THE EFFECTS OF USING RUBRICS ON THE LEARNING ACHIEVEMENT IN EDUCATIONAL ASSESSMENT AND EVALUATION OF STUDENTS IN BHUTANESE UNIVERSITY

BY

TSHERING

A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF EDUCATION
IN CURRICULUM AND INSTRUCTION
FACULTY OF EDUCATION

GRADUATE SCHOOL, RANGSIT UNIVERSITY
ACADEMIC YEAR 2017

Thesis entitled

THE EFFECTS OF USING RUBRICS ON THE LEARNING ACHIEVEMENT IN EDUCATIONAL ASSESSMENT AND EVALUATION OF STUDENTS IN BHUTANESE UNIVERSITY

by

TSHERING

was submitted in partial fulfillment of the requirements
for the degree of Master of Education in Curriculum and Instruction

Rangsit University
Academic Year 2017

Assoc. Prof. Sita Yiemkuntitavorn, PhD.
Examination Committee Chairperson

Nipaporn Chalermnirundorn, Ed.D.
Member

Asst. Prof. Somchanok Phu-ampai, Ed.D.
Member and Advisor

Approved by Graduate School

(Asst. Prof. Plt.Off. Vannee Sooksatra, D.Eng.)
Dean of Graduate School
November 6, 2017

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to Dr. Arthit Ourairat, the President of Rangsit University, Thailand International Cooperation Agency (TICA) and Samtse College of Education (SCE) for granting me this scholarship to study at Rangsit University, Thailand. I would also like to thank the Royal University of Bhutan (RUB) and Royal Civil Service Commission (RCSC) for approving my candidature for the scholarship.

I offer my heartfelt gratitude to my thesis advisor Asst. Prof. Dr. Somchanok Phu-ampai for her continuous support and guidance throughout my study. Without her help, motivation and guidance my thesis would not be possible. I am also extremely indebted to the thesis committee chairperson Assoc. Prof. Dr. Sita Yiemkuntitavorn and Dr. Nipaporn Chalermnirundorn for their valuable comments and suggestions.

I owe my thanks to Dr. Srisamorn Pumasa-ard, Rangsit University, Dr. Sonam Rinchen, Dean of Research and External Linkages, Samtse College of Education and Mr. Changa Dorji, IT Lecturer, Samtse College of Education for assessing the validity of my research instruments and for their valuable feedbacks. I am also grateful to President, faculty members and students of Samtse College of Education for their unwavering support throughout my study.

Lastly, I would like to thank my wife, son, mother, sisters and all my relatives for their moral support and encouragement.

Tshering

Researcher

5906955 : MAJOR: CURRICULLUM AND INSTRUCTION;
M.Ed. (CURRICULUM AND INSTRUCTION)
KEYWORDS : RUBRICS, LEARNING ACHIEVEMENT, OPINION, EDUCATIONAL ASSESSMENT AND EVALUATION.

TSHERING: THE EFFECTS OF USING RUBRICS ON THE LEARNING ACHIVEMENT IN EDUCATIONAL ASSESSMENT AND EVALUATION OF FIRST YEAR STUDENTS IN BHUTANESE UNIVERSITY.THESIS ADVISOR: ASST. PROF. SOMCHANOK PHU-AMPAI, Ed.D., 165 p.

The study was designed to examine the learning achievement and opinions of first year students towards rubric usage in Educational Assessment and Evaluation. A mixed method of quantitative research and qualitative research was used in this study. The study was an experimental research and used two groups pretest-posttest design. The study was conducted at one of the colleges under Royal University of Bhutan. Through cluster random sampling, 2 sections of students for the control group and the experimental group were selected out of 4 sections. Each section had 30 students. The students in the experimental group were taught using rubrics and the students in the control group were taught using a traditional method. Instruments such as achievement test, survey questionnaire and student reflective journal were used to collect data. The Item Objective Congruency index of all the instruments indicated that the items were valid. The Kuder-Richardson (KR-20) coefficient for the achievement test (0.802) and Cronbach's alpha (α) coefficient (0.889) for the questionnaire indicated that the instruments were reliable.

The quantitative data collected from the achievement test and questionnaire were analyzed and interpreted using inferential statistics t-test with $p<0.05$ level of significance, mean and standard deviation. The qualitative data collected from students' reflective journal were analyzed using coding system. The coding system included 3 level of analysis: open, axial, and selective coding.

Student's Signature.....Thesis Advisor's Signature.....

The findings of the study showed a significant difference in the posttest. The mean for the control group was 19.67 and 25.40 for the experimental group with mean difference of 5.73. This indicated that the learning achievement of the students in the experimental group was higher than the control group. The overall mean for survey questionnaire was 4.76 which showed that students in the experimental group exhibited positive opinions towards the rubric usage in Educational Assessment and Evaluation. The analysis of students reflective journal revealed that rubrics: 1) encouraged independent learning among students 2) informed teacher expectations to students 3) provided consistent and objective assessment 4) provided guidance while students were learning 5) helped in the goal setting and planning in Educational Assessment and Evaluation 6) provided feedback 7) motivated them to learn 8) encouraged self-assessment and peer assessment 9) reduced anxiety : all of which may directly or indirectly enhance student's academic performance. The result of the study showed that rubrics enhanced students' learning achievement and students had positive opinions towards rubric usage in Educational Assessment and Evaluation.

Student's Signature.....Thesis Advisor's Signature.....

CONTENTS

CONTENTS (CONT.)

CONTENTS (CONT.)

LIST OF TABLES

Page

Table

LIST OF FIGURES

Page

Figure

ABBREVIATIONS

Abbreviation	Meaning
RUB	Royal University of Bhutan
TICA	Thailand International Cooperation Agency
SRL	Self-Regulated Learning
B.Ed.	Bachelor of Education
SCE	Samtse College of Education
RCSC	Royal Civil Service Commission
SD	Standard Deviation

CHAPTER 1

INTRODUCTION

This chapter describes rationale of the study, objectives of the study, research questions, research hypothesis, scope of the study, limitation of the study, operational definitions, and the expected outcome of the study.

1.1 BACKGROUND AND RATIONALE OF THE STUDY

Nowadays, higher education began to shift from an emphasis on the traditional paradigm of testing knowledge and teacher centered learning to a paradigm characterized by active, students centered learning and thoughtful deliberative assessment (Howell, 2011). However, in many countries around the world traditional teaching and traditional mode of assessment is still practiced in spite of the emerging model of authentic formative assessment for learning. Bhutan, a small Himalayan country is one such country where traditional teaching and traditional mode of assessment are still dominant in the Education System (Sherab, 2009). Educational Assessment and Evaluation module is one such example where traditional approach is commonly used by teachers to impart the knowledge to students. Educational Assessment and Evaluation is an important module offered in the Bhutanese education colleges. It is all about the assessment of child and effective learning.

Teachers used teacher-centered teaching approach which neither facilitate nor empower a learner's autonomous study-skills and subsequently retard lifelong learning skills (Trilling & Fadel, 2009). Teachers often used Lecture method which is a conventional teaching method that involves, primarily, an oral presentation given by teacher to a body of students and its biased and one way street. Teachers simply dictate information to students, who has little or no opportunity to provide their own personal

input, or protest the information being delivered. Whether teacher is right or wrong, the student just has to sit down and take it. They do not get enough opportunities to engage actively in the learning process and have less experience in learning by themselves. They rely on teachers to decide what, when and how to learn. As a result learner does not outgrow his dependency on teachers.

Majority of Bhutanese students attain a great deal of knowledge through repeating after teachers and through memorizing. Students had been conditioned to learn by this method and demanded that they were taught in this manner. Many times they ended by learning the material through route memorization without asking why or seeing the big picture which resulted in poor achievements in Educational Assessment and Evaluation tests (Giri et al., 2016). Once the certain topic was memorized and tested, students tend to forget the subject matter making teaching centered teaching unreliable for degrees where the graduates are expected to have a full understanding of what they learned. Students also lack initiative and problem-solving skills because they have not been trained to search for data by themselves. Continuing to spoon-feeding students in higher education perpetuated the issue of stifling their creative thinking and independent learning (Samah, Jusoff, & Silong, 2009).

The study conducted by Rabgay (2014) found that 75.71% of time was used for lecturing in the Bhutanese classroom. His finding also revealed that teacher talk (85.23%) was much more than student talk time (11.38%) which indicated that classroom interaction was dominated by teacher and the approach was teacher-centered in almost all the subjects. Similarly Giri et al. (2016) also found that teaching was very much syllabus driven and teacher centered in Bhutan. This seems to be in contrast to the way the teacher themselves would prefer to teach. When asked, teacher committed themselves to student-centered but in the interview traditional strictness was a much debated issues especially among students and parents.

According to the Wheel of the Academic Law of Royal University of Bhutan (2015) under the Assessment Regulation 3.4. All assessed work should have associated marking criteria and marking scheme (authentic assessment tool). These guides to

marking should be developed simultaneously with assessment instruments and, where practicable, be approved by the external examiner. Sharing of agreed marking criteria with students is a required feature of good practice. All feedback given to students should be related to the agreed marking criteria. This indicates that teachers should use rubrics in teaching and learning.

However Utha (2015) found out that the assessment at any level in the country takes place through questioning, class test, homework, project work and examination. Bhutanese teachers developed a tendency of using written objective tests such as multiple choice items, matching, and alternative form. And they hardly use authentic assessment tool like rubric in teaching and learning. Even though they use, they generally keep assessment criteria to themselves without articulating what counts when they give grades, creating inconsistent assessment of student performance across the module. Rubrics are used only for assessment purposes. More over all the types of assessments are carried out as summative assessment and not formative evaluation and they rarely address qualitative issues of learner's progress. As a result meaningful assessment and evaluation of students which serve as two purposes (learning approach and assessment tool) is considered as a demanding task, fraught with indecision and frustrations (Renjit, Geroge, Renu, & Souza, 2015).

According to McMillan (2013) the scoring rubrics has emerged as formative assessment model for teaching and learning. The shift from summative assessment to formative assessment has taken place and rubrics is one of the tool to assist student as they engage in the self-regulated learning process. Self-regulated assessment is a student driven process in which a student reflects on the attributes of his or her own work, analyze how well his or her work meets the stipulated criteria, and revises to better meet the criteria. In a student-centered approach, the rubrics could be shared with the students in order to support student learning (Jonsson, 2014; Jonsson & Svingby, 2007). Research had also indicated that such modelling techniques have assisted poor students improve content, develop and voice their writing. So teaching using rubrics would be an alternative approach or method to the existing traditional mode of teaching and assessment in Bhutanese university.

Reddy and Andrade (2010) found out that rubrics aren't just for grading. They can be used as teaching tools as well. When used by teacher as a part of formative assessment, they can help students understand both the holistic nature and /or specific analytics of learning expected, level of learning expected, and then make decision about the current level of learning to inform revision and improvement. The rubric is increasingly gaining recognition as a valuable tool in teaching and learning in higher education (Bharuthram, 2015). Empirical evidences in rubrics studies show that using rubrics can make both learning and assessment reliable (Jeong, 2015). Used widely in the USA at school level, they are increasingly being accepted in higher education as well. That's why Reddy and Andrade (2010) recommended that research on the relationships between rubrics and self-regulatory behavior in students in higher education would be illuminating. Similarly, the use of rubrics as formative evaluation tool or teaching tool, oriented toward learning and the acquisition of competences (Andrade, Du, & Mycek, 2010; Martínez-Figueira, Tellado-González, & Raposo-Rivas, 2013; Torres & Perera, 2010), is spreading in universities along with learning-centered teaching models, largely promoted by the European Higher Education Area.

Using rubrics as an instructional approach facilitate or empower learner autonomous study-skills which lead to lifelong learning. The learner centered approach using rubrics encourages independent learning where learners are responsible for their own learning. This can be other skills for the survival in 21st century where knowledge is abundant. The approach can further enhance learning by doing, critical thinking, analyzing power and organization. Rubrics improve the students' quality of work through self-assessment and feedbacks. Rubrics also guide, monitor, facilitate and scaffold students while they are learning.

Based on the aforementioned advantages that rubrics provided to the learners, this strategy has been regarded as most demanding and appropriate method for teaching Educational Assessment and Evaluation concepts in Bhutanese university. Since not many studies were conducted using rubrics in learning especially in Bhutan, this study was designed to examine learning achievement in Educational Assessment and

Evaluation of first year students using rubrics and to investigate their opinions towards rubric usage.

1.2 RESEARCH OBJECTIVES

1.2.1 To examine the learning achievement in Educational Assessment and Evaluation of first year students using rubrics and traditional method.

1.2.2 To investigate the opinions of students towards rubric usage in Educational Assessment and Evaluation.

1.3 RESEARCH QUESTIONS

1.3.1 What are the effects of using rubrics on the learning achievement in Educational Assessment and Evaluation of first year students in Bhutanese University?

1.3.2 What are the opinions of students towards rubric usage in Educational Assessment and Evaluation?

1.4 RESEARCH HYPOTHESIS

1.4.1 The learning achievement in Educational Assessment and Evaluation of first year students who are taught using rubrics will be higher than students who are taught using a traditional method.

1.5 SCOPE OF THE STUDY

1.5.1 Location of the study

The study was carried out in one of the colleges under Royal University of Bhutan. It is located in the Southern part of Bhutan and it is a semi-urban area.

1.5.2 Population and sample

Population**:** The population of the study comprised of 120 students from 4 sections of first year students in one of colleges under Royal University of Bhutan. The age range was from 18-20 years old. Students were selected for the course based on the merit rating of their grade 12 marks. Therefore all first year students in 4 sections had equal competency in the module.

Sample: The cluster random sampling was used to select 60 students from 2 sections out of 4 sections of first year students. One section was used as an experimental group and the other one as a control group. Each section consisted 30 students.

1.5.3 Content of the study

The content taught to the students in the study is shown in Table 1.1. Unit 2 "*Assessment, testing strategies and item analysis*" was selected form Educational Assessment and Evaluation course book of first year students. Four lesson plans using rubrics were prepared for an experimental group according to the topics and another 4 lesson plans using traditional method were prepared for a control group.

Table 1.1 Content of the study

Lesson Plans	Topics
Lesson plan 1	Introduction to rubrics and assessment
Lesson plan 2	Formative Assessment and Summative Assessment
Lesson plan 3	Testing Strategies and their types
Lesson plan 4	Item analysis

Rubrics were used in lesson plans 2, 3 and 4 of the experimental group.

1.5.4 Time Frame

The study was conducted during term-I for 4 weeks, in between May and June in academic year 2017. One lesson plan lasting one and half hour each was taught twice a week for both the experimental group and the control group.

1.5.5 Variables

In this study there are two variables; independent and dependent.

The independent variables are instructional approach rubrics and a traditional teaching method.

The dependent variables are learning achievement and student's opinions towards rubric usage.

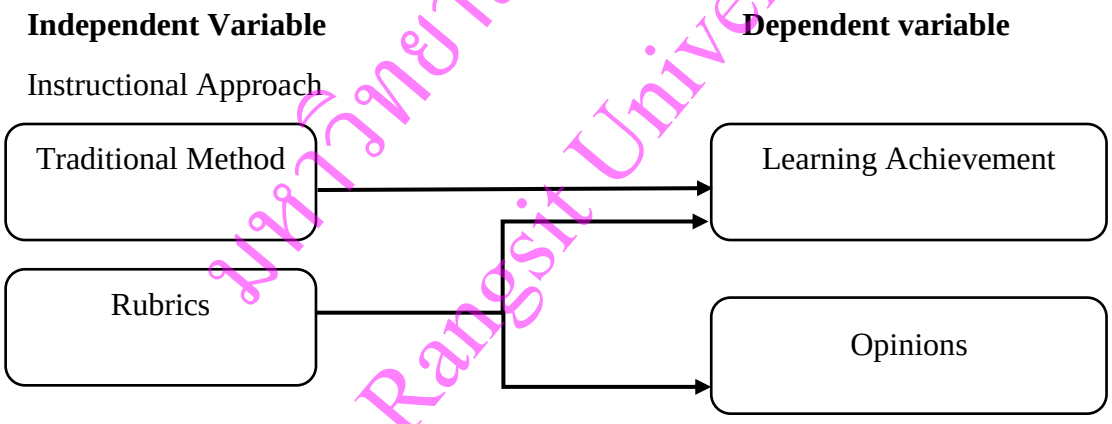


Figure 1.1 Independent and dependent variables.

1.6 LIMITATIONS OF THE STUDY

1.6.1 The study was carried out with only two sections of first year students in a college under Royal University of Bhutan. Therefore the results or findings of the study cannot be generalized with the performance of all first year students in the Bhutan.

1.6.2 The content of the study was limited to only one unit of Educational Assessment and Evaluation module of first year students. Thus the results of this study cannot be generalized to the contents of other subjects or modules.

1.7 OPERATIONAL DEFINITIONS

Rubrics refers to coherent set of criteria for students' work that includes descriptions of levels of performance quality on the criteria. It is used by students as guidelines to work towards teacher's expectation and as tool to construct knowledge. It is used by teacher to guide the students' learning and provide immediate feedback. Students will also use it as self-assessment tool. It is leaner-centered approach where students have to learn Educational Assessment and Evaluation concepts using rubrics. Rubrics will guide the students step by step to the expected learning outcomes. All the resources like the Internet, textbooks, journals, etc were provided to students.

Effects refers to the change bought by using rubrics on student's learning achievement in Educational Assessment and Evaluation and student's opinions towards rubric usage.

Learning achievement refers to students' scores in the achievement tests. It is the learning achievement of the students who were taught using rubrics and a traditional method.

Traditional method of teaching refers to teaching Educational Assessment and Evaluation concepts through lecture method using text, power point presentation and board to students in the control group.

Opinions refers to student's views on the rubric usage in Educational Assessment and Evaluation.

Educational Assessment and Evaluation refers to an educational module offered to first year students studying Bachelor of Education (B.Ed.) in Bhutan.

Students refers to first year students studying Educational Assessment and Evaluation module in one of the colleges under Royal University of Bhutan.

1.8 EXPECTED OUTCOMES OF THE STUDY

1.8.1 The study will tell the difference between students learning achievement in Educational Assessment and Evaluation using rubrics and a traditional method.

1.8.2 The study will show that rubric usage will produce an impact on the students' opinions.

1.8.3 The study would encourage teachers in Bhutan to use rubrics in teaching and learning.

CHAPTER 2

LITERATURE REVIEW

This chapter presents the review of the literature on rubrics, Educational Assessment and Evaluation, traditional teaching method, assessment for learning and reflective journal. The chapter also discusses some of the related learning theories and research.

2.1 RUBRICS

2.1.1 Definition of Rubrics

A rubric is a scoring tool that explicitly represent the performance expectation for an assignment or a piece of work. A rubric divides the assigned work into component parts and provides clear description of characteristics of work associated with each component, at varying levels of mastery. Wolf and steven (2007) define rubrics as a scoring tool used to evaluate a performance in a given outcome area based on a list of criteria describing the characteristics of products or performances at varying levels of accomplishment. According to Renjit et al. (2015), the word rubric came from the Latin word “Rubber”, which means “Red“. During the medieval period, rubric was a set of instructions attached to the law and was written in red. Thus rubric referred to something that was used to authoritatively guide people.

Rubrics are regarded as a descriptive scoring instructional tool and an effective and versatile assessment tool for knowledge acquisition and the development of professional skills (Eshun & Osei-Poku, 2013). Bodo and Hall (n.d) defined rubric as matrix that describes the specific criteria for assignment and performance expectation of each criteria. Rochford and Borchert (2011) also define a rubrics as a scoring tool, a

method of identifying the criteria for evaluating a piece of work. According to Panadero and Romero (2014), rubrics are assessment tool that articulates specific expectations for assignments by listing the criteria for what is particularly important and by describing levels of quality on a scale from excellent to poor.

Rubrics refers to coherent set of criteria for students' work that includes descriptions of levels of performance quality on the criteria. It is used by students as guidelines to work towards teacher's expectation and as tool to construct knowledge. It is used by teacher to guide the students' learning and provide immediate feedback. Students will also use it as self-assessment tool. It is leaner-centered approach where students have to learn Educational Assessment and Evaluation concepts using rubrics. Rubrics will guide the students step by step to the expected learning outcomes.

2.1.2 Components of Rubrics

Dikli (2015) listed four essential components of rubrics. They are task description, scale of achievement, dimensions and description of dimensions. The component of rubrics are further classified as performance element, category scale and descriptor of criteria used for classifying work or assigning points of an element. The performance elements describe the major attributes of the work that will contribute to the overall evaluation. The category scale describes the method used to assign work to global categories or to assign points for the performance element and the descriptors of the criteria used for classifying work or assigning points for an element. Rubrics describes the characteristics of the performance or work that must be present for the work to be assigned to a given level of achievement

According to Stevens and Levi (2013), rubrics contain four essential features namely:

1) A task description or a descriptive title of the task students are expected to produce or perform. The task description is almost always originally framed by the instructor and involves a 'performance' of some sort by the student.

2) A scale (and scoring) that describes the level of achievement (e.g., exceed expectation, meets expectation, and doesn't meet expectation). The scale describes how well or how poorly any given task been performed and occupies yet another side of the grid to complete the rubric's evaluative goal.

3) components/dimensions/criteria are for the completing the assignment/tasks (e.g., types of skills, knowledge, etc.). Dimensions should actually represent the type of components skills students must combine in a successful scholarly work, such as the need for a firm grasp of content, technique, citation, examples, analysis and a use of language appropriate to the occasion.

4) Description of the performance quality (performance descriptor) of the components/dimensions at each level of mastery.

Stevens and Levi (2013) also listed following four key stages in constructing a rubrics. They are reflection. Listing, grouping and leveling, and application. In reflection, we have to reflect on what we want from students and what our expectation is. In listing, we focus on the particular details of the task and what specific objective we hope to see in the completed task. In grouping and labeling, we organize the result of our reflection done in reflection and listing. The grouping of similar expectations will become rubric dimensions. Lastly in application stage, we apply the dimensions and descriptions to the final form of the rubric the grid formats.

2.1.3 Types of Rubrics

The rubrics are of following types:

2.1.3.1 Analytical and holistic rubrics

According to Ayhan and Ugur (2015), there are two types of rubrics namely analytical rubric and holistic rubric. Holistic rubric requires a rater to make a single and overall judgement regarding the quality of the response where as an analytical rubric is used if the assessment provide unique information on more than one feature of the response. The features of scoring rubrics that allow for accurate assignment of scores

include (1) consistency with the interferences to be made, (2) clear description of the performance criteria, (3) criteria that reflect the range of intended response, and (4) alignment with learning.

Holistic rubrics do not provide detailed and diagnostic feedback of strengths and weaknesses of product/performance. Analytical rubrics have a part-to-part, criterion-to-criterion judgement approach which makes the multidimensional assessment possible. Development of rubrics, holistic or analytical, can be for each individual task/event/assignment separately, i.e. task specific, or could be for use across similar task/events/performance i.e. generic (Reddy, 2007). Holistic rubrics is usually used for large-scale assessment because it is assumed to be easy, cheap, and accurate. Whereas analytical rubrics is useful in the classroom since the result can help teachers and students identify students' strengths and learning needs. (Jonsson & Syvingby, 2007).

Analytic rubrics help both learner and measurer identify strengths and areas for improvement. A holistic rubric requires the measurer to score the overall process or product as a whole, without judging the component parts separately. Holistic rubrics are quick to use and provide the measurer with a snapshot of the performance at hand. One limitation of use includes the inability to provide detailed and specific feedback of the performance (Bargainnie, n.d).

2.1.3.2 Generic rubrics and specific rubrics

Renjit et al. (2015) mentioned another two types of rubrics i.e. generic and specific rubrics on existing holistic and analytical rubrics. As name suggests generic rubrics can be used to evaluate a range of task. These generic rubrics contains criteria which are general across tasks. The generic rubric fails to provide specific feedbacks. Generic rubrics can be utilized in assessment of general skills and products. Task specific rubrics are unique to a specific task. It is a means to more reliable of assessment of performance. Specific rubrics can be used while assessing specific knowledge and institution which demands high consistency in scoring. The greatest disadvantage of

specific rubric is that it becomes tedious to construct rubrics for all the task. A generic rubrics is used to assess or evaluate a process across disciplines, where as a task-specific rubrics is applicable only for a specific, defined task (Bargainnie, n.d).

2.1.3.3 Hybrid rubrics

Pierce (2015) described another types of rubrics that is 'Hybrid rubrics'. The hybrid rubric combine the features of both general and task-specific rubrics to provide feedback on broad dimensions of learning as well as on the performance of specific task. Hybrid rubrics that combine features of generic rubrics and task specific rubrics are very useful in classroom assessment because they provide feedbacks to learners on the broad dimension of language production along with their performance on the particular competencies and knowledge targeted by a specific task within a specific unit of instruction.

2.1.4 Advantages of Rubrics

There are several benefits of using rubrics stated in the literature. One widely cited effect of rubric use is the increased consistency of judgement when assessing performance and authentic task. Rubrics are assumed to enhance the consistency of scoring across students, assignments, as well as between different raters. Another frequently mentioned positive effect is the possibility to provide valid judgement of performance assessment that cannot be achieved by means of conventional written tests. Another important effect of rubric use often heard in the common debate, is the promotion of learning. It is assumed that the explicitness of criteria and standards are fundamental in providing the students with quality feedback (Jonsson & Syvingby, 2007).

