

A Pragmatic Study on Applying Rubrics in Imparting Technical Writing for Engineering Students

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Abstract

Inevitably, writing skill has become the part of engineers' responsibility as they have to transmit sensibly the outcome of their work to the outer world. Thus, the engineers must be trained in developing technical writing skill which is the biggest determiner of success in an engineer's career. So, the researcher believes that the writing skill can be developed by implementing evaluation rubrics in assessing process. The aim of this study is to find out students' and teachers' attitude towards writing skill and their perception on evaluation rubrics. For this purpose, the researcher formulated the questionnaires to explore how engineering students and faculty members discern the writing skill, acknowledge the present state of evaluation pattern and their outlook on evaluation rubrics. The results show that teachers and students have a positive attitude towards the use of evaluation rubrics in writing skill.

Keywords: writing skill, evaluation, attitude, rubrics, technical teaching,

I. INTRODUCTION

The 20th century witnesses the rapid growth in science and technology which rises significant demand for qualified engineers. This creates a scope for documentation that reveals technical aspects of a product or service that are accessible to apprehend and follow certain industry standards. Engineers, than any other professionals should focus on the good writing skills as they expose their aspirations and creativity to the universe. In today's world, it is pre-requisite for engineers to communicate their findings, research and applications in a productive and efficient manner. Inevitably, writing skill has become the part of engineers' responsibility as they have to transmit sensibly the outcome of their work to the outer world. Thus, the engineers must be trained in developing technical writing skill which is the biggest determiner of success in an engineer's career. So, the researcher believes that the writing skill can be developed by implementing evaluation rubrics in assessing process.

A rubric is a measurement tool that describes the criteria against which a performance, behaviour, or product is compared and measures. Rubrics list the criteria established for a particular task and the levels of achievement associated with each criterion. A **rubric** is typically an evaluation tool or set of guidelines used to promote the

consistent application of learning expectations, **learning objectives**, or **learning standards** in the classroom, or to measure their attainment against a consistent set of criteria. In instructional settings, rubrics clearly define academic expectations for students and help to ensure consistency in the evaluation of academic work from student to student, assignment to assignment, or course to course. Rubrics are also used as scoring instruments to determine grades or the degree to which learning standards have been demonstrated or attained by students.

A rubric is provided and explained to students before they take up the test and ensures that learning expectations are clearly communicated and understood by students. The teacher uses the specific quality standards for evaluating, scoring or grading an assignment or test. Rubrics are generally designed to be simple, explicit, and easily understood. Rubrics help students to see the connections between learning (what will be taught) and assessment (what will be evaluated) by making the feedback they receive from teachers clearer, more detailed, and more useful in terms of identifying and communicating what students have learned or what they may still need to learn. Educators may use rubrics midway through an assignment to help students assess what they still need to do or demonstrate before submitting a final product. Rubrics may also encourage students to reflect on their own learning progress and help teachers to tailor instruction, academic support, or future assignments to address distinct learning needs or learning gaps. The Analytic Rubric provides more detailed feedback on student performance; scoring more consistent across students and raters. It also helps to identify the strengths and weaknesses.

II. REVIEW OF RELATED LITERATURE

Ashok Sapkota (2012) conducted a study to find out whether there is an improvement in students' writing skills through the strategies of peer correction followed by teacher correction using an action research. He found the technique to be productive in teaching writing through action research as a whole.

Juliana Ng, Paul Lloyd, Ralph Kober & Peter Robinson (2010) conducted a study on developing writing using teaching note reports and evaluates an initiative to enhance first-year accounting students' written communication skills in a large class setting. An empirical evidence of the effectiveness in enhancing writing skill is provided and the results were positive and encouraging.

Carol J. Callinan, Emile van der Zee and Garry Wilson (2017) investigated the relative contribution of model observation, model evaluation, post-submission feedback, and factors relating to self-efficacy as measures through academic confidence. The results revealed that all students benefit from traditional feedback and higher levels of self-efficacy when developing their essay writing performance.

Zahra Fahimi, Ali Rahimi (2014) aimed to investigate the incorporation of self-assessment in writing and its influence on improving writing skill. The results of the analyses of the repeated measures showed students' gradual progression and both learners and teachers had positive attitude towards self-assessment.

