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Evaluating Final-Year Student Classroom Communication at the Faculty of Engineering and Built Environment, Universiti Kebangsaan Malaysia

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ABSTRACT

Classroom communication is a very important and complex aspect in teaching and learning. The complexity of a communication process is attributed to a host of components that include the participants, messages, encoding, decoding, and transmission channels. Not much is currently known concerning classroom communication in the context of engineering education in Malaysian universities. This paper evaluates classroom communication of final-year students of the Electrical and Electronic engineering degree programs at Universiti Kebangsaan Malaysia. Four important aspects of classroom communication were investigated to understand student abilities and issues in classroom communication. One hundred and four students undertook the self-administered survey, yielding a response rate of 92.8%. The majority of the students exhibited good non-verbal communication practices, and scored favourably in the aspect of adapting the way they communicate to others. However, 42.3% of the respondents seemed to have difficulties to explain and express ideas confidently via classroom presentations. Additionally, 43 students (41.3%) appeared to be handicapped in participating actively in class discussions. Finally, at least 40 respondents (38.5%) reported difficulties to express ideas in English, but not to the extent of hindering them in participating in classroom discussions. Further studies are needed to uncover classroom communication issues in student learning among engineering students at Universiti Kebangsaan Malaysia.

Keywords: Engineering education; classroom communication; non-verbal communication; technical communication; soft skills

INTRODUCTION

Communications between students and lecturers, and among students are very important issues in teaching and learning. According to Hubley et al. (1993), communication is a complex multi-stage process that involves multiple components, namely the source, receiver, channel, and the message. Effective communication is also an integral part of an engaging classroom discussion (Duta et al. 2015), and is correlated to positive learning outcomes (Frymier 2005)

In a classroom discussion, the lecturer and students communicate views on specific topics being taught. Dallimore et al. (2004) commented that classroom discussion is a favorite go-to strategy in classroom teaching and learning. This is because classroom discussions can help students learn from one another, and understand course materials better (Weimer 2011). Even though classroom discussion is a commonly used teaching strategy, Tatar (2005) noted that there have been sparse writings on classroom participation.

Currently, not much is known about classroom communication within the context of engineering education (Yusof et al. 2021) in Malaysian universities. Furthermore, in many Malaysian universities, engineering programs are mainly delivered in the English language (Megat Mohd Noor 2002; Gill 2005). Arguably, this could cause communication issues because English is not a mother tongue (Tatar 2005) in Malaysia, albeit being a compulsory subject taught in all Malaysian public schools (Thirusanku et al. 2014). Also crucially, communication skills and English proficiency have been shown to affect graduate employability in the Malaysian job market (Ting et al. 2017; Ong et al. 2020). Thus, there is a veritable need to investigate engineering education classroom communication in Malaysian universities.

METHODOLOGY

This study was conducted to explore student communication in the classroom. It evaluated final-year students of the Electrical and Electronic (E&E) engineering degree programs at the Universiti Kebangsaan Malaysia (UKM), Malaysia.

To gather data, a questionnaire that sought to evaluate important aspects of classroom communication was developed. In this approach, four *a priori* (that is, based on deduction from theory rather than induced from data) aspects were considered for classroom communication within the context of Malaysian engineering education. The four aspects were: i. Explaining and Expressing Opinions (9 questions); ii. Class Discussions (9 questions); iii. Adapting Personal Communication to Others (11 questions); and iv. English Language Usage (4 questions).

During the ideation stage of the questionnaire, a total of 50 questions were initially devised. In the interest of brevity, these questions were later refined and merged down to 33 questions, whose breakdown over the four aspects of classroom communication are as stated above. The resulting questionnaire is an initial step, and should be considered exploratory in nature. In particular, this is the first time classroom communication is studied within the context of Malaysian engineering education. Therefore, the results could be used for future refinements of the questionnaire.

The respondent's answer to each question was graded via a 5-point ordinal Likert scale: 1. Very Untrue, 2. Untrue, 3. Somewhat True, 4. True, and 5. Very True. This bipolar scale indicated the respondent's relative degree of agreement with the statement of each question. Every respondent was required to answer all 33 questions. The questionnaire was untimed and self-administered via the Google Forms online survey platform.

Even though the survey was intended to record anonymous responses, each respondent was required to furnish a student matriculation identification number so as to ensure no replication of responses, and to obtain accurate statistical analysis. The survey itself comprised of two sections. The first section recorded the student's basic information, which were gender, UKM entry qualification, language used in class, and language used at home. The second section was the set of 33 questions, each of which respondents answered by choosing only 1 point from the 5-point Likert scale.

SUBJECT POPULATION

The survey was disseminated to final-year students of the E&E engineering degree programs at UKM. A total of 104 returns out of 112 students were recorded at the end of the 5-day survey period. This translates to an encouraging response rate of 92.8%.

DEMOGRAPHIC DESCRIPTION

Out of the 104 respondents, more than half (58.7%) comprised of female students. The majority of final-year students of the E&E engineering degree programs graduated from the Malaysian Matriculation Program to enter UKM (73%). A distant second at 10% entered the university through the Sijil Tinggi Pelajaran Malaysia (STPM) pre-university examination route. See Figure 1.