Rubrics helps to define quality performance and promote awareness on critical components in a performance. Rubrics not only act as an evaluation tool for instructors, but also act as a feedback pro forma for students. Rubrics are vital tools that can be utilized to solve the problem of subjectivity in evaluation. Rubrics provide consistency

in evaluation, reduces subjectivity and enhances objectivity (Mervat & Hanan, 2015; Renjit et al., 2015).

According to Kinne, Hasenbank, and Coffey (2014), there were some evidences that students invest more metacognitive effort such as evaluating their own work and earn higher grades when provided with the rubric. Rubrics can be used for self-evaluation of students. Candidates who engage in self-evaluation change their focus from 'what is my score?' to 'what did I do well and how could I do better?' thereby shifting the focus of evaluation from an implied norm-referenced focus to an explicit criterion-referenced focus.

Rubrics offer several advantages:

1) Rubrics improve students' performance by clearly showing the students how their work will be evaluated and what is expected.

2) Rubrics promote students' awareness about the criteria to use in assessing peer performance.

3) Rubrics provide students with informative feedback about their strengths and weaknesses.

4) Students report rubrics help them with learning and achievement. Students can use rubrics to focus their efforts and self-assess their own work prior to submission (Stuyniski, 2015).

5) Rubrics allow the assessment to be more objective and consistent

6) Rubrics provide useful feedbacks to the teacher regarding the effectiveness of instruction

7) Rubrics help students become better judges of the quality of their work

8) Rubrics force the teacher to clarify his/her criteria in a specific time

9) Rubrics reduce the amount of time teacher spend evaluating student work.

10) The use of rubric would enhance the other aspects student's learning such as motivation, self-efficacy and self-regulation of learning.

11) Rubrics were used by students as guidelines to work towards teacher's expectation and they even used as tool to construct knowledge (Reddy, 2007).

12) Rubrics can be used by department to evaluate overall programmatic outcomes and come to consensus on course requirements where there are multiple instructors teaching different sections (Bodo & Hall, n.d).

13) Providing clear, well-defined rubrics (scoring criteria) helps the students to plan, strategize, and maneuver their work towards successfully meeting the prescribed criteria, and come up with excellent work or performance (Dikli, 2015).

2.1.5 Limitations of Rubrics

Despite the potential benefits of the adoption of assessment rubrics, their use cannot escape certain criticisms and limitations. Gullo (2005) argues that rubrics are too general and difficult to use effectively. However Egodawatte (2010) agrees, contending that training and guidance on the use of rubrics will help reduce the discrepancies, intrinsically motivate students to use them for learning. Mertler (2001) found out that exclusive use of rubrics has also been characterized by the challenging of converting rubrics scores to grades to meet assessment needs. They risk turning of the role of the teacher into that of grader, leaving less room for teacher to be an authentic reader of students work (Bull, 2014). Rubrics sometime leave less room for creative and imaginative approaches to papers and projects. Without care, rubrics can place more emphasis upon the technical aspect of student work, missing deeper and more difficult to articulate aspects of students' ideas (Bull, 2014). Rohrbach (2010) reported that some educators and students lack the enthusiasm for use of rubric in learning and assessment.

2.1.6 Instructional Rubrics

The six ways to use rubrics in our teaching are 'student as teachers, self-assessment, peer feedback, work-in-progress feedback, a rubric for review and collaborative rubrics'. If students have a long assignment or project, use a rubric to give them feedback on their work-to-date. This keeps them on track especially for large projects. Building a rubric together in class is a way to facilitate students learning (Palmer,n.d). The instructional rubrics help teacher teach as well as evaluate students work. Further creating rubrics with your students can be powerfully instructive. The

instructional rubrics provides students with more feedback about their strengths and areas in need of improvement than traditional forms of assessment do (Andrade, 2000).

According to Turgut and Kayaoglu (2015), the ultimate goal of using rubrics as an instructional tool is to empower students by awakening sense of appreciation for what makes good writing or effective learning. Students are, in turn, expected to be able to develop their own learning skills in the long run. Gezie, Khaja, Chnag, Adamek, and Johnsen (2012) found out that rubrics communicated the instructors' expectations, clarified how to write course assignment, explained grade and point deduction, and, in general, made course expectations clear. If carefully developed, rubrics will be a useful tool for advancing students' learning.

According to Uddin (2014), rubrics are used by teachers to grade student work but many authors argue that they can serve more important roles as well. When used by students as part of a formative assessment of their work in progress, rubrics can teach as well as evaluate. Used as part of a student centered approach to assessment, rubrics has potential to help students understand the targets for their learning and make dependable judgement about their work that can inform revision and improvement.

According to Barot (2016) rubrics offer a chance for necessary skilled discussions after they remarked in erudite communication. Rubrics will assist you teach and they keep you targeted on what you propose to assess. They allow you to prepare your thoughts. They will offer a scaffold with that the scholars can learn. Non-scoring rubrics will encourage students to self-assess their performance. Apart from being considered as an effective tool for measuring, evaluating and reporting students' student achievement, rubrics are also designed to guide students' learning, teacher's instruction, course development and administrators' program observations (Reddy, 2007).

Al-Jarf (2011) mentioned that instructional rubrics also enhanced class engagement behaviors of students. Instructional rubrics are easy to use and explain, communicate instructor expectations clearly, provide students with constructive feedback, and support learning, skill development, understanding, and good thinking.

Rubrics can be designed to formulate standards for levels of accomplishment and can be used to guide and improve performance. They can be used to make these standards clear and explicit to students. Using instructional rubrics promotes student learning and improves the quality of teaching. With the rubric as a guide, students learn to monitor their own progress and make improvements in a timely manner (Yoshina & Harada, 2007).Rubrics guide students in their work and assist teachers with grading. They help students to evaluate the quality of their work as they progress through a class.

Turgut and Kayaoglu (2015) concludes that together with increasing awareness of the importance of giving feedback and involving students in the assessment process, rubrics have changed from being simply an assessment tool to being a potential instructional tool. Rubrics coordinates instruction and assessment. Students are given rubrics at the beginning of the unit of instruction or an episode of work. They tackle the work, receive feedback, practice, revise or do another task, continue to practice, and ultimately receive the grade. Rubrics help students to learn. The criteria and performance-level descriptions in rubrics help students understand what the desired performance is and what it looks like. Effective rubrics show students how they will know to what extend their performance passes muster of on each criterion of importance, and if used formatively can also guide students what their next steps should be enhance the quality of their performance (Brookhart, 2013).

2.2 EDUCATIONAL ASSESSMENT AND EVALUATION

Educational Assessment and Evaluation is an educational module offered in Bhutanese education colleges. It is all about the assessment of child and effective learning. This module familiarizes the student teachers with the concept of assessment and evaluation. They will use both formative and summative assessment in teaching and learning process. It further aims to provide opportunity for the students to become effective assessors and improve the teaching through feedback mechanism. It discusses a range of assessment techniques and tools available, develop, use, and analyze them and ultimately aspire to develop them professionally (RUB, 2010).

2.2.1 Learning outcomes

On completion of the module, the learner should be able to: 1) define and distinguish the terms assessment for/as/and of leaning, and evaluation; 2) list the purposes of assessment; 3) discuss about ways of making assessment educational and fair; 4) discuss the professional responsibility of a teacher in assessment; 5) compare and discuss different types and techniques of assessment; 6) discuss about the background and ways of carrying assessment for learning; 7) describe the characteristics of good test; 8) plan and construct a good test; 8) use Bloom's taxonomy of thinking in preparation of table of specification; 9) prepare marking scheme for various techniques of evaluation; 10) discuss about the benefits of the moderation procedure; 11) differentiate and use various types of testing strategies; 12) understand item analysis with respect to difficulty index, discrimination power and pattern of responses; 13) analyze score tests, interpret the data and standardize the marks; 14) use test results to grade and report the student achievement and 15) use effective ways of giving feedback for the improvement (RUB, 2010).

2.3 TRADITIONAL TEACHING METHOD

Casson (2009) defined traditional teaching as type of teaching which made teacher an active knowledge giver through lecturer method while student become passive listener in the classroom. Traditional teaching method is merely a teacher centered and focus on rote learning and memorization. The main role of teacher and students in the traditional classroom are knowledge giver and knowledge receiver. The text books are considered as the main sources of knowledge and information (Wangmo, 2014). Students lack the plat-form to showcase their own creativity and talents. Novak (2008) stated that traditional teaching is concerned with the teacher being the main controller of the learning environment. Power and responsibility are held by the teacher.

Nazzal (2014) describes traditional method of teaching as formal and teacher centered method. Teacher provides necessary instruction and it is limited to question answer and students memory power. Students are regarded as 'knowledge holes' that

need to be filled with information. All the activities are limited within the classroom and students lack the opportunities to explore beyond classroom. Students are active knowledge receiver. Students learn through listening and observations. The instructions are based on textbooks, lectures, and individual assignments. Teacher is considered as respected role model in community and students have to respect them.

Dikli (2015) defined tradition assessment as a conventional methods of testing, usually standardized and use of pen and paper with multiple-choice, true or false or matching types of test items. The grades in the traditional assessment were used to judge student's abilities. The main propose of the traditional assessment is to ascribe grade for them, to rank and compare them against the standard or other leaners. The traditional assessment failed to take into account students' growth, and inhibit their progress. Traditional assessment does not involve discussions, class projects, and other programs designed to show materials to students and impart knowledge that teacher can observe and measure. Educators try to accurately summarize student's achievement with simple grades and a few words of condensed commentary (Franklin, 2002).

2.4 ASSESSMENT FOR LEARNING

Assessment for learning practices involve students actively in the assessment process. This is made possible by teachers sharing assessment for learning strategies with students (e.g., clarifying learning goals and success criteria or rubric and giving descriptive feedback to their peers) so that students themselves can engage with similar assessment for learning practices to help themselves and their peers with self-regulated, self-monitoring, and autonomous learning (Lee, 2017). Assessment for learning therefore puts students at the center of learning. It involves the active engagement of students in setting goals for their learning and growth, monitoring their progress toward these goals, and determining how to address any gaps (Andrade et al., 2010). Such student-centered classroom assessment is referred to as "assessment for learning" (Lee, 2017).

Assessment for learning is the idea that classroom assessments should support ongoing teaching and learning (Heritage, 2010), thus highlighting the vital role that teacher-made classroom-based formative and process-focused assessments could play in improving the entire education system. Teachers have always evaluated student knowledge through recall test, or by asking content questions during a lecture, but researchers and practitioners are beginning to understand that a different type of teacher developed assessments can play an important role in supporting learning (Price, Pierson, & Light, 2011) and in helping to transform teaching practice. Rubrics are considered inclusive assessment tools that can be used as class-wide assessment tools to help students at all levels make meaningful progress towards curricular goals (Lee, E., & Lee, S., 2009). One of the major strengths of the rubric as an assessment method is that it functions as a teaching as well as an evaluative tool (Andrade, Ying, & Xiaolei, 2008).

The development of high quality evaluation criteria is essential to the effectiveness of a rubric as both an instructional and assessment tool. Together, all of the research cited here strongly suggests that the assessment tools and strategies can positively impact a number of key areas that we know are important aspects of education reform: student/teacher relationships, teacher's ability to personalize instruction, acquisition of 21st century skills, student engagement and student metacognition. These practices are becoming more common in developed countries, but there is still little research on how to adapt these approaches to the school contexts of many emerging market countries (Price et al., 2011).

One of the keys to successful learning is the aligned curriculum (Biggs, 2003): this means that learning outcomes are clear and learning experiences are designed to help student achievement of those outcomes, and carefully designed assessment tasks allow students to demonstrate achievement of those outcomes. This concept is illustrated in Figure below:

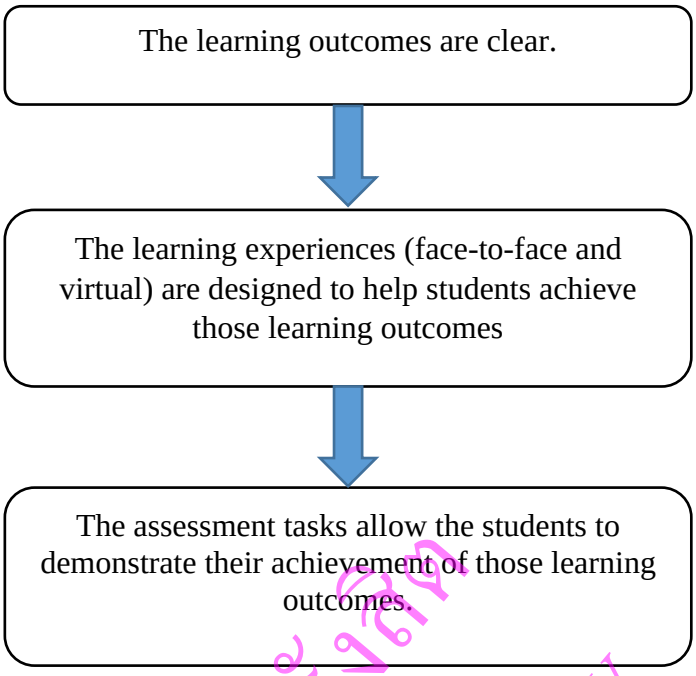


Figure 2.1 showing Assessment for learning.

Source: Biggs, 2003, p.165

In assessment for learning, feedback plays very important role. Isaacs, Zara, Herbert, Coombs, and Smith (2013) defined feedback as a process through which students learn how well they are achieving and what they need to do to improve their performance. One way of conceptualizing feedback in education is to view it as a stimulus that elicit a response, such as constructive comment on strength and weakness of student's work on assessment task. Properly organized feedback provides an automatic self-regulation mechanism that informs teachers and learners and prepare them for the next process (Isaacs et al., 2013, p.61).

Effective feedback will help the learner to 'close the gap' between current knowledge, skills and understanding, and his or her learning goal. According to the research, feedback should be clearly linked with learning intention or criteria, that is, students must be able to understand what they were meant to learn or do and what success on that leaning goal would look like (Isaacs et al., 2013, p.63). Hargreves (2011) writes about provocative feedback, which she theories is useful in helping students think

more critically about learning. Provocative feedback aims to get the learner to think deeply, question him-or herself, have new ideas, reflect on the learning and take action.

2.5 REFLECTIVE JOURNAL

Thorpe (2004) defined reflective journal as personal records of students' learning experience. Reflective journal are basically written records that students maintain after learning different concepts using different strategies. It is also a reflection of one's own learning. Students are asked by their teacher to record the learning related incidents, sometime during the learning process but often just after they occur. Cengiz and Karatas (2015) stated that reflective journal best fit for reflective thinking which adds to the recapitulations power of students. The journal includes research notes, personal comments on your own work, quotes, extracts from books, journal tutorials, and photos or sketches. The journal writing gave students the opportunity to discover self-learning and check personal growth. It also helps in communications and develop students' thinking and writing skills.

According to Weinstein and Mayer (1986), the purpose of writing reflective journal is to critically review the strengths and weaknesses of learning strategies and learning styles. Reflective journals can also be helpful for identifying breaches in your knowledge and skills, and for thinking about how you can address them. It also helps in recapitulation and reflection of students learning which ultimately broadens the horizon of intelligence for further learning. Students' reflective journal help teachers in assess students learning. Reflective journals in this study have been used to collect additional information on students' opinion towards rubric usage in Educational Assessment and Evaluation. The students in the experimental group were asked to write a reflective journal on the rubric usage in Educational Assessment and Evaluation for two times in the 2nd week and the 4th week. The guidelines on how to write reflective journal were provided beforehand and the researcher taught the students how to write a good reflective journal using the guidelines. Students were asked to write about their opinions towards rubric usage in Educational Assessment and Evaluation.

2.6 RELATED LEARNING THEORIES

2.6.1 Self-regulated learning theory

Self-regulated learning (SRL) is recognize as an important predictor of student academic motivation and achievement. It is defined as a process that assist students in managing their thoughts, behavior, and emotion in order to successfully navigate their learning experience. Generally self-regulated learning are separated into phase namely forethought and planning, performance monitoring, and reflection on performance. During forethought and planning phase, students analyze the learning task and set specific goal toward completing task. When student learn unfamiliar topic, however, they may not know best approach to learn that topic. So in this case teacher can instruct students on effective approach to learn the topic. For instance teacher can provide rubric as a guide to learn for students (Zumbrunn, Tadlock, & Roberts, 2011).

Next, in the performance monitoring phase, students employs strategies to make progress on the learning task and monitor the effectiveness of those strategies as well as their motivation continuing progress towards the goal of task. In a final reflection on performance phase, students evaluate their performance on the learning task with the effectiveness of the strategies that they choose. Teacher may provide feedbacks on students' performance.

Figure 2.2 Self-regulated learning.

Source: Zumbrunn et al., 2011, p.6

There are four common assumptions in self-regulated learning. First assumptions explains that students can potentially monitor and regulate their cognition, behavior, and motivation. A second assumption suggests that students actively construct their own goals and meaning or knowledge from their prior knowledge and from the present learning context. Thus, students engage in a constructive process of learning. Not surprisingly, then, it is assumed that all student behavior is goal directed and the process of self-regulation helps in modifying their behavior to achieve goals. Lastly, it is assumed that self-regulatory behavior mediates the relationship between a student's performance, contextual factors, and individual characteristic (Moos & Ringdal, 2012).

According to Effeney, Carrol, and Bahr (2013), the self-regulation and behavior are important aspects of learning and the extent to which school students become self-regulators of their own learning influences their academic success. The skills necessary for self-regulation in academic setting such as school have been investigated under the rubrics of self-regulated learning. Effectively self-regulated learners actively set goals, decide on appropriate strategies, plan their time, organize and prioritize materials and information, shift approach flexibly, monitor their learning by seeking feedback on their performance and make appropriate adjustments for future learning activities. The aim of fostering the skills necessary for 'lifelong learning' in young people has focused attentions on teachers' abilities to encourage self-related learning in the classroom.

Self-regulated learning involves activities that focus on learning objectives in which students direct, modify, and maintain their learning activities. An individual who is self-regulated must use strategies during learning in order to achieve the required academic goals (Agustiani, Musa, & Cahyadi, 2016). Self-regulated learner assess or evaluate personal achievement in regard to the expected out-comes and performance. Students self-regulate their learning by using criteria explicitly listed in the rubrics provided to them. Rubrics have performance expectations of teacher and guides the students towards the teachers' expectation. Therefore rubrics encouraged autonomous and independent learning amongst the students.

2.6.2 Constructivism

Abulnour (2016) defined constructivism as a theory of knowledge in which human actively engage in making and building knowledge by manipulating, creating, and exploring the new information to fit their belief system and prior experience. Knowledge is not passively received but is actively constructed by learner (Savasci & Berlin, 2012). There are multiple forms of constructivism including personal, social, behavioral, and culture. These resolve around the concept that the learner is active in constructing his or her knowledge.

Dewey stressed the idea that the child's own experience must be acknowledge as the heart of both content and the process of education (Ultanir, 2012). He rejected the notion that schools should focus on repetitive rote memorization and emphasized that education needs to be grounded in real experience by which students can only learn through directed living. Hence students should engage in real-world authentic workshops to be provided with opportunities to think themselves and creatively construct their knowledge.

Piaget (1970) found out that learning occurs through construction of meaning rather than passive transmission and that learning takes place around an activity that is engaging and relevant. He believes that learner organize concepts and ideas into schemes, and construct these schemata by testing new information against their prior knowledge. Then they apply the information in new situation followed by integration of the new knowledge. Here child are in control of the knowledge provided by them and construct their own meaning by exploring (Abulnour, 2016).

According to Dagar and Yadav (2016), there arises a need to adopt a new pedagogy which encourages learner to construct a sense of her own self, the development of her autonomy, alongside her progress within the group for interpersonal growth. Constructivist pedagogy is one such approach where activities are proposed to students that are meaningful to them and the learner reflects, searches, uses her capacity for taking initiatives and for being creative. Constructivism emphasizes on learner

centered, learner directed and collaborative style of teaching learning process in which learning is supported by teacher scaffolding and authentic task.

Constructivism believed that learning should be such that learner were provided with opportunities to construct their own new knowledge. Use of rubrics in the classroom would change the role of teacher to a mentor and student as discoverer of their own new knowledge. Students use rubrics to construct knowledge because it has performance expectation criteria. Student breaks the concepts into different components and uses rubrics to understand or construct the main meaning or concepts. The teacher in the constructivist classroom would be facilitator or mentor to guide the learning, not to teach the lesson (Choden, 2012). Yager (1991) said that many approaches had been adopted by constructivist to transform the traditional classroom to learner centered classroom. Lecturer uses constructivist pedagogy in which activity supplements lecture and learner are provided with opportunities to construct their own understanding using explicit criteria provided to them. The instructional rubrics shifted teacher's role from active knowledge giver to facilitator or guide and student's role from consumer of knowledge to constructor or producer of knowledge.

2.6.3 Zone of proximal development

Vygotsky's zone of proximal development model explains how this development occurs. The zone of proximal development is the space between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under the adult guidance or in collaboration with more capable peers. Learning in the zone of proximal development is a joint activity in which the adult or teacher simultaneously keeps an eye on the goal of fully proficient performance and on what the learner, with assistance, is currently able to do. Scaffolding and formative assessment are strategies that teachers use to move learning forward in the zone of proximal development. Scaffolding refers to supports the teacher provide to the learner during problem solving-in the form of reminders, hints, and encourage to ensure successful completion of a task (Shokouhi & Shakouri, 2015).

For example, when a child is first learning the concept, adults may step in and help with the trickiest or most difficult part. In classrooms, teachers help students with their research before sending them to the library on their own. When a student is stuck because he or she can't find the information on a given topic, the teacher may suggest a new search term or help the students narrow the topic, but in the end, the student completes the research process on his or her own. Gradually, as competence increases, the teacher cedes more control to the learner. To be successful, the leaner must also come to understand and take ownership of the goal.

Formative assessment (rubrics) uses insights about the learner's current understanding to alter the course of instruction and thus support the development of greater competence. From the social cultural perspective, formative assessment like scaffolding using rubrics is a collaborative process and involves negotiations of meaning between the teacher and learner about the expectations and how best to improve performance. According to Sadler (n.d.), the teacher could help student internalize quality criteria by simplifying it until these criteria becomes so obvious taken for granted that they need no longer be stated explicitly. Sadler wanted to develop evaluative expertise in students so they could become proficient at monitoring their own learning. Like scaffolding, this kind of classroom interaction between teacher and students and vice versa can foster intrinsic motivation as well as cognitive and metacognitive learning.

2.6.4 Behaviorism

Behaviorism is a learning theory based on the idea that behavior can be controlled or modified based on the experience or consequence of the behavior (Thomas, 2001). Behaviorists believe that the behavior is the result on the learner because of stimulus-response associations of teacher and students (Parkay & Hass, 2000). They also believe that learning as acquisition of new behavior based on cause and effect. Skinner's reward and punishment theory in the classroom helps student in the acquisition of knowledge by rewarding the anticipated behavior and punishing unsuitable ones. Cherry (2016) defined behaviorism is a learning theory that all the

behaviors can be acquired through conditioning which is result of interaction with the environment. The action of any person could be shaped by two conditions namely: operant conditioning and classical conditioning.

Operant conditioning is the association between behaviors and consequences for those behaviors. Here learning takes place through reinforcement and punishment. For example student may be motivated to learn due to earlier positive feedback. Here positive feedback acts as a reinforcement and there is association between motivation and reward (Cherry, 2015). According to Salvin (2003), classical conditioning is a natural stimulus which becomes paired unconditioned stimulus after repeated association and evokes a response. The best example of classical conditioning is Pavlov experiment on a dog. Pavlov said the dogs were demonstrating classical conditioning. He summed it up like this: there's a neutral stimulus (the bell), which by itself will not produce a response, like salivation. There's also a non-neutral or unconditioned stimulus (the food), which will produce an unconditioned response (salivation). According to Isaacs et al. (2013), One way of conceptualizing feedback in education is to view it as a stimulus that elicit a response, such as constructive comment on strength and weakness of student's work on assessment task. Properly organized feedback provides an automatic self-regulation mechanism that informs teachers and learners and prepare them for the next process. Rubric encouraged teacher to provide students with feedback.

Reinforcement like positive feedback would let them explore more and as a result student learn more. Therefore providing feedback using rubrics may act as external stimulus and helps in changing students learning behavior. Positive reinforcements may further motivate or promote self-regulated learning and thereby encouraging independent autonomous learning. Positive feedback improve their leaning. Specific positive feedback are very helpful and should be provided immediately to students.

Learning theories are conceptual frameworks in which knowledge is absorbed, processed, and retained during the learning. Constructivism as a paradigm or worldview posits that learning is an active, constructive process. The learner is an information

constructor. Self-regulated Learning (SRL) is recognize as an important predictor of student academic motivation and achievement. The zone of proximal development is the space between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under the adult guidance or in collaboration with more capable peers. Behaviorism is a learning theory that all the behaviors can be acquired through conditioning which is result of interaction with the environment. It is very important to understand the learning theories and apply in the students' learning process to have incredible result or outcome. The learning theory should be simultaneous with the instructional approach and should have a positive impact on students learning and opinions. Learning theories like Self-regulated Learning, constructivism, zone of proximal development and behaviorism support the use of rubrics as a teaching tool. The rubrics can be incorporated in all learning theories to make the learning more comprehensive. Leaning theories are the backbone for teachers and students to have better prospects towards academic excellence. Therefore learning theories play vital role in students' learning and development.

