

Assessing Oral Communication Skills in the Final Year Project Design Course of an Undergraduate Engineering Program

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Abstract

The paper is part of a larger study that uses multi-method approach in the assessment of communication skills learning outcome in the Final Year Project Design Course (FYPII) of an Undergraduate Electrical Engineering Program (FKE). It used direct assessment to examine students' oral skills when presenting their FYPII design course seminar presentation. The rubric adapted was put to the test by using faculty rater reliability measures to determine the consistency of the scores. It was later reviewed in order to ensure ease of use, reliable and description of expected students' performance during the oral presentation [1]. Once faculty rater reliability was achieved and verified, the rubric was used to achieve inter-rater scores. Descriptive statistics were used to draw inferences on the faculty inter-rater scores. The assessment tool provided tangible information about the students' technical skills and performance in the communication skills ability and recommendations for improvement on the future of the oral presentation assessment tool and process to be used for personal and program development.

Keywords: Communication skills attributes; Direct Assessment; Learning Outcome; Oral Rubrics

1. Introduction

A common practice in engineering curriculum at most higher education institutions is the use of design projects in the final year to give students hands-on and real-world experience with the objective of not only teaching the application of engineering principles, but also acquiring the behavioral skills of communication skills. Since the senior design project is the cornerstone of an engineering program, communication skills should have been fully developed by the students to achieve equilibrium in the expected students' learning outcome. The focus of this study centers on how much communication skills in English has been developed by the engineering students when presenting their FYPII seminar presentation. It is compulsory for engineering students to complete two academic English courses in their first year of their studies, and then students have a choice of selecting one out of the five elective English courses in their second or third year. Because communication skills are introduced early on in the first two years of the engineering experience, the question is are they reinforced and integrated in the later stage throughout the curriculum through a variety of different experiences. Shuman *et al.* [2] categorized the professional skill outcome of communication skills as 'process skills' because students learn a robust process and it is one skill that can be taught and assessed. Thus, faculty must be able to assess communication to ensure appropriate skills are being developed. Assessing student performance to demonstrate accountability has become a necessity in

academia. This view supports ABET Criterion 3 which states that, "...each accredited engineering program must have an assessment program with documented results. The assessment process must demonstrate that outcomes are important to the mission of the institution and the objectives of the program are being measured"[3].

2. Oral Communication Skills Assessment

In assessing performance skills, Miller and Olds [1] proposed the setting of goals and objectives compatible with the departmental program objectives and defining appropriate student performance criteria as well as testing a scoring rubric. Since the purpose of this study was to document the FKE instructional effectiveness in the area of oral communication skills in the process of presenting the students' FYPII design course, it began with the definition of specific, detailed, and measurable communication skills learning objectives addressed by the UTM Graduate Attributes, the Faculty of Engineering Program Learning Objectives (LO4), the Faculty of Electrical Engineering (FKE) Program Outcomes (PO6); and the FYPII Course Outcomes (CO3). All these standards described what level of communication skills competency students are expected to acquire or be able to do by the time they graduate. Specifically, students are required to communicate effectively in oral and written form, make clear and confident presentation appropriate to audience and use technology in presentation form. The researcher then focused on the use of the oral communications

rubrics since faculty are already comfortable evaluating students' oral presentation of the FYPII seminar using rubrics and because all the objectives listed could be reliably assessed using well-designed tested scoring rubrics. FKE stresses that they give strong emphasis and assessment in the seminar oral presentations therefore, it is crucial that the rubrics chosen to assess oral skills should be able to assess these requirements. A rubric is an authentic assessment tool used to measure students' work. It is a scoring guide that seeks to evaluate a student's performance based on the sum of a full range of criteria rather than a single numerical score. It is a formative type of assessment because it becomes an ongoing part of the whole teaching and learning process. This involvement empowers the students and as a result, their learning becomes more focused and self-directed [4]. The communication skills rubric is trait-analytic and it has been shown in the literature to improve validity and reliability, and the quality of the feedback to the participants [5].

