group students in reporting on their perceptions on self-regulating learning and assessment." This result confirms that the students who were taught by the use of quality formative assessment report more perceptions on self-regulating their own learning than those who were not taught by the use of quality formative assessment. Thus, the use of quality formative assessment contributes to the enhancement on the students' level of experience on self-regulating their own learning. As a result of this, one can infer the presence of a strong and statistically significant relationship between the students' placement in the intervention group where the teaching of the course integrated the use of quality formative assessment and their perceptions on the self-regulation of learning with a magnitude of high effect size resulting because of the executed quasi-experimental condition.

As learned from the views of the students who took part in the focus group discussions, there was a positive perception for using quality formative assessment. The students perceived formative assessment as encouraging with respect to making the learning and assessment process more interactive. They also pointed out the favourable effect and the usefulness of formative assessment to

the students' motivation and active participation on the learning process. The focus group discussant students revealed that each form of quality formative assessment has its own benefits to learning improvement. For instance, formative feedback encouraged more learning to occur, self-assessment facilitated relative independence and autonomy for the students and peer assessment enhanced the students' motivation, responsibility and competition on learning. Nevertheless, despite their optimistic perceptions on the advantages of quality formative assessment, the students expressed their concerns because of the amount of time consumed by the assessment activities against the coverage of course content. Even so, in general terms, they favour the use of quality formative assessment on the teaching-learning process.

#### **5.3.4 Research sub-question 4**

What are the views of the educators on the use of quality formative assessment in the instructional processes?

The fourth specific research question focuses on the views of the educators who used quality formative assessment in the teaching of the course. Since perceptions determine actions, the role the educators' perceptions play to the use of quality formative assessment is significant. In the present study, in spite of the major impeding factors to implement and the reluctance on the part of the educators, the perceptions towards the use of quality formative assessment were found to be positive. In fact, because of course modularisation and the shortage of class contact time to cover the content of the course, the use of quality formative assessment remained ineffective. The educators who took part in the study, regardless of their positive views on the advantages of quality formative assessment, they reported the inconvenience to implement due to several impeding factors. The literature also confirms this issue as universal. The inadequacy on the theorisation of quality formative assessment as well as the long practiced direct instruction and summative assessment were among the identified barriers against the effective integration and use of quality formative assessment. As a result, educators often display reluctance to using formative assessment on the lessons of the courses they teach.

#### **5.3.5 Main research question**

In conclusion, the main research question in the present study was answered in the following ways. To remind, the main research question was stated as, "*In what ways can the use of quality formative assessment improve student learning on university courses?*"

The practice of quality formative assessment on lessons of the course significantly improved student learning achievement. Quality formative assessment, if properly used, will likely increase motivation, engagement to deep approach to learning, and increase achievement of marks on tests. However, as the finding in the present study revealed the integration and use of quality formative assessment on the “General Psychology” course at the three universities was not encouraging. For instance, feedback was one of the formative assessments discussed in the study. The information the students obtain from feedback improves performance. Besides, feedback supports the self-regulation on the learning and the learning by sustained student effort. Nevertheless, significant number of the students in this study reported several limitations on the formative feedback practiced. Almost half of them reported a total absence of formative feedback on the lessons of the course. The lack of timeliness, non correspondence with success criteria, and the absence of clear examples on a given feedback were among the major limitations identified against the effective application of formative feedback.

On the other hand, self-assessment by the student is a key in the use of quality formative assessment. It helps in the identification of strength and weakness to assist learning improvement. Even though self-assessment was not consistently practiced, it was perceived as advantageous for a number of reasons. First of all, self-assessment helps to clearly understand the expected learning objectives and assessment tasks on a course. Second, it promotes active learning. Third, it plays a salient role to students’ motivation and the self-regulation of learning. Finally, it has importance to make the students reflective, autonomous, and responsible for learning. As a result of its instructional advantages, the integration of self-assessment in the teaching of university courses needs to get attention.

Peer assessment was another element of quality formative assessment raised in this study. Similar to the self-assessment, peer assessment gives a greater chance of involvement to the student on learning and assessment. However, significant number of the students in this study reported the non-existence of peer assessment practice on lessons. In fact, a little more than half of the respondents perceived peer assessment as a suitable tactic to acquire important skills such as reflection, autonomy, and responsibility to learn and to assess one’s own learning.

In educational assessment, scholars argue on several limitations of the current assessment practices at the higher education context. The existing practices on learning assessment are believed to encourage rote memorisation and surface learning. Moreover, there is a great emphasis to the grading than to the

learning functions of assessment practices at universities. Thus, the significance of using quality formative assessment is underlined, because it brings improvement to student learning and achievement. In the present study, the post-test achievement score mean for the students in the intervention group where quality formative assessment was used on lessons of “General Psychology” course was statistically significantly higher than the post-test achievement score mean for the comparison group students in which quality formative assessment was not used on the lessons of the course. Moreover, the students in the intervention group perceived and reported an enhanced self-regulation on their learning that was resulted from the use of quality formative assessment.

Furthermore, the perceptions by the educators and the students are determinant for the effective use of quality formative assessment. As the study result showed, the educators as well as the students reported positive perceptions towards the instructional advantages for the use of quality formative assessment though they also noted the presence of several impeding factors for its effective use in the present context. For example, the educators raised the new course modularisation approach, shortage of course coverage time, and large number of students per class and the educators’ lack of skills to use quality formative assessment as the major barriers working against the effective implementation of quality formative assessment. On the other side, the students raised shortage of time and too much workload as obstacles to the effective practice of quality formative assessment.

## **5.4 RECOMMENDATIONS**

Based on the findings and the conclusions reached on the study, recommendations to the use of quality formative assessment to improve student learning on university courses and for further research in the area are presented in this sub-section of the chapter.

### **5.4.1 Recommendations in relation to the use of quality formative assessment**

The findings of this study confirmed the salient contributions on the use of quality formative assessment for learning improvement and self-regulation on learning. The use of quality formative assessment brings about significant achievement gains on student learning. It also help students to self-regulate their learning and assessment activities. Therefore, the following recommendations are forwarded in relation to the use of quality formative assessment in the teaching of university courses:

- Department heads, course team leaders, quality assurance officers, educators and students at universities should collaborate and work towards the promotion of the use of quality formative assessment on lessons of university courses because quality formative assessment would have salient contributions to improve the self-regulation of learning, students' learning and assessment skills, and learning achievement.
- The evidence provided on the use of quality formative assessment to effect significant gains on student learning could be well considered both for the design of assessment courses offered to beginning university educators and on continuous professional development (CPD) trainings for experienced university educators.
- The top management at the universities, particularly vice president for academics offices of the respective universities need to facilitate continuous training schemes for university educators on new techniques of instruction which involve the use of quality formative assessment to influence and change the long-existing direct instruction and summative form of assessment gradually to make university education more authentic and simulate the requirements of workplace knowledge and skills, as a result of which the quality and relevance of university courses will be enhanced.
- University educators and course team leaders should design learning environments which integrate the use of quality formative assessment to make learning and assessment activities encourage the active involvement of the student on the ongoing improvement of instructional techniques.
- Academic Development and Resource Centres (ADRCs) and the Higher Diploma Programs (HDPs) at the universities should plan continuous staff professional training programmes in the design of learning environments. The skills training should focus on using quality formative assessment to the enhancement of learning, and to make instruction more interactive. The training should incorporate topics pertinent to the theories of learning and assessment as well as on the issues that can be useful to strengthen the existing positive perceptions of the the educators towards the use of quality formative assessment. There is also a need to overcome the reluctant behavior on the part of the educators towards the

implementation of quality formative assessment in instruction because educators at universities could play the key role in the improvement of instruction and student learning. The ADRCs which are responsible for in-service staff training and skill development should continuously organize hands on trainings to prepare the university educators with the techniques of collecting information on students' learning for improvement purposes. Particularly, short-term staff development programs in the areas of instructional skills should give due emphasis on the specific skills to using quality formative assessment namely formative feedback, self-assessment and peer assessment in the teaching of a university course.

- Additionally, academic departments at the universities should follow mentorship schemes in the design and development of innovative instructional techniques involving quality formative assessment. This can help to have a platform in which instructional skills are shared among the educators with the aim of improving the instructional process for courses.
- Furthermore, educators should practice instructions which involve the use of quality formative assessment aiming at developing the students' learning skills, learning to learn (L2L) because this will help to prepare the students for work place competencies and lifelong learning. To realise this, increasing the active role of the students in the instructional activities need to be emphasised.
- On the other hand, courses and programmes which incorporate the use of quality formative assessment should be planned and implemented in a way to prepare the students to become more responsible, reflective, and autonomous in their learning and assessment activities. Parallel to this, quality assurance personnel at the college level together with the mentors for the team learning groups should strengthen the already initiated collaborative learning practice (five students in a team) to contribute for improved learning and assessment practices in the teaching of university courses.
- Most importantly, in the curriculum design and review process, universities should give great emphasis and incorporate quality formative assessment as one compulsory approach of assessment in course curriculum implementation. Likewise, assessment policies and

standards with respect to higher education courses, which are designed by the Higher Education Relevance and Quality Agency (HERQA) and by the respective universities should include assessment moderation (both internal and external) where evidence on the use of quality formative assessment activities are documented and plans for the improvement of practices are specifically addressed on courses and modules.

- In addition to what has been recommended already, quality audit protocols and practices for higher education courses, both by the respective universities and external quality councils (such as HERQA) should enforce the presentation of evidence on how the course educators at the universities implement quality formative assessment in the delivery of courses. Correspondingly, the educators teaching and assessment performance evaluation forms, which are filled out by the students and the department heads at the end of each course delivery should include sufficient items which can measure whether the course educator has properly implemented quality formative assessment on the teaching of courses.

#### **5.4.2 Recommendation for further research**

This study was conducted in the teaching of one course at the three universities of west Ethiopia. Replication of this research will be helpful in broadening the scope of this research. Further research that considers greater number of courses and universities will be needed. Moreover, a rigorous quasi-experimental research that focuses on innovative techniques of instructions, which can contribute to the improvement of learning and assessment for university courses are recommended. In addition, similar research projects considering the major predictors of student learning improvement and achievement need to be carried out. More specifically, future research with the aim of replicating the evidence presented and the methodology used should build on this study. As the practices of using quality formative assessment on the lessons of university courses are not well developed, more evidence on the effects may attract attention and promote the practice to improve student learning and achievement.

#### **5.4.3 Contributions of the study**

In the opinion of the researcher, there is a research gap concerning how and to what extent the use of quality formative assessment improves learning and achievement in the context of higher education in Ethiopia. As discussed in the previous chapters, quality formative assessment includes formative

feedback, self-assessment, and peer assessment respectively. The existing research evidence gave emphasis on either elements of quality formative assessment in isolation (for example, feedback or peer assessment). The combined effect of quality formative assessment elements (such as formative feedback, self-assessment, and peer assessment) on learning improvement was not well studied and documented. On the other hand, the available research evidence did not give enough attention to the significance of design research in education. Therefore, the researcher believes that this study contributes to the theory and practice of instructional science aiming at simplifying instruction and improving learning in the context of higher education. This was possible by the use of quality formative assessment as one essential technique and instructional innovation. Hence, as presented in the result chapter of this study, the use of quality formative assessment on the lessons of a “General Psychology” course resulted to significant learning gain and self-regulation of learning as shown by the effect size estimates for the students placed in the intervention group.

## **5.5 LIMITATIONS OF THE STUDY**

The findings of this study could be understood in line with the following limitation. The quasi-experimental intervention that involved the use of quality formative assessment on the lessons of the course was implemented with 378 (214 male and 164 female) first year students of three universities who were enrolled for “General Psychology” course and six educators who were teaching the course. Moreover, mixed methods research is not without methodological limitations. Mixed methods research is a challenging task for beginning researchers. The limited knowledge and skills of the researcher of this study towards mixed methodologies of research were recognized as challenges by which the researcher overcame through extensive reading on previous research works and the available literature on mixed methods studies. The extensive data, the long time it took for the collection and the execution of quasi-experiment procedures were also among the challenges acknowledged in the present study.

## **5.6 FINAL REMARK**

This study attempted to examine the ways by which quality formative assessment improves student learning and self-regulation in a university course. To achieve this purpose, four specific research questions were formulated and pertinent data were collected to answer the questions. The existing practice on the use of quality formative assessment in the “General Psychology” course at west Ethiopian universities was not promising according to the perceptions of significant numbers of

students in this study. Nevertheless, the empirical evidence from this quasi-experimental research indicated remarkable learning gains and active involvement of the students in assessment and the self-regulation of learning. In addition to what has been stated above, despite mentioning a number of obstacles which hindered the proper implementation, the university educators and the students reported positive perceptions towards the importance of quality formative assessment on curriculum implementation and student learning improvement. Quality formative assessment assists students to develop learning and assessment skills, which in turn make them active in learning and using assessment information. As educational assessment writers insist ***“one cannot fatten the cow only by weighing up but also by feeding”***. Therefore, to put the final remark in this study, the use of quality formative assessment makes a notable difference in the improvement of student learning, achievement gain and the self-regulation of learning. The integration and use of formative assessment in the form of formative feedback, self-assessment and peer assessment on the teaching of university courses can have a greater contribution to learning improvement and the self-regulation of learning by students.