2.7 RELATED RESEARCH AND STUDIES

Eshun and Osei-Poku (2013) conducted a study on 'Design Students' Perspective on Assessment Rubric in Studio-Based Learning' to examine students' perspectives on use of rubric in Studio-Based Learning at Kwame Nkrumah University of Science and Technology, Ghana. The participants were full-time, second-year undergraduate communication design students. The students were registered for DAD 251 Graphic Design I and II. One hundred forty students out of a total population of 546 (student population within the Department as of 2010) were sampled for the study. The sampling is convenient sampling. Questionnaire using five points Likert scale was administered to the participants to investigate students' perception on the use of rubric. The data was analyzed using the Statistical Packages of Social Science (SPSS) 16.0 for window software. This involves the calculation of frequency scores. The assessment strategy was introduced with the desire to improve students' participation and involvement in studio-based learning programme. The study revealed that the use of

criteria and rubrics for peer assessment had a remarkable positive impact on students' learning in the studio, and offered notable potential for equipping them for lifelong learning after school. The students in the study reported using the criteria to become independent learners, self-initiate work and regulate their learning.

Smith, Bachmann, Blum, Birri, and Hess (2017) conducted quasi-experimental study on 'Effects of a rubric for mathematical reasoning on teaching and learning in primary school' in Switzerland to evaluate whether rubrics help teachers teach and assess mathematical reasoning in primary school and whether such an instrument might support student learning. In two Swiss cantons, 762 students in 44 5th- and 6th-grade primary classes worked on their reasoning competencies, and half of them additionally employed our standards-based rubric. All of the teachers received a 1-day training and participated in the final project evaluation. An achievement test and questionnaire for students and teachers were administered before and at the end of the intervention. The results of our quantitative longitudinal analyses indicated that the rubric fostered the teachers' perceived diagnostic skills but only indirectly impacted on their use of formative feedback. Based on the students' perceptions, however, they observed a direct effect of the rubric on formative feedback and student self-assessment. There were indications of effects mediated by self-regulation and self-efficacy which resulted in high performance by students.

Manzanares, Baez, Ortega-Lopez, and Villalain (2015) conducted a study on 'self-regulation and Rubrics Assessment in Structural Engineering subjects' in Spain to test whether significant differences exist in the knowledge of students after a training program in self-regulation learning using rubrics and to test whether the use of rubrics will improve the perceptions of students with regard to their own knowledge. The sample of student consisted of 116 students studying on the third year of their degree course in Technical Architecture on the Structural Engineering module. A total of 6 rubrics evaluated the knowledge of students in the 6 topics. The rubrics were used by students to regulate and to assess their own learning. Descriptive statistics (mean and standard deviation) were calculated, as well as a fixed-effect ANOVA (the group following the self-regulation program versus the control group), and the effect value

was found. The study revealed that the teaching program had centered on self-regulated learning, feedback given to students on their learning processes, and the use of rubrics that facilitated students' self-evaluation of their own learning. The use of rubrics by the teacher had shown itself to be effective, allowing both teacher and students to measure prior (conceptual and procedural) knowledge. Moreover, rubrics also assisted the analysis of student progress in the teaching process.

Kind (2017) conducted a study on "Development of evidence based, student - learning-oriented rubric for pre-service science teachers' pedagogical content knowledge to develop pedagogical content knowledge (PCK) rubrics, that is, guides providing criteria for grading that are potentially applicable to a range of science topics and levels of teacher experience. Grading criteria applied in the rubrics were based on qualitative analyses of planned topic-specific professional knowledge (TSPK) and content knowledge (CK). Data were collected via three topic-specific vignettes from 239 pre-service science teachers (PSTs) starting a university-based, full-time, one year teacher education programme in England. The statements were analyzed for TSPK and CK. Although findings cannot be generalized, the methodology offered a strategy for supporting out-of-field teachers, and those seeking instructional strategies to add to existing repertoires.

Fastre, Klink, and Merrienbore (2010) investigated the effect of performance based criteria on student's performance and self-assessment skills among 39 novice secondary vocational education students in the domain of nursing and care in Netherland. In a performance-based assessment group students were provided with a preset list of performance-based assessment criteria, describing what students should do, for the task at hand. The performance-based group was compared to a competence-based assessment group in which students received a preset list of competence-based assessment criteria, describing what students should be able to do. Participants were randomly assigned in one of the two conditions: competence-based criteria and performance based criteria. Performance based criteria was rubric. Questionnaire, knowledge test, judgement scheme for video assessment and the mental report rating scale were used to collect data. Mann–whitney *U* tests were performed to test for

differences between the two conditions. SPSS software was used to analyze the data. The result of the study was students who received the performance criteria performed better than the students who received the competence based criteria. Students who received the performance-based criteria experienced a lower mental effort during assessment than students who received the competence-based criteria. Similarly, students who received the performance-based criteria became better self-assessors than the students who received the competence-based criteria.

Roger and Karen (2008) conducted a case study on 'student perceptions and use of an assessment rubric for a group concept map in Physiology' to investigate students' opinion towards the assessment rubrics. The study was carried out at The University of Queensland, Australia. The opinion across the groups were correlated to academic achievements in the course. Two groups of four students volunteered to video recorded during four hours workshop, during which they completed their maps. Students reviewed the basis of how to construct a concept map using example based on content unrelated to the assessment task and were then taught how to use the assessment rubrics. Survey using Likert scale was designed to capture the opinions of all second-year dentistry students regarding the rubrics and concept map assessment task. The medians and interquartile ranges of opinions from the survey responses were calculated using graph Pad Prism (version 4).The internal consistency of all items on each survey was measured using Cronbach's-coefficient using SPSS version 10.0 (Macintosh).An-value of 0.8 or higher indicates that the survey items reliably measure related themes or constructs. The result of the study reveal that the rubrics was strongly favored by most students. It was encouraging that most students liked the rubric and reported that it helped them to complete the task. Again, because assessment rubrics do not stand alone as learning tools, it was not surprising that the students needed guidance beyond the rubric to complete the concept mapping task.

Reddy (2007) conducted experimental research on "Effect of Rubrics on Enhancement of Student's Learning" to investigate the contribution of rubrics on enhancement of motivation, development of self- regulation characteristics and improvement in academic performance. The study was conducted at ICFAI Business

School in Hyderabad, India. The rubric intervention was applied in the natural context of instruction in business school for a period of one semester. The random sampling was used to select two groups of students from different sections in Business school. Data were collected using questionnaire, survey and test and analyzed by using two-sample t-test. The study enhanced the understanding of how rubric could support student-learning process. The result of the study showed that academic performance of student in the experimental group (where rubric was used as guide) was higher the control group (where no rubric was used).

Uddin (2014) conducted a study on "Impact of the Use of Rubrics on the performance of student" at BRAC University, Dhaka. Researcher conducted semi open-ended questionnaire among the randomly selected teachers and students of BRAC University. The researcher carried out 'one sample statistics' to see mean of students performance before and after the application of rubrics, 'one sample test' to test the null hypothesis and 'chi-square test' to see the independence of sample. The results showed a significant impact of rubrics on students' performance along with a strong positive attitude of both students and teachers towards the use of rubrics

Howell (2011) studied on 'Exploring the Impact of Grading Rubrics on the Academic Performance: Findings from a Quasi-Experimental, Pre-Post Evaluation' and the study sought to explore whether grading rubric used enhances the academic performance of college students. The study tested the following hypothesis: Grading rubric use exert an important, positive impact students' academic performance. Quasi-experimental pre-post evaluation was carried out in 200 level, undergraduate randomly selected in elective course over one year at university in southern US town. The researcher had given two same assignments to two groups of students. One assignment with the rubric was given to one group and same assignment, but without rubrics was given to another group. The data was analyzed using descriptive statistics. The result of study revealed that students provided with rubrics while they were doing assignment performed better in their test comparing to other group. Hence the above hypothesis was proved.

Phillips and Choudhury (2014) carried out study on the 'Grading Rubrics: What's in it for faculty' at Chamberlain College of Nursing in USA to explore the use of standardized analytical rubric to guide students' performance and to examine the faculty's perceptions regarding the use of standardized analytical rubrics for students evaluation on required nursing assignment. They also investigated how teaching and learning practices are promoted through the use of standardized analytical rubric. The study adopted survey and pre-posttest to elicit information 356 students and teachers randomly selected from Chamberlain College of Nursing. The result of the study showed that Analytical rubric was objective, efficient, consistent, and reliable and led to overall satisfaction.

Silva (n.d) conducted a study on 'Rubrics for Assessment: Their Effects ESL students' authentic Task Performance'. The study adopted a pre-post Quasi Experimental design. The sample consist of 70 secondary students randomly selected from 2 classes in National school, Sri Lanka. The study was an attempt to address the problem by studying the effect of provision of rubrics used for assessing the students before they do their assessment task. The problem was most students were not satisfied with the score or grade they received for their assignment. The student's pre-post scores in the two groups were compared using the statistical package SPSS version 16 and correlation coefficient were calculated for teacher assessment and student's self-assessment. The result of the study was the students who received rubrics along with the explanation of what is meant by each criterion and how the grading is done performed significantly better than the group which received the rubrics without any explanation. Another finding was the self-assessed scores of the group which received detail explanation of rubrics showed a high correlation with the scores of teacher at the post test.

Qasim (2015) did case study on 'Using Rubrics to Assess Writing: Pros and Cons in Pakistani Teachers' Opinion' to examine the viewpoints of Pakistani University teachers on the effectiveness of rubrics to assess their students writing. The participants consisted of three language teachers and three literature teachers. The sampling was purposive and convenient. The study adopted a case study research design. The data was

summarized and categorize in themes and then analyzed. The result of the study revealed that four out of the six respondents agreed that rubrics were effective for grading writing and should be used to address mechanical errors in students' work. The study suggested that rubrics should embrace authentic criteria for writing assessment so that they leave space for self-reflection and autonomous learning for students.

Reynolds-Keefer (2010) investigated study on 'Rubric-referenced assessment in teacher preparation: An opportunity to learn by using' to explore how rubrics impacted students learning, as well as whether using rubrics influenced the likelihood that they would use rubric in future as teacher. The study was conducted in United States. 45 undergraduate students enrolled in Educational Psychology were participants in this exploratory study. The sampling was purposive. The nine open-ended questionnaires were used to collect data from students. The response to all the questions regarding to the impact of using rubrics as a student were generally positive, and students indicated that rubrics were important to their process of learning, as well as their perception of assessment and learning in the classroom. In this study, Students also shared that rubrics helped them to complete their assignment and expressed that rubric gave them insight into teacher's expectation. Students indicated that they did feel rubrics impacted grading, but findings were different from study carried out by Andrade and Du (2005) where they did not see the impact as being primarily 'Better, fair grades' (p.5) but instead quicker and more responsive grading. Students reported that rubrics were useful throughout the process of completing assignment, and response indicated that areas in which the many uses of rubrics could be emphasized during instruction to maximum utility. Students also highlighted that by creating a more specific and open assessment tool, they felt increased ability to communicate questions and ideas regarding the assignment. Additionally, students reported a greater likelihood of using rubrics in the future because of their experience with rubric as student.

Cothran (n.d.) investigated on 'Students' Use of and Perspectives on Rubrics' to investigate the students' use of and perspectives on rubrics with a writing assignment. The participants of the study were 39 college students enrolled in an introduction to teaching course at university in the United States. The sampling was purposive. The

short survey using five Likert scale and individual interview were used to collect data. Interview data were analyzed via a constant comparison process. The survey answers were analyzed via descriptive statistics. The result of the study supports the finding of Nicholls (1992, p. 267-286) that conception of students as active educational theorist as these students provided critical insights into the use rubrics and suggested that rubrics were positive addition to a teacher's methods as they could provide a meaningful way to plan for and interpret student learning.

Birkett (2014) did mixed method research on 'An Investigation into EAP(English for Academic Purpose) Teacher and Student Perception and Interpretation of an Academic Writing Marking Rubric' in order to know the perceptions and interpretations of EAP teachers and first year students towards academic rubric . A purposive sampling strategies was used to select three current EAP teachers to participate as the three 'core teachers' in this research. The researcher used questionnaire and semi-structured interview to collect data. The result of the study revealed that the reliable scoring of performance assessments could be enhanced by the use of rubrics and rubric made expectation and criteria explicit, which facilitated feedback and self-assessment.

Turgut and Kayaoglu (2015) investigated the effect of using rubrics as an instructional tool on students' writing performance in English as a foreign language at Karadeniz Technical University in Turkey. This study was basically a quasi-experimental research comparing pre- and post-test essay paper scored by the three raters upon the completion of a four-weeks treatment based on the use of rubrics. The convenient sampling technique was used to select 38 students aged 18-20 of two classes from 55 classes. Sixteen of students were in treatment group and 22 in control group. The experimental group received training on using rubrics while producing work. The students in control group continued their class without being taught the rubric. The treatment lasted for four weeks in which both experiment and control group were on two different essay types by the same instructor. The ANOVA test was used to analyze the raters for the control group and experimental groups separately. A t-test was also used to assess whether the means of two groups were statistically different from each

other. The results showed that there was statistically significant difference between two groups in the sense that the experimental group distinctively performed better than the control group in writing composition papers; (experimental group mean (M=74), control group mean (*M* = 58), t(df2)=: 9.987, *p*>.05. This obviously indicated that rubrics had potential for teachers to make their writing course more productive.

Ghalib and Al-Hattami (2015) conducted a study to investigate the performance of holistic and analytical scoring rubrics in the context of EFL writing. The sampling was convenient sampling. The participants of research consisted of 30 male and female undergraduate students of Yemeni University in Yemen and they were aged between 21 and 25. The data was collected from 30 participant attending an English undergraduate program in the university. The researcher used psychometric statistics (inter-rater Agreement, Intra-Class Correlation, t-test and ANOVA) to compare the performance of students on the two rubrics in accurately diagnosing students' strengths and weaknesses and placing them along the continuum of foreign language writing proficiency. The result of the study showed that there was a significant difference between the means of the two scoring rubrics, holistic and analytic approaches. Analytical scoring rubrics placed examinees along a more clearly defined scale of writing ability, and were, therefore, more reliable than holistic scoring rubrics instruments for evaluating EFL writing for achievement purposes than holistic scoring rubric.

Lesit, Woolwine, and Bays (2012) conducted study on 'The effects of Using a Critical Thinking Scoring Rubric to Assess Undergraduate Students' Reading skills' to investigate the use of critical thinking rubric as an assessment of reading achievement for students enrolled in a reading intervention course in USA. The research was based on quantitative analysis. The sampling was purposive. The participants were 164 students enrolled in reading intervention course. The data was analyzed with SPSS where the researcher computed paired sample t-test, Pearson correlation and ANNOVA. The result showed significantly higher post-assessment rubric scores ($p < 0.001$) and significant change in rubric score over the time ($p < .05$). This indicated that rubrics had a positive effect on the reading achievement.

Christie et al. (2015) carried out study on 'Improving the Quality of Assessment Grading Tools in Master of Education Course: A Comparative Case Study in the Scholarship of teaching and learning' to investigate how quality of postgraduate education course can be improved through use of assessment tool rubrics. It was case study with three in-depth interviews and two rounds of a modified Delphi Method. The interviewees consisted of Australian expert in assessment, a US lecturer in M.Ed course and an Australian students who had recently completed a M.Ed by coursework. The research resulted in the development of checklist, in the form of a set of questions, that a lecturers should ask themselves before writing rubrics. The paper demonstrated how assessment grading tools might be researched, developed, applied and constantly improved in order to advance the Scholarship of Teaching and Learning.

Hiroshi (2015) conducted a study on "Is a Rubric worth the Time and Effort? Conditions for Success" to examine how Japanese University instructors use or do not use rubrics. The study collected qualitative data using two different methods: a focus group and two semi-structured interviews. The study was divided into three stages: pilot study, focus group and semi-structured interview. For pilot study, convenient sampling were used to choose seven Nagaya University of commerce and Business (NUCB) faculty members who do not belong to assessment related committees. For focus group, seven NUCB faculty members from the Students Advisroy Committee (SAC) were selected. And semi-structured interviews were carried out with 13 members of the Tokai A team, the seven universities participating in the national project: Improving Higher Education for Industrial Needs was funded by MEXT. The findings showed that many of the instructors in the sample were unfamiliar with rubrics. Some of those who knew about rubrics did not use them for specific reasons. These included that they require too much time and effort. The study suggested that rubrics could be instrumental and effective assessment tools if certain conditions are met. Factors influencing rubric use include; 1) instructors' understanding of and engagement in using rubrics; 2) examining and understanding the contexts in which rubrics are used; 3) placing political pressure on instructors to use rubrics at the institutional level.

2.8 CONCLUSION

From the related research and studies, the researcher can conclude that rubrics have positive impact on students learning and subsequently on their learning achievement. All participants in above research supported rubrics and had positive opinions towards the rubric usage in the research. The results of all the related researches were in favor of rubrics and encouraged teacher to use rubrics in teaching and learning. This indicated that rubrics could be an effective instructional approach in enhancing learning achievement of the students. Almost all the related research concluded that the learner centered approach rubrics encourages independent leaning where learner is responsible for his or her leaning, critical thinking, organization and analyzing. The instructional rubrics shifted teacher's role from active knowledge giver to facilitator or guide and student's role from consumer of knowledge to constructor or producer of knowledge.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter describes the research design, population and sample, research instruments, data collection procedures (ethical consideration) and data analysis. The chapter also describes the reliability and validity of research instruments used in the study. It also shows how research is designed to examine the learning achievement and opinions of students towards rubric usage in Educational Assessment and Evaluation.

3.1 RESEARCH DESIGN

The research methodology of this study is a mixed method which aims to find out the learning achievement and opinions of first year students towards rubric usage in Educational Assessment and Evaluation. Mixed methods research is the combination and integration of qualitative and quantitative methods in the same study (Molina-Azorin, 2016). The overall purpose and central premise of mixed methods studies is that the use of quantitative and qualitative approaches in combination provides a better understanding of research problems and complex phenomena than either approach alone (Creswell & Clark, 2007). Better understanding can be obtained by triangulating one set of results with another and thereby enhancing the validity of inferences. Greene, Caracelli, and Graham (1989) pointed out other important purposes, rationales, and advantages of mixed methods research as complementarity (elaboration or clarification of the results from one method with the findings from the other method), development (when researcher uses result from one method to help develop the use of other method) and expansion (seeking to extend the breadth and range of inquiry by using different methods for different inquiry components).

The figure 3.1 describes the research design of the study. The researcher adopted experimental research design to collect both the quantitative data and qualitative data. The quantitative data were collected through pretest, posttest and survey questionnaire and the qualitative data were collected through students' reflective journal.

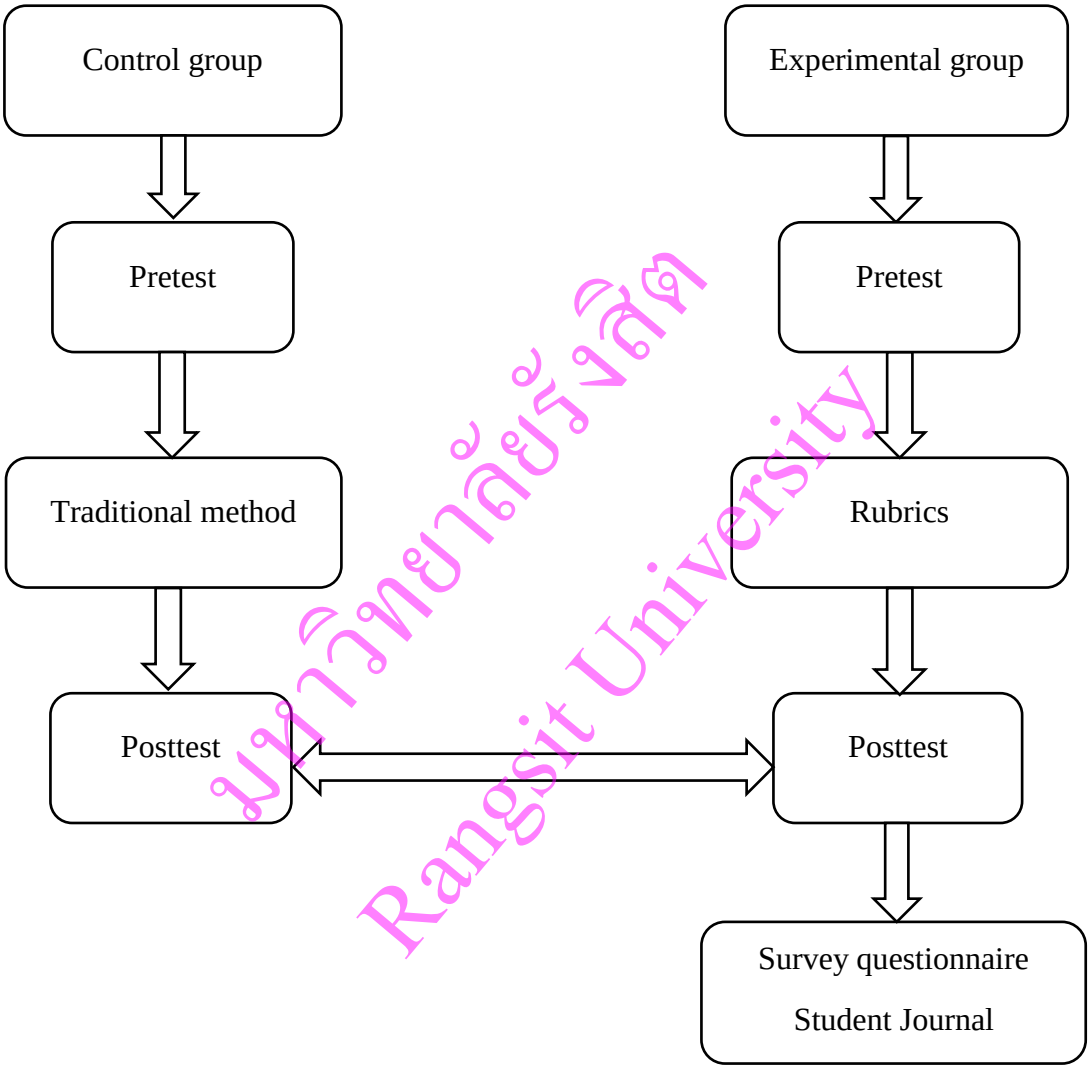


Figure 3.1 Illustration of research process.

3.2 POPULATION AND SAMPLE OF THE STUDY

3.2.1 Population

The population of the study comprised of 120 students from 4 sections of first year students in one of the colleges under Royal University of Bhutan. Each section had 30 students and consisted of mixed gender and mixed ability students. Students were selected for the course based on the merit rating of their grade 12 marks. Therefore all first year students in 4 sections had equal competency in the module.

3.2.2 Sample

The cluster random sampling was used to select 60 students from 2 sections out of 4 sections of first year students. One section was used as an experimental group and the other one as a control group. Each section had 30 students and the age range was from 18 to 20 years.

3.3 RESEARCH INSTRUMENTS

In this study the researcher used both qualitative and quantitative methods. The quantitative method was used to collect data to answer the research question 1.3.1. "What is the effect of using rubrics on the learning achievement in Educational Assessment and Evaluation of first year students in Bhutanese University?" and qualitative method was used to collect data to answer research question 1.3.2. "What are the opinions of students towards rubric usage in Educational Assessment and Evaluation?" The quantitative data for this study was collected by conducting pretest and posttest in both groups and survey questionnaire on student's opinions towards rubric usage in the experimental group. The qualitative data was collected from the experimental group based on student's reflective journals (two times over the study period).

3.3.1 Intervention Instrument

3.3.1.1 Rubrics

The two types of rubrics were analytical and holistic rubrics which were designed and used in the lesson to study the effects of using rubrics on the learning achievement of students. The analytical rubrics and holistic rubrics has numerous advantages comparing to other types of rubrics. Therefore analytical rubrics and holistic rubrics were selected for the study. The rubrics for the Educational Assessment and Evaluation concept or knowledge is analytical since it has level of performance for each criteria along with description while the rubrics for the bookkeeping is holistic as it provides the wholesome view of the expected outcome. The rubrics were developed based on the objectives of Unit 2 of Educational Assessment and Evaluation course book and could be applied to all the topics under Unit 2.

In the experimental group, the researcher introduced rubrics to the students and then taught how to use rubrics to learn Educational Assessment concepts. Researcher provided students with rubrics along with the topic. Students learned the given topic using rubrics. Rubrics has description of expected outcome of the given topic. Rubrics guided the students step by step to the expected learning outcomes. Teacher facilitated, monitored and scaffolded when students were learning the given topic using rubrics. Teacher made sure that all the resources like the Internet, textbooks, journals, etc were available for the students. (The rubrics are attached in appendix I).

3.3.1.2 Lesson plan

The researcher used 8 lesson plans in total. Four lesson plans were prepared for the experimental group using rubrics while other 4 lesson plans were prepared separately for the control group in a traditional way with the same objectives. Each lesson plan lasted for one and half hour. The control group was taught in a traditional way using a lecture method (power point presentation, text book and lecture). The experimental group was taught using rubrics. In the 1st week, the researcher

introduced rubrics to students and taught how to use rubrics to learn Educational Assessment and Evaluation concepts in the experimental group. (The detailed plan, content of study and objectives of the study were reflected in Appendix K*)*. Researcher taught twice a week in both the experimental group and the control group.