With the use of the rubrics the following research question would be answered: How does the use of the oral communications assessment rubrics when assessing the oral communication skills demonstrated by students in the FYP presentation reflect on:

- its reliability;
- the assessment committee faculty members' inter rater scores;
- the relationship of the inter rater scores to score received by students from the faculty (CASR).

3. Sample

The research focused on the graduating undergraduate engineering students enrolled in the Final Year Project II (FYPII) design course, SE_4824 in the final semester of Semester II, 2008/2009 from the Faculty of Electrical Engineering (FKE) at Universiti Teknologi Malaysia (UTM) Skudai, Johor. As this course is offered only once a year during the second semester, the selection of sample population was dependent on the course and students' availability. There were eight departments and the number of samples chosen was based on the cluster of the students in the eight departments. Clustering the samples is ideal when it is impossible to compile a list of the elements composing the population, thus, the researcher first identifies cluster – groups based on the eight departments in FKE, obtained names of individuals within those clusters, and then sampled within them [6]. Convenience non-random sampling was used as the samples were dependent on the number of students at the time and date according to the schedule prepared by the faculty for the FYPII presentation. Table 1 shows the number of students observed during the FYPII design demonstration

during the rubrics reliability test and the collection of the inter rater scores.

Table 1: Sample Size

Department on FKE	Rubrics Reliability Test		Inter Rater Scores	
	Students	Raters	Students	Raters
POWER	3	1	1	2
ENCON	4	1	1	2
CIED	3	1	1	2
MER	5	1	2	2
INSEED	5	1	2	2
MICE	6	1	2	2
TOP	3	1	1	2
RaCED	2	1	1	2
TOTAL	31	8	11	16

4. Method

The researcher examined existing instruments in the fields of oral communication with the aim of improving oral competencies of engineering students. In a review of literature, Schuurman *et al.* [7] asked employers to rank oral communication competencies according to the extent that they need improvement. The four highest rated competencies were organizing the communication, displaying sufficient general knowledge about the topic, showing confidence, and adjusting to the audience. Many publications have described competencies that students should acquire to become good communicators [8-11]. Based on the employers input and communication skills, Schuurman *et al.* believe that the following competencies are core to oral communications: Content-development skills, i.e., competence in ideation generation, amplification, and organization; Presentation skills, i.e. competence in generating interest, sustaining attention, using appropriate language, and being clear; Receptive skills, i.e., listening and interpretive competence; and Audience analysis skills.

Since the purpose of this study was to make educational improvements, there was a need to assess the effectiveness of those improvements as compared to what has been currently practiced by the FKE when assessing oral communications using the present Seminar Evaluation Form. Therefore, the next step of this study was to find a valid and reliable instrument to assess oral communication skill sets and to make improvement. A review of relevant literature did not reveal an instrument that focused on exactly the four skill sets. However, a review of the Workforce Presentation Pointers instructional guide from Norback *et al.* [12] and Norback and Hardin [13], the researcher found some similarity on the core competencies of oral communication as outlined by Schuurman *et al.* and decided to adapt the rubrics from Norback, Griffin and Forehand [14]. It is a one-page set of criteria for a well-done presentation,

where each criterion is judged on a scale of 1 to 5. It is unique as it stressed on information about communication collected directly from people in the workforce: practicing engineers, managers, and senior executives of organizations employing many engineers in the engineering sectors and has been tested for reliability and validity. Thus, the workforce presentation rubrics used here was claimed to have high *content validity*, because it is based on empirical evidence and these presentation skills were described as being central to graduates' job competitiveness and quick ascent up the career ladder. The oral presentation skills observed in this study draws heavily on the details in each set of workforce information, particularly as they relate to the concerns typically present in senior design classes.

4.1 Rubrics Reliability Test

The researcher first presented and discussed the criteria given in oral presentation rubrics with the faculty supervisors in FKE. The discussion resulted in the revision of the rubric's items to reflect on a continuous process to ensure reliability and increase content validity informed by the rubric's use in practice. Based on students' work and the faculty's communicative needs, the researcher received constructive feedback from the faculty members to make the rubrics more relevant to the FYPII design course outcome in achieving communicative competence in line with the faculty's program outcomes and course outcomes for communicative competence. For example, it was found that the rubrics for 'Slides' were too long tedious and was simplified. This is to make the rubrics more acceptable, easy to use, reliable, and descriptive of expected student performance so that the results would help to improve the course and the FKE curriculum. The rubrics used during the rubrics reliability testing were finalized and a list of twenty one items that aimed to measure various aspects of oral communication was listed based on the four constructs (Appendix A).