## REFERENCES

- Alt, D. 2015. Assessing the contribution of a constructivist learning environment to academic self-efficacy in higher education. *Learning Environment Research*, 18 (1): 47-67.
- Andrade, H.L. 2010. Students as the definitive source of formative assessment: Academic self-assessment and the self-regulation of learning. Northeastern Educational Research Association (NERA) *Conference proceedings: University of Connecticut, October 20, 2010*.
- Andrade, H.L., & Du, Y. 2007. Student responses to criteria-referenced self-assessment. *Assessment and Evaluation in Higher Education*, 32 (2): 159-181.
- Andrade, HL & Valtcheva, A. 2009. Promoting learning and achievement through self-assessment. *Theory into Practice*, 48 (1): 12-19.
- Anthony, G & Walshaw, M .2003. *Fractions assessment using a real context. NEMP probe report*. Palmerston North, New Zealand: Massey University.
- Aron, A, Aron, EN & Coups, EJ. 2009. *Statistics for psychology. 5<sup>th</sup> ed*. Upper Saddle River, NJ: Pearson Education.
- Asghar, A. 2010. Reciprocal peer coaching and its use as a formative assessment strategy for first year students. *Assessment & Evaluation in Higher Education*, 35 ( 4): 403-417.  
DOI: 10.1080/02602930902862834
- Ashcroft, K. 2004. Quality assurance and the massification of higher education in Ethiopia. Addis Ababa: Unpublished.
- Astin, A.W., & Ontonio, A.L. 2012. Assessment for Excellence: *The philosophy and practice of assessment and evaluation in higher education. 2nd ed*. New York: ROWMAN & LITTLEFIELD PUBLISHERS.

- Ausubel, D.P. 1980. Schemata, cognitive structure, and advance organizers: A reply to Anderson, Spiro, and Anderson. *American Educational Research Journal*, 17 (3): 400-404.
- Banta, T.W., Griffin, M, Flateby, T.L. & Kahn, S. 2009. Three promising alternatives for assessing college students' knowledge and skills (NILOA Occasional Paper No.2). Urbana, IL: University of Illinois and Indiana University, National Institute for Learning Outcomes Assessment. Available at: [www.bhsu.edu/portal/faculty](http://www.bhsu.edu/portal/faculty). (Accessed on 14 March 2012).
- Baumgartner, E, Bell, P, Brophy, S, Hoadley, CH., His, SH. Joseph,D, Orrill, Ch, Puntambekar, S, Sandoval,W. & Tabak, I. 2003. Design-based research: An emerging paradigm in educational inquiry. *Educational Researcher*, 32 (1): 5-8.
- Bayerlein, L. 2014. Students' feedback preferences: how do students react to timely and automatically generated feedback? *Assessment and Evaluation in Higher Education*, 39 (8): 916-931.
- Bell, B. & Cowie, B. 2001. *Formative Assessment and Science Education*. Dordrecht: Kluwer Academic.
- Bennett, R. 2011. Formative assessment: a critical review. *Assessment in Education*, 18 (1): 5-25.
- Bevitt, M. 2015. Assessment innovation student experience: A new assessment challenge and call for a multi-perspective approach to assessment research. *Assessment and Evaluation in Higher Education*, 40 (1): 103-119.
- Birjandi, P. 2010. The role of self-assessment in promoting Iranian EFL students' motivation. *English Language Teaching*, 3 (3): 211-220.
- Bird, F.L. & Yucel, R. 2015. Feedback codes and action plans: building the capacity of first year students to apply feedback to a scientific report. *Assessment & Evaluation in Higher Education*, 40 (4): 508-527.
- Black, P. 1998. Formative assessment: Raising standards. *School Science Review*, 80 (2): 39-46.

- Black, P. 1999 Assessment, learning theories, and testing systems. In: Murphy, P. (ed.). *Learning and assessment*. London: Paul Chapman, pp. 118-134.
- Black, P. 2004. *The nature and value of formative assessment for learning*. London: King's College.
- Black, P. 2007. Full marks for feedback: Make the grade. *Journal of the Institute of Educational Assessors*, 2 (1) :18-21.
- Black, P. 2014. Using formative assessment practices to lift student achievement. *Journal of professional learning*, pp 1-5. URL: <http://cpl.asn.au/journal/semester> 1-2015.
- Black, P. & Wiliam, D. 1998a. Assessment and classroom learning. *Assessment in Education*, 5 (1):7-74.
- Black, P. & Wiliam, D. 1998b. Inside the black box: Raising standards through classroom assessment. *Phi Delta Kappan*, 80 (2): 139–144.
- Black, P. & Wiliam, D. 2005. Changing teaching through formative assessment: research and practice. *Formative assessment-improving learning in secondary classrooms*. Oxford, United Kingdom: Oxford University Press (OECD).
- Black, P. & Wiliam, D. 2007. Large-scale assessment systems: Design principles drawn from international comparisons. *Measurement: Interdisciplinary Research and Perspectives*, 5 (1): 1-53. DOI:10.1080/15366360701293386
- Black, P. & Wiliam, D. 2009. Developing the theory of formative assessment. *Journal of Personnel Evaluation in Education*, 1 (1): 1-40.
- Black, P, Harrison, CH, Lee, C., Marshal, B. & Wiliam, D. 2004. Working inside the black box: assessment for learning in the classroom. *Phi Delta Kappan*, 86 (1): 9-21.

- Blanche, M.T. & Durrheim, K. 2004. *Social science research in context*. Pietermaritzburg: University of KwaZulu-Natal.
- Bloom, B.S., Hastings, J.T. & Madaus, G.F. (eds). 1971. *Handbook on the formative and summative evaluation of student learning*. New York: McGraw-Hill.
- Bostock, S.J. 2000. Computer assisted assessment - experiments in three courses. *A workshop at Keele University*. Available online at: [http://www.keele.ac.uk/depts/cs/Stephen\\_Bostock/docs/caa-ktn.htm](http://www.keele.ac.uk/depts/cs/Stephen_Bostock/docs/caa-ktn.htm). (Accessed on 13 March 2011).
- Boud, D. 1991. *Implementing student self-assessment*. 2<sup>nd</sup> ed. Campbell Town: The Higher Education Research and Development Society of Australasia (HERDSA).
- Boud, D. 1995. *Enhancing learning through self-assessment*. London: Kogan Page.
- Boud, D. & Falchikov, N. 2006. Aligning assessment with long-term learning. *Assessment and Evaluation in Higher Education*, 31 (4): 399-413.
- Boud, D., Lawson, R. & Thompson, D.G. 2014. Does student engagement in self-assessment calibrate their judgment over time? *Assessment & Evaluation in Higher education*, 38 (8): 941 – 956.
- Bourke, R. 2000. *Students' conceptions of learning and self-assessment in context*. Unpublished doctoral thesis, Massey University, Palmerston North, New Zealand.
- Brandt, W. & Pinhok, N. 2009. *Connecting formative assessment research to practice: An introductory guide for educators*. Highlights. Learning Point Associates.
- Brookhart, S.M. 2003. Developing Measurement Theory for Classroom Assessment Purposes and Uses. *Educational Measurement Issue and Practice*, 22 (4): 5-12.
- Brookhart, S.M. & Nitko, A.J. 2014. *Educational assessment of students 7th ed*. Pearson New International Edition.

- Brown, J. 2007. Feedback: The student perspective. *Research in Post-Compulsory Education*, 12 (1): 33–51.
- Brown, T.L. & Hirschfeld, H.F. 2008. Students' conceptions of assessment: Links to outcomes. *Assessment in Education: Principles, Policy and Practice*, 15 (1): 3-17.
- Brown, S. 2005. Assessment for learning. In: Gravestock, P & Mason, KO. *Learning and Teaching in Higher Education*, (1): 81-89.
- Brown, S. & Knight, P. 1994. *Assessing students in higher education*. Teaching and Learning in Higher Education Series. London: Routledge.
- Bruner, J. 2004. Life as Narrative. *Social research*, 71 (3): 691-710.
- Bryan, C . & Clegg, C. 2006. *Innovative assessment in higher education*. New York: Routledge.
- Burke, R.B., Onwuegbuzie, A.J. & Turner, L.A. 2007. Toward a Definition of Mixed Methods Research. *Journal of Mixed Methods Research* (1): 112-133. DOI: 10.1177/1558689806298224
- Butler, R. 1988. Enhancing and undermining intrinsic motivation: The effects of task involving and ego-involving evaluation on interest and performance. *British Journal of Educational Psychology*, 58 (2): 1–14.
- Careless, D. 2006. Different perceptions in the feedback process. *Studies in Higher Education*, 31 (2): 219-233.
- Careless, D. 2007a. Conceptualizing pre-emptive formative assessment. *Assessment in Education*, 14 (2): 171-184.
- Careless, D. 2007b. Learning-oriented assessment: Conceptual bases and practical implications. *Innovations in Education and Teaching International*, 44 (1): 57-66.

- Careless, D. 2008. *Learning oriented assessment: Principles, practices, and a project*. Victoria: University of Wellington.
- Case, S. 2007. Reconfiguring and realigning the assessment feedback processes for an undergraduate criminology degree. *Assessment & Evaluation in Higher Education*, 32 (3): 285–299.
- Clark, I. 2011. Formative assessment: Policy, perspectives and practice. *Florida Journal of Educational Administration and Policy*, 4 (2): 158-180.
- Cohen J. 1988. *Statistical power analysis for the behavioural sciences*. New York, NY: Routledge Academic
- Cohen, L., Manion, L. & Morrison, K. 2007. *Research methods in education*. 6<sup>th</sup> ed. London: Routledge.
- Collins, A. Joseph, D. & Bielaczyc, K. 2004. Design Research: Theoretical and Methodological Issues. *THE JOURNAL OF THE LEARNING SCIENCES*, 13 (1): 15 -42.
- Colliver, J.A. 2002. Constructivism: The view of knowledge that ended philosophy or a theory of learning and instruction. *Teaching and Learning in Medicine*, 14 (1): 49-51.
- Corbin, J., & Strauss, A. 2008. *Basics of Qualitative Research*. 3<sup>rd</sup> ed. California: Sage publications.
- Cowie, B. 2005. Pupil commentary on assessment for learning, *The Curriculum Journal*, 16 (2): 137–151.
- Cozby, B.C. 2001. *Methods in behavioural research*. 3<sup>rd</sup> ed. New York: McGraw Hill.
- Cozby, B.C. 2009. *Methods in behavioural research*. 10<sup>th</sup> ed. New York: McGraw Hill.
- Creswell, J.W. 2007. *Qualitative inquiry and research design: choosing among five approaches*. 2<sup>nd</sup> ed. New Delhi: Sage Publications.

- Creswell, J.W. 2009. *Research design: A qualitative, quantitative and mixed- method approaches*. 3<sup>rd</sup> ed. London: Sage publication inc.
- Creswell, J.W., Clark, V.L., Gutmann, M.L. & Hanson, W.E. 2003. *Advanced mixed methods research designs*. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 209–240). Thousand Oaks, CA: Sage.
- Cronje, J. 2006. Paradigms Regained: Toward Integrating Objectivism and Constructivism in Instructional Design and the Learning Sciences. *Educational Technology Research and Development*, 54 (4): 387-416.
- Crooks, T. 1988. The impact of classroom evaluation practices on students. *Review of Educational Research*, 58 (4): 438-481.
- Crotty, M. 1998. *The foundation of social research: Meaning and perspectives in the research process*. London: Sage.
- Deneen, C.H., & Boud, D. 2014. Patterns of resistance in managing assessment change. *Assessment & evaluation in Higher Education*, 39 (5): 577 – 591.
- Diamond, R.M. 2008. *Designing, and assessing courses and curricula: A practical guide*. San Francisco: Jossey-Bass.
- Dori, T.J. 2003. From nationwide standardised testing to school-based alternative embedded assessment in Israel: Students' performance in the matriculation 2000 project. *Journal of Research in Science Teaching*, 40 (1): 34-52.
- Driscoll, MP. 2000. *Psychology of learning for instruction*. (2nd ed.) Boston: Allyn & Bacon.