Marlies Schillings, Herma Roebertsen Hans Sevelberg, Diana Dolmans (2014) conducted a literature review to improve writing skill by using feed-forward information. The authors found that most interventions had positively affected the students' performance. They added that the literature review suggests that feedback dialogue acts as a promising intervention in improving academic writing skills.

Professional writing is a complex process. Knowing the situation demand and writing in different styles and setting an appropriate tone over the text help to sustain a good and clear communication and documentation too. The teachers have to design different rubrics for the multiple forms of assessment. Each rubric should be framed in a such way that it should fend on its own, with similarity in general criteria. This study intends to probe the teachers' and students' attitude towards writing skill and the effect of Rubrics on writing skill. This research focus on the following question:

Do students and teachers believe that Rubrics has a positive effect on teaching writing skill?

III. METHODOLOGY

The aim of this study is to find out students' and teachers' attitude towards writing skill and their perception on evaluation rubrics. For this purpose, the researcher formulated the questionnaires to explore how engineering students and faculty members discern the writing skill, acknowledge the present state of evaluation pattern and their outlook on evaluation rubrics. The questionnaires aimed to study the respondents' level of interest in writing skills, awareness on evaluation rubrics and interest level in implementing evaluation rubrics. The data from the questionnaire helped to obtain the needs for improvement in writing skill. Further, the qualitative data in this study provided a better understanding about teachers' and students' attitudes towards evaluating writing skill with rubrics.

3.1 The Sample

The present study focused on investigating engineering students mastering in writing skill. The simple random sampling method was embraced to select the sample for the study. The researcher selected the First-year engineering students of Sri Krishna College of Engineering and Technology. 30 students were selected randomly from Electronics and Communication Engineering as subject of the study because most of the professionals' crucial problem is writing skill. Five faculty members from Sri Krishna Institutions were selected randomly, who have adequate experience that makes their recommendations and remarks valuable for the research.

3.2 Instruments

“Questionnaires are any written instruments that present respondents with a series of questions or statements to which they are to react either by writing out their answers or selecting from among existing answers” (Brown, 2001, p.6). Typically, a questionnaire is one of the data collection techniques and its purpose is to convert the information needed into a formalized set of questions and present it to one or more respondents to collect the desired outcome and finally interpret and analyze the data being collected. In this research, the questionnaire was given to the first year Electronics and Communication Engineering to transform their attitude towards writing skill to meet the desired responses. Questionnaires can be an effective means of measuring the behavior, attitudes, preferences, opinions and, intentions of relatively large numbers of subjects more quickly than other methods. Thus, the researcher provided the questionnaires for teachers to measure their attitude towards writing skill of students and use of rubrics in evaluation method.

3.3 Description of the Questionnaire

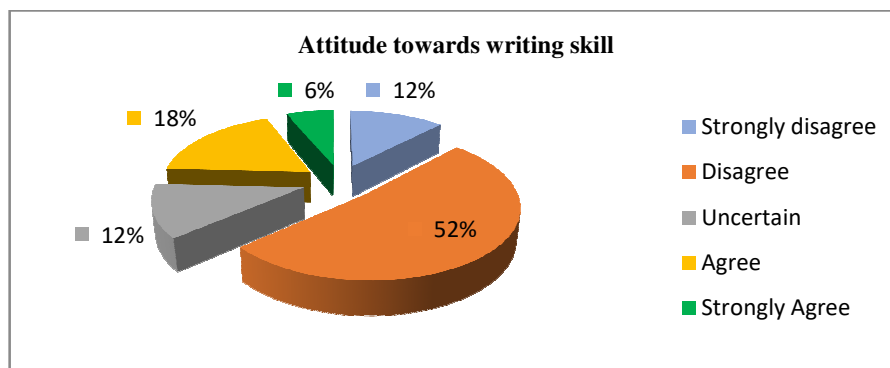
The questionnaire holds fifteen efficacy statements on three aspects following the Likert scale of five points descending from (5) Strongly agree to (1) Strongly disagree and multiple-choice questions to get a holistic view of students' attitude towards writing skill, existing evaluation pattern and awareness on evaluation rubrics and its implementation in enhancement of the writing skill. In each of the questions the participants have to choose one specific option.