3.3.2 Quantitative Data collection Instruments

3.3.2.1 Learning Achievement test

Pretest and posttest were conducted in both the control group and the experimental group to collect the quantitative data. Thirty multiple choice questions were prepared from Unit two of Educational Assessment and Evaluation course book. First pretest was administered in the beginning of the study. After that, the control group was taught using a traditional method (lecture method) while the experimental group was taught using rubrics. Later posttest with the same questions as given in the pretest was administered at the end of the study. The main propose of the pretest and the posttest in this study was to examine and compare the students learning achievement in the experimental group and the control group before and after the treatment was given. (The learning achievement test was attached in appendix D).

3.3.2.2 Survey Questionnaire

The researcher developed survey questionnaire using five points Likert scale focusing on students' opinions towards rubric usage in Educational Assessment and Evaluation. Twenty survey questionnaires were prepared based on rubrics used in Educational Assessment and Evaluation, and administered once to the experimental group to investigate student's opinions towards the rubric usage. (Survey questionnaire was attached in appendix G). The questionnaire collected data through Likert scale with five points from, strongly disagree to strongly agree; 1= Strongly disagree, 2=Disagree, 3= Moderate, 4=Agree and 5=Strongly agree as shown in Table 3.1. The five points Likert Scale on students' agreement to investigate students' level of opinion towards rubric usage is shown in Table 3.2

Table 3.1 score for the level of opinion (agreement)

Level of Opinion(agreement)	Score
Strongly Agree	5
Agree	4
Undecided	3
Disagree	2
Strongly Disagree	1

Source: Brown, 2010

Table 3.2 Interpretation of mean score with the reference to level of opinion (Agreement)

Mean	Level of opinion (Agreement)
4.51-5	Strongly agree
3.51-4.50	Agree
2.51-3.50	Moderate
1.51-2.50	Disagree
1-1.50	Strongly Disagree

Source: Brown, 2010

3.3.3 Qualitative Data Collection Instrument

3.3.3.1 Students' Reflective Journal

The students in the experimental group were asked to write a reflective journal on the rubric usage in Educational Assessment and Evaluation. The students wrote reflective journal for two times in the 2nd week and the 4th week. Students were asked to write about their opinions towards rubric usage in Educational Assessment and Evaluation. The guidelines on how to write reflective journal were provided beforehand and the researcher taught the students how to write a good reflective journal using the guidelines. (The guidelines for reflective journal is attached in appendix O for

reference). The main aim of reflective journal in the study was to investigate student's opinions towards rubric usage in Educational Assessment and Evaluation.

3.4 VALIDITY AND RELIABILITY OF RESEARCH INSTRUMENTS

3.4.1 Validity

Validity is defined as a degree to which a measurement measures what it purports to measure (Bolarinwa, 2015). It also means that instruments are meaningful, useful and appropriate (Mohamad, Sulaiman, & Salleh, 2015).

In this study the research instruments were validated by three experts which included a senior professor from Rangsit University and two senior lecturers from Samtse College of Education under Royal University of Bhutan. Three experts calculated Item Objective Congruence (IOC) of instruments. Item Objective Congruence (IOC) of the instrument were calculated to see whether the item is aligned with the learning objectives or not.

The result of the IOC index ranges from -1 to +1.

+1; the item clearly matches objectives or ensure that the following measure meet the objectives stated

0; unclear or unsure whether the measures meet the objectives or not.

-1; item clearly doesn't match objectives or ensure that the measure doesn't meet the stated objectives reality (Turner & Carlson, 2009).

The formula for calculating IOC is $\sum \frac{r}{n}$. 'r' represents the sum of score of individual expert and 'n' represents the number of experts who validates the items. If the value of test item is between 0.67 - 1.00, it is considered for accuracy and acceptable. But, if the value is below 0.67, it indicates that the item needs to be rephrased according to the expert.

Rubrics and opinion questionnaire were also validated by the experts using IOC. Rubrics and opinion questionnaire were developed with the objectives. Later experts checked the objectives of each items of the instrument using IOC. Experts calculated the IOC to see whether the item was aligned with the learning objectives or not. (The IOC for rubrics and opinion questionnaire are attached in appendix H and F). Similar process was repeated for the lesson plans and learning achievement test.

Three experts used IOC to validate the lesson plans. All 8 lesson plans were rated as +1 by three experts which indicated that all items were in lined with the above stated objectives and considered as valid for the study. (The IOC for the validating the lesson plans is attached in appendix J). The rating for all the test items or learning achievement test were above 0.67 which indicated that the items were valid for the study. (The IOC for the learning achievement is attached in appendix C)

3.4.2 Reliability

Reliability means that the scores of an instrument are stable and consistent (Creswell, 2005). According to Mohamad et al. (2015), the scores should remain the same when the instrument is administered repeatedly at different times, and it should remain consistent.

The researcher had developed 45 test items from Unit 2 of the first year student's Educational Assessment and Evaluation coursework book. The test items was tried out with one section of first year students in Research College, which is neither a control group nor an experimental group prior to experiment. Kuder-Richardson's formula (KR-20) was computed to find out the reliability coefficient of the test items. The KR-20 coefficient was 0.802 which is greater than 0.70, this revealed that the test items were reliable. From 45 test items, 30 test items were selected for pretest and posttest.

Similarly, 25 opinion questionnaire statements were trialed out with the same section of first year students where test items were tried out and selected 20 reliable statements. Cronbach's alpha (α) was 0.889, which indicated that the instrument was

reliable for the study. A score of 0.70 or greater is generally considered to be acceptable in Cronbach's Alpha scales as shown in Table 3.3.

Table 3.3 showing description of internal consistency using Cronbach's alpha

Cronbach's alpha	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

Source: Andale, 2014, p.1

3.5 DATA COLLECTION PROCEDURES

Researcher visited the research college and obtained the approval from the President of the college. Researcher then arranged classes with the respective module tutors. The researcher met with both the experimental group and the control group.

Four lesson plans using rubrics were prepared for the experimental group and the other 4 lesson plans were prepared for the control group to teach in traditional method. In the experimental group, the whole class was briefed on how to use rubrics and procedures they needed to follow to achieve the expected outcomes. The students were provided rubrics as a guide for learning and as self-assessment tool for their work. They were instructed to use rubrics throughout their learning activity. Pretest and posttest was administered to both the experimental group and the control group. Further, the students in the experimental group were asked to write two reflective journals on their opinions towards rubric usage in Educational Assessment and Evaluation. The anonymity and confidentiality of the students and students' opinions were taken care.

3.6 DATA ANALYSIS

Comparative statistical analysis was done using paired sample t-test and independent sample t-test to analyze the data collected from pretest and posttest. A comparative statistical analysis using paired sample t-test was done within the group. Comparison of pretest and posttest scores of two groups was done by conducting independent t-test to assess and compare the learning achievement between the control group and the experimental group. The inferential statistics t-test with $p<0.05$ level of significance, the mean and standard deviation were used to infer the results in this study. The total average mean and standard deviation were computed for questionnaires on student's opinions towards rubric usage and presented through graphical presentation. The data collected from student's reflective journal were analyzed by using a coding system (open, axial, and selective) based on the Grounded Theory of Corbin and Strauss (2008).

CHAPTER 4

DATA ANALYSIS

The main purpose of this study was to examine and compare the learning achievement in Educational Assessment and Evaluation of first year students using rubrics and a traditional method and to investigate their opinions towards rubric usage in Educational Assessment and Evaluation. The mixed methods of quantitative approach and qualitative approach were adopted in this study. Pretest, posttest, and survey questionnaire were used for quantitative approach and student's reflective journal was used for qualitative approach. The result analyses were done based on the learning achievement test scores, survey questionnaire and students' reflective journal.

4.1 DATA ANALYSIS OF TEST SCORES

The first objective of the study was to examine and compare the learning achievement in Educational Assessment and Evaluation of students after using rubrics in the experimental group and a traditional method in the control group. Therefore pretest and posttest with same questions were administered for both groups at the beginning and at the end of the study. (The learning achievement test for both groups is attached in the appendix D)

Comparative statistical analysis was done using paired sample t-test within the group i.e. analysis of pretest and posttest within the group and independent sample t-test between the groups which was for a comparison of pretest and posttest scores between the experimental group and the control group. The comparison was done based on mean, standard deviation and inferential statistics with $p<0.05$ level of significance.

4.1.1 Comparison of pretest and posttest scores within the group(Paired sample t-test)

The comparison of pretest and posttest scores within the group was done by comparing mean, standard deviation and significance value (p). The mean of the pretest and posttest of the control group were 7.03 and 19.67 as shown in Table 4.1. The mean of pretest and posttest of the experimental group were 7.10 and 25.40 respectively. The mean difference of pretest and posttest of the control group was 12.64 and the mean difference of pretest and posttest of the experimental group was 18.30. The significance value (p) for both the group was 0.000 which is lower than 0.05 ($p<0.05$). This means that there was statistically significant rise in students' scores in the posttest when compared to the students' scores in the pretest in both the control group and the experimental group.

The figure 4.1 shows the mean of the pretest and posttest scores for the control and the experimental group.

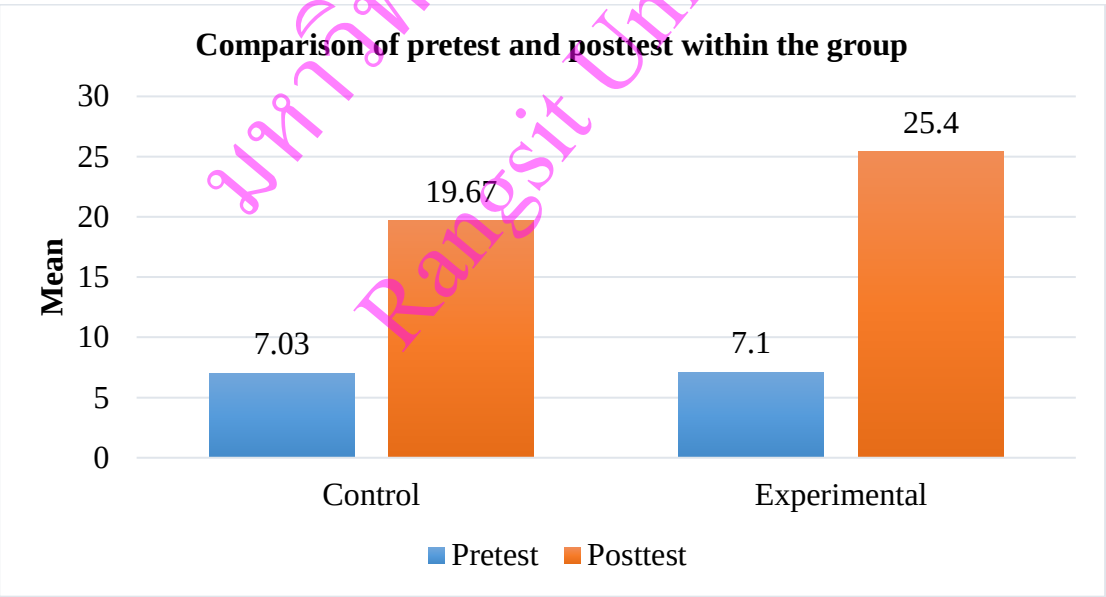


Figure 4.1 Comparison of Pretest and Posttest within the Group.

4.1.2 Comparison of pretests and posttests scores between the groups (Independent Sample t-test).

Table 4.1 shows the comparison of pretests and posttests between the group (the control and the experimental group).

Tests	Group	Mean	Mean Difference	Standard Deviation	Sig (2 tailed)
Pretest	Control	7.03	0.07	2.25	0.910
	Experimental	7.10		2.43	
Posttest	Control	19.67	5.73	2.76	0.000*
	Experimental	25.40		1.61	

* Significant ($p<0.05$)

Table 4.1 shows that the mean difference in the pretest of the control and the experimental group was 0.07 and the two tailed significance value (p) was 0.910 which is higher than 0.05 ($p>0.05$). This indicates that the test scores in the pretest for both groups were not statistically significant. This means students in both groups had equal learning ability before the treatment.

The mean difference of the posttest between the control group and the experimental group was 5.73 and significant value (p) was 0.000 which was lower than the significant value $p<0.05$. This indicated that there was statistically significant difference in the posttest scores between the control group and the experimental group. This showed that the test scores in the posttest for the experimental group were significantly higher than the test scores of the control group in the posttest. As expected by the researcher students in the experimental group performed better than the students in the control group.

Figure 4.2 illustrates the comparison of mean scores of the pretest and the posttest of the control group and the experimental group.

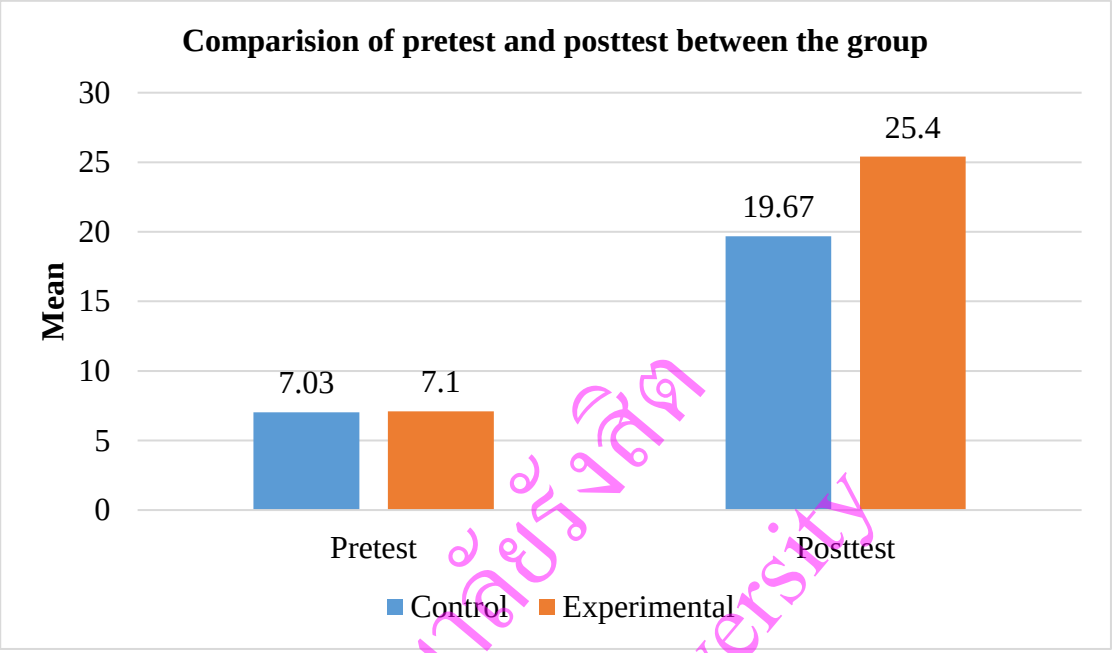


Figure 4.2 Comparison of pretest and posttest between the groups.

In statistics, the standard deviation is a measure that is used to quantify the amount of variation or dispersion of sets of data values. It indicates how much data are concerted from the mean on average. A low standard deviation indicates that the data points tend to be close to the mean, while a high standard deviation indicates that the data points are spread out over a wider range of values. A smaller standard deviation also means greater consistency, predictability and quality (Barde, M., & Barde, P., 2012).

The standard deviation of the means of the pretest in the control group and the experimental group were 2.25 and 2.43 respectively as shown in the Table 4.2. The difference between the standard deviation of the means of the pretest was 0.18 which is negligible. This indicated that the level of variation in scores of both groups were similar. This means that the learning ability of the students were similar in both groups.

The standard deviation of means of the posttest in the control and the experimental group were 2.76 and 1.61 respectively as shown in Table 4.2. The standard deviation of the posttest of the control group had increased by 0.51 when compared to its pretest. This indicated that the scores of students in the control group were scattered away from the mean, which means students in the control group had varied learning ability. The standard deviation of the posttest of the experimental group has decreased by 0.82 when compared to its pretest. This indicated that scores of students in the experimental group were more concentrated around the mean, which means the learning ability of students in the experimental group were almost same. The variation in the standard deviation between the groups was caused by the treatment given. Therefore researcher concluded that rubrics had positive effects on the learning achievement of the students.

4.2 ANALYSIS OF THE SURVEY QUESTIONNAIRE

The second objective of this study was to investigate the students' opinions towards rubric usage in Educational Assessment and Evaluation. The 20 survey items of questionnaire using five points Likert scale were prepared and administered to the experimental group at the end of the study. The survey questionnaire focused on students' opinions towards rubric usage in Educational Assessment and Evaluation. The mean and standard deviation were computed as shown in the table 4.2.

Table 4.2 illustrates the result of student's level of opinion towards rubric usage in Educational Assessment and Evaluation. The questionnaire was divided into four components: Opinion on interest, opinion on guidance, opinion on confidence and opinion on feedback.

Table 4.2 illustrates the mean, standard deviation and students' level of opinion towards rubric usage in Educational Assessment and Evaluation.

Sl. No		Mean	Std. Deviation	Level of Opinion
A	Opinion on Interest			
1	Learning educational Assessment and Evaluation with rubrics is fun.	4.67	.498	Strongly Agree
2	I like the assessment tool-rubric	4.80	.407	Strongly Agree
3	I enjoyed learning Educational assessment and Evaluation with rubrics.	4.87	.346	Strongly Agree
4	Rubrics makes the learning interesting.	4.77	.430	Strongly Agree
5	I like learning with rubrics.	4.87	.346	Strongly Agree
	Total	4.79	.405	Strongly Agree
B	Opinion on Guidance			
6	Rubrics guided me while I am learning	4.73	.450	Strongly Agree
7	I became independent learner with the rubrics	4.80	.407	Strongly Agree
8	I understood the Educational Assessment and Evaluation concept more clearly with help of rubrics.	4.77	.430	Strongly Agree
9	I become more responsible for learning with rubrics	4.73	.450	Strongly Agree
10	My performance improved after using the assessment tool-rubrics	4.73	.450	Strongly Agree
	Total	4.75	.437	Strongly Agree
C	Opinion on Confidence			
11	I am confident in learning Educational Assessment and Evaluation concepts with rubrics	4.63	.490	Strongly Agree
12	I learn better with the rubrics	4.87	.346	Strongly Agree
13	I get good grades in Educational Assessment and Evaluation when assessment tool-rubrics are used	4.67	.479	Strongly Agree
14	I can perform better if there are rubrics	4.77	.430	Strongly Agree

Table 4.2 illustrates the mean, standard deviation and students' level of opinion towards rubric usage in Educational Assessment and Evaluation (Cont.)

15	Learning Educational Assessment and Evaluation concepts are easier with rubrics	4.67	.479	Strongly Agree
	Total	4.72	.445	Strongly Agree
D	Opinion on Feedback			
16	The feedback from my teacher improved my learning	4.77	.430	Strongly Agree
17	The feedbacks are specific to the criteria used in the rubrics and very helpful	4.77	.430	Strongly Agree
18	Feedback motivated me learn more	4.77	.430	Strongly Agree
19	Feedback improved my performance in Educational Assessment and Evaluation	4.83	.379	Strongly Agree
20	Feedback were given immediately by teacher and help us learn a lot	4.70	.466	Strongly Agree
	Total	4.77	0.429	Strongly Agree

Source: Choden, 2012, p.12; Garcia-Ros et al., 2012; McMillan, 2013, p.61; Miller, Linn, & Gronlund, 2009, p.351

Level of opinion: 1-1.50 strongly disagree, 1.51-2.50 disagree, 2.151-3.50 undecided, 3.51-4.50 Agree, 4.51-5.00 strongly Agree.

Table 4.3 illustrates the summary of students' level of opinion towards rubric usage in Educational Assessment and Evaluation.

Variables	Mean	Std. Deviation	Level of Opinion
Interest	4.79	0.405	Strongly Agree
Guidance	4.75	0.437	Strongly Agree
Confidence	4.72	0.445	Strongly Agree
Feedback	4.77	0.430	Strongly Agree
Total	4.76	0.429	Strongly Agree

It is evident from Table 4.2 that in the first component of student's opinion questionnaire, 'opinion on interest' almost all the students strongly agreed with all the statements. The total mean was 4.79 with standard deviation 0.405. This indicated that rubrics arose interest in them and made them learn more. The highest mean was 4.87 with the standard deviation 0.35 for the two statements '*I enjoyed learning Educational assessment and Evaluation with rubrics*' and '*I like learning with rubrics*'. The lowest mean was 4.67 with the standard deviation 0.49 for one statement '*Learning educational Assessment and Evaluation with rubrics is fun*'.

In the second component of the student's opinion questionnaire, 'opinion on guidance' students had strongly agreed with all the statements. The total mean was 4.75 with standard deviation 0.437. The highest mean was 4.80 for one statement '*I became independent learner with the rubrics*' with standard deviation 0.407 and the lowest mean were 4.73 for three statements with the standard deviation 0.450 each. Therefore this indicated that students strongly agreed that rubrics provided guidance while they were learning Educational Assessment and Evaluation concepts.

For the third component of opinion questionnaire 'opinion on confidence' all the students strongly agreed with the statements which indicated that rubrics made them more confident in learning Educational Assessment and Evaluation concepts. The total mean was 4.72 with the standard deviation 0.445. The highest mean was 4.87 for one statement '*I learn better with the rubrics'* with the standard deviation 0.346. The lowest mean were 4.63 with the standard deviation 0.490 for statement '*I am confident in learning Educational Assessment and Evaluation concepts with rubrics'*.

In the fourth component, 'opinion on providing feedback' all the students strongly agreed with all the statements. The total mean was 4.77 with the standard deviation 0.429. This clearly indicated that rubrics provided feedback to the students while they were learning. The highest mean was 4.83 for one statement '*Feedback improved my performance in Educational Assessment and Evaluation*' with the standard deviation 0.379 and the lowest mean was 4.70 for another statement '*Feedback were given immediately by teacher and help us learn a lot*' with the standard deviation 0.466.

The total mean for all components (interest, guidance, confidence and feedback) was 4.76 out of 5 as shown in Table 4.3. This indicated that the students' level of opinion towards rubric usage in Educational Assessment and Evaluation falls in the (Strongly Agree) category on the Likert scale. This means students in the experimental group had positive opinions towards rubric usage in Educational Assessment and Evaluation.

The data analysis of students' opinion questionnaires showed that almost all students strongly agreed that rubrics used in Educational Assessment and Evaluation arose interest in them, provided guidance, provided feedback and gained confidence in learning Educational Assessment and Evaluation concepts using rubrics. Therefore researcher concluded that students had positive opinions towards rubric usage in Educational Assessment and Evaluation. The overall students' level of opinion towards rubric usage is shown in figure 4.3.

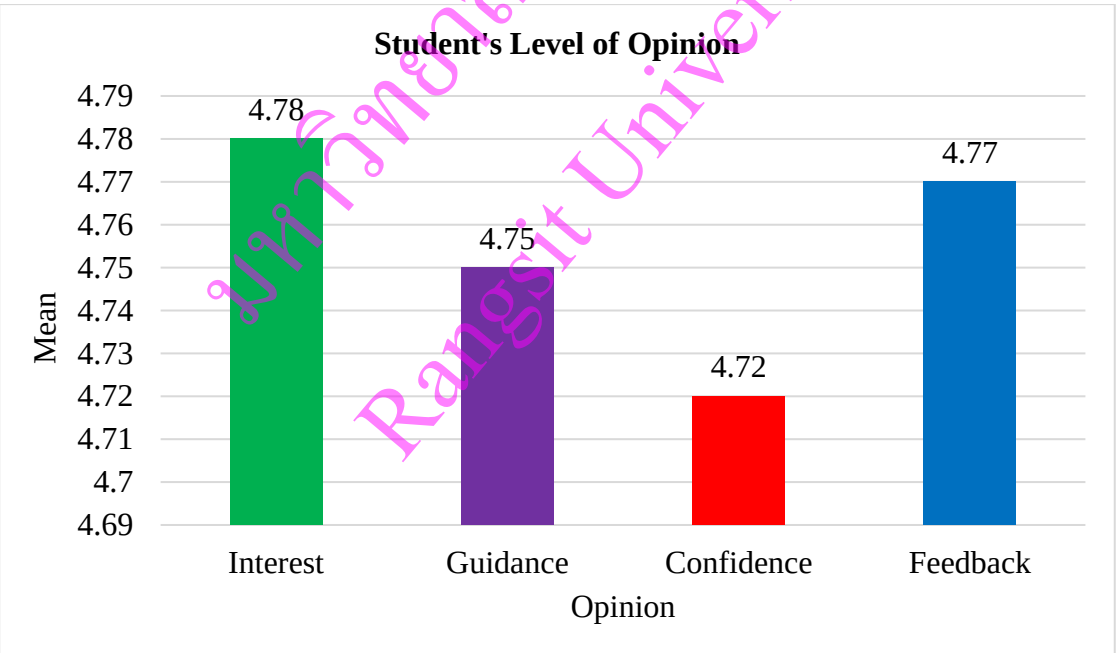


Figure 4.3 Student's level of opinion towards rubric usage.

Figure 4.3 in the above graph shows the overall students' level of opinion towards rubric usage in Educational Assessment and Evaluation. The data represented in the above graph is the mean of the rating done in the Likert Scale by the students in four different components of opinion (interest, guidance, confidence and feedback). The

graphs clearly show that means for the all the four components of opinions were rated above 4.71 which falls into the strongly agree level of opinion on the Likert Scale. Therefore, the researcher concluded that the students had positive opinions towards the rubric usage in Educational Assessment and Evaluation.