- Driscoll, DL., Yeboah, AA., Salib, Ph and Rupert, D. 2007. Merging Qualitative and Quantitative Data in Mixed Methods Research: How To and Why Not Ecological and Environmental Anthropology (University of Georgia, Paper 18.  
URL: [http:// digital communs.unl.edu/icwdmee/18](http://digitalcommuns.unl.edu/icwdmee/18).
- Drowns, R.L., Kulik, C.L., Kulik, J.A. & Morgan, M.T. 1991. The instructional effect of feedback in test-like events. *Review of Educational Research*, 61 (2): 213 – 238.
- Duckor, B. 2014. Formative Assessment in Seven Good Moves: Using Assessments Thoughtfully. *Education Leadership*, 71 (6): 28-32.
- Dunn, K.E., & Mulvenon, S.W. 2009. A critical review of research on formative assessments: The limited scientific evidence of the impact of formative assessments in education. *Practical Assessment Research & Evaluation*, 14 (7): 1-11 Available online at: <http://pareonline.net/getvn.asp?v=14&n=7>. (Accessed on 20 March 2015).
- Edelson, C.D. 2002. Design research: What we learn when we engage in design. *The Journal of the Learning Sciences*, 11 (1): 105-121.
- Elwood, J., & Klenowski, V. 2002. Creating communities of shared practice *Assessment and Evaluation in Higher Education*, 27 (3): 243-256.
- Ellery, K. 2008. Assessment for learning: a case study using feedback effectively in an essay-style test. *Assessment & Evaluation in Higher Education* 33 (4): 421-429. Available online at <http://dx.doi.org/10.1080/02602930701562981>. (Accessed on 20 March 2015).
- Entwistle, N.J., & Tait, H. 1990. Approaches to learning, evaluations of teaching, and preferences for contrasting academic environments, *Higher Education*, 19 (1): 169–194.
- Entwistle, N.J. 1991. Approaches to learning and perceptions of the learning environment: Introduction to the special issue. *Higher Education*, 22 (3): 201–204.

- Ertmer, P.A., & Newby, T.J. 2013. Behaviourism, cognitivism, constructivism: Comparing critical features from an instructional design perspective. *Performance Improvement Quarterly*, 26 (2): 43-71.
- Even, R., & Tirosh, D. 2002. Teacher knowledge and understanding of students' mathematical learning. In English, L. (ed.). *Handbook of international research in mathematics education*. Mahwah, NJ: Laurence Erlbaum, pp. 219-240.
- Federal Democratic Republic of Ethiopia (FDRE). 2007. *Higher education proclamation* No.351/2003 Addis Ababa: People's Representative Council.
- Fernandes, S., Flores, M.A. & Lima, R.M. 2012. Students' views of assessment in project-led engineering education: findings from a case study in Portugal. *Assessment & Evaluation in Higher Education*, 37 (2): 163-178.
- Fisher, R., Cavanagh, J. & Bowles, A. 2011. Assisting transition to university: Using assessment as a formative learning tool. *Assessment & Evaluation in Higher Education*, 36 (2): 225-237. available online at: <http://dx.doi.org/10.1080/02602930903308241>. (Accessed on 15 December 2014).
- Flick, W. 2006. *An introduction to qualitative research. 3<sup>rd</sup> ed.* London: Sage.
- Frey, B., & Overfield, K. 2001. Faculty professional development and evaluation. *New Horizons in Adult Education*, 15 (2): 4-19.
- Gagne, R.M., & Medsker, K.L. 1996. *The conditions of learning: Training applications*. Fort Worth, TX: Harcourt Brace College Publishers.
- Gamlem, S.M., & Smith, K. 2013. Student perceptions of classroom feedback. *Assessment in Education: Principles, Policy and Practice*, 20 (2): 150-159.

- Gay, L.R., & Airasian, P. 2003. Educational research: Competencies for analysis and applications. 7<sup>th</sup> ed. Englewood Cliffs, New Jersey: Merrill Prentice Hall.
- Gebril, A., & Brown, T.L. 2013. The effect of high-stakes examination systems on teacher beliefs: Egyptian teachers' conceptions of assessment. *Assessment in Education: Principles, Policy & Practice*, 21 (6): 16 – 33.
- Gibbs, G. 1999. Socio-cultural aspects of assessment. *Review of research in education*, (24), pp. 335-392: available online at <http://rre.aera.net>. (Accessed on 7 September 2014).
- Gibbs, G., & Simson, C. 2005. Conditions under which assessment supports students' learning. *Learning and Teaching in Higher Education*, 1 (1): 3-31.
- Gijbels, D., & Dochy, F. 2006. Teacher knowledge and understanding of students' mathematical learning. In English, L.D. (ed.). *Handbook of international research in mathematics education*. Mahwah: Lawrence Erlbaum, pp. 219-240.
- Gillingham, M.G., & Guthrie, J.I. 1987. Relationship between CBE and research on teaching. *Contemporary Educational Psychology*, 12 (3): 189 – 199.
- Harlen, W. 2006. Teachers' summative practices and assessment for learning – tensions and synergies. *The Curriculum Journal* 16(2):207 – 223. DOI:10.1080/09585170500136093
- Harlen, W. 2007. Designing a fair and effective assessment system. *Paper presented at the 2007 BERA Annual Conference as part of the ARG symposium. Future Directions for Student Assessment. University Of Bristol*.
- Hatch, J.A. 2002. *Doing Qualitative Research in Education Settings*. Albany: Sunny Press.
- Hattie, J. 2009. The black box of tertiary assessment: An impending revolution. In: Meyer, LH, Davidson, S, Anderson, H, Fletcher, R, Johnston, P & Rees, M (eds). *Tertiary assessment and higher education student outcomes: Policy, practice & research*. Wellington, New Zealand: Ako Aotearoa, pp.259-275.

- Hattie, J. 2012. Feedback for Learning: know Thy Impact. *EDUCATIONAL LEADERSHIP*, 70 (1): 18 – 23.
- Hattie, J., & Timperley, H. 2007. The power of feedback. *Review of Educational Research*, 77 (1): 81-112.
- Hendry, G.D., Bromberger, N. & Armstrong, S. 2011. Constructive guidance and feedback for learning: the usefulness of exemplars, marking sheets and different types of feedback in a first year law subject. *Assessment & Evaluation in Higher Education*, 36 (1): 1-11. Available online at:<http://dx.doi.org/10.1080/02602930903128904>. (Accessed on 26 January 2015).
- Heritage, M. 2007. Formative assessment: What do teachers need to know and do? *Phi Delta Kappan*, 89 (2): 140-145.
- Higher Education Relevance and Quality Agency for Ethiopia (HERQA). 2008. *Jimma University institutional quality audit report*. Publication series 31. Addis Ababa, Ethiopia: Jimma University.
- Hodgson, P., & Pang, M.Y. 2012. Effective formative e-assessment of student learning: a study on a statistics course. *Assessment & Evaluation in Higher Education*, 37 (2): 215-225.
- Hounsell, D., McCune, V., Hounsell, J. & Litjens, J. 2008. The quality of guidance and feedback to students. *Higher Education Research & Development*, 27 (1): 55-67.
- Hyslop, E.J., & Strobel, J. 2008. Constructivism and education: Misunderstandings and pedagogical implications. *The Teacher Educator*, 43 (1): 72-86.
- Iowa University. 2010. Literature review on formative assessment. Iowa University. Available online at: <http://www.aea267.k12.ia.us/icc>. (Accessed on 15 December 2014).
- James, D. 2005. Importance and impotence? Learning, outcomes and research in further education. *The Curriculum Journal*, 16 (1): 83–96.

- James, D., & Fleming, S. 2005. Agreement in student performance in assessment. In: Gravestock, P. & Mason, KO. 2005. *Learning and Teaching in Higher Education*, 1 (1): 32-50.
- Jimma University. 2007. Internal quality assessment. Unpublished.
- Jimma University. 2009. Internal quality assessment. Unpublished.
- Johnson, R.B., & Onwuegbuzie, A.J. 2004. Mixed Methods Research: A Research Paradigm Whose Time Has Come. *Educational Researcher*, 33 (7): 14-26.  
URL: <http://www.jstor.org/stable/3700093>
- Johnson, R.B., Onwuegbuzie, A.J. & Turner, L.A. 2007. Towards a definition of mixed methods research. *Journal of mixed methods research*, 1 (2): 112-133.
- Johansson, C.H., & Felton, P. 2014. *Transforming Students: Fullfilling the Promise of Higher Education*. John Hopkins Press.
- Jonassen, D. 1991. Objectivism versus constructivism. *Educational Technology Research and Development*, 39 (3): 5-14.
- Jonassen, D. 1999. *Designing constructivist learning environments*. In: Reigeluth, CM (ed.), *Instructional design theories and models: Volume 2, A new paradigm of instructional theory*. Mahwah: Elbrum, pp.215 – 239.
- Jones, E.A. 2010. Expanding professional development opportunities to enhance the assessment process. *Assessment Update*, 21 (3): 3-4.
- Kahl, S. 2005. Coming to terms with assessment. *Education Week*, 25 (13): 26-33
- Kaplan, R.M., & Saccuzzo, D.P. 2001. *Psychological testing: Principles, applications, and issues*. 5<sup>th</sup> ed. Wadsworth: Thomson Learning.

- Keaten, J.K., & Murphy, E.R. 1993. A field investigation of peer assessment as part of the student group grading process. *Paper presented at the annual meeting of the Western states Communication Association.*
- Kember, D. 1991. Instructional design for meaningful learning. *Instructional Science*, 20, 289-310.
- Klassen, S. 2005. Contextual assessment in science education: Background issues and policy. Available online at: [www.interscience.wiley.com](http://www.interscience.wiley.com). (Accessed on 20 January 2012).
- Kluger, A., & DeNisi, A. 1996. The effects of feedback interventions on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin*, 119 (2): 254-284.
- Knight, P.T. 2001. The Achilles' heel of quality: The assessment of student learning: The Sixth QHE Seminar. Birmingham, 25–26 May, 2001.
- Knight, P.T., & Yorke, M. 2003. *Assessment, learning and employability*. Berkshire: McGraw Hill.
- Kraayenoord, C.E., & Paris, S.G. 1997. Australian students' self-appraisal of their work samples and academic progress. *Elementary School Journal*, 97 (5): 523–537.
- Labay, M. 2011. *Formative Assessment: A brief overview of its theory and practice in K-12 education*. Bradford J. Parks: Oakland University.
- Lave, J. 1988. *Cognition in practice: Mind, mathematics and culture in everyday life*. Cambridge: Cambridge University Press.
- Leahy, S., Lyon, C., Thompson, M. & William, D. 2005. Classroom assessment: Minute by minute, day-by-day. *Educational Leadership*, 63 (3): 19-24.
- Leech, N.L., & Onwuegbuzie, A.J. 2007. An array of qualitative data analysis tools: A call for data analysis triangulation. *School Psychology Quarterly*, 22 (4): 557-584.

- Leedy, P., & Ormrod, J. 2001. *Practical research: Planning and design*. 7<sup>th</sup> ed. Upper Saddle River, NJ: Merrill Prentice Hall. Thousand Oaks: SAGE.
- Lew, D.N., Alwis, W.A. & Schmidt, H.G. 2010. Accuracy of students' self-assessment and their beliefs about its utility. *Assessment & Evaluation in Higher Education* 35 (2): 135-156. Available online at: <http://dx.doi.org/10.1080/02602930802687737>. (Accessed on 20 January 2015).
- Li, J., & Luca, R.D. 2014. Review of assessment feedback. *Studies in Higher Education*, 39 (2): 378-393.
- Lipnevich, A.A. 2007. *Response to assessment feedback: The effects of grades, praise, and source of information*. Rutgers: The State University of New Jersey: Unpublished doctoral thesis.
- Lipnevich, A.A., McCallen, L.N., Miles, K.P. & Smith J.K. 2014. Mind the gap. Students' use of exemplars and detailed rubrics as formative assessment. *Instructional Science*, 42 (4): 539-559.
- Lipnevich, A.A., & Smith, J.K. 2007. (April). Russian and American perspectives on self-regulated learning. *Presented at the annual meeting of the American Educational Research Association*, Chicago, IL.
- Lipsey, M.W., & Wilson, D.B. 1993. The efficacy of psychological, educational and behavioural treatment. *American Psychologist*, 48 (12): 1181 – 1209.
- Litchman, M. 2010. *Qualitative research in education: A user's guide*. (2<sup>nd</sup> ed). Thousand Oaks: Sage.
- Liu, N.F., & Careless, D. 2006. Peer feedback: The learning element of peer assessment. *Teaching in Higher Education*, 11 (3): 279 – 290.