IV. FINDINGS AND DISCUSSIONS

Students' Questionnaire

Table 1: Attitude Towards Writing skill (Q1-Q5)

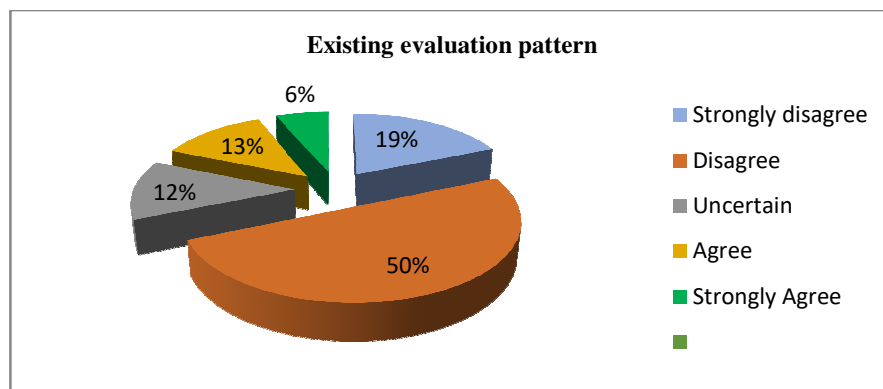
S.No	Attitude	Strongly disagree	Disagree	Uncertain	Agree	Strongly Agree	Total
1	I plan my writing process.	3	19	2	5	1	30
2	I feel competent in writing English.	0	14	4	8	4	30
3	I try to practise writing skill as much as possible.	6	18	0	4	2	30
4	I like to train myself in writing to improve my powers of expression.	1	16	7	4	2	30
5	I have clear goals for developing my writing skill.	7	14	3	5	1	30



After analyzing the attitude of students towards writing skill, it was found that 52% showed poor interest towards writing skill, and only 18% exhibited good interest in acquiring writing skill.

Table:2: Existing Evaluation Pattern (Q6-Q10):

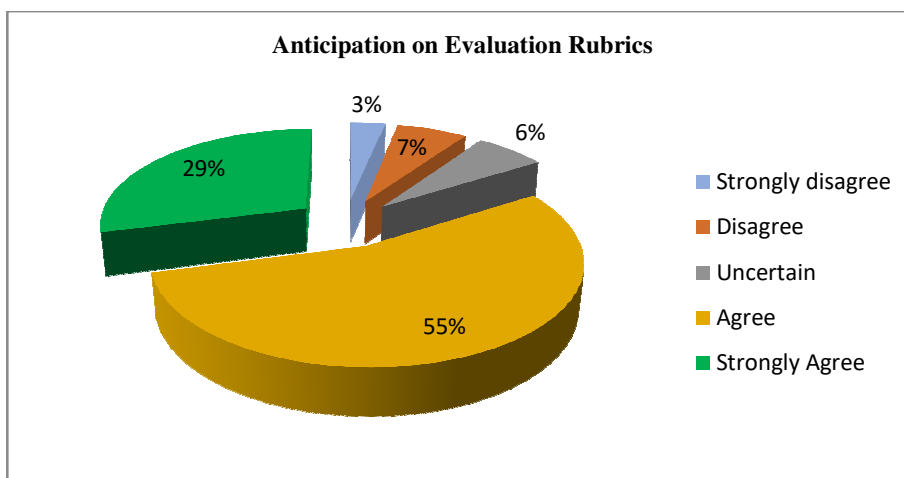
S.No	Questions	Strongly disagree	Disagree	Uncertain	Agree	Strongly Agree	Total
6	Does existing evaluation procedure provide opportunities for writing and encouragement?	8	12	5	3	2	30
7	Does it promote success in writing?	5	18	4	2	1	30
8	Does teacher feedback reinforce your writing skill?	4	15	3	5	3	30
9	Does the script is evaluated appropriately?	7	17	2	4	0	30
10	Does evaluation identify your area of interest & area of improvement in writing skill?	5	18	2	3	2	30



Questions six to ten surveyed the current evaluation pattern adopted in the engineering colleges. The figure clearly states that 50% expresses their disinterest in the existing evaluation pattern and the chart presents that existing evaluation pattern is not pertinent enough to develop the writing skill of engineering students because it does not pave the way for any further progression.