4.2 Inter Raters Score

During the rubric reliability testing, the assessment committee faculty members worked separately in each department, but to achieve inter rater scores, the two raters from each department worked together to rate the oral presentation of the students. Each student presented a fifteen-minute presentation with slides. Students were observed in terms of their communicative abilities and how they draw on conclusions from their results and reasons for any obvious discrepancies from expected trends and faculty asked questions to probe for evidence of analysis, synthesis, and evaluation by the student.

To obtain inter-rater scores a method proposed by Kranov *et al.* [10], called 'norming' was followed as it was an important part of establishing raters' reliability. During these sessions, raters watched each presentation, rated the presentation using the oral presentation rubrics, and then discussed their ratings with another rater until agreement was reached and came to consensus on how the oral communication skills were expressed. Raters must come to consensus in perceptions of possible scores for each of the oral competencies. Thus, rubrics can be an influential tool in faculty development efforts in terms of developing and maintaining consistency among raters. The self imposed criterion for inter rater scores was discussed and it was agreed that it should fall within one point of each raters' scores. This level of agreement was considered satisfactory for holistic program assessment purposes and had been used in the studies by Kranov *et al.* [10], Miller and Olds [1], and Racicot and Pezeshki [5]. Should there be any differences between the scores of more than one point between the two raters, then McMartin *et al.* suggested that "the scores be discussed until a common understanding of the scoring criteria was reached and applied" [15].

The researcher analyzed ratings for each program, averaging the scores of all inter raters for each aspect and reported results in graphical and written form. Overall average for student's oral performance from each department and differences in dimensional performance useful to programs improvements were reported.

4.3 Faculty Self Assessment

At the same time, while inter raters used the workforce oral presentation rubrics, the other examiners in the faculty used the FKE's Seminar Evaluation Form. The grades obtained through the Course Assessment Summary Report (CASR) were crossed tabulated with the inter rater scores and the final outcome of communication skills were compared and analyzed to show congruency in the assessment of the oral presentation.

5. Results

The Cronbach Alpha value for the overall twenty one item tested in each of the four constructs in the workforce communication rubrics was 0.91 from the thirty one samples piloted ($N = 31$).

The Alpha reliability value for the items in each of the four constructs was 0.76 – Content; and Delivery using Slides; 0.86 – Delivery of Speakers, and 0.90 – Delivery in Keeping the Audience Attention. Since the alpha value was greater than 0.60, these rubrics were considered to have good

reliability and it should make a good assessment tool for this study. Only if the reliability value is less than 0.60 will the instruments be considered as having low reliability. An alpha of 0.60 or above is considered satisfactory for psychological research.[16].

5.1 Rubrics reliability Test

Table 2 shows a consolidated summary of observation during the rubrics reliability test. Most of the undergraduate engineering students had an average or moderate ability when making oral presentation of their project in all four constructs; content, delivery using slides, delivery style of the speaker, and delivery - keeping audience attention.

Rankings from the rubrics were entered as data into SPSS. The range to interpret the data for further analysis was obtained based on a manual scoring to obtain the division of scores: $(5 - 1 = 4 / 3 = 1.33 + 1 = 2.33)$. The range of criteria are Low / Developmental Area (1.00 to 2.33); Moderate/Adequately Effective (2.34 to 3.66); and High / Strength (3.67 to 5.00)

Students from the departments of POWER, ENCON, CIED, MER, MICE and TOP got an overall moderate score in the presentation for Content, Slide use, Speakers ability and Keeping the Audience Attention, with mean scores between 3.02 and 3.50. Students in INSEED and RaCED were better with high mean scores of 3.89 and 3.86 respectively. The overall average mean score was moderate at 3.43, and this was considered encouraging as none of the students were found to have low competency in the oral presentation skill and none of the raters gave a despairingly inconsistent rating since all the raters agreed within one point difference. It was verified that the workforce oral communication rubrics was a reliable tool to measure student ability in the oral presentation and project demonstration of the FYPII project design course. The test had proven that the rubric is an authentic assessment tool that could be used to measure students' work. This ensured that communication skills ability in FYPII could be further examined and the language production and language learning behaviors could be assessed easily and reliably and descriptive of students' performance.