- Lizzio, A., & Wilson, K. 2008. Feedback on assessment: students' perceptions of quality and effectiveness. *Assessment & Evaluation in Higher Education*, 33 (3): 263-275. Available online at: <http://dx.doi.org/10.1080/02602930701292548>. (Accessed on 10 December 2014).
- Looney, J.W. 2011. Integrating formative and summative assessment: Progress toward a Seamless System? *OECD Education Working Papers*, No. 58, OECD Publishing. Available online at: [doi: 10.1787/5kghx3kbl734-en](https://doi.org/10.1787/5kghx3kbl734-en). (Accessed on 10 December 2014).
- Lu, J., & Law, N. 2012. Online peer assessment: effects of cognitive and affective feedback. *Instructional Science*, 40 (2): 257-275.
- Lysakowski, R.S., & Walberg, H.J. 1982. Instructional effects of cues, participation and corrective feedback: A quantitative synthesis. *American Educational Research Journal*, 19 (2): 559 – 578.
- MacLellan, E. 2001. Assessment for learning: The differing perceptions of educators and students. *Assessment and Evaluation in Higher Education*, 26 (4): 307–318.
- Mahmoodi, M.H., Kalantari, B. & Ghaslani, R. 2014. Self-regulated learning (SRL), motivation, and language achievement of Iranian EFL Students. *Social and Behavioral Sciences*, 98: 1062 – 1068.
- McConlogue, T. 2012. But is it fair? Developing students' understanding of grading complex written work through peer assessment. *Assessment & Evaluation in Higher Education*, 37(1): 113-123. Available online at <http://dx.doi.org/10.1080/02602938.2010.515010>. (Accessed on 10 June 2014).

- McDowell, L., & Mowl, G. 1996. Innovative assessment - its impact on students. In: Gibbs, G. (ed.). *Improving student learning through assessment and evaluation*. Oxford: The Oxford Centre for Staff Development, pp. 131-147. Available online at: [http://www.lgu.ac.uk/deliberations/assessment/mowl\\_content.html](http://www.lgu.ac.uk/deliberations/assessment/mowl_content.html). (Accessed on 10 June 2014).
- McDowell, L., Wakelin, D., Montgomery, C. & King, S. 2011. Does assessment for learning make a difference? The development of a questionnaire to explore the student response. *Assessment & Evaluation in Higher Education*, 36 (7): 749-765. Available online at <http://dx.doi.org/10.1080/02602938.2010.488792>. (Accessed on 10 June 2014).
- McKenney, S., & Van den Akker, J. 2005. Computer-based support for curriculum designers: A case of developmental research. *Educational Technology Research and Development*, 53 (2): 41-66.
- McMahon, T. 2010. Combining peer-assessment with negotiated learning activities on a day-release undergraduate-level certificate course (ECTS level 3). *Assessment & Evaluation in Higher Education*, 35 (2): 223-239. Available online at <http://dx.doi.org/10.1080/02602930902795919>. (Accessed on 10 June 2014).
- McMillan, H.J. 2003. Understanding and improving teachers' classroom assessment decision-making: Implication for theory and practice. *Educational Measurement: Issue and Practice*, 22 (4): 34-43.
- McQueen, R.A., & Knussen, C.H. 1999. *Research methods in psychology: A practical introduction*. London: Pearson Education.
- Merrill, M.D. 1991. Constructivism and instructional design. *Educational Technology*, 31 (5): 45-53.
- Merrill, M.D. 2007. The proper study of instructional design. In Robert A. Reiser and John V. Dempsey (Eds.). *Trends and Issues in Instructional Design and Technology*(2nd ed). Pearson Prentice Hall, pp. 336-341.

- Mills, S.H., Bennet, B., Crawford, C.B. & Gould, L. 2009. A model for integrating assessment across an undergraduate political science major. *Assessment update: Progress, Trends, & Practices in Higher Education*, 21 (6): 1-16.
- Ministry of Education (MOE). 1994. *Education and training policy*. Addis Ababa: FDRE.
- Molenda, M., & Pershing, J.A. 2003. *The strategic impact model or "Indiana model."* Unpublished paper. Bloomington: Indiana University.
- Moodley, Y., & Potter, CH. 2008. *An overview of Michael Scriven's "The methodology of evaluation" 1967*. Johannesburg: University of the Witwatersrand,
- Muijs, D. 2004. *Doing quantitative research in education with SPSS*. London: Sage Publications.
- Murphy, E. 1997. *Constructivism: From philosophy to practice*. US Department of Education: ERIC.
- Nicol D.J., & Macfarlane-Dick, D. 2006. Formative assessment and self-regulated learning: a model and seven principles of good feedback practice. *Studies in Higher Education*, 31 (2): 199-218.
- Nicol, D.J., Thompson, A. & Breslien, C. 2014. Rethinking feedback practices in higher education: a peer review perspective. *Assessment & Evaluation in Higher education*, 39 (1): 102 – 122.
- Nitko, A.J. 2004. *Educational assessment of students*. 4<sup>th</sup> ed. Ohio: Merrill Prentice Hall.
- Norman, G. 2003. The effectiveness and the effects of effect sizes. *Advances in Health Science Education*, 8 (2): 183 – 187.
- Offerdahl, E.G, & Tomanek, D. 2011. Changes in educators' assessment thinking related to experimentation with new strategies. *Assessment & Evaluation in Higher Education*, 36 (7): 781-795. Available at <http://dx.doi.org/10.1080/02602938.2010.488794>. (Accessed on 20 January, 2014).

- Orsmond, P., & Merry, S. 2011. Feedback alignment: effective and ineffective links between educators' and students' understanding of coursework feedback. *Assessment & Evaluation in Higher Education*, 36 (2): 125-136.  
Available at: <http://dx.doi.org/10.1080/02602930903201651>. (Accessed on 20 January 2014).
- Papinczak, T., Young, L. & Groves, M. 2007. Peer assessment in problem based learning. A qualitative study. *Advances in Health Science Education*, 12:169-186.
- Perera, A.M., & Morgan, J.E. 2006. Student Perceptions of the Value of Formative Assessment in their Academic Development. Chelmsford: Writtle College. Available at <http://castledocs.writtle.ac.uk>. (Accessed on 12 March 2015).
- Pintrich, P.R. 2000. The role of goal orientation in self-regulated learning. In: Boekaerts M., Pintrich, PR & Zeidner, M. (eds.). *Handbook of self-regulation* San Diego, CA:Academic, pp. 452-502.
- Pintrich, P.R., & De Groot, E.V. 1990. Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, 82 (1): 33-40.
- Popham, W.J. 2006. *Defining and enhancing formative assessment*. Los Angeles: University of California.
- Poulos, A., & Mahony, M.J. 2008. Effectiveness of feedback: the students' perspective. *Assessment & Evaluation in Higher Education*, 33 (2): 143-154. Available at <http://dx.doi.org/10.1080/02602930601127869>. (Accessed on 10 December 2014).
- Pryor, J., & Crossouard, B. 2005. A sociocultural theorization of formative assessment. Paper presented at the *Socio-cultural Theory in Educational Research and Practice Conference*, University of Manchester, 8–9 September, 2005.
- Punch, K. 2005. *Introduction to social research: Quantitative and qualitative approaches*. 2<sup>nd</sup> ed. New Delhi: SAGE.

- Randall, M., & Mirador, J. 2003. How well am I doing? Using a corpus-based analysis to investigate tutor and institutional messages in comment sheets. *Assessment & Evaluation in Higher Education*, 28 (5): 516-526.
- Rawlins, P. 2007. *Students' perceptions' of the formative potential of the National Certificate of Educational Achievement*. University of Australia: Unpublished Doctoral Thesis.
- Ray, J.A. 2002. Constructivism and classroom teachers: What can early childhood educators do to support the constructivist journey? *Journal of Early Childhood Teacher Education*, 23 (4): 319-325.
- Raes, A., Vanderhoven, E. & Schellens, T. 2013. Increasing anonymity in peer assessment by using classroom response technology within face-to-face higher education. *Studies in Higher Education*, 40 (1): 178 – 193.
- Richey, R., & Klein, J. 2005. Developmental research methods: Creating knowledge from instructional design and development practice. *Journal of Computing in Higher Education*, 16 (2): 23-38.
- Robbins, F., & Aydede, M. 2009. *The Cambridge Handbook of Situated Cognition*. Cambridge University Press.
- Rogoff, B. 1990. *Apprenticeship in thinking: Cognitive development in social context*. New York: Oxford University Press.
- Ross, J.A. 2006. The reliability, validity, and utility of self-assessment. *Practical Assessment, Research and Evaluation*, 11 (10). Available online at: <http://pareonline.net/getvn.asp?v=11&n=10>. (Accessed on 10 December 2014).
- Ross, J.A., Hogaboam-Gray, A. & Rolheiser, C. 2002. Student self-evaluation in grade 5-6 mathematics: Effects on problem-solving achievement. *Educational Assessment*, 8 (1):43-59.

- Ruiz-Primo, M.A., & Furtak, E.M. 2004. Informal Formative Assessment of Students Understanding of Scientific Inquiry. The Regents of the University of California.
- Ruthven, K.A. 2002. *Assessment in mathematics education*. In Haggerty, L. (ed.). *Teaching mathematics in secondary schools*. London: Routledge Falmer, pp. 176-191.
- Sadler, R. 1989. Formative assessment and the design of instructional assessments. *Instructional Science*, 18 (1): 119-144.
- Sambell, K., & McDowell, L. 1998. The construction of the hidden curriculum: messages and meaning in the assessment of student learning. *Assessment and Evaluation in Higher Education*, 23 (4): 391-402.
- Scriven, M. 1967. *The methodology of evaluation*. In: Tyler, R. Gagne & Scriven, M. *Perspectives on curriculum evaluation* (AERA Monograph Series - Curriculum Evaluation) Chicago: Rand McNally.
- Schimmel, B.J. 1983. A meta-analysis of feedback to students in computerized and programmed instruction. *Paper presented at the annual meeting of the American Educational Research Association, Montreal, Canada*.
- Schramm, W. 1962. *Programmed instruction: Today and tomorrow*. New York: Fund for the Advancement of Education
- Schunk, D.H. 1991. Self-efficacy and academic motivation. *Educational Psychologist*, 26 (3): 207–231.
- Schunk, D.H. 2005. Self-regulated learning: The educational legacy of Paul R. Pintrich. *Educational Psychologist*, 40 (2): 85-94.
- Segers, M., & Dochy, F. 2001. New assessment forms in problem-based learning: the value-added of the students' perspective. *Studies in Higher Education*, 26 (3): 327–343.

- Shaughnessy, J.J., Zechmeister, E.B. & Zechmeister, J.S. 2009. *Research methods in psychology*. 8<sup>th</sup> ed. New York: McGraw Hill.
- Shaw, I., & Gould, N. 2001. *Qualitative Research in Social Work: Context and Method*. Sage Publications.
- Shepard, L.A. 2000. The role of assessment in a learning culture. *Educational Researcher*, 39 (7): 4–14.
- Shepard, L.A. 2005a. Linking formative assessment to scaffolding. *Educational Leadership*, 63 (3): 66-70.
- Shepard, L.A. 2005b. Formative assessment: Caveat emptor. The Future of Assessment: Shaping Teaching and Learning. Paper presented at ETS Invitational conference, New York, October 10-11, 2005.
- Shevelson, R.J., Young, D.B., Ayala, C.C., Brandon, P.R. & Furtak, EM. 2008. On the impact of curriculum-embedded formative assessment on learning: A collaboration between curriculum and assessment developers. *Applied Measurement in Education*, 21 (4): 295–314.
- Shrock, S. 1991. A brief history of instructional development. In: Anglin, G. (ed). *Instructional technology: Past, present, and future*. Englewood Libraries Unlimited, pp. 11-19
- Shute, V. 2008. Focus on formative feedback. *Review of Educational Research*, 78 (1): 153-189.
- Shute, V.J., & Kim, Y.J. 2008. Formative and Stealth Assessment. In Spector JM., Merrill, MD., Merrienboer, JV and Driscoll, MP .2008. *Handbook of Research on Educational Communications and Technology* (3rd ed.) NY: Lawrence Erlbaum. (Accessed on 12 March 2013).
- Silver, C.E., Duncan, R.G. & Chinn, CA. 2007. Scaffolding and Achievement in Problem-Based and Inquiry Learning: A Response to Kirschner, Sweller, and Clark. *EDUCATIONAL PSYCHOLOGIST*, 42 (2): 99–107.

- Sivan, A. 2000. The implementation of peer assessment: An action research approach. *Assessment in Education: Principles, Policy & Practice*, 7 (2): 193-213.  
Available online at:<http://dx.doi.org/10.1080/713613328>. (Accessed on 10 December 2014).
- Skinner, B.F. 1953. *Science and human behaviour*. London: MacMillan.
- Sluismans, D., Dochy, F. & Moerkerke, G. 1999. Creating a learning environment by using self-, peer- and co-assessment. *Learning Environments Research*, 1 (2): 293–319.
- Smith, K. 2009. From test takers to test makers. *Educational Leadership*, 67 (3): 26-30.
- Smith, E., & Gorard, S. 2005. They don't give us our marks: The role of formative feedback in student progress. *Assessment in Education*, 12 (1): 21-28.
- Smith, P.L., & Ragan, T.J. 1998. *Instructional design*. 2<sup>nd</sup> ed. New York: Merrill.
- Stefani, L. 2005. Assessment of student learning: Promoting a scholarly approach. In: Gravestock, P. & Mason, K.O. *Learning and Teaching in Higher Education*, (1): 51-66.
- Stess, A., Coertjens, L., & Petegem, P.V. 2013. Instructional development in higher education: Impact on teachers' teaching behavior as perceived by students. *Instructional Science*, 41 (6): 1103 – 1126.
- Stiggins, R.J. 2001. *Student involved classroom assessment* 3<sup>rd</sup> ed. Upper Saddle River, NJ: Prentice Hall.
- Stiggins, R.J., & Chappuis, J. 2005. Using student-involved classroom assessment to close achievement gaps. *Theory into Practice*, 44 (1): 11-18.
- Strijbos, J.W., & Sluismans, D.M. 2010. Unravelling peer assessment: Methodological, functional, and conceptual developments. *Learning and Instruction*, 20: 265-269.