4.3 ANALYSIS OF STUDENTS' REFLECTIVE JOURNAL

The main purpose of the reflective journal was to investigate the students' opinions towards rubric usage in Educational Assessment and evaluation. The students in the experimental group wrote two reflective journals in the 2nd and the 4th weeks of the study. The students in the experimental group were asked to write their opinions towards the rubric usage in Educational Assessment and Evaluation. The data obtained from the students' journal were analyzed by using the coding system (open, axial and selective) based on Grounded Theory of Corbin and Strauss (2008). The overall data were organized and interpreted in nine core themes: 1) Encouraged independent learning 2) Informed teachers' expectation 3) Consistent and objective assessment 4) Provided guidance 5) Helped in goal setting and planning 6) Provided feedback 7) Motivated to learn 8) Encouraged self-assessment and peer assessment 9) Reduced anxiety.

4.3.1 Encouraged Independent Learning

The students in their reflective journal mentioned that rubrics encouraged independent learning where the learner was responsible for his/her own learning. Here it means learners tried to learn on their own and construct the meaning with the help of criteria explicitly listed in rubrics. A student acquired knowledge by his or her efforts and developed the ability for inquiry and critical evaluation.

> "Rubrics has detailed description of the characteristics for each level of performance, so with the help of rubric, we can learn ourselves" (EILSRJ5)

> "It helped me to develop and gather lot of information without the help of teacher and it encourages self-assessment". (EILSRJ7)

"Learning using rubrics is one of the best way to learn without depending on others". (EILSRJ23)

"Rubrics helped us to learn independently". (EILSRJ8)

Instructional rubrics facilitated learner autonomous study-skill among the students in the experimental group which subsequently led to lifelong learning. Rubrics helped students to be autonomous by being able to judge their own work. Majority of students acknowledged that rubrics encouraged them to be independent learner, self-initiate work and regulate their own learning. Therefore, it can be concluded that rubrics encouraged independent learning in the learners.

4.3.2 Informed teacher's expectations

Students felt that they better understood teacher expectation when rubrics were provided to them. Students stated that understanding the expectation of teacher, format of the task and the resources necessary to complete it were all important in doing high quality work.

"Instructional rubrics was helpful in general. We are able to carry out the task with the expectation of teacher's desire." ITESRJ6

"Rubric helped me to fulfill the teacher's expectation and as a result I managed to score high marks in the given task".ITESRJ24

Rubrics were used by students as guidelines to work towards teacher's expectation. The criteria and performance-level descriptions in rubrics helped students to understand what the desired performance was and what it looked like. Majority of students acknowledged that rubrics informed them about the teachers' expectation. Hence researcher can conclude that rubrics informed students about teachers' expectation and as a result students in the experimental group performed better than students in the control group.

4.3.3 Consistent and objective assessment

Students in the experimental group revealed that rubrics allowed the assessment to be more objective and consistent. They also emphasized that rubric-referenced grading as fair and transparent. Students saw rubrics as a valuable grading tool because rubrics helped them to attain better grades. Rubrics comprehended and justified the grade to the students. That's why students were liberated from the perception of traditional biased grading.

> "Well-defined grading criteria made everything clear and understandable." (COASRJ15)

> "Rubrics made grading transparent instead of traditional unsteady grading system". (COASRJ18)

> "Rubrics strengthened the quality and standard of assessment. It made assessment and evaluation fair and provided justice." (COASRJ27)

The above excerpts show that rubrics encouraged consistent and objective assessment in the experimental group.

4.3.4 Provided Guidance

The entries in student's journal described rubrics as a 'guide to learn'. This is because rubrics monitored student's progress and provided them direction. When rubrics were given to the students with the task description, it helped students monitor and assess their progress as they worked toward clearly indicated goals.

> "Rubrics have helped me by providing guidance on what specific expectation my Lecturer has for the specific task". (PGSRJ12)

"Rubrics guided me while I am learning Educational Assessment and Evaluation concepts". (PGSRJ14)

"Rubrics were helpful in learning Educational Assessment and Evaluation concepts as it provides clear information of what to do."(PGSRJ25)

"It acted as a guide and provided direction in which area should be focused." (PGSRJ27)

4.3.5 Helped in Goal setting and planning

The students showed high interest in using the rubrics and they seemed to be aiming for the highest level in the rubrics. This showed that rubrics helped them in goal-setting and planning which were crucial metacognitive strategies that supported students' learning. Students also revealed that the integration of the rubrics in Educational Assessment and Evaluation course served them in planning and shaping instruction by breaking the Educational Assessment and Evaluation concepts into different components and directing students towards manageable learning targets.

"Rubrics supported good thinking". (HGPSRJ30)

"I used rubrics to allocate time and resources in the planning and completion of my task."(HGPSRJ27)

"Rubrics helped me in planning to achieve goal that was set in the beginning of class with the help of rubrics."(HGPSJJ19)

"We use that as a guideline to help us plan out the given task". (HGPSRH26)

4.3.6 Provided feedback

Students also stated that rubrics were an effective tool to provide focused feedback. The feedback enabled them to learn meaningfully and effectively. Rubrics also assisted them in overcoming their shortcoming in learning through meaningful feedback.

"We received necessary feedbacks on our task from our tutor". (PFSRJ29)

"Rubrics helped me to receive feedback from our tutor. Feedback helped us to learn more". (PFSRJ13)

"We received feedback both from our tutor and from our friends. The feedbacks were provided based on rubrics". (PFSRJ18)

4.3.7 Motivated to Learn

Students also reflected in the journal that involving them in development of criteria and rubrics motivated them to learn. This is because they were clear with criteria to success. The positive feedback that they received from the lecturer also motivated them. The motivation encouraged the students to engage themselves in exploring information with enthusiasm.

"When we are clear with the skill we need to master, we gain confidence and solve the problem easily". (MLSRJ19)

"Learning with rubrics was helpful in general. We were able to do the given task with the expectation of teacher desire. It made me confident in learning Educational Assessment and evaluation."(MLSRJ9)

"Positive feedback provided using rubrics were motivating".MLSRJ4

4.3.8 Encouraged self-assessment and peer assessment

Based on student's reflective journal, it was also found that rubrics could be used for self-assessment and peer assessment of students where they evaluated their own work and compared with others work, and earned better grades. This led to the development the personal habit of self-assessment amongst the students and encouraged peer assessment.

"Rubrics helped us in self-assessment and peer assessment. Peer assessment was a good way to look at others work, assess them and compare to our work in order to learn from our friends. Self-assessment was very helpful as it allowed me to spot the mistakes in my own work and rate myself." (ESPSRJ21)

"Rubrics not only helped us to learn but it also helped us to do self-assessment." (ESPSRJ6)

"Rubrics helped us to reflect, analyze and improve our work." (ESPSRJ28)

"Learning using rubrics was very effective way of learning. Since there were categories given in rubric, we could easily assess our work and rate ourselves."ESPSRJ30

4.3.9 Reduced Anxiety

Since rubrics helped students to focus their effort on producing high quality work and getting better grades, they felt less anxious in learning Educational Assessment and Evaluation concepts.

"Rubrics focused us in fulfilling goal and objective of the task." (RASRJ12)

"I enjoyed learning with rubrics as it gave me clear direction". (RASRJ21)

"I was never worried about the procedure. Rubrics contained everything. Teacher should use rubric for all the types". (RASRJ27)

Based on student's reflective journal, the researcher concluded that the opinions of students towards rubric usage were: 1) rubrics encouraged independent learning 2) rubrics informed teacher's expectation 3) rubrics provided consistent and objective assessment 4) rubrics provided guidance 5) rubrics helped in goal setting and planning 6) rubrics provided feedback 7) rubrics motivated to learn 8) rubrics encouraged self-assessment and peer assessment and 9) rubrics reduced anxiety.

4.4 CONCLUSION

In general, rubrics used in Educational Assessment and Evaluation had positive effects on students' learning. The data analysis of pretest and posttest revealed that the students using rubrics performed better than the students who were taught using a traditional method. The data analysis of survey questionnaire and student's reflective journal also stated that students exhibited positive opinions towards rubric usage in Educational Assessment and Evaluation.

In summary, the use of rubrics had been shown to facilitate learning through several ways. The first way was aiding students in understanding teachers' expectation and using feedback from teachers, peers or themselves. The fact that rubrics contain different levels of quality also means that it is easier to provide and possibly to interpret the constructive feedback. The others were due to impact on self-related learning and related factors such as independent learning, guidance and student anxiety; factors that may in turn affect student performance. Again, an important requirement seemed to be the transparency provided, which made it possible for students to estimate their own capability, as well as to plan, monitor and evaluate their work according to the explicit criteria. This means that students could exert more control of their own learning, which potentially reduces anxiety and improve learning.

CHAPTER 5

CONCLUSION, DISCUSSION, AND RECOMMENDATION

The chapter presents the conclusion and discussion of data analyzed in chapter 4 followed by recommendation in following sequence:

5.1 Conclusion

5.2 Discussion and

5.3 Recommendation

5.1 CONCLUSION

The main purposes of the study were 1) to examine and compare the learning achievement in Educational Assessment and Evaluation of first year students using rubrics and a traditional method, and 2) to investigate the students' opinions towards rubric usage in Educational Assessment and Evaluation.

Therefore both qualitative data and quantitative data were collected to fulfill the above stated objectives. The conclusion drawn from the results of the data analysis was presented below.

5.1.1 The Result of the Test Score Analysis

The first objective of the study was to examine and compare the learning achievement in Educational Assessment and Evaluation of students after using rubrics in the experimental group and a traditional method in the control group. Therefore, pretest and posttest were administered in both groups to compare the learning achievement before and after giving the treatment.

A comparative statistical analysis using paired sample t-test was done within the group to analyze the pretest and posttest of both the experimental and the control group. The mean of the pretest and posttest of the control group were 7.03 and 19.67 as shown in the table 4.1. The mean of pretest and posttest of an experimental group were 7.10 and 25.40 respectively. The mean difference of pretest and posttest of the control group was 12.64 and the mean difference of pretest and posttest of an experimental group was 18.30 with significant value (p) with 0.000 which is lower than $p<0.05$. This indicated that there was statistically a significant difference in the test scores of the students in the posttest when compared to the pretest for both the group.

A comparative statistical analysis using independent t-test was done between the groups. The mean difference of posttest between control group and experimental group was 5.73 and significant value (p) was 0.000 which is lower than the significant value $p<0.05$. This indicated that there was statistically a significant difference in posttest scores between the control group and the experimental group. This showed that the test scores in the posttest for the experimental group was significantly higher than the test scores of the control group in the posttest. The result was as expected by researcher with better performance by the experimental group because they were given treatment comparing to students in the control group. Hence, the finding supported research hypothesis, which stated that the learning achievement in Educational Assessment and Evaluation of first year students who are taught using rubrics will be higher than students who are taught using a traditional method.

Therefore, the results of mean, standard deviation and significant value (p) computed using paired sample t-test and independent sample t-test indicated that there was significant rise in the test scores of the experimental group after using rubrics.

5.1.2 Result Analysis of survey questionnaire

The second objective of this study was to investigate the student's opinions towards rubric usage in Educational Assessment and Evaluation. Therefore to fulfill this objective, the 20 survey questionnaire using five points Likert scale were prepared and

administered to the experimental group at the end of the study. The survey questionnaire focused on student's opinions towards rubric usage in Educational Assessment and Evaluation. The questionnaire was divided into four components: opinion on interest, opinion on guidance, opinion on confidence and opinion on feedback. The mean and standard deviation were computed as shown in the table 4.2. The total mean for all components (interest, guidance, confidence and feedback) was 4.76 out of 5. This indicated that the students' level of opinion towards rubrics usage in Educational Assessment and Evaluation falls in the (Strongly Agree) category on the Likert scale. This means that students in the experimental group had positive opinions towards rubric usage in Educational Assessment and Evaluation. The data analysis of student's opinion questionnaires also showed that the students strongly agreed that the rubrics used in Educational Assessment and Evaluation arose interest in them, provided guidance, provided feedback and gained confidence in learning Educational Assessment and Evaluation concepts using rubrics.

Therefore the researcher concluded that the students had positive opinions towards rubric usage in Educational Assessment and Evaluation which is strongly correlated with students learning achievement.

5.1.3 Result of the Students' Reflective Journal analysis

The main purpose of the reflective journal was to investigate the student's opinions towards rubric usage in Educational Assessment and Evaluation. The data obtained from the students' journal were analyzed by using the coding system (open, axial and selective) based on Grounded Theory of Corbin and Strauss (2008).

According to students' reflective journal, majority of students revealed that rubrics encouraged independent learning where they learned by themselves and constructed the meaning with the help of criteria explicitly listed in the rubrics. They also shared that rubrics made teachers' expectation very clear. The criteria and performance-level descriptions in the rubrics helped them to understand what the desired performance is and what it looked like. Students in the experimental group also

emphasized that rubric-referenced grading as objective, consistent, fair and transparent. This is because rubrics comprehended and justified the grades to all the students. That's why students in the experimental group were liberated from perception of traditional biased grading. They also described the rubrics as a 'guide to learn'. This is because rubrics acted as a guide and monitored student's progress and also provided direction while they were learning Educational Assessment and Evaluation concepts.

Rubrics helped students in goal-setting and planning which were crucial metacognitive strategies that supported student's learning. Students also stated that rubrics provided more informative feedback about their strengths and areas in need of improvement. Feedback enabled the students to learn meaningfully and effectively and then led to the development of learning behaviors such as monitoring performance, reflecting on feedback and improving their performance. Rubrics provided students with a tool for self-assessment and peer assessment. Students stated that when they had an assessment criteria in their hand, they could assess their own performance which is known as self-assessment. They also mentioned that rubrics could be used by classmates to give each other specific feedback on their performance. Therefore rubrics encouraged self-assessment and peer assessment among students in the experimental group.

Students also reflected in the journal that rubrics motivated them to learn. The rubrics helped the students to understand the teachers' expectations as well as the skill levels they need to demonstrate. Therefore rubrics ignited student's self-motivation and engagement in their learning. The positive feedbacks also motivated them. The motivation encouraged the students to engage themselves in exploring information with enthusiasm. Students also shared that rubrics reduced anxiety during learning because rubrics helped them to focus their effort on producing high quality work and getting better grades. As result, they felt less anxious in learning Educational Assessment and Evaluation concepts.

Therefore from the student's reflective journal and student's opinion questionnaire, the researcher concluded that the opinions of students towards rubrics usage in Educational Assessment and Evaluation were: 1) rubrics encouraged

independent learning among students 2) rubrics informed teacher expectations to students 3) rubrics provided consistent and objective assessment 4) rubrics provided guidance while students were learning 5) rubrics helped in goal setting and planning in Educational Assessment and Evaluation 6) rubrics provided feedback 7) rubrics motivated them to learn 8) rubrics encouraged self-assessment and peer assessment 9) rubrics reduced anxiety 10) rubrics arose interest in them and 11) students gained confidence in learning Educational Assessment and Evaluation using rubrics.

5.2 DISCUSSION

This study had two major findings. The first finding was that rubrics used in Educational Assessment and Evaluation enhanced the learning achievement of first year students. The second finding was that students had positive opinions towards the rubric usage in Educational Assessment and Evaluation.

5.2.1 Learning achievement test

The first finding was from the analysis of student's achievement tests that was pretest and posttest of the control group and the experimental group. The findings showed that there was no significant difference in the mean score of the students in the control group and the experimental group in the pretest before giving the treatment. However there was significant difference in the mean score in the posttest for both control group and the experimental group. The posttest mean score of the experimental group was significantly higher than the posttest mean score of the control group. This indicated that the students in the experimental group performed better than the students in control group. Therefore researcher concluded that rubrics used in Educational Assessment and Evaluation enhanced the learning achievement of first year students in Bhutanese University.

The findings of this study was consistent with the findings of Uddin (2014) who found out that rubrics had a significant impact on student's academic performance. The finding was also congruent with the findings of Jonsson (2014) and Howell (2011). They

found out that rubrics contributed to a solid academic performance by playing a substantive role in positively impacting academic performance. It was also similar with the findings of Panadero and Jonsson (2013). However, Pinto and Santos (2006) argued that the exclusive use of assessment rubrics may not achieve the effective learning outcomes. There was the need to move beyond basic usage to a more innovative approach that guaranteed students the experience of ownership. Egodawatte (2010) agreed that contending training and guidance on the use of rubrics will help reduce the discrepancies, and intrinsically motivate students to use them for learning. Andrade (2000) had also shown that just providing a rubric to students was not consistently associated with better performance, and concluded that students must engage deeply with rubrics, perhaps by co-creating them and using them for self- and peer assessments, as students did in the study conducted by Reitmeier, Svendsen, and Vrchota (2004).

In consonance with previous researchers, Reddy and Andrade (2010) also found that rubrics enabled them to engage in important processes, including identifying critical issues in given tasks and, thereby, reducing uncertainty and doing more meaningful work, determining the amount of effort needed for task, evaluating their own performances in order to get immediate feedback, and focusing their efforts so as to improve their performance. The finding of the study was also strikingly similar to the findings of Manzanares et al. (2014). In their study, they found that students improved their procedural knowledge in the field of structural engineering after using rubrics as self-regulated learning method. Fastre et al. (2010) also found that the students who received the performance based criteria performed better than the students who did not received the performance criteria.

The possible reasons to account for such a significant gains in the test scores in the experimental group could be due to immense implication of rubrics on student's academic performance. Students used rubrics to support their own learning and academic performance. Using rubrics helped them to focus on their effort, produce work of high quality, earn better grades and felt less anxious about the given task (Andrade & Du, 2005). Al-jarf (2011) found that rubrics promoted learning because it helped in defining important outcomes for students. Rubrics have been widely acknowledged to

enhance student learning and improve instruction (Marie, 2013). This was in lined with what Brookhart (2003) asserted that rubrics facilitated students' awareness of learning goals as well as the application of feedback which were very important in enhancing the learning achievement of students. Cothran (n.d) also found out that rubrics were positive addition to a teachers' methods as they could provide a way to plan and interpret students learning. This supports the research findings of Andrade and Du (2005). Turgut and Kayaoglu (2015) also concluded that the ultimate goal of using rubrics as an instructional tool is to empower students by awakening a sense of appreciation of what makes good learning or effective leaning. Rubrics also acted as a 'guide to learn' while students were learning. McGatha and Darcy (2010) found out that rubrics can be designed to formulate standards for levels of achievement and can be used to guide and improve performance. Jonsson (2014) clarified that the way in which rubrics supported learning and instruction was by making expectation and criteria explicit, which facilitated feedback and self-assessment.

Another reason for the significant increase in the test scores was due to shift in traditional paradigm of teacher centered teaching to a paradigm characterized by active and students centered learning. Use of rubrics in the classroom had changed the role of teacher to a mentor and student as a discoverer of their own new knowledge. The learner centered approach using rubrics encouraged independent learning where learner was responsible for his/her own learning. Rather than simply regurgitating factual information, rubrics encouraged students to work towards open-ended 'real world' problems and tasks by actively demonstrating higher-order cognitive competencies such as critical and reflective thinking (Howell, 2011). Rubrics also supported metacognitive strategies of planning, monitoring and regulating (Reddy, 2007). As a result, rubrics used in Educational Assessment and Evaluation enhanced student's learning. This was in consonance with the findings of Peat and Moriarty (2009). It was also explained in the study conducted by Reddy (2007). She concluded that rubrics lead to the development of learning behaviors such as monitoring performance, reflecting on feedback, assessing and revising performance in students.

The other reason for better performance by the experimental group was due to several learning theories associated with rubrics used in the module. Learning using rubrics was greatly based on self-regulated learning theory. Self-regulated learning is defined as an active and constructive process through which learners can set goals, and monitor and control their cognition, motivation, and behavior (Zheng, 2016). Rubrics assisted the students in managing their thoughts, behavior, and emotion in order to successfully navigate their learning experience. According to Effeney et al. (2013), the self-regulation and behavior were important aspects of learning and the extent to which students become self-regulators of their own learning influenced their academic success. Cheng and Huang (2014) also agreed that self-regulated learning had positive effects on student's academic performance. The integration of rubrics in Educational Assessment and Evaluation had also supported constructivist theory of learning where leaners actively constructed their own knowledge using explicit criteria listed in rubrics. Numerous studies supported that constructivist learning enhanced student's academic performance (Ahmad, 2011; Akanwa & Ovute, 2014; Gemayel, 2010; Qarareh, 2016). The feedback provided by rubrics relies on the Behaviorist theory of leaning which believes that the learner get motivated to learn when they received positive feedback. The motivation fostered student's learning. This was supported by the research findings of Gbollie and Keamu (2017) who found that motivation had a significant impact to student's academic performance.

5.2.2 Survey Questionnaire and Students' reflective journal

The second finding was from the analysis of survey questionnaire and student's reflective journal. The second finding was that students had positive opinions towards the rubric usage in Educational Assessment and Evaluation.

5.2.2.1 Survey questionnaire

The survey questionnaire on student's opinions towards rubric usage was computed using mean and standard deviation as show in table 4.2. All the statements under four components of opinion were rated above 4.51 which falls in strongly agree

category. This is because they found rubrics as a valuable tool in teaching and learning in higher education. Students' response to the statement *'I am confident in learning Educational Assessment and Evaluation concepts with rubrics*' was rated the lowest from 20 items, one possible reason could be time constraint because this study was carried out for only four weeks. Since they were using rubrics for the first time, it was not easy to gain confidence in short period of time. However the total mean for all the components (interest, guidance, confidence and feedback) was 4.76 out of 5. This indicated that the students' level of opinion towards rubric usage in Educational Assessment and Evaluation falls in the (Strongly Agree) category on the Likert scale. This means students in the experimental group had positive opinions towards rubric usage in Educational Assessment and Evaluation.

This finding of the study was supported by Eshun and Osei -Poku (2013) who concluded that in terms of studio based learning, 86% of the students had positive perceptions on the use of rubrics for its support in learning process, and 89% believed that rubrics made them to have a good acquaintance to each other, but Andrade and Du (2005) reported that students not only had a positive perception towards rubrics but they also agreed that rubrics supported their academic performance in the contexts of providing feedback, guidance and generation of interest. In the study conducted by Raposo-Rivas (2016), almost one in three students (72.4%) were satisfied with the use of rubrics in their learning. Similarly, Kulprasit (2016) also found that students showed positive attitudes toward the writing rubrics when rubrics were used as assessment for learning in English as Foreign Language (EFL).

The possible reasons for students to have positive opinions towards rubric usage could be because of autonomous, guided and less anxious learning environment created by rubrics. Like students in the study conducted by Moni, K. W., and Moni, K. B. (2008), almost all the students in the experimental group strongly agreed that rubrics used in Educational Assessment and Evaluation arose interest in them, provided guidance, provided feedback and gained confidence while they were learning Educational Assessment and Evaluation concepts using rubrics. Another reason why students had positive opinions towards rubrics was because they perceived its

value. That's why they had rated all the statements above 4.51. The finding of Kutlu, Yildirim, and Bilican (2010) indicated that teachers with the positive attitude towards rubrics benefitted from the rubrics more than the teacher with negative attitude towards rubrics. Contreras-Higuera, Martınez-Olmo, Rubio-Hurtado, and Vila-Banos (2016) also concluded that rubrics were useful for promoting awareness of competences and for making assessment of these more transparent, as previous studies have found (Navarro, Ortells, & Martı, 2011;Raposo & Martínez, 2011).

5.2.2.2 Students Reflective journal

The findings from the reflective journal were discussed below:

According to the student's reflective journal, students revealed that rubrics made teachers' expectation explicit. They liked the fact that rubrics let them know "what is expected," and contrasted it with "guessing game" they felt they had to do when teacher did not provide rubric. This matched with the findings of Qasim (2015) and Maxwell (2010) that rubrics informed students about teachers' expectation. This helped students to focus more attention to primary content and reduce effort to add unnecessary material in their task (Uddin, 2014). As Andrade and Du (2005) found in their study, they also expressed that rubrics gave them insight into teacher's expectations. Therefore, the student's knowledge about the teacher's expectations helped them develop self-regulation skills to identify their strengths and weaknesses and perform better (Qasim, 2015).

Students in the experimental group emphasized that rubric-referenced grading as objective, consistent, fair and transparent. This finding was very much consistent with the findings of Bloxham, Boyd, and Orr (2011) which shared the same thing. Jonsson (2014) also identified that rubrics made assessment tasks more transparent for students and provided them with the tools to unlock secret by involving them in the assessment process. However it contradicted with the findings of Andrade and Du (2005) where they did not see the impact as being primarily "Better, fair grades" (p. 5), but instead quicker and more responsive grading.

Students also described rubrics as a guide to learn. This was in line with what Shepherd and Mullane (2008) asserted that students learned to monitor their own progress and made improvement in a timely order using rubrics as a guide. Rubrics also guided instructional design and delivery (Jonsson & Svingby, 2007; Reddy & Andrade, 2010; Steven & Levi, 2013; Wolf & Stevens, 2007). McGatha and Darcy (2010) found that rubrics can be designed to formulate standards for levels of achievement and can be used to guide and improve performance. This supports students' opinions on rubric as a guide to learn.

Students uniformly endorsed in their journal that integration of the rubrics in Educational Assessment and Evaluation course served them in planning and shaping instruction by breaking the Educational Assessment and Evaluation concepts into different components and directing students towards manageable learning targets. This findings reflected the key aspects of self-regulatory behaviors such as goal setting, planning, self-assessment and revision (Zimmerman, 2000). This finding also validated the cyclic process of formative assessment described by Black and Wiliam (1998), which requires that students are able to recognize the goal, consider evidence about the position of their work in relation to that goal and have an understanding of a way to close the gap between the two (Andrade & Du, 2005). Students mentioned in their journals that rubrics were an aid to them in both planning and completion of the task.