Table 2: Reliability of the Workforce Oral Communication Rubrics

Dept		Content	Slide	Speaker	Audience	Overall Oral workforce communication
1=POWER	Mean	3.17	2.89	3.07	3.11	3.02
	SD	1.23	.89	.95	1.02	.95
2=ENCON	Mean	3.44	3.42	3.10	2.83	3.26
	SD	.38	.26	.58	.88	.42
3=CIED	Mean	4.00	3.63	2.93	3.00	3.44
	SD	.87	.28	.12	1.20	.17
4=MER	Mean	3.40	3.13	3.28	3.40	3.26
	SD	.29	.32	.59	.55	.34
5=INSEED	Mean	4.00	3.98	3.60	3.93	3.89
	SD	.40	.40	.51	1.04	.48
6=MICE	Mean	3.71	3.46	3.40	3.50	3.50
	SD	.40	.33	.33	.41	.31
7=TOP	Mean	3.33	3.19	3.00	3.33	3.19
	SD	.29	.17	.00	.33	.08
8=RaCED	Mean	3.75	3.78	4.00	4.00	3.86
	SD	.00	.16	.00	.00	.06
All	Mean	3.61	3.44	3.30	3.40	3.43
	SD	.56	.48	.53	.78	.47

5.2 FKE Self Assessment of Communication Skill Course Outcome (CASR)

Research Question 1(iii) asked if there is any relationship with the Inter Rater scores obtained from using the rubrics to the actual scores received by students from the faculty. To look into this relationship, the Key Performance Indicator (KPI) set

by the faculty which was within the Engineering Accreditation Council of Malaysia (EAC) standards for each Program Outcome was analyzed from the Table 3.

A review of the breakdown of the Seminar Evaluation Form used by the FKE showed that only 8 percent was allocated for the assessment of oral communication. The rest of the marks allocated in the

FYP II assessment are for Progress Evaluation (40 percent); Thesis Writing (30 percent); Seminar and Project Demonstration (30 percent). The 30 percent from seminar and project demonstration was further broken down into assessment of PO4 – the ability to work with modern instrumentation, software and hardware (12percent), PO5 – the ability to design a system, component or process to fulfill certain specification (10 percent); and here only 8 percent was actually allocated for PO6 – effective oral communication. This distribution of marks was quite contradictory to the policy set by the faculty which stresses that it gives strong emphasis on the assessment of communication skills, but instead it could be seen here that the proportion for the assessment of oral presentation was considered inadequate.

Since the researcher was not able to obtain the breakdown of marks for the evaluation of

communication skills through the Seminar Evaluation Form, the results of the Course Assessment Summary Report (CASR) for the assessment of the FYP II was sufficient to show the relationship of the inter rater scores to all the scores received by the students in the eight departments in FKE. The Key Performance Indicators (KPI) set by EAC and the faculty was at 0.65 or 65 percent for the assessment of PO6 – the Ability to communicate effectively. Since we need to see the relationship of the Inter Rater scores with the grades received from CASR, the KPI scores in CASR need to be converted into a 5 point Likert-type scale score. This makes 0.65 equivalent to a score of 3.25 ($5 \times 65/100 = 3.25$). The other KPI scores received by students according to their department as reported in CASR for the breakdown of PO6 – ‘communicate effectively either orally or in written form’ are shown in Table 3. The numbers in parenthesis are their equivalent to the 5 point Likert-type scale scores.