- Struyven, K., Dochy, F. & Janssens, S. 2005. Students' perceptions about evaluation and assessment in higher education. *Assessment and Evaluation in Higher Education*, 30 (4): 325-341.
- Sullivan, H., Ice, K. & Niedermeyer, F. 2000. Long-term instructional development: A 20-year ID and implementation project. *Educational Technology Research and Development*, 48 (4): 87-99.
- Sun, L., & Williams, S. 2004. An instructional design model for constructivist learning. In: Cantoni, L. and McLoughlin, C. (eds.) *ED-MEDIA 2004: World Conference on Educational Multimedia, Hypermedia & Telecommunications*, Vols. 1-7. Assoc Advancement Computing Education, Norfolk, pp. 2476-2483. ISBN 1880094533.
- Suurtaman, C., Koch, M. & Arden, A. 2010. Teachers' assessment practices in mathematics: classrooms in the context of reform. *Assessment in Education: Principles, Policy & Practice*, 17 (4): 399-417.
- Tan, K. 2008. *Conceptions of self-assessment. What is needed for long-term learning?* (pp. 114-127). *Rethinking assessment in Higher Education. Learning for the longer term.* Oxon: Routledge.
- Tang, J., & Harrison, C. 2011. Investigating university tutor perceptions of assessment feedback: three types of tutor beliefs. *Assessment and Evaluation in Higher Education*, 36 (5): 583-604.
- Taras, M. 2001. The use of tutor feedback and student self-assessment in summative assessment tasks: Towards transparency for students and for tutor. *Assessment & Evaluation in Higher Education*, 26 (6): 605-614.
- Taras, M. 2005. Assessment, summative and formative: Some theoretical reflections. *British Journal of Educational Studies*, 53 (4): 466-478.
- Taras, M. 2009. Summative assessment: The missing link for formative assessment. *Journal of Further and Higher Education*, 33 (1): 57-69.

- Teddlie, CH., & Tashakori, A. 2009. *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioural sciences*. Thousand Oaks: Sage.
- Tesfaye Getinet. 2012. Effects of instructional intervention on students' learning gains: An experimental research. *Latin America Journal of Physics Education*, 6 (2): 187-195.
- Teshome Yehulaw. 2004. The status and challenges of Ethiopian Higher Education systems and its contribution to development. *Ethiopian Journal of Higher Education*, 1 (1): 1-19.
- Thompson, A.G. 1992. *Teachers' beliefs and conceptions: A synthesis of the research*. In; Grouns, DA (ed.). *Handbook of research on mathematics teaching and learning*, New York: Macmillan, pp. 127–146.
- Topping, K.J. 1998. Peer assessment between students in colleges and universities. *Review of Educational Research*, 68 (3): 249-276.
- Torrance, H. 1993. Formative assessment: Some theoretical problems and empirical questions. *Cambridge Journal of Education*, 23 (3): 333-342.
- Torrance, H. 2007. Assessment in post-secondary education and training: editorial introduction. *Assessment in Education: Principles, Policy & Practice*, 14 (3): 277-279.  
Available online at <http://dx.doi.org/10.1080/09695940701591859>.  
(Accessed on 10 December 2014).
- Torrance, H., & Pryor, J. 2001. Developing formative assessment in the classroom: Using action research to explore and modify theory. *British Educational Research Journal*, 27(5): 615-631. URL: <http://www.jstor.org/stable/1501956>. Date accessed 03, September 2010.
- Trumbell, E., & Lash, A. 2013. *Understanding Formative Assessment: Insights from Learning Theory and Measurement Theory*. WestEd.Org.

- Van den Akker, J., & Plomp, T. 1993. Development Research in curriculum, propositions and experiences. *Paper presented at American Educational Research Association (AERA) meeting, April 12-16 Atlanta. Unpublished.*
- Van den Akker, J. 1999. *Principles and methods of development research.* In: Van den Akker, J, Branch, R, Gustafson, K. Nieveen, N & Plop, T. (eds), *Design approaches and tools in education and training* Dordrecht: Kluwer Academic Publishers, pp. 1 -14.
- Van den, Akker, J., Bannan, B., Kelly, A.E., Nieveen, N., & Plomp, T. 2007. An Introduction to Educational Design Research. Proceedings of the seminar conducted at the East China Normal University, Shanghai (PR China), November 23-26.
- Voerman, I.V., & Gustafson, K.L. 2004 . Paradigms in the theory and practice of education and training design. *Educational Technology Research and Development, 52* (2): 69-89.
- Vygotsky, L.S. 1978. *Mind in society: The development of higher psychological processes.* Cambridge, MA: Harvard University Press.
- Watson, A. 2006. Some difficulties in informal assessment in mathematics. *Assessment in Education: Principles, Policy & Practice, 13* (3): 289-303.
- Wen, M.L., & Tsai, Ch-Ch. 2006. University students' perceptions and attitudes towards peer assessment. *Higher Education, 51*, 27 – 44.
- Wiliam, D. 2007. Changing Classroom Practice. *Educational Leadership, 65* (4): 36-42.
- Wiliam, D. 2011. What is assessment for learning? *Studies in Educational Evaluation, 37* (1): 3-14.
- Wiliam, W., & Thompson, M. 2007. Integrating assessment with instruction: what will it take to make it work? In Dwyer, CA. (ed.) *The future of assessment: shaping teaching and learning.* Mahwah, NJ: Lawrence Erlbaum Associates, pp. 53-82.

- Williams, J.A. 2010. You know what you've done right and what you've done wrong and what you need to improve on: New Zealand students' perspectives on feedback. *Assessment in Education: Principles, Policy & Practice*, 17 (3): 301-314. Available online at <http://dx.doi.org/10.1080/0969594X.2010.496249>. (Accessed on 10 December 2014).
- Williams, P. 2008. Assessing context-based learning. Not only rigorous but also relevant. *Assessment and Evaluation in Higher Education*, 33 (4): 395-408.
- William, D., Lee, C., Harrison, C. & Black, P.J. 2004. Teachers developing assessment for learning: Impact on student achievement. *Assessment in Education: Principles, Policy and Practice*, 11 (1): 49-65.
- Wilson, B., & Cole, P. 1991. A review of cognitive teaching models. *Educational Technology Research and Development*, 39 (4): 47-64.
- Wilson, B., Teslow, J., & Osmond-Jouchoux, J.R. 1995. The impact of constructivism (and postmodernism) on ID fundamentals. In: Seels, B.B. (ed.). *Instructional design: A reconsideration*. Englewood Cliffs: Educational Technology, pp. 137-158.
- Wilson, K., & Lizzio, A. 2008. A just in time intervention to support the academic efficacy of at risk first year students. *FYE Pacific Rim Conference*: Griffith University.
- Wilson, M., & Scalise, K. 2006. Assessment to improve learning in higher education: The BEAR Assessment System. *Higher Education*, 52 (4): 635-663.
- Winne, P. 2001. *Information processing models of self-regulated learning*. In: Zimmerman, B. & Schunk, D. (eds.) *Self-regulated learning and academic achievement: Theory, research, and practice*. New York: Longman, pp. 153-189.
- Wood, D. 1998. *How children think and learn: The social context of cognitive development* (2<sup>nd</sup> ed.). Oxford: Blackwell.

- Yohannes, W. 2005. Report of HERQA/EQUIP workshop on subject bench marking. Addis Ababa: unpublished.
- Yorke, M. 2003. Formative assessment in higher education. *Moves towards Theory and the Enhancement of Pedagogic Practice*, 45 (4): 477-501.
- Zimmerman, B.J. 1990. Self-regulated learning and academic achievement: An overview. *Educational Psychologist*, 25 (1): 3-17.
- Zimmerman, B.J. 1998. *Developing Self-Fulfilling Cycles of Academic Regulation: An Analysis of Exemplary Instructional Models*. In Schunk, DH & Zimmerman, BJ (eds). *Self-regulated learning: From teaching to self-reflective practice*. New York: Guilford, pp 1-19.
- Zimmerman, B.J. 2001. *Theories of self-regulated learning and academic achievement: An overview and analysis*. In: Zimmerman, BJ & Schunk DH (eds). In: *Self-regulated learning and academic achievement: Theoretical perspectives*, (2<sup>nd</sup> ed). Mahwah, NJ: LEA, pp.1–36.
- Zimmerman, B.J. 2002. Becoming a self-regulated students: An overview. *Theory into Practice*, 41 (2): 64-70.
- Zimmerman, B.J. 2013. from Cognitive Modeling to Self-Regulation: A Social Cognitive Career Path. *Educational Psychologist*, 48 (3): 135-147.

**LIST OF ANNEXURES**  
**ANNEXURE 1**  
**QUESTIONNAIRE FOR STUDENTS**

**Purpose:** This questionnaire is prepared to collect data on the extent of the quality formative assessment practice engaging students in self-regulated learning and assessment. The data to be collected through the questionnaire is used for research purposes only. Information that you provide will be kept confidential.

**General directions:**

- Please follow the instructions carefully.
- Respond to all questions.

You do not have to write your name or identify yourself in any way.  
I thank you sincerely in advance for your cooperation!

**Instruction:** Please show your answer by circling the appropriate number on the right of each of the items.

**SECTION A: BIOGRAPHICAL DATA**

1. Name of the university \_\_\_\_\_
2. Department \_\_\_\_\_
3. Your gender    Male         Female
4. Age:    19 – 21     22 – 24     25 and above

**SECTION B: Self-regulated learning and use of quality formative assessment**

**Instruction:** For each of the following items, focus on the use of quality formative assessment that promoted your self-regulated learning and assessment. Make a circle to indicate your choice. The meaning of the numbers/choices is shown in the table below.

<b>Keys:</b>	<b>1= always not true,</b>	<b>2= mostly not true,</b>
	<b>3= mostly true,</b>	<b>4= always true</b>

**Part 1: Self-regulated learning**

<b>No.</b>	<b>In this psychology course.....</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
1	Your self-regulated learning was enhanced by formative assessment	1	2	3	4
2	Lesson objectives were communicated to you	1	2	3	4
3	You were engaged in assessing the progress of your learning	1	2	3	4
4	You had greater control over your own learning	1	2	3	4
5	You managed your learning outcomes actively	1	2	3	4
6	You had a chance to set learning goals	1	2	3	4
7	You had an opportunity to focus your actions on the learning goals	1	2	3	4
8	Your confidence has increased because of your control over the learning	1	2	3	4
9	You received feedback that improved your learning	1	2	3	4
10	Your motivation to learn was increased because you had greater control over your own learning	1	2	3	4
11	Because of the formative assessment, you understood your strengths and weaknesses	1	2	3	4
12	You gave yourself feedback to reflect on the correctness of your actions	1	2	3	4
13	You interpreted the feedback actively given to you by the educator and your peers	1	2	3	4

## Part 2: Formative feedback from educator

No	In this psychology course.....	1	2	3	4
1	There were plans to improve learning	1	2	3	4
2	The educator communicated the expected knowledge and skills with regard to the course	1	2	3	4
3	The educator communicated information that could improve your learning	1	2	3	4
4	You received plenty of feedback on what you were doing	1	2	3	4
5	You often received timely feedback	1	2	3	4
6	The feedback given helped you understand things better	1	2	3	4
7	The feedback you received had an explanation regarding the correct answers	1	2	3	4
8	The feedback you received was supportive of your learning	1	2	3	4
9	Your motivation to learn increased due to the feedback given to you by the course educator	1	2	3	4
10	You acted upon the feedback to improve your learning	1	2	3	4
11	The feedback you received from the educator encouraged you to self-regulate your learning	1	2	3	4
12	The feedback you received helped you apply more effort with regard to dealing with challenging learning tasks	1	2	3	4
13	The feedback received is linked directly to the success criteria	1	2	3	4
14	The feedback given focused on your learning task performance	1	2	3	4
15	There is hardly any feedback	1	2	3	4
16	The feedback showed you how to do better next time	1	2	3	4
17	The feedback you received included worked out examples	1	2	3	4