Table 3: Anticipation on Evaluation Rubrics (Q11-Q15)

S.No	Questions	Strongly disagree	Disagree	Uncertain	Agree	Strongly Agree	Total
11	I am interested to know the instructor's grade criteria for the given task	0	2	3	17	8	30
12	I like to receive specific feedback for my writing from the instructor.	1	2	4	16	7	30
13	I wish the instructor to evaluate the script using a scoring rubric.	0	1	1	19	9	30
14	I like to be informed about the parameters of the task before the commencement of the test.	2	4	0	15	9	30
15	I prefer evaluation to be an essential component of effective instruction.	2	1	1	18	8	30

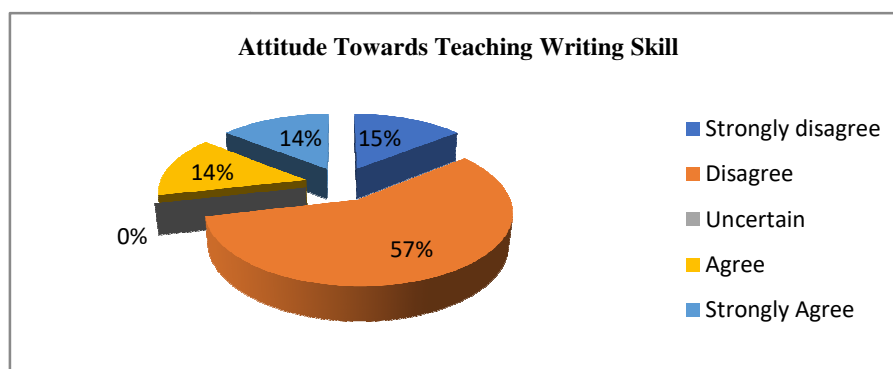


The extent to which the participants' desire for evaluation rubrics was analysed and inferred that 55% agree to evaluate using the evaluation rubrics.

Teacher's Questionnaire

Table 4: Attitude Towards Teaching Writing skill (Q1-Q5)

S.No	Questions	Strongly disagree	Disagree	Uncertain	Agree	Strongly Agree	Total
1	I prefer teaching writing skill to other skills.	0	4	0	1	0	5
2	Does the syllabus emphasize writing skill?	1	3	0	0	1	5
3	Sufficient hours are allocated for teaching writing skill.	0	4	0	1	0	5
4	I explain the components of writing task.	2	2	0	1	0	5
5	I take great efforts to teach writing skill.	1	4	0	0	0	5

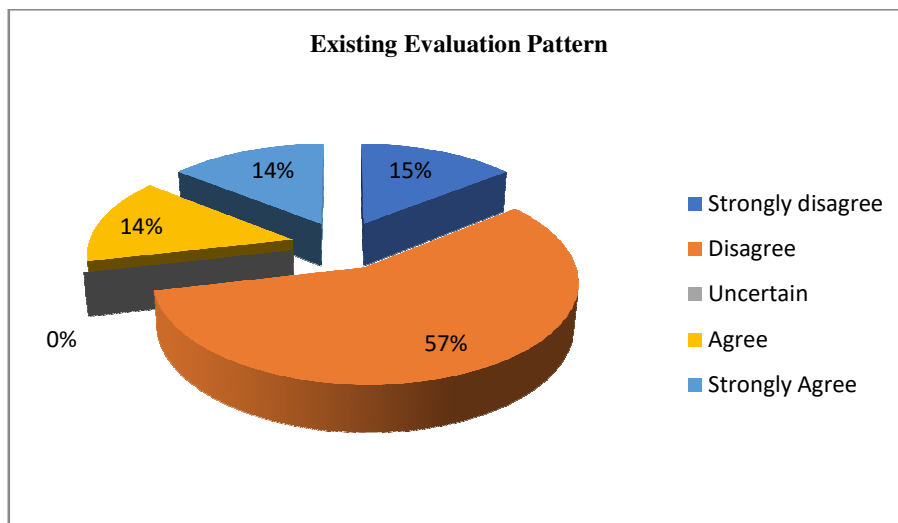


The table indicates that the percent of teachers' interest towards teaching writing skill. 57% of them show poor attitude towards teaching writing skill. Only 14% agree to show good interesting in teaching writing skill.