Table 3: Course Assessment Summary Report (CASR) PO6 – Communication Skills

No	Bachelor of Electrical Engineering	Department	KPI for PO6 set by EAC	KPI achieved by Students	% difference	Rank
1.	SEE - Electrical	POWER	0.65 (3.25)	0.71 (3.55)	+06%	6
		ENCON				6
2.	SEI - Control and Instrumentation	CIED	0.65 (3.25)	0.86 (4.30)	+21%	3
3.	SEM -Mechatronics	MER	0.65 (3.25)	0.67 (3.35)	+02%	8
4.	SEP - Medical Electronics SEL – Electronics	INSEED	0.65 (3.25)	0.73 (3.65)	+08%	5
		MICE		0.75 (3.75)		+10%
5.	SET – Telecommunication	TOP	0.65 (3.25)	0.94 (4.70)	+29%	1
		RaCED				1
AVERAGE				0.78 (3.90)		

CASR showed the overall achievement of the students in the FYP II course inclusive of the assessment through Progress Evaluation (40percent), Thesis (30 percent) and Seminar and Project Demonstration – PO4, PO5 and PO6 – Communicate effectively either orally or in written form (30percent), therefore, it could be interpreted that if a department like TOP and RaCED were to have achieved the highest KPI of 0.94, it indicated that the

students had achieved an equivalence of a score of 4.70 in a 5 point Likert-type scale value and a score of 7.54 given by the assessment committee faculty members using the seminar evaluation form. This is almost a full score and it could be interpreted that students in TOP and RaCED were excellent students and have achieved a score which was 29 percent higher than the standard KPI set by EAC and the faculty.

5.3 Relationship of CASR Scores to Inter-Raters Scores

Following the results of the Rubrics reliability test, no changes were made to the Workforce Communication Rubrics since it had met the reliability criteria for this study. The researcher continued the assessment process to answer the Research Question I (ii) and (iii) - How does the use of the oral communications assessment rubrics when

assessing the oral communication skills demonstrated by students in the FYP presentation reflect on;

- (ii) the assessment committee faculty members' inter rater scores, and
- (iii) the relationship of the inter rater scores with the actual grades received by students from the faculty (CASR).

Table 4 and Appendix B summarize the mean scores of the four categories from rater 1(R1) and rater 2(R2).

Table 4: Inter Rater Scores of Workforce Oral Communication

Department	Student/ Inter Rater	content	delivery slides	delivery speakers	delivery - keeps the audience's attention	Overall Mean Score - workforce communication
1=POWER	S1_R1	2.00	2.00	2.00	2.00	2.00
	S1_R2	3.00	2.67	3.00	3.00	2.92
	Means	2.50	2.33	2.50	2.50	2.46
2=ENCON	S1_R1	3.75	3.22	3.20	3.00	3.29
	S1_R2	3.25	3.44	3.00	2.33	3.01
	Means	3.50	3.33	3.10	2.67	3.15
3=CIED	S1_R1	3.50	3.89	3.00	1.67	3.01
	S2_R2	3.50	3.78	3.00	3.33	3.40
	Means	3.50	3.83	3.00	2.50	3.21
4=MER	S1_R1	3.25	2.89	3.80	3.67	3.40
	S1_R2	3.50	3.44	3.40	3.00	3.34
	Means	3.38	3.17	3.60	3.33	3.37
	S2-R1	3.00	2.78	2.40	2.67	2.71
	S2_R2	3.50	3.11	3.00	4.00	3.40
Means	3.25	2.94	2.70	3.33	3.06	
5=INSEED	S1_R1	4.25	4.56	4.00	5.00	4.45
	S1_R2	4.00	4.22	4.20	4.67	4.27
	Means	4.13	4.39	4.10	4.83	4.36
	S2_R1	3.75	3.56	3.20	3.00	3.38
	S2-R2	4.50	4.44	3.40	4.33	4.17
Means	4.13	4.00	3.30	3.67	3.77	
6=MICE	S1_R1	3.75	3.33	3.00	3.33	3.35
	S1_R2	3.00	2.89	3.00	3.00	2.97
	Means	3.38	3.11	3.00	3.17	3.16
	S2_R1	3.75	3.44	3.80	3.33	3.58
	S2_R2	3.75	3.56	3.60	4.00	3.73
Means	3.75	3.50	3.70	3.67	3.65	
7=TOP	S1_R1	3.50	3.33	3.00	3.33	3.29
	S1_R2	3.50	3.33	3.00	3.00	3.21
	Means	3.50	3.33	3.00	3.17	3.25
8=RaCED	S1_R1	4.25	3.89	3.40	3.33	3.72
	S1_R2	3.75	3.89	4.00	4.00	3.91
	Means	4.00	3.89	3.70	3.67	3.81
All	Means	3.55	3.44	3.25	3.32	3.39