### Part 3: Self – assessment

No	In this psychology course.....	1	2	3	4
1	There were plenty of self-assessment opportunities to improve your learning	1	2	3	4
2	Self-assessment helped you revise your work	1	2	3	4
3	You received guidance from the educator with regard to your self-assessment activities	1	2	3	4
4	The self-assessment helped you understand the learning goals	1	2	3	4
5	The self-assessment helped you to know the extent you have achieved the learning goals	1	2	3	4
6	The self-assessment helped you know what to do to achieve the stated learning goals	1	2	3	4
7	The self-assessment helped you assess the quality of your learning	1	2	3	4
8	The self-assessment helped you identify your strengths in learning	1	2	3	4
9	The self-assessment helped you identify your weaknesses in learning	1	2	3	4
10	The self- assessment helped you manage your learning	1	2	3	4
11	The self-assessment enhanced your self-regulation of the learning	1	2	3	4
12	The self-assessment increased your motivation to learn	1	2	3	4
13	You often use the self-assessment information to improve your performance in learning	1	2	3	4
14	The self-assessment helped you become a reflective students	1	2	3	4
15	The self-assessment helped you become an autonomous students	1	2	3	4

**Part 4: Peer assessment**

No	In this psychology course.....	1	2	3	4
1	There were opportunities when your work was assessed by another student	1	2	3	4
2	There were opportunities when you assessed other students' work	1	2	3	4
3	You gained knowledge while assessing other students' work	1	2	3	4
4	Peer assessment motivated you in your studies	1	2	3	4
5	Peer assessment helped you become a reflective students	1	2	3	4
6	Peer assessment helped you become an autonomous students	1	2	3	4
7	Peer assessment encouraged deeper learning rather than surface learning	1	2	3	4
8	Peer assessment increased your responsibility to learn	1	2	3	4
9	Assessment done by your peers was fair	1	2	3	4
10	Assessment done by your peers was accurate	1	2	3	4
11	Peer assessment has given you more chances of learning	1	2	3	4
12	Peer assessment has given you more chances to do the assessment	1	2	3	4

**ANNEXURE 2**  
**INTERVIEW SCHEDULE FOR EDUCATORS**

1. What are your personal perceptions of formative assessment?
2. To what extent does quality formative assessment provide an opportunity for student learning improvement?
3. Do you like to practise formative or summative assessment? Why?
4. Have you ever been trained how to implement formative assessment?
5. In your opinion, what are the major barriers to implementing quality formative assessment in your courses?
6. How do the large class sizes and heavy workloads impede the implementation of formative assessment in your class?
7. Explain how you use formative assessment in your course.
8. What are the main problems you faced regarding the implementation of formative assessment?
9. What encouragement did you receive from the head of the department or other academic staff to implement formative assessment?
10. What are the students' reactions when you implement formative assessment in your teaching activity?
11. Sometimes educators may have positive perceptions about formative assessment and yet do not implement it in their teaching. What do you think are the reasons?
12. What do you recommend that will enable educators to implement formative assessment in their teaching?
13. What other points would you like to add?

Thank you for your participation

**ANNEXURE 3**  
**FOCUS GROUP DISCUSSION GUIDE**

1. What are your general views about formative assessment?
2. What are the contributions of formative assessment practice with regard to enhancing your self-regulated learning skills?
3. What are the effects of formative assessment on your learning?
4. How useful was the formative feedback in terms of your learning?
5. How useful was the peer assessment exercise for your learning?
6. How useful was the self-assessment exercise for your learning?
7. To what extent did formative assessment implementation help you develop confidence in your learning, academic skills and what you need to do to improve your learning?
8. What is your preference with regard to learning “surface knowledge” or “deep learning?” Why?
9. Did the implemented formative assessment promote “surface learning” or “deep learning” in your class?
10. In what ways did the implemented formative assessment allow you to demonstrate your understanding?

Thank you for your participation

**ANNEXURE 4**  
**CLASSROOM OBSERVATION SCHEDULE**

1. What are the actions of the educator at the start, during and at the end of a given lesson regarding the implementation of quality formative assessment?
2. What are the actions of the students at the start, during and at the end of a given lesson where quality formative assessment is implemented?
3. What types of formative assessment were used? How frequently were they utilised? What were the roles of the educator and the roles of the students?
4. Do students participate actively both individually and in groups in formative assessment during the lesson?
5. How do students interact during a lesson where quality formative assessment is implemented?

**ANNEXURE 5**  
**SAMPLE LESSON PLAN TEMPLATE**

**Lesson plan template**

Course Name: <i>Introduction to psychology</i>	Department: <i>Nursing</i>	Class Year: <i>One</i>
Course Code: <i>Psyc 1011</i>		
Credit Hours: <i>5 ECST</i>		
Lesson topic/s : <i>Learning: Definitions, characteristics, and factors affecting individual learning</i>		
Lesson objectives: <i>By the end of this lesson, students will be able to:</i> <i>Define learning</i>		
<ul style="list-style-type: none"> <li>• <i>Differentiate the attributes of learning (change in behaviour, not directly observed, relatively enduring change, depends on practice)</i></li> <li>• <i>Conceptualise the characteristics of learning</i></li> <li>• <i>Mention the factors that affect individual's learning</i></li> </ul>		
Learning materials and resources: <i>handout.PPT, activity worksheets</i>		

**Lesson details**

Time	Lesson activity	Student's task	Teacher's role
5'	Introduction: lesson topics and objectives	Recognise lesson topics and objectives	Introduce lesson topic and objectives
30'	Lecture+ formative assessment (questioning, class activity, short quiz)	<ul style="list-style-type: none"> <li>• Follow the lecture</li> <li>• Ask and answer questions</li> <li>• Actively perform class activity task</li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• <i>Give assessment task (questioning + class activity)</i></li> <li>• Give formative/prompt feedback</li> </ul>
10'	Reflection of the learning to lesson objectives	Confirm the extent that lesson objectives were attained	Ask if students fulfil the lesson objectives
5'	Summary of the day's lesson	Actively tell what they have learned	Check if students attained the lesson objectives
Type of assessment and feedback: <i>questioning + class activity</i>			
<ul style="list-style-type: none"> <li>• <i>formative/prompt feedback (individual + whole class feedback)</i></li> </ul>			
Lesson review comments: <i>(educator's comment on the lesson)</i>			

**ANNEXURE 6**  
**PRE-TEST ITEMS (FORM A)**

**Instruction: Choose the correct answer for each question and blacken the letter of your choice in the answer sheet attached**

1. Which one of the following statements is not true about learning? It---
  - A. Can result from practice or experience
  - B. Can result from accidental conditions
  - C. May not be directly observed
  - D. Is relatively enduring change in behaviour
  
2. One of the following does not affect an individual's learning.
  - A. Readiness for learning
  - B. The purpose of learning
  - C. Attention of the students
  - D. None of these
  
3. One of the following behaviour is not regarded as a learned behaviour
  - A. Fatigue
  - B. Riding a horse
  - C. Excitement
  - D. A and C
  
4. Which of the following does not belong to the characteristics of learning?
  - A. Learning affects the conduct of the students
  - B. Learning is both individual and social
  - C. Learning is a purposeful experience
  - D. None of these
  
5. Which one of the following does food represent in Pavlov's experiment of classical conditioning?
  - A. Conditioned response
  - B. Conditioned stimulus
  - C. Unconditioned stimulus
  - D. Unconditioned response

**\*\* Answer questions 7-10 based on the following ward case. Some patients in a certain surgical ward of a hospital experience a sense of fear (increased heart beat) whenever an angrily shouting doctor enters the ward. In this situation,**

6. The fear of patients (increased heart beat) is \_\_\_\_\_
  - A. Unconditioned response
  - B. Unconditioned stimulus
  - C. Conditioned response
  - D. Conditioned stimulus\
  
7. The doctor is a/an\_\_\_\_
  - A. Conditioned response
  - B. Conditioned stimulus
  - C. Unconditioned stimulus
  - D. Unconditioned response
  
8. Angrily shouting behaviour of the doctor is \_\_\_\_
  - A. Conditioned response
  - B. Conditioned stimulus
  - C. Unconditioned stimulus
  - D. Unconditioned response

9. Based on the above situation extinction of the fear behaviour likely occurs
- When the doctors increases frequency of visit to the ward
  - When the doctor is transferred to another ward
  - When the doctor takes a 2 months leave vacation
  - B and C can be answers
10. Some cancer patients develop taste aversion behaviour when a meal is followed by the chemotherapy they are taking. In this situation, the taste aversion behaviour develops because of \_\_
- Operant conditioning
  - Observational learning
  - Classical conditioning
  - Cognitive learning
11. Which one of the following goes with the view of operant conditioning learning?
- Learned behaviour is the result of its consequence
  - Negative reinforcement and punishment weaken behaviour
  - Positive reinforcement weakens behaviour
  - A and B are correct
12. The operant procedure for reinforcing responses that come closer and closer to the desired response is called \_\_\_\_
- Superstitious response
  - Serial learning
  - Auto shaping
  - Shaping
13. A schedule of reinforcement in which the number of responses required to produce a reinforcement changes unpredictably during operant conditioning learning is referred to as a \_
- Fixed-interval schedule
  - Variable-ratio schedule
  - Variable interval schedule
  - Mixed schedule
14. Ahmed is a journalist and He proofreads newspaper manuscripts for a publisher and paid \$8 for every three pages he reads. Ahmed is likely to be reinforced by a \_\_\_\_\_ schedule of reinforcement.
- Fixed-interval
  - Fixed-ratio
  - Variable-interval
  - Variable ratio
15. In operant conditioning the presentation of aversive behaviour to decrease the probability of response is\_\_
- Negative reinforcement
  - Secondary reinforcement
  - Punishment
  - Intermittent reinforcement

16. Abebe often buys beautiful flowers for his wife because she no more complains his late arrival home. This can be an example of negative reinforcement because\_\_\_\_
- A. Abebe feels pleased with himself
  - B. Abebe now buys flowers more often
  - C. Abebe was punished for coming late
  - D. Abebe’s wife is grateful to receive the flowers
17. All employees at Jimma University get their salary at the end of every month. This is an example of\_\_\_\_
- A. Fixed-ration schedule
  - B. Variable-ration schedule
  - C. Fixed-interval schedule
  - D. Variable-interval schedule
18. The “law of effect was initially formulated by:-
- A. B.F. Skinner
  - B. John B. Watson
  - C. John Dewey
  - D. Edward L. Thorndike
19. The view that “learning is the result of observation, modeling and imitation is held by \_\_\_\_theory of learning.
- A. Cognitive
  - B. Social
  - C. Behaviour
  - D. None of these
20. One of the following learning theories assumes the occurrence of learning as a change in the way individual processes information in the mind.
- A. Behaviourist theory of learning
  - B. Cognitive theory of learning
  - C. Social learning
  - D. None of these

**ANSWER SHEET FOR THE PRACTICE EXAM**

Jimma University  
College of Social Sciences and Law  
Department of psychology, practice exam for “Introduction to psychology”

Your University\_\_\_\_\_Department\_\_\_\_\_St.number\_\_\_\_\_

**Instruction: Read each question and select the correct answer from the given alternatives.**

**Blacken the circle of your letter choice for the correct answer**

Question No	Alternatives				Question No	Alternatives			
	A	B	C	D		A	B	C	D
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	11	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	12	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	13	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	14	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	15	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	16	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	17	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	18	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	19	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	20	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

THANK YOU VERY MUCH!