Students mentioned in their journals that rubrics provided more informative feedback about their strengths and areas in need of improvement. Similar findings was also reflected in the study by Helvoort (2010) that rubrics encouraged meaningful feedback. Al-jarf (2011) also found that rubrics helped in analyzing students work and provide beneficial feedback to students that will lead to higher quality work. They routinely commented in their journal that rubrics provided immediate and positive feedback which helped them to perform better. Panadero and Jonsson (2013) also concluded that another manner for the use of rubrics to contribute to student learning was by aiding the feedback process, which has been deemed useful by teachers and students alike in their study. Gullo (2005) concluded that students were more self-

motivated and engaged in their learning if they were provided with meaningful feedback from instructional tool like rubrics.

Students stated that rubrics encouraged self-assessment and peer assessment. With the help of criteria listed in rubrics, they were able to assess their own performance and improve their quality of work. This supports the findings of Andrade, Ying, and Xiaolei (2008) which claimed that student's self-assessment using rubrics leads to improvement in their performance. Similar finding was also highlighted by Lovorn and Rezaei (2011); Steven and Levi (2013) in their studies that rubrics provided students with a self-assessment and peer feedback tool. García-Ros et al. (2012) also found that rubrics were the most appropriate tools for self-and peer assessment in universities. Smit et al. (2017) also observed a direct effect of the rubric on student's self-assessment. He and Canty (2012) confirmed that rubrics referenced self-assessment enhanced student's performance in anatomy class.

Students also shared that rubrics reduced anxiety. This was due to the fact that they did not know exactly where to put emphasis, what to look for, how much emphasis they should give on different elements of task. When they knew what they had to include and what they did not have to include and how much emphasis they had to put on different elements, they felt a sort of relief and they could produce their best product as much as possible. Besides, it also gave them a sense of independence, a sense of autonomy, when they knew what they had to do and why (Uddin, 2014). This supports the findings of Reynolds-Keefer (2010); Panadero and Jonsson (2014) where rubrics lowered student's anxiety level because of increased communication between teacher and students.

Occasionally 1 or 2 students expressed dissatisfaction with rubrics saying that rubrics created a restrictive environment with little room for interpretation. However, majority of students experienced an incredible impact of rubrics in their performance. In time, they were so much motivated that overwhelming numbers of students showed great deal of enthusiasm in the hope that rubrics must be included in all the courses in university. This is because of the positive emotions that they

experienced during treatment using rubrics facilitated the meta-cognitive process in them and improved their performance.

5.3 RECOMMENDATIONS

The present study found out that rubrics used in Educational Assessment and Evaluation enhanced students' learning achievement and also students had positive opinions towards rubrics. Based on the outcome, the following recommendations were made.

5.3.1 Recommendation for implementation

1) Since the study found out that teaching Educational Assessment and Evaluation module using rubrics enhanced learning achievement and also students had positive opinions towards rubric usage, Bhutanese University teachers are recommended to use rubrics as instructional approach in other modules as well.

2) The researcher recommend Royal University of Bhutan to train university teachers to use rubrics in teaching and learning.

3) The effective use of rubrics requires rubrics to be of high quality in order to have positive effects in the classroom.

4) Development of rubrics for each topic was recommended by students in the experimental group.

5) The study would serve as references for future researcher who carries out research in the same field.

6) Teachers may also try to teach other topics in Educational Assessment and Evaluation using rubrics besides assessment and item analysis.

5.3.2 Recommendation for future research

1) A majority of the studies done so far illustrate the use of rubrics only for evaluation. The ways in which they can be used to teach has not been sufficiently addressed. Therefore studies are needed in the areas like self-regulated learning using rubrics, rubrics as instructional approach and rubrics as learning approach.

2) Future research needs to be carried out over a longer period of time to make the study result more reliable and significant.

3) Further research is needed to find the dimension of how the use of rubrics to influence student attitudes and self-regulation behaviors.

4) Further research needs to examine whether this strategy or approach will bring similar outcome if used in other subjects too.

5) Research is needed to investigate whether each students learning using rubrics in Educational Assessment and Evaluation can bring similar outcome.

6) Further research is needed to find the opinions of teachers on the use of rubrics in Educational Assessment and Evaluation.

7) Further research is needed to find the opinions of teachers on the use of rubrics in other subjects as well.

Rubrics enhanced students' learning achievement and also students had positive opinions towards rubric usage in Educational Assessment and Evaluation. Therefore rubrics had positive effects on students' learning achievement in Educational Assessment and Evaluation.

REFERENCES

Abulnour, R. (2016). *How do Ontario Secondary School Science teachers who have demonstrated leadership and expertise in the area of constructivist learning theory enact assessment and evaluation?* (Unpublished Master's thesis). University of Toronto, Toronto.

Agustiani, H., Musa, M., & Cahyadi, S. (2016). Self-efficacy and self-Regulated Learning as Predictors of Students Academic Achievement. *The open Psychology Journal, 1*(9), 1-6.

Ahmad, M. (2011). The effect of using constructivist learning model in the training of science on the cognitive achievement and the development of social skills among first preparatory graders. *Educational Journal, 3*(6), 34-55.

Akanwa, U., & Ovute, A. (2014). The effect of Constructive Teaching model on SSS Physics Students Achievement and Interest. *Journal of Study and Method in Education, 4*(1), 35-38.

Al-Jarf, R. (2011). Creating and Sharing Writing iRubrics. *Asian EFL Journal. Professional Teaching Articles, 51*, 41-62.

Andale (2014). *Cronbach's Alpha: Simple Definition, Use and Interpretation*. Retrieved from http://www.statisticshowto.com/cronbachs-alpha-spss/

Andrade, H. L., Du, Y., & Mycek, K. (2010). Rubric-referenced self-assessment and middle school students' writing. *Assessment in Education: Principles, Policy & Practice, 17*(2), 199–214. doi:10.1080/09695941003696172

Andrade, H. L., Ying, D., & Xiaolei, W. (2008). Putting Rubrics to the Test: The Effect of a Model, Criteria Generation, and Rubric-Referenced Self-Assessment on Elementary School Students' Writing. *Educational Measurement: Issues & Practice, 27*(2), 3-13.

Andrade, H., & Du, Y. (2005). Student's perspectives on rubric-referenced assessment. *Practical Assessment, Research and Evaluation, 10* (3), 1-11.

Andrade, H.G. (2000). Using rubrics to promote thinking and learning. *Educational Leadership, 57*(5), 13-18.

Ayhan, U., & Ugur, M. (2015). Key of Language Assessment: Rubrics and Rubric Design. *International Journal of Language and Linguistics, 2*(2), 82-92.

REFERENCES (CONT.)

Baimbola, O., & Daniel, O. (2010). The constructivist based teaching strategy on academic performance of student in integrated science at the junior secondary school level. *Educational Study and Reviews, 5*(7), 347-353.

Barde, M. P., & Barde, P. J. (2012). What to use to express the variability of data: Standard deviation or standard error of mean? *Perspectives in Clinical research, 3*(3), 113-116.

Bargainnie, S. (n.d). *Fundamentals of Rubrics*. Retrieved from https://www.webpages.uidaho.edu/ele/scholars/practices/Evaluating_Projects/Resources/Using_Rubrics.pdf

Barot, M. (2016). Effects of Rubrics to Measure Achievements for ESL Learner as an Authentic Task Performance. *International E-Journal for Research in ELT, 2*(2), 156-164.

Bharuthram, S. (2015). Lecturers' Perceptions: The Value of Assessment Rubrics for Informing Teaching Practice and Curriculum Review and Development. *African Educational Review, 12*(3), 415-428. Retrieved from https://eric.ed.gov/?q=rubric+as+teaching+tool&id=EJ1107331

Biggs, J. (2003). *Teaching for quality learning at university: What the student does* (2nd ed.). Buckingham: Society for Research into Higher Education and Open University Press.

Birkett, T. M. (2014). *An investigation into EAP teacher and student perceptions and interpretations of an academic writing marking rubric. HKU scholar hub: University of Hong Kong*. Retrieved from https://hub.hku.hk/bitstream/10722/208031/1/FullText.pdf?accept=1

Black, P., & Wiliam, D. (1998). Inside the black box: Raising standards through classroom assessment. *Phi Delta Kappan, 80*(2), 139-148.

Bloxham, S., Boyd, P., & Orr, S. (2011). Mark my words: the role of assessment criteria in UK higher education grading practices. *Studies in Higher Education, 36*(6), 655-670.

REFERENCES (CONT.)

Bodo, B., & Hall, M. (n.d).*Rubric Essentials*. Retrieved from http://assessment.vt.edu/content/dam/assessment_vt_edu/Assessment_Resources/Rubric%20Development%20and%20Matching_Final_web.pdf

Bolarinwa, O. A. (2015). *Principles and methods of validity and reliability testing of questionnaires used in social and health science researches*. Retrieved from http://www.npmj.org/article.asp?issn=1117-1936;year=2015;volume=22;issue=4;spage=195;epage=201;aulast=Bolarinwa

Brookhart, S. (2003). Developing measurement theory for classroom assessment purposes and uses. *Educational Measurement: Issues and Practice, 22*(4), 5-12.

Brookhart, S. M. (2013). *How to create and Use Rubrics for Formative Assessment and grading*. Retrieved from http://www.ascd.org/publications/books/112001/chapters/What-Are-Rubrics-and-Why-Are-They-Important%C2%A2.aspx

Broughton, G., Broughton, G., Brumfit, C., Pincas, A., & Wilde, R. D. (1994). *Teaching English as a Foreign Language* (2nd ed.). London: Routledge Publisher.

Brown, S. (2010). *Likert Scale Example for survey*. *Iowa State University Extension*. Retrieved from http:/www.extension.iastate.edu/Documents/ANR/LikertScaleExamplesforSurveys.pdf

Bull, B. (2014). *The Benefits and limitation of Grading Rubrics*. Retrieved from http://etale.org/main/2014/04/10/the-benefits-limitations-of-grading-rubrics/

Casson, A. (2009). *Assessment in outdoor Education.* Queen's University: Heritage Branch Publisher.

Cengiz, C., & Karatas, F. (2015). Examining the effects of reflective journal on pre-service science teachers' general chemistry laboratory achievement. *Australian Journal of Teacher Education, 40*(10), 125-146.

REFERENCES (CONT.)

Cheng, C. M., & Huang, S. H. (2014). Web-based reading annotation system with an attention based self-regulated learning mechanism for promoting reading performance. *British Journal of Educational Technology, 45*(5), 959–980.

Cherry, K. (2015). *What is Behaviorism?* Retrieved from http;/psychology.about.com/od/psyshologystudygudes/a/learning_sg.ht

Cherry, K. (2016). *A Summary of Piaget's Stages of Cognitive Development Chart*. Retrieved from https;//www.verywell.com/piagets-stages-of-cognitive-development-2795457

Choden, R. (2012). *The development of authentic assessment tools for the seventh grade science lab-based learning at Khasadrupchu M.S.S. Thimphu, Bhutan* (Unpublished Master's thesis). Rangsit University, Pathumthani.

Christie, M., Grainger, P., Dahlgren, R., Call, K., Heck, D., & Simon, S. (2015). Improving the quality of assessment grading tools in Master of Education courses: a comparative case study in the Scholarship of Teaching and Learning. *Journal of the Scholarship of Teaching and Learning, 15*(5), 22-35.

Clark, I. (2011). Formative Assessment: Policy, Perspectives and Practice. *Florida Journal of Educational Administration and Policy, 4*(2), 158-180.

Corbin, J., & Strauss, A. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (3rd ed.). Thousand Oaks, CA: Sage publishers.

Contreras-Higuera, W. H., Martinez-Olmo, F., Rubio-Hurtado, M. J., & Vila-Banos, R. (2016). University students' perception of E-portfolio and Rubric as Combined Assessment Tools in Education Courses. *Journal of Educational Computing Research, 54*(1), 85-107.

Cothran, D. J. (n.d). *Student's Use of and Perspectives on Rubrics*. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.214.8637&rep=rep1&type=pdf

Creswell, J.W. (2005). *Educational Research: Planning, Conducting and Evaluating Quantitative and Qualitative Research* (2nd ed.). USA: Pearson Merrill Prentice Hal.

REFERENCES (CONT.)

Creswell, J., & Clark, V. (2007). *Designing and conducting mixed methods research*. Thousand Oaks, CA: Sage.

Dagar, V., & Yadav, A. (2016). Constructivism: A Paradigm for Teaching and Learning. *Art and Social Science Journal, 7*(4), 1-4.

Dikli, S. (2015). *Traditional Assessment vs. Authentic Assessment. Principles and Methods of Assessment*. Retrieved from https://abdao.wordpress.com/2015/07/18/traditional-vs-authentic-assessment/

Effeney, G., Carrol, A., & Bahr, N. (2013). Self-Regulated learning: Key Strategies and their sources in sample of adolescent male. *Australian Journal of Educational & Developmental Psychology, 13*, 58-74.

Egodawatte, G. (2010).A rubric to self-assess and peer-assess mathematical problem solving tasks of college students. *Acta Didactica Napocensia, 3*(1), 78.

Eshun, E. F., & Osei-Poku, P. (2013). Design Students' Perspectives on Assessment Rubric In studio-Based Learning. *Journal of University Teaching and Learning Practice, 10*(1), 1-13. Retrieved from http://ro.uow.edu.au/jutlp/vol10/iss1/8/

Falchikov, N. (2005). *Improving Assessment through Students' involvement: Practical Solution for aided learning in Higher and further education* (1st ed.). USA: Routedge farmer Publisher.

Fastre, G. M., Klink, M. V., & Merrienbore, J. J. (2010). The effects of performance-based assessment criteria on student performance and self-assessment skills. *Advance Health Sciences Education, 15*(4), 517-532.

Franklin, J. (2002). *Disadvantages of Traditional Assessment. 21st Century of Social Studies Assessment*. Retrieved from http://alternativeassessment.weebly.com/dta1more.html

Garcia-Ros, R., Fuentes, M. C., González, E., Molina, G., Moya, L., Natividad, L., & Sanchez, P. (2012).Designing and using rubrics in higher education: An innovation project in the psychology degree. *Electronic Journal of Research in Educational Psychology, 10*(3), 1477-1492.

REFERENCES (CONT.)

Gbollie, C., & Keamu, H. P. (2017). **St**udent Academic Performance: The Role of Motivation, Strategies, and Perceived Factors Hindering Liberian Junior and Senior High School Students Learning**.** *Education Research International, 2017*, 1-11.

Gemayel, G. (2010). The effect of using the constructivist learning model to train statistics in the development of scientific thinking among the students of the fourth year. *The Journal of Education, 17*(2), 249-284.

Gezie, A., Khaja, K., Chnag, V. N., Adamek, M. E., & Johnsen, M. B. (2012). Rubrics as a Tool for Learning and Assessment: What Do Baccalaureate Students Think? *Journal for Teaching in Social Work, 32*(4), 421-437.

Ghalib, T., & Al-Hattami, A. (2015). Holistic versus Analytic Evaluation of EFL Writing: A Case Study. *Canadian Center of Science and Education, 8*(7), 225-236.

Giri, N., Utha, K., Giri, K., Gurung, B., Kjaer-Rasmussen, L. K., Keller, H. D., & Keller, K.D. (2016). *Quality of School Education in Bhutan*. Retrieved from www.vbn.aau.dk

Greene, J., Caracelli, V., & Graham, W. (1989). Toward a conceptual framework for mixed-method evaluation designs. *Educational Evaluation and Policy Analysis, 11*, 255–274.

Gullo, D. F. (2005). *Understanding assessment and evaluation in early childhood education*. New York: Teachers College Press, Columbia University.

Hafner, J., & Hafner, P. (2003). Quantitative analysis of the rubric as an assessment tool: An empirical study of student peer-group rating. *International Journal of Science Education, 25*(12), 1509-1528.

Hargreaves, E. (2011). Teacher Classroom Feedback; still trying to get it right. Pedagogies: *An international Journal, 7*(1), 1-15.

He, X., & Canty, A. (2012). *Empowering student learning through rubrics-reference self-assessment*. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3391778

REFERENCES (CONT.)

Helvoort, J. V. (2010). A scoring rubric for performance assessment of information literacy in Dutch Higher Education. *Journal of Information Literacy, 4*(1), 22-39.

Heritage, M. (2010). *Assessment for Teaching and Learning*. Retrieved from https://www.ets.org/Media/Research/pdf/HeritagePresenterSession4.pdf

Hiroshi, I (2015). Is a Rubric worth the Time and Effort? Conditions for Success. *International Journal of Learning, Teaching and Educational Research, 10*(2), 32-45.

Howell, R. J. (2011). Exploring the impact of grading rubrics on academic performance: Findings from a quasi-experimental, pre-post evaluation. *Journal on Excellence in College Teaching, 22* (2), 31-49.

Isaacs, T., Zara, C., Herbert, G., Coombs, S. J., & Smith, C. (2013). *Key Concepts in Educational Assessment*. London: Sage Publication Ltd.

Jeong, H. (2015). Rubrics in the Classroom: do teachers really follow them? *Jeong Language Testing Asia, 5*(6), 2-14.

Jonsson, A. (2014). Rubrics as a Way of Providing Transparency in Assessment. *Assessment & Evaluation in Higher Education, 39* (7), 840-852.

Jonsson, A., & Svingby, G. (2007). The Use of scoring rubrics: Reliability, Validity and educational consequences. *Educational Research Review, 2*(2), 130-144. Retrieved from https://www.pdx.edu/education/sites/www.pdx.edu.education/files/Scoring_Rubrics (Reliability, Validity, Consequences).pdf

Kind, V. (2017). Development of evidence-based, student-learning-oriented rubrics for pre-service science teachers' pedagogical content knowledge. *International Journal for Science Education, 2017*, 1-33. Retrieved from http://www.tandfonline.com/doi/full/10.1080/09500693.2017.1311049

Kinne, L., Hasenbank, J., & Coffey, D. (2014). Are We There Yet? Using Rubrics to support Progress towards Proficiency and Model Formative Assessment. *AILACTE Journal, 11*(1), 109-128.

REFERENCES (CONT.)

Krashen, S. (1981). *Second Language Acquisition and Second Language Learning*. Oxford: Pergamon.

Kulprasit, W. (2016). EFL Students' Attitudes toward Authentic and Formative Assessment: The Role of Writing Rubric. *International Journal of Languages, Literature and Linguistics, 2*(1), 32-37.

Kutlu, O., Yilirim, O., & Bilivan, S. (2010). The comparison of the views of teachers with positive and negative attitudes towards rubrics. *Procedia Social and Behavioral Science, 9*, 1566-1573.Retrieved from http://ac.els-cdn.com/S1877042810024717/1-s2.0-S1877042810024717-main.pdf?_tid=1311be48-6dec-11e7-8a28-00000aacb362&acdnat=1500624816_7a0b192409525b812db42618002cb3fe

Lee, E., & Lee, S. (2009). Effects of Instructional Rubrics on Class Engagement Behaviors and the Achievement of Lesson Objectives by Students with Mild Mental Retardation and Their Typical Peers. *Education and Training in Developmental Disabilities, 44*(3), 396-408.

Lee, I. (2017). *Assessment as Learning in the L2 Writing Classroom***.** Retrieved https://link.springer.com/chapter/10.1007/978-981-10-3924-9_4

Lesit, C. W., Woolwine, M. A., & Bays, C. L. (2012). The Effects of Critical Thinking Scoring Rubric to Assess Undergraduate students' Reading Skills. *Journal of College Reading and Learning, 43*(1), 31-57.

Looney, J. W. (2011). *Integrating Formative and Summative Assessment: Progress towards a Seamless system*. Retrieved from http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=edu/wkp (2011)4&doclanguage=en

Lovorn, M. G., & Rezaei, A. R. (2011). Assessing the assignment: Rubrics training for pre-service and new in-service teachers. *Practical Assessment Research & Evaluation, 16*(16), 1-18.

REFERENCES (CONT.)

Manzanares, M. C., Baez, A. A., Ortega-Lopez, V., & Villalain, J. M. (2014). Self-regulation and Rubrics Assessment in Structural Engineering subjects. *Education Research International, 2015*, 1-8. Retrieved from http://dx.doi.org/10.1155/2015/340521

Marie, J. (2013). Rubric-referenced oral production assessments: perceptions on the use and actual use of rubrics in oral production assessments of high school students of St. Scholastica's College, Manila. *Language Testing in Asia, 3*(4), 1-14.

Martınez-Figueira, E., Tellado-Gonzalez, F., & Raposo-Rivas, M. (2013).*The rubric as a tool for self-evaluation: A pilot study*. Retrieved from http://red-u.net/redu/index.php/REDU/article/view/490

Maxwell, S. (2010). *Using rubrics to support graded assessment in a competency based environment*. Retrieved from https://www.ncver.edu.au/publications/publications/all-publications/using-rubrics-to-support-graded-assessment-in-a-competency-based-environment

McGatha, M., & Darcy, P. (2010). Rubrics at play. *Mathematics Teaching in the Middle School, 15*(6), 328-336.

McMillan, J. H. (2013). *Sage Handbook of Research on Classroom Assessment*. USA: SAGE Publication, Inc.

Mertler, C. A. (2001). Designing scoring rubrics for your classroom, Practical Assessment. *Research & Evaluation, 7*(25). Retrieved from http://pareonline.net/getvn.asp?v=7&n=25

Mervat, M. H., & Hanan, A. K. (2015). Developing Assessment Rubrics Graphics Design Studio-Based Learning: Experiments in Active Learning in a Case Study. *International Design Journal, 5*(2), 1245-1255.

Miller, D., Linn, R. L., & Gronlund, N. E. (2009). *Measurement and Assessment in teaching* (10th ed.). New Jersey: Pearson Education, Inc.

Mintz, S. (2017). *Reimagining the Academic Experience*. Retrieved from https://www.insidehighered.com/blog/higher-ed-gamma/reimagining-academic-experinece

REFERENCES (CONT.)

Mohamad, M. M., Sulaiman, N. L., & Salleh, K. M. (2015). Measuring the Validity and Reliability of Research Instruments. *Procedia - Social and Behavioral Sciences, 204* (15), 164 – 171.

Molina-Azorin, J. F. (2016). Mixed Method research: An opportunity to improve our studies and research skills. *European Journal of Management and Business Economies, 25*, 37- 40.

Moni, K. W., & Moni, K. B. (2008). Student perceptions and use of an assessment rubric for a group concept map in physiology. *Advance Physiology Education, 32*(1), 45-54**.**

Moos, D. C., & Ringdal, A. (2012). *Self-regulated Learning in the Classroom: A Literature Review on the Teacher's Role*. Retrieved from http://dx.doi.org/10.1155/2012/423284

Navarro, J., Ortells, M., & Martí, P. (2011*). Assessment rubrics as a tool for educational improvement*. Retrieved from http://spieu.uji.es/JACMain/11/EVAL/6.pdf

Nazzal, N. (2014). *Modern and Traditional teaching method*. Retrieved from http://gulfnews.com/news/uae/education/modern-vs-traditional-teaching-methods-1.1418127

Nicholls, J. G. (1992). *Students as educational theorist*. Retrieved from https://books.google.co.th/books?id=ZsMhvSjTIIUC&pg=PT151&dq=Nicholl

Nitko, A. J. (2004). *Educational Assessment of students* (4th ed.). New Jersey: Pearson Education, Inc.

Novak, K. (2008). *Tradition Teaching*. Retrieved from https://ehlt.flinders.edu.au/education/DLiT/2002/environs/scott/tradteac.htm

Palmer, P. (n.d). *Six ways to use Rubric as teaching tool*. Retrieved from https://patrice-palmer.mykajabi.com/blog/six-ways-to-use-rubrics-as-teaching-tools

Panadero, E., & Jonsson, A. (2013). The use of scoring rubrics for formative assessment purposes revisited. *Educational Research Review, 9*, 129-144. doi:10.1016/j.edurev.2013.01.002

REFERENCES (CONT.)

Panadero, E., & Romero, M. (2014). To rubric or not to rubric? The effects of self-assessment on self-regulation, performance and self-efficacy. *Assessment in Education: Principles, Policy & Practice*, *21*(2), 133-148.

Parkay, F. W., & Hass, G. (2000). *Curriculum planning* (7th ed.). Needham Heights, MA: Allyn & Bacon.

Peat, B., & Moriarty, L.J. (2009). *Assessing criminal justice/criminology education: A resource handbook for educators and administrators*. Durham, NC: Carolina Academic Press.

Penh, P. (2013). Assessment: A help or hindrance to Educational proposes. *International Journal for humanities and social science*, *3*(6), 87-93.

Phillips and Choudhury (2014). *Rubrics: What's in it for Faculty?* Retrieved from http://www.nursinglibrary.org/vhl/bitstream/10755/316855/1/Choudhury_GradingRubrics.pdf

Piaget, J. (1970). *Science of Education and the Psychology of the Child*. New York: Orion Press.