In the department of POWER, rater 1 (R1) gave an overall low mean scores in all the four areas assessed during the seminar oral presentation - content, delivery-slides, delivery-speaker and delivery-keeps the audience's attention where the overall mean score was 2.00. However, R2, gave mean scores in all the four areas assessed within the average range of 2.67 to 3.00, and the overall moderate mean score was 2.92 for student 1. The

student faired much lower than the department's achievement score at 3.55 and the KPI standard level of 3.25 when they were assessed by the inter raters directly using the workforce communications rubrics.

R1 and R2 in ENCON were both consistent in rating the students, even though there was a high score given by R1 in the area of Content. Other than this, the student scored lower than the department's achievement level of 3.55, but slightly higher than

the KPI standard level of 3.25 since the average scores were 3.29 and 3.01 respectively.

The department's achievement level in CIED was 4.30 but overall, the mean score here was much lower than the department's achieved score. R1 overall rating was moderate at 3.01, while R2 was at 3.40, and these scores were higher than the KPI standard level of 3.25 from R2, even though the score given by R1 was lower than the KPI level.

There was not much difference in the department achieved scores to the KPI standards in rating the students in MER. S1 obtained an overall moderate rating from R1 at 3.40, and similarly from R2 at 3.34. These two scores were almost at the same level as the department achieved KPI level of 3.35. S2 also obtained an overall moderate rating from R1 at 2.71, and 3.40 from R2. This showed that the raters in MER were consistent at giving students a moderate score when using the rubrics.

Both the inter raters in the department INSEED were consistent as the scores given by R1 and R2 for SI showed high scores which have exceeded the department's achievement level of 3.65 and the KPI level of 3.2. The only inconsistency was in the assessment of S2 for delivery-slides. R1 gave an average score of 3.56, while R2 gave a high score of 4.44. Similarly, in delivery-keeps the audience's attention, R1 also gave an average score of 3.00, while R2 gave a high score of 4.33. As a result, the overall mean score for S2 given by R1 and R2 range from moderate at 3.38 to a high score of 4.17.

In the assessment of S1 in the department of MICE, the student got an average score of 3.35 which was higher than the KPI level of 3.25 but lower than the department average score of 3.75. R2 also gave a moderate score of 2.97 which was lower than the KPI level. On the other hand, for S2, R1 gave an overall moderate mean score of 3.58 while R2 gave a higher mean score of 3.73. However, both students were rated lower than the department achieved score which was 3.75.

The inter raters in the department of TOP and RaCED were both consistent in their ratings. The department achieved score in both TOP and RaCED was very high at 4.70. This indeed proved very challenging for the students who must have scored 90 percent in the FYPII design course. However, results from inter raters observation showed that the student in TOP only managed to achieve an overall moderate inter rater score of 3.29 and 3.21. On the other hand, the overall inter rater score for the student in RaCED was highly effective at 3.72 and 3.91, but it was still a challenge for the student to achieve the RaCED department score of 4.70. Appendix B summarizes all the findings of the inter raters scores to the FKE achieved scores from CASR and the KPI level.

Finally, the overall mean score could be used to show the relationship of the inter rater scores to that achieved scores in each department KPI as shown in Table 5 below.