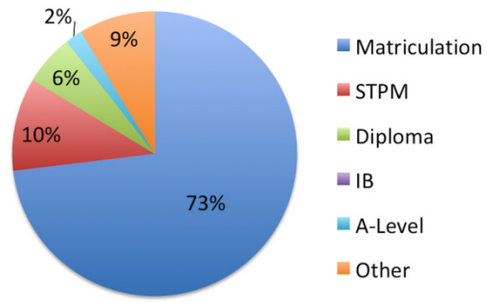

FIGURE 1. Distribution of survey respondent's entry qualification into UKM's Electrical and Electronic engineering degree programs. Total respondents = 104 students.

Interestingly, most respondents (78.8%) speak the Malay language in class. The only other language spoken in class is English, by 21.2% of the students. It is therefore unsurprising that 77% of the respondents also habitually converse in Malay at home, as shown in Figure 2.

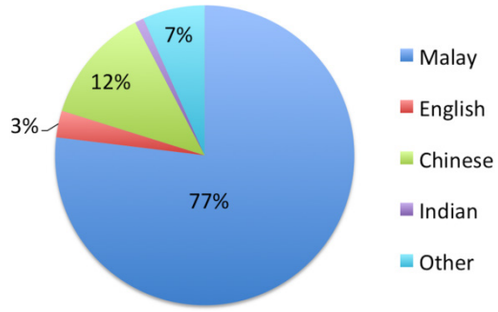

FIGURE 2. Distribution of survey respondents' language use at home. Total respondents = 104 students.

RESULTS AND DISCUSSION

In this section, we discuss the survey results for each of the four components that make up classroom communication, that is, (i) Explaining and Expressing Opinions; (ii) Class Discussions; (iii) Adapting Personal Communication to Others; and (iv) English Language Usage. Statements of each surveyed domain were scaled from 1 to 5, where 1 denotes 'Very Untrue' and 5, 'Very True'.

EXPLAINING AND EXPRESSING OPINIONS

In this component, 9 elements were analyzed and the results tabulated in Table 1. For each of the elements, its average Likert scale score, mode (the most commonly selected scale point response), and mode frequency (how many respondents selected the mode scale point) were determined.

From the results obtained, it was found that the students, in explaining and expressing themselves, to a large degree feel competent in giving class instructions to classmates. This element received the highest score of 3.91, where majority respondents (57.7%) answered by selecting scale point 4. A close second at 3.87 average score, students also

feel relatively confident in providing simple instructions on a class topic to classmates.

On the other hand, at the lowest end, with a score of 3.50, students feel less confident in giving classroom presentations. This is where most respondents (42.3%) — by selecting scale point 3 — indicated they are uncertain in their ability to deliver classroom presentations confidently. Also of significant note is the final-year engineering students feel less adroit in answering lecturer's questions (3.54). Also notably, at a score of 3.58, the students are, to some extent, uncertain in their ability to use diagrams and charts to express their ideas.

What is very revealing here is no items exceeded the score of 4. Furthermore, the lowest score element suggests public speaking fear among the final-year UKM students. This observation is in agreement with recent findings of public speaking anxiety among university students reported elsewhere (Siddique et al. 2020; Raja et al. 2017; Kankam et al. 2017; Tee et al. 2020; Grieve et al. 2021; Dansieh et al. 2021; Marinho et al. 2017). Therefore, it will be constructive for universities to acknowledge public speaking fear among students, and to provide the necessary support for honing their presentation skills.

CLASS DISCUSSIONS

As in the previous category, 9 items were scrutinized in this domain of 'Class Discussions', listed in Table 2. There are four items that exceeded the score of 4. At the apex is students' positivity in their ability to discuss class matters with classmates. This garnered a score of 4.33. Following very closely at 4.32, students are not abashed at asking for more details and clarification on something not understood in class. What is also encouraging is majority (64.4%) of the E&E students are willing to ask others questions when they do not understand what their classmates have said. The score for this entry is 4.29.

In the lower range, the respondents find some difficulty in leading classroom discussions. The score for this is 3.44. Students also report problems asking questions in class to obtain lesson information (3.42). Worryingly, at the lowest end (3.35), more than 41% of the respondents seem to struggle to participate actively in class discussions.

TABLE 1. Average scores and modes for the domain of Explaining and Expressing Opinions. Responses were graded on a 5-point Likert scale where 1 denotes 'Very Untrue' and 5, 'Very True'.