Pierce, G. (2015). *Rubrics Development for Assessment*. Retrieved from https://www.bu.edu/provost/files/2015/03/2.26.15-CEIT-Assessment-Rubric-Development-PowerPoint.pdf

Pinto, P. L., & Santos, L. (2006). *Definition of assessment criteria/Self-assessment*. Retrieved from http://tsg.icme11.org/document/get/687

Price, J. K., Pierson, E., & Light, D. (2011). *Using Classroom Assessment to Promote 21stCentury Learning in Emerging Market Countries*. Retrieved from http://cct.edc.org/sites/cct.edc.org/files/publications/Using%20Classroom%20Assessment.pdf

Qarareh, A. O. (2016). The Effect of Using the Constructivist Learning Model in Teaching Science on the Achievement and Scientific Thinking of 8th Grade Students. *International Education Studies*, *7*(9), 178-196.

REFERENCES (CONT.)

Qasim, A. (2015). Using Rubrics to Assess Writing: Pros and Cons in Pakistani Teachers' Opinions. *Journal of Literature, Languages and Linguistics*, *24*, 51-58. Retrieved from http://www.iiste.org/Journals/index.php/JLLL/article/viewFile/27152/27835

Rabgay, T. (2012). *The effect of cooperative learning method method on learning achievement and opinion of the seventh grade students towards science subject, Bhutan* (Unpublished Master's thesis). Rangsit University, Pathumthani.

Rabgay, T. (2014). A Study of Factors Influencing Students' Academic Performance in a Higher Secondary School in Bhutan. *RABSEL; CERD Educational Journal, 16*(2), 74-97.

Raposo, M., & Martınez, E. (2011). *The rubric in university education: A resource for mentoring groups of students.* Retrieved from http://journals.sagepub.com/doi/pdf/10.1177/0735633115612784

Raposo-Rivas, M. (2016). *University Students' Perceptions of Electronic Rubric-Based Assessment*. *Digital Education Review*. Retrieved from http://revistes.ub.edu/index.php/der/article/viewFile/15442/pdf_1

Reddy, Y. (2007). Effect of Rubrics on Enhancement of Student Learning Achievement. *Assessment & Evaluation in Higher Education, 7*(1), 3-7.

Reddy, Y., & Andrade, H. (2010). A review of rubric use in higher education. *Assessment & Evaluation in Higher Education*, *35*(4), 435-448.

Reitmeier, C. A., Svendsen, L. K., & Vrchota, D. A. (2004). Improving oral communication skills of students in food science courses. *Journal of Food Science Education, 3*, 15–20.

Renjit, V., Geroge, A., Renu, G., & Souza, P. (2015). Rubrics in Nursing Education. *International Journal of Advanced Research*, *3*(5), 423-428.

Reynolds-Keefer, L. (2010). Rubric-referenced assessment in teacher preparation: An opportunity to learn by using. *Practical Assessment, Research & Evaluation, 15*(8), 1-9. Retrieved form http://pareonline.net/getvn.asp?v=15&n=8

REFERENCES (CONT.)

Rochford, L., & Borchert, P. S. (2011). Assessing higher level learning: Developing rubrics for case analysis. *Journal of Education for Business, 86*, 258-265.

Roger,W., & Karen, B. (2008). Student perceptions and use of an assessment rubric for a group concept map in physiology. *Advance in Physiology Education, 32*, 47-54. doi:10.1152/advan.00030.2007

Rohrbach, S. (2010*). Analyzing the appearance and wording of assessments: Understanding their impact on students' perception and understanding, and instructors' processes*. Retrieved from http://www.designresearchsociety.org/docs-procs/DRS2010/PDF/102.pdf

Royal University of Bhutan (2015). *The Wheel of the Academic Law of Royal University of Bhutan*. Retrieved from http://www.rub.edu.bt/regulation

RUB (2010). *Personal and Professional Syllabus Handbook*. Samtse College of Education: KMT Press.

Sadler, D. R. (n.d). Formative assessment and the design of instructional systems. *Instructional Science, 18*(2), 119–144.

Salend, S. J. (2009). *Classroom Testing and Assessment for students*. USA: A SAGE Company.

Salvin, R. E. (2003). *Educational Psychology, Theory and Practice* (7th ed.). USA: Allyn and Baccon.

Samah, S. A., Jusoff, K. H., & Silong, A. D (2009). Does Spoon-feeding Impede Independent Learning? *Canadian Social Science, 3*(5), 82-90.

Savasci, F., & Berlin, D. F. (2012). Science teacher beliefs and classroom practice related to Constructivism in different school settings. *Journal of Science Teacher Education, 23*(1), 65-86.

Schafer, D. (2001). Effects of Teacher Knowledge of Rubric on Students Achievement in Four Content Area. *Applied Measurement In Education, 14*(2), 151-170.

Seger, M., Dochy, F., & Cascallar, E. (2003). *The Era of Assessment Engineering: Changing Perspective on teaching and learning and Role of New Modes of Assessment*. Netherland: Kluwer Academic Publisher.

REFERENCES (CONT.)

Shepherd, C. M., & Mullane, A. M. (2008). Rubrics: The Key to Fairness in Performance Based Assessments. *Journal of College Teaching and Learning (CTL), 5*(9), 27-32.

Sherab, K. (2009*). Bhutanese Teachers' Pedagogical Orientation in the Primary Classes (PP-VI): A Factor on Quality of Education*. Retrieved from http://www.pce.edu.bt/cerd/Quality%20of%%20Education%2011.pdf, 30 Jan 2017

Sherpard, L. A. (2005). Linking Formative Assessment to Scaffolding. *Assessment to Promote Learning, 63*(3), 66-70.

Shokouhi, M., & Shakouri, N. (2015). Revisiting Vygotsky's Concept of Zone of Proximal Development: Towards a Stage of Proximity. *International Journal of English Literature and Culture, 3*(2), 60-63. doi:10.14662/IJELC2015.006

Simon, M., & Forgette-Giroux, R. (2001) A Rubric for Scoring Post-Secondary Academic Skills. *Practical Assessment, Research and Evaluation, 7*(18), Retrieved from http://pareonline.net/getvn.asp?v=7&n=18

Silva, R. D. (n.d). Rubrics for Assessment: Their Effects on ESL Students Performance. *Open University of Sri Lanka, 19*, 136-141. Retrieved from http://www.nus.edu.sg/celc/research/books/4th%20Symposium%20proceedings/19).%20Radhikda%20De%20Silva.pdf

Smit, R., Bachmann, P., Blum, V., Birri, T., & Hess, K. (2017). Effects of a rubric for mathematical reasoning on teaching and learning in primary school. *An International Journal for the Learning Science, 45*(208), 1-20. Retrieved from https://link.springer.com/article/10.1007/s11251-017-9416-2

Stevens, D., & Levi, A. (2013). *Introduction to rubrics: An assessment tool to save grading time, convey effective feedback, and promote student learning*. Virginia: Stylus Publishing LLC.

Stuyniski, E. (2015). *How Rubrics help you and your student*. Retrieved from http://kb.ecampus.uconn.edu/2015/06/23/2194/

Thomas, R. M. (2001). *Recent Theories of Human Development*. New York: SAGE Publications, Inc.

REFERENCES (CONT.)

Thorpe, K. (2004). *Reflective Learning Journal: from concept to practice*. Retrieved from http://www.ingentaconnect.com/content/routledg/crep/2004/00000005/00000003/art00004

Torres, J. J., & Perera, V. H. (2010). *Rubrics as a teaching tool for tutoring and assessment of learning in online forums in higher education*. Retrieved from http://www.sav.us.es/pixelbit/pixelbit/articulos/n36/11.pdf

Trilling, B., & Fedel, R. (2009). *21st Century Skills, Learning for Life in our Times. Jossey-Bass Inc Pub.* Wiley: Jossey-Bass.

Turgut, F., & Kayaoglu, M. N. (2015). Using rubrics as an instructional tool in EFL writing courses. *Journal of Language and Linguistic Studies, 11*(1), 47-58.

Turner, R. C., & Carlson, L. (2009). Indexes of Item-Objective Congruence for Multidimensional Items. *International Journal of Testing, 3*(2), 163-171.

Uddin, J. (2014). *Impact of Use of Rubrics on the performance of Students*. Dhaka: BRAC University.

Ultanir, E. (2012). An Epistemological Glance at the Constructivist Approach: Constructivist Learning in Dewey, Piaget, and Montessori. *International Journal of Instruction, 5*(2), 195-212.

Utha, K. (2015). *Formative Assessment Practices in Bhutanese Secondary Schools and Its Impact on Quality of Education*. Aalborg University, Denamrk.

Wamgmo, K. (20140. *The effects of activity based learning approach on learning achievement and learning satisfaction of seventh grade students towards mathematics* (Unpublished Master's thesis). Rangist University, Pathumthani.

Weinstein, C. E., & Mayer, R. E. (1986). The teaching of learning strategies. In M.C. Wittrock (Ed.), *Handbook of research on teaching* (pp. 3315-327). New York: Macmillan.

Wolf, K., & Stevens, E. (2007). The role of rubrics in advancing and assessing student learning. *The Journal of Effective Teaching, 7*(1), 3-14.

REFERENCES (CONT.)

Wylie, C., & Lyon, C. (2012). *Formative Assessment-Supporting Students learning. L&D connection*. Retrieved from https://www.ets.org/Media/Research/pdf/RD_Connections_19.pdf

Yager, R. E. (1991). The constructivist learning model: Towards real reform in science education. *Science Teacher, 58* (6), 52-57.

Yoshina, J., & Harada, V. (2007).Involving students in learning through rubrics .*Library Media Connection, 25*(5), 10-14.

Zheng, L. (2016). The effectiveness of self-regulated learning scaffolds on academic performance in computer-based learning environments: a meta-analysis. *Asian Pacific Education Review, 2*(17), 187-202.

Zimmerman (2002). *Cyclical model of the self-regulated learning process*. Retrieved from https://www.researchgate.net/figure/250152070_fig1_Figure-1-Cyclical-model-of-the-self-regulated-learning-process-adapted-from-Zimmerman

Zimmerman, B., & Schunk, D. (2001). *Self-regulated learning and academic achievement: Theoretical perspectives* (2nd ed.). Mahwah, NJ: Lawrence Erlbaum.

Zumbrunn, S., Tadlock, J., & Roberts, E. D. (2011). *Encourage Self-Regulated Leaning in the Classroom*. Virginia Commonwealth University: MERC Publication.

APPENDICES

APPENDIX A

LETTER OF APPROVAL

Royal University of Bhutan
Samtse College of Education
"You cannot give what you do not have." Druk Gyalpo

Ref: 57/SCE/RES/2017/1147 Dates: 10.5.2017

Subject: Permission to conduct research at Samtse College of Education

Mr Tshering, lecturer at Samtse College of Education is currently pursuing his masters programme in Curriculum and Instruction at Rangsit University, Thailand. As a partial fulfillment for his masters programme, he is carrying out a research study on the *Effects of using rubrics on the learning achievement in educational assessment and evaluation of students in RUB.*

For this, he is required to observe, teach, administer questionnaire and conduct learning achievement test to B.Ed first year students. The study will commence from 11th May and complete by 11th June, 2016.

Therefore, the concerned tutors, students and coordinators are advised to render full support to Mr Tshering to enable him to get quality data and timely completion.

Wish you all the very best of luck.

Dr. Sonam Rinchen
DRIL

Copy to:

i). Mr. Tshering, Camp SCE, Samtse
ii). DAA, SCE
iii). CRC file

: 05 365391(Director General) 365397 (DRIL) 365274 (Adm) 365273 (Office) 365363
(Fax) P.O Box No. 329
Visit us at www.sce.edu.bt

APPENDIX B

LETTER OF CONFRIMATION

1

Date: 15/05/2017

Dear Tshering,

I have gone through your instruments and found that almost all instruments are valid for the data collection. I have rated your instruments as per the IOC (Item Objective Congruence). There are slight changes in some of the instruments and I hope you will take care of it. All comments and feedbacks are attached with the instrument.

I wish you all the best in data collection and see you soon.

Thanking you

Dr. Srisamorn Pumasa-ard
Professor
Faculty of Education,
Rangsit University

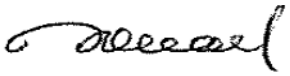
Date: 15/05/2017

Dear Tshering,

Find your research instruments along with the ratings and feedbacks. I have rated your instruments as per the IOC (Item Objective Congruence) and I found out that your documents (Lesson plans, Questionnaire, achievement test and rubrics) are valid and reliable.

Wishing you good luck for your good work!

Thanking you



Dr. Sonam Rinchen

Professor

Samtse Collge of Education

Royal University of Bhutan

Date: 13/05/2017

Dear Tshering,

Thank you for giving me this opportunity. I have fairly gone through your documents and came to know that you had put lots of hardships to come up with this documents. While validating the documents, I found out that your documents (Lesson plans, rubrics, achievement test and questionnaire) were reliable, appropriate and effective. I am confident that your instruments can collect authentic data for your master thesis.

If you need any clarification, please feel free to write to me.

Thank you and good luck!

Yours Truly

Changa Dorji

Senior Lecturer (Educational Assessment and Assessment)

Samtse College of Education

Royal University of Bhutan

APPENDIX C

ITEM OBJECTIVE CONGRUENCE OF PRETEST AND POSTTEST

Item Objective Congruence for Learning Achievement Test by the Expert

1.If rating is +1, the item clearly matches the objective or ensure that the following measures meet the objectives stated.

2.If the rating is 0, it means the item is unclear or unsure whether the measure meet the objectives or not

3.If the rating is -1, the item clearly does not match objectives or ensure that measure does not meet the stated objectives reality

Questions	Expert 1	Expert 2	Expert 3	IOC Average	Congruence
Question 1	+1	+1	+1	+1	Accepted
Question 2	+1	+1	+1	+1	Accepted
Question 3	+1	0	+1	0.67	Accepted
Question 4	+1	+1	+1	+1	Accepted
Question 5	+1	+1	+1	+1	Accepted
Question 6	+1	+1	+1	+1	Accepted
Question 7	+1	+1	+1	+1	Accepted
Question 8	+1	+1	0	0.67	Accepted
Question 9	+1	+1	+1	+1	Accepted
Question 10	+1	+1	+1	+1	Accepted
Question 11	+1	0	+1	0.67	Accepted
Question 12	+1	+1	+1	+1	Accepted
Question 13	+1	+1	+1	+1	Accepted
Question 14	+1	+1	+1	+1	Accepted
Question 15	+1	+1	+1	+1	Accepted
Question 16	+1	+1	+1	+1	Accepted
Question 17	+1	+1	+1	+1	Accepted
Question 18	+1	+1	+1	+1	Accepted
Question 19	+1	+1	+1	+1	Accepted
Question 20	+1	0	+1	0.67	Accepted
Question 21	+1	+1	+1	+1	Accepted
Question 22	+1	+1	+1	+1	Accepted
Question 23	+1	+1	+1	+1	Accepted
Question 24	+1	+1	0	0.67	Accepted
Question 25	0	+1	+1	0.67	Accepted
Question 26	+1	+1	+1	+1	Accepted
Question 27	+1	+1	+1	+1	Accepted
Question 28	+1	+1	+1	+1	Accepted
Question 29	+1	+1	+1	+1	Accepted
Question 30	+1	+1	+1	+1	Accepted

APPENDIX D

LEARNING ACHIEVEMENT TEST

Pretest and posttest Questions

Unit: II **Time: 50 minutes**

Topic: Assessment, Testing strategies and Item analysis **Total marks: 30**

……

Directions: *Choose the correct or the best response for each question from the four given options and circle it.*

1. *It is the judgment made about quality of students' achievement while they are still in the process of learning so that teacher can guide their learning.* Which of the following process is best defined by the statement?
    a. Formative evaluation
    b. Summative evaluation
    c. Formative assessment
    d. Summative assessment

2. All the following are associated with matching item **EXCEPT:**
    a. Direction
    b. Premises
    c. Responses
    d. Qualifiers

3. Which of the following is an example of formative assessment?
    a. State assessment
    b. Semester exam
    c. Chapter test
    d. Student record keeping

4. *Avoid use of specific determiners and qualifiers while developing True – False Items.* Which of the following is a determiner?
    a. Always
    b. Frequently
    c. Sometimes
    d. Usually

5. What is the most probable problem if all or large number of high achievers has selected the wrong option as answer for a given multiple-choice item?
    a. Poorly written stem
    b. Heterogeneous options
    c. The key is incorrect
    d. Illogical ordering of options

6. Which of the following defines the summative assessment?
    a. Assessment that provides feedbacks to the student
    b. Assessment that guides the students while they are learning
    c. Assessment conducted at the end of course to grade the students
    d. Assessment that focuses on the process of learning

7. What is the chance of getting correct answer in the blind guessing for completion items?
    a. 100
    b. 50
    c. 25
    d. 0

8. All of the following are the type of summative assessment **EXCEPT:**
    a. Examinations
    b. Standardized test
    c. Written product
    d. Giving feedback

9. Why is summative assessment important?
    a. to determine the grade and future direction of students
    b. to guide students while they are learning
    c. to oriented and enhance quality learning
    d. to provide information to students

10. Which of the following is **NOT** objective testing strategy?
    a. Multiple Choice Question
    b. Alternative Form (True or False)
    c. Matching type question
    d. Essay type question

11. Which of the following is the most important purpose of assessment in education?
    a. To provide feedback to the learners
    b. To assign grades to the learners
    c. To inform stakeholders of leaner's performance
    d. To compare the performance

12. Which of the following word closely represents the concept of 'reliability' in assessment?
    a. Usefulness
    b. Relevancy
    c. Consistency
    d. Effectiveness

(The table below shows the pattern of responses provided by top and bottom group students for a certain multiple-choice item. Use the information to answer Question 13).

	A*	B	C	D
Number in top group	17	9	0	4
Number in bottom group	13	6	0	11

**Correct response*

13. Which of the following option needs to be revised for the item to be more effective?
    a. A and B
    b. B and C
    c. C and D
    d. D and A

14. The average score of a certain essay item scored on a 1 to 5 scale is 4.3 for the top group and 1.7 for the bottom group. What is its discrimination index?
    a. 0.55
    b. 0.60
    c. 0.65
    d. 0.70

15. According to Aiken (2000), what is the optimal range of mean item difficulty value for the selected response item having four alternatives?
    a. 59-79
    b. 64-84
    c. 67-87
    d. 75-95

16. Which of the following information is **NOT** provided by item analysis?
    a. Difficulty level of the item
    b. Discriminating power of the item
    c. Pattern of the students' responses
    d. Quality of the students' responses

17. Which one is a 'High positive discrimination' range given in the item analysis interpretation box?
    a. +0.40 or higher
    b. +0.20 to +0.39
    c. +0.01 to +0.19
    d. 0 to negatives

18. Of the following which one is a 'very easy difficult' range given in the item analysis interpretation box?
    a. 01%-25%
    b. 26%-50%
    c. 51%-75%
    d. 76%-100%

19. Which one is the most important advantage of oral assessment?
    a. Avoids plagiarism
    b. Enhances vocabulary
    c. Improves communications
    d. Improve memory power

(The table below shows the pattern of responses provided by top and bottom group students for a certain multiple-choice item. Use the information to answer Question 20, 21, 22)

Groups	**Options**			
	A	**B**	***C**	**D**
Number in top group	22	5	5	3
Number in bottom group	13	7	9	6

20. What is difficulty index?

a. 70
b. 55
c. 75
d. 80

21. What is discrimination index?

a. -0.4
b. -0.3
c. -0.35
d. -0.5

22. How much the given item can discriminate?

a. Moderate positive discrimination
b. Moderate positive discrimination
c. Low positive discrimination
d. No discrimination or negative discrimination

23. The correct answer in the multiple choice question is known as…….

a. Distractor
b. Stem
c. Key
d. Option

24. An item analysis focuses on following information **EXCEPT:**

a. Item Difficulty
b. Item Discrimination
c. Standard deviation
d. Distractor information

25. What is the interpretation of an item if difficulty index of item lies between 26-50%?

a. Very difficult
b. Moderately difficult
c. Easy
d. Very easy

26. Which of the following is the guideline for writing matching items?

a. The blank in the question should always be at the end of the stem
b. Do not arrange the answers in the pattern
c. Specify the length of answer of the question
d. Wording of premises should be longer than wording of response

27. Following are the ways to make distractor plausible **EXCEPT**:

a. Use the students' most common errors
b. Use words that have verbal associations with item stem
c. Use homogenous and similar content to the correct answer
d. Use heterogeneous content to the correct answer

28. Which of the following term best describes ‘to aid learning’?
    a. Diagnostic
    b. Formative
    c. Summative
    d. Evaluative

29. Which item is the easiest item by looking at the difficulty index?
    a. P=10%
    b. P=45%
    c. P=78%
    d. P=95%

30. *Indicate clearly in the directions that response may be used once, more than once or not at all.* Which of the following item’s direction must be written according to this guideline?
    a. Completion
    b. Multiple-choice
    c. Alternate response
    d. matching

Answers

1. C
2. D
3. D
4. A
5. A
6. C
7. D
8. D
9. A
10. D
11. A
12. C
13. B
14. C
15. A
16. D
17. A
18. D
19. A
20. D
21. A
22. D
23. C
24. C
25. B
26. D
27. D
28. B
29. D
30. B

APPENDIX E

PRETEST AND POSTTEST SCORES

Pretest and Posttest scores out of 30

Student	Control Group		Experimental Group	
	Pretest	Posttest	Pretest	Posttest
Student 1	7	20	7	24
Student 2	9	22	5	24
Student 3	10	15	9	25
Student 4	4	17	11	24
Student 5	5	17	9	26
Student 6	7	18	4	25
Student 7	6	19	5	24
Student 8	8	24	7	25
Student 9	5	25	8	23
Student 10	4	21	6	24
Student 11	6	17	5	27
Student 12	9	21	7	24
Student 13	9	17	11	28
Student 14	8	15	8	28
Student 15	5	24	9	25
Student 16	6	17	5	24
Student 17	2	23	6	23
Student 18	7	21	8	25
Student 19	11	19	7	27
Student 20	5	17	4	26
Student 21	5	23	6	24
Student 22	9	19	7	28
Student 23	11	18	5	26
Student 24	8	22	5	27
Student 25	4	17	9	26
Student 26	9	20	3	24

Student 27	9	21	12	28
Student 28	7	23	10	26
Student 29	9	20	11	24
Student 30	7	18	4	28

APPENDIX F

ITEM OBJECTIVE CONGRUENCE FOR SURVEY QUESTIONNAIRE

Item Objective Congruence for Survey Questionnaire by the Expert

1. If rating is +1, the item clearly matches the objective or ensure that the following measures meet the objectives stated.
2. If the rating is 0, it means the item is unclear or unsure whether the measure meet the objectives or not
3. If the rating is -1, the item clearly does not match objectives or ensure that measure does not meet the stated objectives reality

Questions	Expert 1	Expert 2	Expert 3	IOC Average	Congruence
Question 1	+1	+1	+1	+1	Accepted
Question 2	+1	+1	+1	+1	Accepted
Question 3	+1	+1	+1	+1	Accepted
Question 4	+1	+1	+1	+1	Accepted
Question 5	+1	+1	0	0.67	Accepted
Question 6	+1	+1	+1	+1	Accepted
Question 7	+1	+1	+1	+1	Accepted
Question 8	+1	+1	+1	+1	Accepted
Question 9	+1	+1	+1	+1	Accepted
Question 10	+1	+1	+1	+1	Accepted
Question 11	+1	+1	+1	+1	Accepted
Question 12	+1	+1	+1	+1	Accepted
Question 13	+1	+1	+1	+1	Accepted
Question 14	+1	+1	+1	+1	Accepted
Question 15	+1	+1	+1	+1	Accepted
Question 16	+1	+1	+1	+1	Accepted
Question 17	+1	+1	+1	+1	Accepted
Question 18	+1	+1	+1	+1	Accepted
Question 19	+1	0	+1	0.67	Accepted
Question 20	+1	+1	+1	+1	Accepted

APPENDIX G

SURVEY QUESTIONNAIRE ON OPINIONS OF STUDENTS

Survey questionnaire on opinion towards rubric usage

There are 20 items from 1 to 20. Please rate each item from your point of view by ticking (√). You are allow to tick (√) against each item only once.

The scale 1 to 5 means as follows:

1- Strongly disagree

2- Disagree

3- Neither agree nor disagree

4-Agree

5-Strongly agree

Sl. No	Items	1	2	3	4	5
A	Opinion on Interest					
1	Learning educational Assessment and Evaluation with rubrics was fun.					
2	I like the assessment tool-rubrics					
3	I enjoyed learning Educational assessment and Evaluation with rubrics.					
4	Rubric makes the learning interesting.					
5	I like learning with rubrics.					
B	Opinion on Guidance					
6	Rubric guided me while I am learning					
7	I became independent learner with the rubrics					
8	I understood the Educational Assessment and Evaluation concept more clearly with help of rubrics.					
9	I become more responsible for learning with rubrics					
10	My performance improved after using the assessment tool-rubrics					
C	Opinion on Confidence					

11	I am confident in learning Educational Assessment and Evaluation concepts with rubrics					
12	I learn better with the rubrics					
13	I get good grades in Educational Assessment and Evaluation when assessment tool-rubrics were used					
14	I can perform better if there were rubrics					
15	Learning Educational Assessment and Evaluation concepts are easier with rubrics					
D	Opinion on Feedback					
16	The feedback from my teacher improved my learning					
17	The feedbacks are specific to the criteria used in the rubrics and very helpful					
18	Feedback motivated me learn more					
19	Feedback improved my performance in Educational Assessment and Evaluation					
20	Feedback were given immediately by teacher and help us learn a lot					

Source: Choden, 2012, p.12; Garcia-Ros et al., 2012; McMillan, 2013, p.61; Miller, Linn, & Gronlund, 2009, p.351

APPENDIX H

ITEM OBJECTIVE CONGRUENCE FOR RUBRICS

Item Objective Congruence for Rubrics

1. If rating is +1, the item clearly matches the objective or ensure that the following measures meet the objectives stated.