**ANNEXURE 7**  
**POST-TEST ITEMS (FORM B)**

**Instruction: Choose the correct answer for each question and blacken the letter of your choice in the answer sheet attached**

1. Samson is a newspaper editor and he proofreads newspaper manuscripts for a publisher and is paid \$12 for every three pages he reads. Ahmed is likely to be reinforced by a schedule of reinforcement.  
A. Fixed-ratio                      C. Variable-ratio  
B. Fixed-interval                  D. Variable interval
2. In operant conditioning the presentation of aversive behaviour to decrease the probability of response is\_\_  
A. Negative reinforcement          C. Punishment  
B. Secondary reinforcement        D. Intermittent reinforcement
3. Petros often buys beautiful flowers for his wife because she no longer complains about his late arrival home. This can be an example of negative reinforcement because, \_\_\_\_  
A. Petros' wife is grateful to receive the flowers.    C. Petros was punished for coming late  
B. Petros often buys flowers                              D. Petros feels pleased with himself
4. Identify the wrong statement about learning.  
A. Results in a relatively enduring change in behaviour  
B. Can result from accidental conditions  
C. May not be directly observed.  
D. Can result from practice.
5. Learning is not affected by  
A. purpose                              C. Readiness  
B. Attention                             D. None of these
6. Identify the behaviour that is not regarded as a learned behaviour  
A. Riding a horse                      C. Fatigue  
B. Excitement                          D. A and C
7. Which of the following does not belong to the characteristics of learning?  
A. Learning is a purposeful experience  
B. Learning is both individual and social  
C. Learning affects the conduct of the students  
D. None of these.
8. The view that "learning is the result of observations, modelling and imitation is held by the \_\_\_\_\_ theory of learning.  
A. Cognitive                              C. Behaviour  
B. Social                                    D. Constructivist

9. In the classical conditioning experiment of Ivan Pavlov, the presentation of food represents a/an
- |                         |                           |
|-------------------------|---------------------------|
| A. Conditioned stimulus | C. Unconditioned response |
| B. Conditioned response | D. Unconditioned stimulus |
10. Some cancer patients develop taste aversion behaviour when a meal is followed by the chemotherapy they are taking. In this situation, the taste aversion behaviour develops because of \_\_
- |                           |                           |
|---------------------------|---------------------------|
| A. Operant conditioning   | C. Classical conditioning |
| B. Observational learning | D. Cognitive learning     |
11. One of the following learning theories assumes the occurrence of learning as a change in the way individual processes information in the mind.
- |                                    |                    |
|------------------------------------|--------------------|
| A. Behaviourist theory of learning | C. Social learning |
| B. Cognitive theory of learning    | D. None of these   |

**\*\* Answer question 12-15 based on the following ward case. Some patients in a certain pediatric ward experience a sense of fear (increased heart beat) whenever a shouting physician enters the ward. In this situation,**

12. The shouting behaviour of the doctor is \_\_\_\_
- |                         |                           |
|-------------------------|---------------------------|
| A. Conditioned stimulus | C. Unconditioned response |
| B. Conditioned response | D. Unconditioned stimulus |
13. The doctor is a/an
- |                         |                           |
|-------------------------|---------------------------|
| A. Conditioned response | C. Unconditioned stimulus |
| B. Conditioned stimulus | D. Unconditioned response |
14. The fear of patients (increased heart beat) is a /an
- |                           |                         |
|---------------------------|-------------------------|
| A. Unconditioned response | C. Conditioned response |
| B. Unconditioned stimulus | D. Conditioned stimulus |
15. Based on the above situation, extinction of the fear behaviour likely occurs
- |   |
|---|
| A. When the doctors increases frequency of visits to the ward |
| B. When the doctor is transferred to another ward             |
| C. When the doctor takes a two- month vacation                |
| D. B and C can be the answers.                                |

16. The process by means of which a teacher reinforces responses of students that come closer and closer to the correct response is \_\_\_\_
- A. Superstitious response
  - B. Shaping
  - C. Auto shaping
  - D. Serial learning
17. Which one of the following goes with the view of operant conditioning learning?
- A. Learned behaviour is the result of its consequence
  - B. Negative reinforcement and punishment weaken behaviour
  - C. Positive reinforcement weakens behaviour
  - D. A and B are correct
18. A schedule of reinforcement in which the number of responses required to produce a reinforcement changes unpredictably during operant conditioning learning is referred to as a
- A. Fixed-interval schedule
  - B. Variable-ration schedule
  - C. Variable interval schedule
  - D. Mixed schedule.
19. All employees in a flower plantation receive a salary at the end of every week. This is an example of \_\_\_\_
- A. Fixed-ration schedule
  - B. Variable-ration schedule
  - C. Fixed-interval schedule
  - D. Variable-interval schedule.
20. The “law of effect” was initially formulated by:-
- A. B.F. Skinner
  - B. Edward L. Thorndike
  - C. Ivan Pavlov
  - D. John B. Watson

**ANSWER SHEET FOR THE PRACTICE EXAM**

Jimma University  
College of Social Sciences and Law  
Department of Psychology, Practice exam for introduction to psychology  
Your university\_\_\_\_\_Department\_\_\_\_\_St.Number\_\_\_\_\_

**Instruction: Read each question and select the correct answer from the given alternatives.**

**Blacken the circle of your letter choice for the correct answer**

Question No	Alternatives				Question No	Alternatives			
	A	B	C	D		A	B	C	D
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	11	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	12	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	13	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	14	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	15	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	16	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	17	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	18	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	19	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	20	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

THANK YOU VERY MUCH!

**ANNEXURE 8**  
**CODING OF THE INTERVIEW DATA**

Interview question	Responses	Code (perception)
1. What are your personal perceptions of formative assessment?	<p>i have a <u>positive perception</u> towards fa even though it does not go with the introduction of course modularization practice because of <u>students characteristics (many slow students)</u> and <u>shortage of block course duration</u>. i am <u>trying to implement</u> it (with some hesitation) even though it <u>seems ineffective</u> with modularization and the blocking of courses</p> <p>my perception of fa is that using <u>some forms of assessment</u> (such as questioning, accidental quizzes, tests, examples and feedback) in the <u>middle of a lecture</u> with the aim of improving student learning and progress in a course.</p> <p>FA is a means to check students' <u>learning progress throughout the course of instruction</u>.</p> <p>FA is a very crucial process of <u>identifying weak &amp; strong</u> side of student learning in a lesson/course, which aims at improvement or progress of learning, and based on assessment results there can be possibility of giving remedial instruction to improve <u>student understanding and learning</u>.</p> <p>It is checking students' learning progress <u>frequently</u> with the intention of <u>diagnosis</u>, and after the assessment giving feedback and improving <u>teaching methods</u> may follow.</p> <p>According to my perception formative assessment, if implemented consistently, it is good for <u>giving student feedback</u> and encouraging <u>student participation</u> in learning. Moreover, it benefits students because of the <u>high retention</u> possibility of the learned content in lessons and the <u>step-by-step improvement</u> in their learning.</p>	<p><b>Code (perception)</b> positive perception towards fa of students characteristics (many slow students shortage of time even though it seems ineffective with modularisation using some forms of assessment middle of a lecture improving student learning and progress learning progress throughout the course of instruction. identifying weak &amp; strong improve student understanding and learning. checking students' learning progress frequently intention of diagnosis, improving teaching methods. giving student feedback student participation in learning high retention of content step-by-step improvement in learning.</p>
2. To what extent does quality formative assessment provide an opportunity for student learning improvement?	<p>It has a great implication for the improvement of learning.it <u>prepares both the teacher and students</u> to do something next in order to improve the learning and achievement of objectives.</p>	<p><b>Code (learning opportunity)</b> prepares both the teacher and students if accompanied by peer group assessment. practical implementation improves quality of education. * impeding factors shortage of time and material, class size.</p>
	<p>It is very important for the improvement of student learning if it accompanied by feedback provision and also <u>peer group assessment</u>.</p>	<p>Implementation is highly questionable.</p>

	<p>If <u>practically implemented</u> for sure it improves the teaching learning process, student understanding and performance, and <u>quality of education</u>. But due to impracticality due to many <u>impeding factors</u> such as .....</p> <p>It provides opportunity for student learning improvement but due to shortage of time and material, <u>class size</u>... its <u>implementation is highly questionable</u>.</p> <p>Quality formative assessment for students self-assessment, assess one another, <u>improves students learning skill</u>. Theoretically it has big contribution to strengthen <u>student-teacher relationship</u>. It helps to check learning progress. Timely indication for understanding of the subject matter. Moreover, the teacher checks the extent to which <u>learning objectives</u> are attained by students.</p>	<p>Improves students learning skill. contributes to strengthen student-teacher relationship Checks the extent to which learning objectives are attained</p>
	•	•
<p>3. Which one do you like to practice in your course? Formative or summative assessment? Why?</p>	<p>Despite the many impeding factors to implement formative assessment such as <u>workload, teaching multiple courses, large class size, resource limitations, lack of skill and preparation, and the lack of training</u>, the educator <u>preferred to practice</u> formative assessment for it has a <u>salient contribution</u> to the improvement of student learning in the course.</p>	<p><b>Code (barriers to implement)</b> workload, teaching multiple courses, large class size, resource limitations, lack of skill and preparation, and the lack of training, educator preferred to practice formative assessment salient contribution</p>
	<p>Both of them because FA is helpful for giving remedial instruction, to check students' progress in attaining the learning objectives and in knowing the levels of students. It also help the teacher and the students <u>how to proceed to next lessons</u>. In what way to teach them and <u>learn how to learn</u>. On the other hand the summative helps to check students' competence and attainment of course goals.</p>	<p>how to proceed to next lessons. what way to teach learn how to learn</p>
	<p>Both, FA to improve learning, it <u>benefits students to practice</u> and for high retention of the learned material. SA to ascertain the development of students' competence in the learned material.</p>	<p>benefits students to practice</p>
	<p>I use both of them. To know the progress of students I use FA mostly in a <u>non-graded form</u> such as question-answer, class activities, quizzes because they are <u>more supportive</u> to student learning improvement. To evaluate whether objectives have been achieved, I use SA such as graded tests, quizzes, assignments,</p>	<p>non-graded form more supportive</p>

	final exams.	
	Both, FA help to identify the <u>position of students in the learning series</u> and SA to give mark and grade students' performance.	position of students in the learning series.
	I prefer to use formative assessment because if conditions are fulfilled. For <u>immediate and timely interaction</u> ... you will see how progressing the students in the course are. FA <u>gives a greater opportunity for self-reflection &amp; interaction</u> with the students. SA is only for the next course (gives lesson).	For immediate and timely interaction opportunity for self-reflection & interaction
		<b>Code (skill training)</b>
4. have you ever been trained how to implement formative assessment?	<u>Not any formal training</u> . In the higher diploma programme emphasis is given to other instructional skills rather than assessment skills.	not any formal training other instructional skills yes, a little in hdp training as a topic in a course can know what it is but not how to implement
	Yes, a little in <u>HDP</u> training	
	Yes in HDP.	
	I learned about it as a topic in a course. I can <u>know what it is</u> but <u>not how to implement</u> (lack the skill)	
	Yes, in my undergraduate course as one topic	
	•	<b>Code (barriers to implement)</b>
5. In your opinion, what are the major barriers to implementing quality formative assessment in your courses?	Materials and <u>existing facilities</u> such as copy, print and the like are often lacking or <u>inadequate</u> in many instances.	materials and existing facilities lacking or inadequate
	Student <u>readiness</u> , less <u>participation</u> , resources (readings, books, reference materials and other facilities)	student readiness, less participation,
	Because it takes <u>time</u> against course content coverage, lack of <u>planning and preparation</u> , <u>resistance</u> from the student side (they consider it as an <u>extra workload</u> to them)... I myself train other educators but I have <u>difficulties to implement</u> myself (FA)	takes time against content coverage lack of planning and preparation, Students resistance consider it as an extra workload difficulties to implement
	There can be many barriers to mention such as <u>lack of skill</u> and knowledge, -ve attitude because the implementation of FA <u>requires much time and effort</u> , it <u>increases teacher's load</u> , the <u>size</u> of the students in a class is also a problem, students <u>lack of readiness &amp; language skill limitation</u> .	lack of skill and knowledge, negative attitude because increases teacher's load students' language skill limitation. large class size
	Class size, workload /how busy I am in <u>teaching multiple courses</u> (3-4 courses in a semester).	teaching multiple courses

	For reasons of heavy workload, <u>time pressure</u> for preparing, tendency to resist change, and the tendency to believe that the conventional practice or summative type of <u>assessment as right</u> .	time pressure for preparing summative as right.
6. How do the large class sizes and heavy workloads impede the implementation of formative assessment in your class?	In large classes, I <u>cannot identify the students'</u> level and learning progress. Understanding the students learning difficulties becomes difficult and problematic. <u>Group work (activity) is difficult</u> in large class. Difficult to assess as Planned b/s of too much workload. Moreover, the students' lack of preparation may create a problem to implement FA.	cannot identify the students' group work (activity) is difficult in large class.
	No problem of class size in the context of our university/not also that much workload	No problem of class size
	There is not series problem with respect to class size the problem is my perception to implement FA. In our case class size is manageable to implement FA.	<u>my perception</u> to implement no problem of class size
	Difficult to assess and give <u>individual feedback</u> to students. I cannot check each students progress in learning (I always <u>run to cover the content</u> of the course)	difficult to give individual feedback run to cover the content
7. Explain how you use formative assessment in your course.	I use question and answer in the middle of my lectures, accidental quiz, observation in group work, informed tests + mid-term exam, individual and group <u>assignment presentation</u> and <u>comment to presentations (individual or whole class feedback comment dependently)</u>	individual and group assignment presentation individual feedback & comment whole class feedback & comment
	By using question and answer method, class activities, home take activities, <u>reading assignment</u> for portions not covered in lecture time, <u>feedback after tests and quizzes</u> , whole class feedback after an assessment (test, mid-term exam) and also individual feedback	reading assignment feedback after tests and quizzes
	Sometimes I try to use by asking a <u>single question for discussion</u> , and also <u>non-graded quizzes and assignments</u> .	question for discussion non-graded quizzes and assignments.
	I use assignments (individual + group), question and answer, short-tests on weekly bases + discussion on the test results and feedback. <u>Establish forum for discussions... what it mean... debate... argument.. mostly non-marked and for the purpose of improving learning</u>	debate... argument.. non-marked and for the purpose of improving learning
8. What are the main problems you faced regarding the implementation of formative assessment?		<b>Code (barriers to implement)</b>
	Student readiness and preparation, <u>lack of learning skills (how to learn)</u> . Students' get easily confused. Their <u>learning capacity is limited</u> in my opinion. Teaching-learning environment may not promote (facilitate) for the implementation of FA. <u>Motivational factors</u> are also problems for instance <u>students are not challenging students</u> . Students' should	student readiness and preparation lack of learning skills easily confused learning capacity is limited motivational factors teaching-learning environment students are not challenging students