Table 5: Comparison of Departments KPI to Inter Rater Scores

No.	Bachelor of Electrical Engineering	Department	KPI for PO6 set by EAC	KPI achieved by Students	Ranking based on KPI	Inter Rater Scores	Ranking based on Inter Rater Score
1.	SEE - Electrical	POWER	0.65	0.71	6	2.46	8
		ENCON	3.25	3.55	6	3.15	7
2.	SEI - Control and Instrumentation	CIED	0.65 3.25	0.86 4.3	3	3.21	6
3.	SEM -Mechatronics	MER	0.65 3.25	0.67 3.35	8	3.22	5
4.	SEP - Medical Electronics SEL – Electronics	INSEED	0.65 3.25	0.73 3.65	5	4.07	1
		MICE		0.75 3.75	4	3.41	3
5.	SET – Telecommunication	TOP	0.65 3.25	0.94	1	3.25	4
		RaCED		4.70	1	3.91	2
AVERAGE			3.25	0.78 3.90		2.93	

The inter rater score were much lower than the achieved KPI of each department except for INSEED which was at a moderate score according to the department's achieved score to a high score from the inter rater score. The average inter raters score were also lower (2.93) than the departments' KPI achieved

by students (3.90) and the KPI standards (3.25). This suggest that from the use of explicit direct assessment instrument like the Workforce Communications Rubrics to measure students' oral communication skills, it help the student to reach the outcome, and assess the extent to which the student meets these

outcomes. It also suggested that a faculty can learn a great deal from the assessment of student performance in oral communication skills that acts as a feedback tool to facilitate student learning.

6. Discussion

The assessment of oral presentation skills in the FYPII Design course started by recognizing there was a need for improvement in the use of oral presentation skills rubrics. It is necessary to incorporate direct assessment of the professional skills especially communication skills into core courses like the FYPII senior year design course to maximize student learning of the skills and at the same time make the curriculum more precise and to have wider and deeper impact. Reliable and valid data requires a multi-step process to create and test scoring rubrics which clearly articulate the objectives being assessed and describe in detail each level of observed student performance.

The practical applications of using the Workforce Communications rubric or any kind of assessment rubric can be seen here. First, evaluating student skills or knowledge using a rubric such as this can be useful in training new teachers or for comparing perceptions of seasoned teachers. That is, in this research, the training process itself proved to be a useful exercise in determining standards for the evaluation of oral speeches. The raters used in this study are experienced instructors and have evaluated oral presentation numerous times but rarely get the chance to compare their evaluations to those of another. In the desire for high inter rater reliability, much discussion was necessary to bring the raters to similar standards and to keep their evaluations in-line with the training manual descriptions. Most disciplines have their own standards, perhaps as articulated by their national organization, which are widely acknowledged and could be used for creating a rubric and training activity similar to those utilized in this study. Second, students can benefit from the use of a standardized rubric based on discipline-specific criteria because it clearly identifies the competencies expected and allows them to see which areas are in the greatest need of improvement once they have been assessed [8].

When comparing the Inter Rater scores to the achieved KPI in each department, it is of particular interest to learn that observation of communication effectiveness were lower than the expected KPI achieved in each department and the KPI standards of EAC. It is difficult to ascertain the reason why Communication Skills were assessed highly by the assessment committee faculty members when using the Seminar Evaluation Form prepared by FKE, although one possible reason could be that the faculty members assessed students mainly on PO4 and PO5

while the assessment of PO6 only covered 8 percent, and thus more emphasis were placed on the assessment of the technical components rather than that of the communication skills. The results also bear out the assumption that technical programs may not be providing students with the essential non-technical skills, specifically the communication skills needed to prepare students for the workforce. In this case it might be most effective to involve a trained communication expert who will be better equipped to evaluate the specific oral communication skill sets to enhance engineering students' oral communication skills in future FYPII seminar and demonstration presentation.

Even though the results shown in this study uses random sampling of the eight departments in the Faculty of Electrical Engineering and the results interpreted based on each departments scores, however, the scores could be generalized to represent student population who have different levels of ability in communicative competency. Therefore, different levels of achievements need to be identified and assessed using differently methods of assessment tool so as not to create biasness identifying the actual communication outcomes of the students.