Table 5: Existing Evaluation Pattern (Q6-Q10)

S.No	Questions	Strongly disagree	Disagree	Uncertain	Agree	Strongly Agree	Total
6	The existing evaluation pattern paves way to revise and edit better?	2	3	0	0	0	5
7	Students are informed about an expected outcome before taking up the test.	0	4	0	1	0	5
8	There is a scope for written feedback in the existing evaluation pattern.	0	3	0	0	1	4

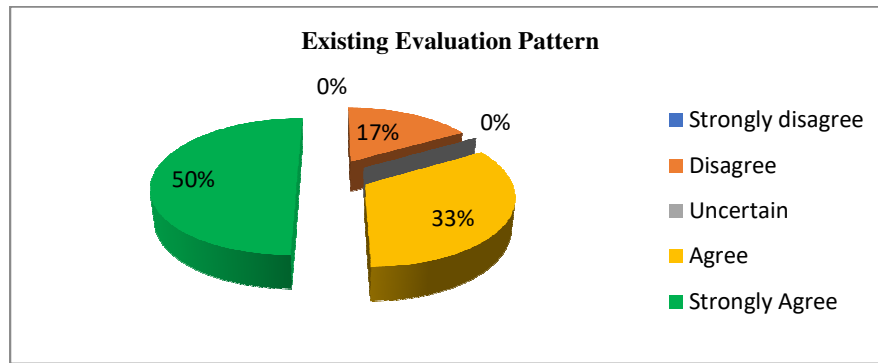
9	Evaluation is regarded as an essential component of effective instruction.	2	3	0	0	0	5
10	Does the current evaluation pattern justify the scores assigned to the performance?	1	4	0	0	0	5



The teachers' attitude towards existing evaluation pattern indicates low and negative. 57% shows disregard for present evaluation method and only 14% agree to continue with the same pattern.

Table 6: Anticipation on Evaluation Rubrics (Q11-Q15)

S.No	Questions	Strongly disagree	Disagree	Uncertain	Agree	Strongly Agree	Total
11	Rubric influences students' writing skill	0	0	0	2	3	5
12	Rubric helps students to gain a greater sense of accountability & ownership.	0	0	0	1	4	5
13	Encourages independent learning.	0	0	0	1	4	5
14	Facilitates good quality of work for teachers.	0	1	0	2	2	5
15	Indispensable in bringing the desired outcomes.	0	0	0	3	2	5



The teachers' anticipation on using rubrics for evaluating writing skill shows high percentage of positivity. Only least percentage expresses the disregard on using the rubrics in writing skill.

V. CONCLUSION

The ability to connect effectively in writing determines the professional success. Writing skill is a crucial task for Engineering students, which are to be communicated in documents such as reports, instructions, emails, transcoding etc. In recent days, people are impatient and tendency to read the text entangles further correspondence. Therefore, it is important to propound the ideas precisely, concisely and clearly to save significant time, prevent misunderstanding, and improve results. In conclusion, it is inferred from the results that the students and teachers show a high and positive note of using rubrics in teaching learning process to progress in the writing skill. The use of rubrics by teachers in assessing students' writing undoubtedly indicate a purposeful breakthrough in writing skill. The findings of the study may be specific to one particular institution, but their implications are significant to others educators as well. Rubrics help the teachers to set apparent standards for students, dispense guidelines to reach those standards and promote grading. The use of rubrics improves the reliability of scoring writing assignments. It clearly communicates the goal and performance expectations of students in an explicit way. Practicing to evaluate the scripts using the analytic rubric would help the engineering students to improve their writing skill.

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