	motivate teachers by questioning and challenging the teacher but currently this is not the culture of learning.	
	Readiness and preparation of students. They are <u>not motivating and challenging</u> . Resources are limited no printer, copy.....	students not motivating and challenging
	Students are not ready for non-graded assessment tasks. They <u>fail to complete if the assessment task is non-graded</u> . Students are <u>passive</u> often times. They give attention to assessment task only if graded. The <u>university structure</u> also gives attention to graded ones. There is <u>little or no knowledge about FA</u> . The focus is on SA... the management leads to Summative assessment.	failure to complete non-graded assessment passive students university structure also gives attention to graded ones little or no knowledge about fa
	<u>Lack of Knowledge and skill</u> , class size, workload and shortage of time against covering the content of the course. <u>Sometimes -ve attitude</u> towards FA b/s it increases the workload.	lack of knowledge and skills negative attitude towards FA
	<u>No time to give feedback</u> b/s of large class size. I spend the time to finish course content. In this case, I do <u>not see the importance</u> of FA and giving feedback. <u>Student-teacher relationship</u> is also not in line with the principles of using FA, students are more grade oriented than learning oriented.	no time to give feedback large class size time to finish course content. i do not see the importance student-teacher relationship
9. What encouragement did you receive from the head of the department or other academic staff to implement formative assessment?	So far there is no any. However as announced by the quality assurance office of our university there will be <u>best teacher's award</u> coming soon for those who use innovative teaching and assessment methods in their courses including formative assessment.	no any best teacher's award innovative teaching and assessment formative assessment.
	<u>Almost nothing</u>	
	Almost nothing because it seems they <u>do not have enough knowledge and awareness</u> about formative assessment.... They only <u>focus on graded assessments</u> for example-summative continuous--- want to see timely reported grades to make supervision of the teaching learning process.	do not have enough knowledge and awareness focus on graded assessments want to see timely reported grades
	None at all. <u>Didn't recognize</u> it very well. No one makes follow up about it.	didn't recognise it very well. no follow up about it.
	No consideration on the essence of formative assessment. <u>No any reinforcement</u>	No consideration to formative assessment No any reinforcement
10. What are the students' reactions when you implement formative assessment in your teaching activity?	Some <u>believe it is beneficiary</u> for the improvement of their learning. Others <u>misunderstand</u> the value of FA--- they think it as <u>continuously adding up marks</u> to students or as a means/mechanism of <u>safeguarding</u> them from achieving failing grades.	believe it's beneficiary to improve learning Others misunderstand the value think as continuously adding up marks to students safeguarding from failing grades.
	They react as <u>tiresome of assessment practices</u> (frequent assessment) tide up for many	react as tiresome of assessment practices

	courses as all demand of course <u>continuous assessment</u> (not identified whether formative or summative)	continuous assessment
	Most of the time <u>students are found to be passive</u> . This also <u>demotivates teachers</u> to implement FA... and other innovative instructional techniques.	student passivity demotivates teachers
	In my perception students are <u>not willing to do non-graded</u> assessment tasks. They are also mostly passive, to make me not enforce myself to implement FA.	not willing to do non-graded assessment.
	Some students have <u>negative attitude</u> towards formative continuous assessment. They <u>often complain</u> saying we have another assessments to keep us busy.	negative attitude often complain saying busy
	When I implement formative assessment/with all the constraints/ try to let them believe in the advantages. When I <u>appreciate, encourage and give feedback they feel happy</u> . They understand the style of teaching... you see students <u>becoming interested</u> in the learning process... they <u>show positive reactions</u> and like the course.	let them believe in the advantages. appreciate, encourage and give feedback they feel happy understand the style of teaching becoming interested to learn show positive reactions like the course.
11. Sometimes educators may have positive perceptions about formative assessment and yet do not implement it in their teaching. What do you think are the reasons?	The main reasons may be <u>lack of motivation, lack of skill &amp; also training</u> in practicing FA. <u>Encouragement is missing</u> from the academic system awareness creation and increase is important.	lack of motivation lack of skill & also training in practicing fa encouragement is missing
	Because majority have <u>no clear understanding</u> about assessment. <u>Status quo oriented</u> . The orientation they have is about <u>marking or pass and fail</u> .	no clear understanding about assessment status quo oriented focus on marking or pass and fail.
	Because formative assessment <u>increases work load/burden</u> . It <u>takes time</u> to plan and prepare the lesson. Lack of <u>planning</u> ahead of time.	increases work load/burden takes time to plan and prepare lack of planning
	<u>Lack of training</u> on <u>how to implement</u> . <u>Lack of follow up</u> from department head. And also large class size is impeding the implementation of formative assessment.	lack of training on how to implement lack of follow up
	They <u>believe in the importance</u> and yet they may <u>lack the knowledge and skill</u> . They also <u>lack sufficient understanding</u> and what the tactics are. Moreover there is <u>not enough time to the cover contents</u> of the course; management and class size are also not encouraging to implement formative assessment.	believe in the importance lack the knowledge and skill lack sufficient understanding on what the tactics are. not enough time to the cover contents management not encouraging class size not encouraging
12. What do you recommend that will enable educators to implement formative assessment in their teaching?	<u>Motivating</u> teachers and students, professional <u>skills training</u> for teachers. T-L process in the globe is changing. Most teachers want to leave. There is an <u>absence of incentive</u> and staff drainage.	motivating teachers and students professional skill training absence of incentive and staff drainage.
	Continuous/formative assessment is very <u>good for the teaching learning process</u> . All teachers should apply for <u>quality of learning to occur</u> .	very good for the teaching learning process quality of learning to occur

	<p><u>Independent learning</u> improves <u>students' learning skills</u> and <u>self-confidence</u>. There seems a need to <u>increase the awareness</u> of teachers and students through orientation and short skill training.</p>	<p>Independent learning improves students' learning skills- and self-confidence need to increase the awareness of teachers and students orientation and short skill training.</p>
	<p>There is a need to <u>change the attitude</u> of educators and students. Providing training for teachers on <u>what and how to implement</u> formative assessment is essential for its effective implementation.</p>	<p>need to change the attitude of educators and students. providing training for teachers what and how to implement</p>
	<p>Provision of training on how to implement. <u>Lack of follow up</u> from department heads has to be improved. And also large class size is impeding the implementation of formative assessment; thus arranging <u>manageable class size</u> will contribute for the implementation of formative assessment.</p>	<p>provision of training on how to implement improve lack of follow up manageable class size</p>
	<p><u>Problems</u> affecting the implementation of formative assessment should be <u>resolved first</u>. Moreover there is a need on the part of <u>teachers to be committed</u> for the implementation of formative assessment. Their knowledge and skill should be upgraded. There is also a need to <u>orient students</u> about the benefits of formative assessment. <u>Mechanisms should be devised</u> on how to handle formative assessment.</p>	<p>problems should be resolved first teacher commitment upgrade knowledge and skill orient students about the benefits mechanisms on how to handle formative assessment.</p>
13. What other points would you like to add?	<p>The system should enhance the awareness of students towards FA, its purpose and benefits to the improvement of learning. Most students assigned/admitted to universities are underprepared, they lack motivation, they have low capacity to learn and they are not prepared to put an effort into their study “ they often say why should I bother myself, I will score C, the passing grade thanks for continuous assessment it will safeguard me from achieving a failing grade.</p>	<p>enhance the awareness of students purpose and benefits to the improvement of learning students underprepared lack motivation low capacity to learn not prepared to put effort</p>
	<p>The skills of <u>learning how to learn</u> are very important for the implementation of FA and student learning improvement. Both teachers and students should get training and the <u>1-5 peer learning and team teaching</u> has to be strengthened towards implementation of formative assessment. Short-term, periodic trainings for teachers will change the situation positively.</p>	<p>skills of learning how to learn are very important teachers and students should get training 1-5 peer learning has to be strengthened</p>
	<p>Blocking of courses brings a challenge to the implementation of formative assessment. Updating teachers' skills is important. The teaching method is <u>still lecture dominant</u>. FA is known and yet <u>not understood very well</u>. The perception of teachers towards FA and student-centred method of teaching is not that much positive.</p>	<p>blocking of courses is a challenge updating teachers' skills is important lecture dominant formative assessment is known and yet not understood very well perception of teachers not positive</p>

	Very important to <u>prepare standard guideline on how to implement</u> . Motivation and incentives for teachers and <u>follow up</u> whether formative assessment was implemented or not is important at initial stages.	prepare standard guideline on how to implement motivation and incentives for teachers follow up at initial stages.
--	---	--

## APPENDIX A



### Research Ethics Clearance Certificate

This is to certify that the application for ethical clearance submitted by

**F M Weldmeskel [45548388]**

for a D Ed study entitled

The use of quality formative assessment to improve student  
learning in Ethiopian Universities

has met the ethical requirements as specified by the University of South Africa  
College of Education Research Ethics Committee. This certificate is valid for two  
years from the date of issue.



Prof CS le Roux  
CEDU REC (Chairperson)  
[lrouxcs@unisa.ac.za](mailto:lrouxcs@unisa.ac.za)  
Reference number: 2013 MAY/45548388/CSLR

30 May 2013

## APPENDIX B



# JIMMA UNIVERSITY

ጅማ ዩኒቨርሲቲ

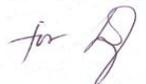
ቁጥር  
Ref.No 51270/526  
ቀን  
Date 28 NOV 2012

TO: Mizan – Tepi University  
Mizan  
Wolkite University  
Wolkite  
College of Social Sciences and Law  
College of Natural Sciences  
College of Business and Economics  
Jimma University

Subject: Request for Letter of Permission to Conduct Research

Fisseha Mikre, an academic staff in our university, is a PHD candidate at UNISA. He is by now working on a research project titled “The Use of Quality Formative Assessment to Improve Student Learning in Ethiopian Universities” Hence; He is looking for your collaboration. This is therefore to request your good office help him in writing letter of permission (*to whom it concern*) that allows him collect data for the research.

With Best Regards

*for*   
Taye Tolemariam (Ph D)  
V/P for Academic Research  
& Student affairs



Tel. +251-47 11 114 57 Fax: +2514711114 50 P.O.Box. 378 E-mail:ero@ju.edu.et  
PBX:+251471111458-60 +251471112040 JIMMA,ETHIOPIA website:http://www.ju.edu.

APPENDIX C

ሚዛን-ቴፒ ዩኒቨርሲቲ  
የመ/ማ/ም/ማ/ል/ምክትል ፕሬዝዳንት  
ጽ/ቤት



MIZAN-TEPI UNIVERSITY  
OFFICE OF L/T/R/C/D/S VICE  
PRESIDENT

ቁጥር Mtu 6618/59/2012  
Ref.No  
ቀን 10 Dec-2012  
Date

**To Whom it concern**

**Subject: Letter of Permission to Conduct Research**

Fisseha Mikre is a PhD student at the University of South Africa (UNISA). He is by now working on a research project titled “*The Use of Quality Formative Assessment to Improve Student Learning in Ethiopian Universities.*” In a letter referenced *JU 70/526*, dated on the *28<sup>th</sup> November 2012*, he presented a request for letter of permission to conduct research. Hence, he is looking for information from your department. This is therefore to request your good office to help him in providing the necessary information.

With Best Regards!

*Legesse Dadi (PhD)*  
For



☎ 0473360346  
☎ 047 8359006

መልስ ሲጻፉልን የእኛን ቁጥር ይጥቀሱ  
In replying, please quote our ref. no.

✉ 260  
Fax 0473360019

## APPENDIX D



# JIMMA UNIVERSITY

ጅማ ዩኒቨርሲቲ

ቁጥር  
Ref.No 49/13/12  
ቀን  
Date 8/4/12

**From:** College of Social Sciences and Law

**E-mail:** [dean.cssl@ju.edu.et](mailto:dean.cssl@ju.edu.et)

**Tel:** +251-0471122432

**Fax:** +251-0471122437

**Jimma University**

To whom it may concern

**Subject: Permission to Conduct Research**

Fisseha Mikre, a staff member of the Department of Psychology and PhD student at the University of South Africa, is working on a research project titled "The *Use of Quality Formative Assessment to Improve Student Learning in Ethiopian Universities*". Hence he is looking for information from your Department/School. This is, therefore, to request your cooperation in providing him with relevant information.

With best regards,

  
**Gashahun Lemesse**  
Dean, College of Social  
Science and Law



Tel. +251-47 11 114 57 Fax: +2514711114 50 P.O.Box. 378 E-mail: [ero@ju.edu.et](mailto:ero@ju.edu.et)  
PBX: +251471111458-60 +251471112040 JIMMA, ETHIOPIA website: <http://www.ju.edu.et>