Following that, the inter rater's data showed similar pattern and correspondence in their evaluation of students oral communication skills in almost all items. This indicated how well the inter raters were able to assess students' oral communication abilities, and how to enhance these skills for future improvements. The individual items comprising the instrument can also be used to identify areas that need improvement. One suggestion by Schuurman *et al.*, [7], "to interpret the data is to examine the distribution for each item to determine which ones elicit relatively low average scores". The data showed that both inter raters rated 'delivery – slide 9 - prepares handouts that are easy to understand' (2.41) and 'content3 - includes overviews, introduction, main content, summary / conclusions, and next steps slides' (2.86) as the lowest scores. This could lead to the development of programs or activities aimed to improve these items. Although the students excelled at some competencies, such as presenting message clearly and in a logical, organized, easy-to-follow sequence in the Content area, Delivery of Slides, Delivery of Speakers and Keeping the Audience Attention, however, some of these fundamental skills have not yet been achieved by a number of students. That is, a variety of competencies relative to students' delivery, one of the most fundamental in communication skills, has not been achieved to a satisfactory degree by the time they graduate. More attention must be paid to teaching students the importance of the language they use and the verbal and nonverbal methods of delivery. Overall, the fact that there are still students who were rated "low" in almost all competency areas outlined in the rubric is another cause for alarm and

must result in changes in the way the faculty teaches its basic speaking course by re-examining both the content of the course and the way in which it is delivered. It is possible that the lack of student skills could be a product of poor course design, not inadequate instructional delivery. The specific causes of the lack of student competencies needs to be explored further in this particular case.

One of the most important aspects of course assessment system should be “closing the loop” by providing feedback to the instructional agency or department so that improvements can be made where warranted and strengths and weaknesses can be identified. Clearly, the development of the communicative skills learning outcome in an engineering program still has work to do in their basic general education course such as the English language communication course offered in the university. Although it is disappointing for faculty members to face the fact on the weaknesses identified, this result highlights the importance of conducting program wide assessments. Without large-scale assessments at the programmatic level, deficiencies will not be recognized or addressed; and academic departments may continue with the status quo which may or may not be instructionally effective[5]

Even though UTM recognizes the importance of communication skills and effective communication skills are seen as a key attribute of its graduates for success in employment, however, UTM and its engineering departments have no specific policy on it. Efforts have been made to encourage communication skills in the engineering curriculum, and efforts must be made to place a higher priority on its usage alongside the technical skills. This is another issue that has to be considered in order to upgrade the ranking of UTM to be equivalent to the standards of top international universities that have received international accreditation standards.

Finally, the instrument developed to measure students’ oral communication skills in this study proved to result in a high degree of internal consistency and high degree of inter-rater reliability. It is recommended to extend this method of assessment to other courses in the curriculum to evaluate communication skills of different groups of students involved in project and laboratory work. Therefore, this study would provide a model of performance-based assessment using a standardized rubric for practitioners and scholars in a variety of disciplines and may be used by any institution wishing to undertake a large-scale assessment of general education competencies [8]

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APPENDIX A

Workforce Oral Communications Rubrics

I. Content	1. Message presented clearly and in a logical, organized, easy-to-follow sequence.
	2. Technical terms used properly.
	3. Includes overview, introduction, main content, summary/conclusions, and next steps slides.
	4. Charts and graphs, if used, are relevant, clear and understandable
II. Delivery - Slides	1. Slides and speech free of spelling and grammatical Errors
	2. Slides free of distractions
	3. Transitions smoothly between topics
	4. Important information is emphasized in slides (for example, through the use of color or font)
	5. Identifies the purpose of each slide and handout
	6. Prepares slides that are clear and easy to understand
	7. Prepares slides that are concise
	8. Prepares charts and graphs so they are effective and easy to understand
	9. Prepares handouts that are easy to understand
III. Delivery - Speaker	1. Has good posture
	2. Avoids distracting distractions
	3. Uses effective speaking style by using proper inflection and avoiding “ums”
	4. Uses effective speaking style by using good volume and Pace
	5. Speaks fluently in the English Language
IV. Delivery – Keeps the Audience’s Attention	1. Maintains good eye contact
	2. Conveys material with confidence and enthusiasm
	3. Response appropriately to audience questions

5.00

Dept Average Score

KPI