   2.If the rating is 0, it means the item is unclear or unsure whether the measure meet the objectives or not

   3.If the rating is -1, the item clearly does not match objectives or ensure that measure does not meet the stated objectives reality

Sl. no	Items	Expert 1	Expert 2	Expert 3	IOC Average	Congruence
1	Rubric has a clear list of criteria to be rated	+1	+1	+1	+1	Accepted
2	Each criteria has detailed descriptions	+1	+1	+1	+1	Accepted
3	The rubric relates to the outcome(s) being assessed	+1	+1	+1	+1	Accepted
4	The rubric enable various raters to arrive at similar score	+1	+1	+1	+1	Accepted
5	Grading is consistent	+1	+1	+1	+1	Accepted
6	The rubric measures the content it is supposed to measure	+1	+1	+1	+1	Accepted
7	The task descriptors describes the task in enough detail to convey a clear level of expectation	+1	+1	+1	+1	Accepted
8	Students can also use rubric for self-assessment	+1	+1	+1	+1	Accepted
9	It gives clear guidance to complete task	+1	+1	+1	+1	Accepted
10	It can be used immediately in the instruction	+1	+1	+1	+1	Accepted
11	It is convenient to use	+1	+1	+1	+1	Accepted
12	It is understandable	+1	+1	+1	+1	Accepted
13	The rubric appears to be useful, feasible and practical	+1	+1	+1	+1	Accepted

APPENDIX I

RUBRICS

Rubric for learning Educational Assessment and Evaluation

Content	Excellent(4)	Good(3)	Satisfactory (2)	Needs Improvement (1)
Definition of concepts	Defines the concept correctly with detailed explanation	Defines the concepts correctly with partial explanation	Define the concepts with some errors	Defines the concepts wrongly
Use of Educational Assessment and evaluation terminologies	Uses most appropriate assessment terminologies with clear pronunciation and correct spelling	Uses appropriate assessment terminologies with some unclear pronunciation and correct spelling	Uses limited assessment terminologies with wrong pronunciation or few errors in spelling	Uses inappropriate assessment terminologies and wrong spelling
Use of diagrams/ models and examples	Uses good diagrams/models / examples in explaining the assessment concepts and principles	Uses adequate diagrams/models /examples in explaining the assessment concepts and principles	Uses limited diagrams/models/examples in explaining assessment concepts and principles with more errors	Uses wrong diagrams/models/examples in explaining the assessment concepts and principles
Types of assessment and testing strategies	All types of the assessment and testing strategies are clearly explained with examples	All types of assessment and testing strategies are clearly explained without examples	Many types of assessment and testing strategies are missing and partial explanation only	Types of assessment and testing strategies are missing
Calculation	Formulas are correctly used, all the steps are shown and answer is correct	Formulas are correctly used, all steps are shown but answer is wrong	Formulas are correct,some steps are not shown and answer is wrong	Formulas are wrong, many steps are not shown and answer is also wrong
Making connectio	Makes connection with	Makes connections to	Makes limited	Makes no connection to

n with real-life situation	real life application with justification	real life application but without justification	connections to real life situation	real life application

Source: Andrade & Mycek, 2010; Choden, 2012; Howell, 2011; Stevens and Levi, 2013

The development of the rubrics for book keeping

Score	Description of performance
4	-all educational assessment and evaluation concepts, principles and importance were thorough and accurate. -all guidelines along with example were clearly stated. -all the formulas and steps in the calculation are shown. -clean and legible writing
3	-most of the educational assessment and evaluation concepts and principles were thorough and accurate -most of the guidelines along with example were clearly stated -few formulas and steps in the calculation were missing -legible writing
2	-Few educational assessment and evaluation concepts and principles were thorough and accurate. -few guidelines along with examples were stated -many formulas and steps in the calculation were missing -illegible writing in some cases
1	-Many educational assessment and evaluation concepts and principles were wrong -guidelines were missing -the calculation was wrong
0	-no information recoded in the book

Source: Andrade & Mycek, 2010; Choden, 2012;Stevens and Levi, 2013

APPENDIX J

ITEM OBJETIVE COMGRUENCE FOR LESSON PLAN

Item Objective Congruence for lesson Plan by the Expert

1. If rating is +1, the item clearly matches the objective or ensure that the following measures meet the objectives stated.
2. If the rating is 0, it means the item is unclear or unsure whether the measure meet the objectives or not
3. If the rating is -1, the item clearly does not match objectives or ensure that measure does not meet the stated objectives reality

Lesson plan No	Rating by Expert 1	Rating by Expert 2	Rating by Expert 3	Average	Congruence
Lesson 1 (Experimental)	+1	+1	+1	+1	Acceptable
Lesson 2 (Experimental)	+1	+1	+1	+1	Acceptable
Lesson 3 (Experimental)	+1	+1	+1	+1	Acceptable
Lesson 4 (Experimental)	+1	+1	+1	+1	Acceptable
Lesson 5 (Control)	+1	+1	+1	+1	Acceptable
Lesson 6 (Control)	+1	+1	+1	+1	Acceptable
Lesson 7 (Control)	+1	+1	+1	+1	Acceptable
Lesson 8 (Control)	+1	+1	+1	+1	Acceptable

APPENDIX K

SAMPLE LESSON PLANS USING RUBRICS

(Introduction of rubric)

Lesson Plan No. 1 **Time:** 1 and ½ hour **Grade:** First year students **Subject**: Educational Assessment and Evaluation **Unit:** II(Assessment and Testing Strategies) **Topic**: Orientation of rubrics and reflective journal	
Objectives	By the end of the lesson the students will be able to: 1. Define rubric in their own words 2. Describe analytical rubric and holistic rubrics 3. Develop rubric using all the steps involved in rubric development 4. Use rubric for their learning 5. understand how to write a reflective journal fulfilling all the criteria laid down in the journal guideline
Teaching/ learning strategies	Lecture cum demonstration, activity based teaching, discussion, facilitation
Teaching learning materials	Laptop, internet, text book, reference books, white board, power point presentation, projector and rubrics.
Previous knowledge of the students	Students have some knowledge about assessment.

Introduction **(10 minutes)** -Gain attention -ask some question on previous knowledge -then introduce the topic	Teacher gain the attention of students by projecting topic on LCD projector screen and asks some questions related to the topic. Teacher reinforces those students who responded to the question. After that teacher share the objective of the lesson and then introduce the topic to students. The topic is rubric and reflective journal. Teacher highlights on the importance of rubric in learning.
Lesson development (60 minutes) -guiding -facilitating -discussion -student activities -Monitor students	**Teachers Activity (30 minutes)** • Teacher explain the concept of assessment tool rubric to students using power point presentation. Example of rubric are also used to make the concept clear. Rubric is assessment tool that will assess, guide and assist students while they are learning. • After that Teacher elaborates on two types of rubrics namely analytical rubrics and holistic rubric. Teacher uses power point presentation to explain two types of rubric. • Techer shows the rubric on LCD projector screen and discuss the criteria or dimensions of rubric along with degrees or weightage. Teacher brief students on how to use rubric while they are learning and provides them with a copy of rubric each.

	• Teacher monitor or guide students while they are learning the given topic. • Teacher highlight the importance of independent learner-centered learning using rubrics to enhance learning achievement of students. • Finally teacher will teach students on how to write a reflective journal by explaining each of the guidelines associated with writing journal.
	Students activities(30 minutes)
	Activity 1 • Students will explore steps involved in the development of rubrics through internet, text books and other resources provided to them. • They will write down all the steps of development of rubric in their note book. • They will discuss with their nearby friends. • Some of them will share in class. Activity 2 • Students will go through features of the given rubric. They will read criteria and description of rubric and then discuss in group. • Once they get familiar with the rubric, they have to practice how to use rubric while they are learning educational assessment and evaluation concepts.

	• They will also learn how to do self-assessment and peer assessment using rubric as assessment tool. Activity 3 • Teacher will project guidelines on how to write journal on LCD projector screen and explain one by one. Students will write the journal by looking at the examples shown by teacher. This is to prepare the students on how to write reflective journal.
Follow up activity(15 minutes)	• Teacher will ask anyone from the class to explain how to use rubric while they are leaning • Student written journal will be checked by teacher and provide necessary feedbacks.
Closure(5 minutes)	• Teacher recapitulates what they have learn in the lesson • Teacher assess and evaluate students by asking some questions on rubrics • Teacher encourage students to use rubric for learning and give homework to read more rubric.

(Lesson using rubric)

Lesson Plan No. 2 **Time:** 11/2 hour **Grade:** First year students **Subject**: Educational Assessment and Evaluation **Unit:** II(Assessment and Testing Strategies) **Topic**: Assessment: Formative and summative assessment	
Objectives	By the end of the lesson the students will be able to: 6. Define the term 'formative assessment and summative assessment'. 7. Differentiate formative assessment and summative assessment. 8. Explain the importance of formative assessment and summative assessment 9. share the learning materials among themselves willingly (sharing is loving)
Teaching/ learning strategies	discussion, activity based learning, self-guided learning using rubrics
Teaching learning materials	Laptop, internet, text book, reference books, white board and rubrics.
Previous knowledge of the students	Students have studied the rubric in pervious classes.
Introduction **(10 minutes)**	Teacher gains the attention of the students and recapitulates the previous lesson. Teacher evaluate previous knowledge by asking some questions. Teacher introduce the topic by

-Gain attention -Recapitulates previous knowledge -evaluate previous knowledge -then introduce the topic	projecting the topic on the LCD Projector screen. Teacher ask the students weather they have any idea on formative assessment and summative assessment. The expected answer may be 'NO'. Teacher then brief students on how to learn the given topic by using rubric.
Lesson development (60 minutes) -explanation -discussion -student activities -facilitation -Monitor students	**Teachers Activity (10 minutes)**
	• Teacher provides topic 'formative assessment and summative assessment' to student. • Teacher provides student with a copy of rubric each. • Teacher also provides resources related to the topic. • Teacher make sure internet connectivity is there • Teacher monitor and guide students while they are learning using rubric • Teacher provides feedbacks to student
	Students activities(50 minutes)
	Activity 1. • Students will explore formative assessment and summative assessment through internet, text books and other resources

	• Rubric will guide them while they are exploring information from different resources. • Rubric was already developed by teacher. • They will gather information and analyze all the information • They will construct concept and meaning from the gathered information. • In particular, they will define formative assessment and summative assessment and also differentiate formative assessment form summative assessment • They will write down in their note book • They will do self-assessment using rubric • They will show to teacher and receive feedbacks from teacher. Activity 2 • Students will work in pair. • Each pair will have rubric and rubric will guide them while they are learning • In pair, they will explore the importance of formative assessment and summative assessment • They will use internet, text books and other resources as a source of information • They will gather information and do critical analysis on the gathered information • They will write down and show to teacher • They will receive immediate feedbacks from teacher

Follow up activity(15 minutes)	• Teacher will ask anyone from the class to explain formative assessment and summative assessment • Student have to differentiate formative assessment from summative assessment • Students should explain the importance of formative assessment and summative assessment
Closure(5 minutes)	• Teacher recapitulates what they have learn in the lesson • Teacher assess and evaluate students by asking some questions on formative assessment and summative assessment. • Teacher encourages students to apply in real life situation.

APPENDIX L

SAMPLES OF TRADITIONAL LESSON PLAN

Traditional lesson

Lesson Plan No. 5 **Time:** 11/2 hour **Grade:** First year students **Subject**: Educational Assessment and Evaluation **Unit:** II(Assessment and Testing Strategies) **Topic**: Assessment: Formative and summative assessment	
Objectives	By the end of the lesson the students will be able to: 10. Define the term 'formative assessment and summative assessment'. 11. Differentiate formative assessment and summative assessment. 12. Explain the importance of formative assessment and summative assessment
Teaching/ learning strategies	Lecture method and power point presentation
Teaching learning materials	Laptop, power point presentation, projector
Previous knowledge of the students	Students have some knowledge on assessment

Introduction **(10 minutes)** -Gain attention -Recapitulates previous knowledge -evaluate previous knowledge -then introduce the topic	Teacher gains the attention of the students and recapitulates the previous lesson. Teacher evaluate previous knowledge by asking some questions. Teacher introduce the topic by projecting the topic on the LCD Projector screen. Teacher ask the students weather they have any idea on formative assessment and summative assessment.
Lesson development (60 minutes)	**Teachers Activity (50 minutes)**
	• Teacher introduce topic to the class • Teacher explain assessment and types of assessments using text book. Teacher read the definition of assessment and types of assessment from the text book and explain simultaneously. • To supplement further, teacher uses power point presentation to show the examples and types of assessment. **Formative assessment** • Formative assessment is known as assessment for learning. This type of assessment takes place when students are learning. It focusses more on the process than the product. Formative assessment provides feedback but does not grade students.

	Summative assessment • Summative assessment is known as assessment of learning and it takes place at the end of module or unit or chapter. Unlike formative assessment, summative assessment focusses more on product. Scores and grades are very important in summative assessment. It helps in modification of course or programme. • Through oral presentation, teacher explain the importance of formative assessment and summative assessment • Teacher list all the importance of formative assessment and summative assessment on board
	Students activities(15 minutes)
	Activity 1. • Student listens while teacher is explaining. • students watch the power point presentation • students write down the note in their note book
Follow up activity(10 minutes)	• Teacher will ask students to write down the definition of summative assessment and formative assessment as homework • Teacher will ask some questions on assessment
Closure(5 minutes)	• Teacher recapitulates what they have learn in the lesson • Teacher assess and evaluate students by asking some questions on formative assessment and summative assessment.

Traditional lesson

Lesson Plan No. 8 Time: 11/2 hour **Grade:** First year students **Subject**: Educational Assessment and Evaluation **Unit:** II(Assessment and Testing Strategies) **Topic**: Testing Strategies (multiple choice question, matching and alternate form question)	
Objectives	By the end of the lesson the students will be able to: 13. Define testing strategies in their own words 14. List down all types of testing strategies 15. Describe three testing strategies and their guidelines. 16. Develop each type of testing strategies using guidelines.
Teaching/ learning strategies	Lecture method, oral presentation
Teaching learning materials	Laptop, text book, white board, power point presentation, projector.
Previous knowledge of the students	Students have studied formative assessment and summative assessment in previous class.

Introduction **(10 minutes)** -Gain attention -Recapitulates previous knowledge -evaluate previous knowledge -then introduce the topic	Teacher gains the attention of the students and recapitulates the previous lesson. Teacher evaluate previous knowledge by asking some questions. Teacher introduce the topic by projecting the topic on the LCD Projector screen. Teacher ask the students weather they have any idea on testing strategies. The expected answer may be 'NO'.
Lesson development (60 minutes)	**Teachers Activity (45)**
	• Teacher introduce the topic 'testing strategies' to students using LCD projector. • Teacher define testing strategy and list all the testing strategies using power point presentation. **Testing strategies:** • Testing strategies are different types of item or question to test or assess student's knowledge. All types of testing strategies falls under summative assessment • The different types of testing strategies are Multiple choice question, completion form question, alternative form questions, matching type question and essay type question

	• Teacher explains multiple choice question, alternative and matching type question using power point presentation. Teacher reads the sentences in the slide and explain simultaneously. • Teacher also explains the guidelines to develop each testing strategies one by one on board. First teacher explain the guidelines for development of multiple choice question. After that teacher explains the guidelines for matching and alternative form question.
	Students activities(15) minutes
	• Students follows teacher • Students listens while teacher is explain • Students copy down the notes in their note book.
Follow up activity(15 minutes)	• Teacher will ask anyone from the class to define testing strategies. • Teacher checks students note book.
Closure(5 minutes)	• Teacher recapitulates what they have learn in the lesson • Teacher assess and evaluate students by asking some questions on testing strategies, types of testing strategies and guidelines • Teacher ask students to read on taught topic.

APPENDIX M

INSTRUMENTS VALIDATORS

Names of the Experts who validated the Instruments

Sl. No	Name	Position title	Institution
1	Dr. Srisamorm Pumasa-ard	Professor	Rangsit University, Bangkok
2	Dr. Sonam Rinchen	Professor	Samtse College of Education, Samtse Bhutan
3	Mr. Changa Dorji	Senior Lecturer	Samtse College of Education, Samtse Bhutan

APPENDIX N

RELIABILITY 'P' AND 'R' VALUES OF THE TEST ITEMS

Reliability Statistics

Cronbach's Alpha	N0. of Items
.889	20

Scale Statistic

Mean	Variance	Std. Deviation	N of Items
17.86	26.980	5.194	20

Case Processing Summary

		N	%
Cases	Valid	20	100.0
	Excluded[a]	0	.0
	Total	20	100.0

a. List wise deletion based on all variables in the procedure.

APPENDIX O

GUIDELINES FOR STUDENT'S REFLECTIVE JOURNAL

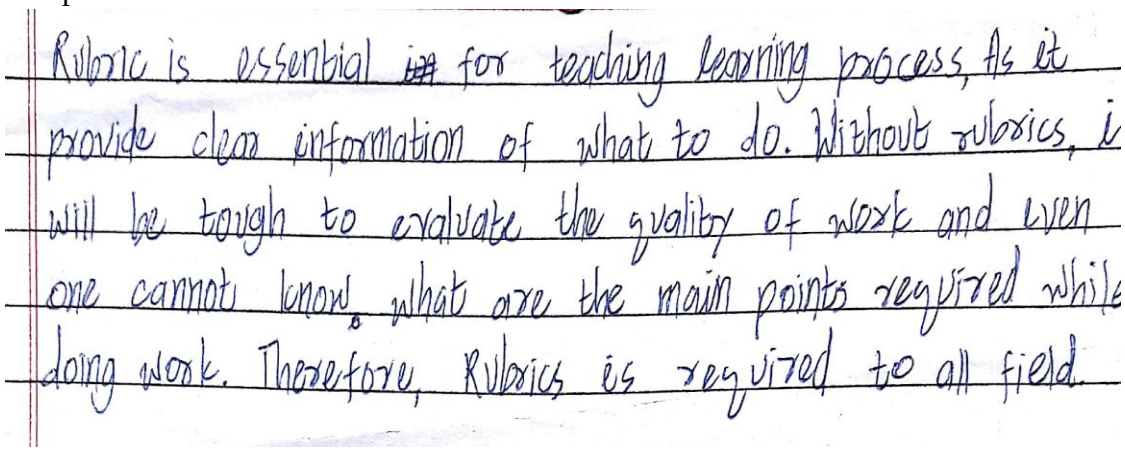
Guidelines for writing students' reflective journal

Write down your opinion towards rubric usage in Educational Assessment and Evaluation. You may include your perspectives, experiences, observations and feelings towards the rubric used in the lesson.

APPENDIX P

SAMPLE OF STUDENTS' REFLECTIVE JOURNAL

Sample 1


Rubric is essential ~~is~~ for teaching learning process, As it provide clear information of what to do. Without rubrics, it will be tough to evaluate the quality of work and even one cannot know, what are the main points required while doing work. Therefore, Rubrics is required to all field.

Sample 2

Learning Rubrics was helpful in general. We are able to do the work with the expectation of teacher's desire. As a future teacher too its important for the teacher too to provide student with rubrics so that they will have or they can perform upto the expectation of teachers. It made me confident in learning Educational Assessment and Evaluation concepts with rubric.

When the students are not able to decide what to write or when to continue, the rubrics gives a clear information and eventually the doubt is cleared. The student's expression can be fully cleared.

APPENDIX Q

CODES FOR STUDENTS' REFLECTIVE JOURNAL

Codes used for Students' Reflective Journal

SRF: Student's Reflective journal

EIL: Encouraged Independent learning

ITE: Informed Teachers' Expectation

COA: Consistent and Objective assessment

PG: Provided Guidance

HGP: Helped in Goal setting and planning

PF: Provided Feedback

ML: Motivated to Learn

ESP: Encouraged Self-assessment and Peer assessment

RA: Reduced Anxiety

APPENDIX R

EXCERPTS FROM STUDENTS' REFLECTIVE JOURNAL

Excerpts from Students Reflective Journal

Themes	Excerpts
Encouraged Independent Learning	"Rubrics has detailed description of the characteristics for each level of performance, so with the help of rubric, we can learn ourselves" (EILSRJ5) "It helped me to develop and gather lot of information without the help of teacher and it encourages self-assessment". (EILSRJ7). "Learning using rubric is one of the best way to learn without depending on others". (EILSRJ23) "Rubric helped us to learn independently". (EILSRJ8)
Informed teachers' expectation	"Instructional rubric was helpful in general. We are able to carry out the task with the expectation of teacher's desire." UTESRJ6 "Rubric helped me to fulfill the teacher's expectation and as a result I managed to score high marks in the given task".UTESRJ24
Consistent and objective assessment	"Well-defined grading criteria made everything clear and understandable." (COASRJ15). "Rubrics made grading transparent instead of traditional unsteady grading system". (COASRJ18) "Rubric strengthened the quality and standard of assessment. It made assessment and evaluation fair and provided justice." (COASRJ27)
Provided Guidance	"Rubrics have helped me by providing guidance on what specific expectation my Lecturer has for the specific task". (PGSRJ12) "Rubrics guided me while I am learning Educational Assessment and Evaluation concepts". (PGSRJ14) "Rubric was helpful in learning Educational Assessment and Evaluation concepts as it provides clear information of what to do."(PGSRJ25) "It acted as a guide and provided direction in which area should be focused." (PGSRJ27)

Helped in Goal setting and planning	"Rubric supported good thinking". (HGPSRJ30) "I used rubric to allocate time and resources in the planning and completion of my task."(HGPSRJ27) "Rubric helped me in planning to achieve goal that was set in the beginning of class with the help of rubrics."(HGPSJJ19) "We use that as a guideline to help us plan out the given task". (HGPSRH26)
Provided Feedback	"We received necessary feedbacks on our task from our tutor". (PFSRJ29) "Rubric helped me to receive feedback from our tutor. Feedback helped us to learn more". (PFSRJ13) "We received feedback both from our tutor and from our friends. The feedbacks were provided based on rubric". (PFSRJ18)
Motivated to learn	"When we are clear with the skill we need to master, we gain confidence and solve the problem easily". (MLSRJ19) "Learning with rubrics was helpful in general. We were able to do the given task with the expectation of teacher desire. It made me confident in learning Educational Assessment and evaluation."(MLSRJ9) "Positive feedback provided using rubric were motivating" MLSRJ4
Encouraged Self-assessment and peer assessment	"Rubrics helped us in self-assessment and peer assessment. Peer assessment was a good way to look at others work, assess them and compare to our work in order to learn from our friends. Self-assessment was very helpful as it allowed me to spot the mistakes in my own work and rate myself." (ESPSRJ21). "Rubrics not only helped us to learn but it also helped us to do self-assessment." (ESPSRJ6) "Rubric helped us to reflect, analyze and improve our work." (ESPSRJ28)

	"Learning using rubric is very effective way of learning. Since there are categories given in rubric, we could easily assess our work and rate ourselves."ESPSRJ30.
Reduced Anxiety	"Rubric focused us in fulfilling goal and objective of the task." (RASRJ12) "I enjoyed learning with rubric as it gave me clear direction". (RASRJ21) "I was never worried about the procedure. Rubric contained everything. Teacher should use rubric for all the types". (RASRJ27)

APPENDIX S

INDEPENDENT SAMPLE T-TEST

AND

PAIRED SAMPLE T-TEST

Group Statistics

Students		N	Mean	Std. Deviation	Std. Error Mean
Pretest	Control group	30	7.03	2.251	.411
	Experiment group	30	7.10	2.426	.443
Posttest	Control group	30	19.67	2.758	.504
	Experiment group	30	25.40	1.610	.294

Independent Sample t-test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% confidence ID	
									Lower	Upper
PRETEST	Equal variances assumed	.197	.659	-.1	58	.913	-.06	.604	-1.28	1.1
	Equal variances not assumed			-.1	57.6	.913	-.06	.604	-1.28	1.1
POSTTEST	Equal variances assumed	10.4	.002	-9.8	58	**.000**	-5.73	.583	-6.90	-4.6
	Equal variances not assumed			-9.8	46.7	**.000**	-5.73	.583	-6.91	-4.6

Group Statistics

Paired sample Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest (Control)	7.03	30	2.251	.411
	Posttest (Control)	19.67	30	2.758	.504
Pair 2	Pretest (Experimental)	7.10	30	2.426	.443
	Posttest(Experimental)	25.40	30	1.610	.294

Paired Sample t-test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence ID				
					Lower	Upper			
Pair 1	Pre and post control	-12.63	3.846	.702	-14.069	-11.19	-17.9	29	.000
Pair 2	Pre and post Experiment	-18.30	2.693	.492	-19.306	-17.29	-37.2	29	.000

BIOGRAPHY

Name	Tshering
Date of Birth	February 5, 1983
Place of Birth	Paro, Bhutan
Institution Attended	Sherubtse College, Bhutan B.Sc. (Life science), 2009 Samtse College of Education, Bhutan Postgraduate Diploma in Education (PgDE), 2011 Rangsit University, Thailand Master of Education in Curriculum and Instruction, 2017
Scholarship	TICA and RUB Cost sharing
Address	Shari, Paro, Bhutan tshering.sce@rub.edu.bt
Position and Office	Samtse College of Education, Royal University of Bhutan, Academic, Position: Associate Lecturer