No.	Statement	Average Score	Mode	Mode frequency (*n*)	Mode frequency (%)
1.	I am able to answer lecturer's questions in class.	3.54	3	48	46.2
2.	I am able to give simple instructions to classmates on a class topic.	3.87	4	52	50.0
3.	I am able to explain simple facts to classmates.	3.84	4	50	48.1
4.	I am able to explain difficult subject matter using detailed examples.	3.59	3	47	45.2
5.	I am able to express my ideas clearly and concisely in class.	3.70	4	49	47.1
6.	I am able to restate information orally to my classmates.	3.81	4	56	53.8
7.	I am able to give clear instructions to classmates.	3.91	4	60	57.7
8.	I am able to confidently give presentations in class.	3.50	3	44	42.3
9.	I am able to use diagrams and charts to express my ideas in class.	3.58	3	41	39.4

TABLE 2. Average scores and modes for the domain of Class Discussions. Responses were graded on a 5-point Likert scale where 1 denotes 'Very Untrue' and 5, 'Very True'.

No	Statement	Average Score	Mode	Mode frequency (*n*)	Mode frequency (%)
1.	I am able to discuss class matters with classmates.	4.33	4	60	57.7
2.	I am able to discuss class-related problems or issues in detail.	3.98	4	60	57.7
3.	I am able to lead classroom discussions.	3.44	3	47	45.2
4.	I participate actively in class discussions.	3.35	3	43	41.3
5.	I am able to ask questions in class to obtain lesson information.	3.42	4	39	37.5
6.	I am able to ask complex questions to get the appropriate information.	3.61	4	47	45.2
7.	I ask for more details and clarification on something not understood.	4.32	4	67	64.4
8.	In conversations, I ask the other person questions when I don't understand what they've said.	4.29	4	67	64.4
9.	I am able to listen to others without interrupting.	4.12	4	50	48.1

Collectively, these scores suggest that the students are somewhat comfortable discussing among themselves. But weaknesses are also apparent. Limited participation in class discussions, and asking questions in class are the chief misgivings. Table 2 displays the scores for 'Class Discussions'.

ADAPTING PERSONAL COMMUNICATION TO OTHERS

In this set, 11 constituents were evaluated. The leading score (4.44) records more than 45.2% of the respondents allowing classmates to finish talking before they speak. A peg down the ladder, it was found that respondents actively try to understand differing ideas of classmates (4.40). Also positively, the students give attention to their classmates in conversations (4.39). These good communicative practices indicate the students are courteous and thoughtful to others in their conversations.

At the bottom, 3 elements stand out. At a score of 3.29, students view themselves as less tending to talk more than the other person. Next, they note that their classmates do not put words in their mouths or finish their sentences (3.34). On a personal level, most respondents do not finish sentences or supply words to classmates during their speaking turn (3.60). These scores further reinforce indications that the respondents are courteous when speaking to others. In addition, to a certain degree, the respondents also think their courtesy is reciprocated by the persons they are conversing with.

Looking at the overall picture, the respondents seem to be accommodative when speaking to others. The students also employ good non-verbal communication techniques and appropriate body language in a discussion. Table 3 represents the scores for 'Adapting Personal Communication to Others'.

TABLE 3. Average scores and modes for the domain of Adapting Personal Communication to Others. Responses were graded on a 5-point Likert scale where 1 denotes 'Very Untrue' and 5, 'Very True'.

No.	Statement	Average Score	Mode	Mode frequency (*n*)	Mode frequency (%)
1.	I consider cultural issues when speaking to others.	4.02	4	50	48.1
2.	I try to understand ideas that are different from mine.	4.40	4	64	61.5
3.	I think about what the other person needs to know and how best to convey it.	4.25	4	65	62.5
4.	I think about what I'm going so I can get my points across correctly.	4.18	4	57	54.8
5.	People tend to put words in my mouth, or finish my sentences for me.	3.34	3	35	33.7
6.	I tend to talk more than the other person.	3.29	3	41	39.4
7.	I pay attention to others while in conversation.	4.39	4	58	55.8
8.	I tend to finish sentences or supply words for the other person.	3.60	3	36	34.6
9.	I let the other person finish talking before speaking.	4.44	4	47	45.2
10.	People are interested and attentive when I talk to them.	3.73	3	53	51.0
11.	I use appropriate body language while having a conversation.	4.26	4	47	45.2

TABLE 4. Average scores and modes for the domain of English Language Usage. Responses were graded on a 5-point Likert scale where 1 denotes 'Very Untrue' and 5, 'Very True'.

No.	Statement	Average Score	Mode	Mode frequency (*n*)	Mode frequency (%)
1.	I am able to confidently use English in class.	3.53	3	46	44.2
2.	In English conversations, my words usually come out the way I'd like.	3.57	4	42	40.4
3.	I find it difficult to express ideas in English.	3.25	3	40	38.5
4.	I DO NOT participate in class discussions because of poor English.	2.58	2	37	35.6

ENGLISH LANGUAGE USAGE

To round up the research, English language usage in the classroom among students was studied. In this segment, only 4 items were enquired, listed in Table 4. For item 1, most respondents (44.2%) selected scale point 3, indicating they are *somewhat* able to use English in class confidently. However, at least 40 respondents (38.5%) reported difficulties to express ideas in English, as indicated by item 3.

These scores correlate with the majority of the respondents being habitual speakers of the Malay language, both in class and at their homes. Interestingly, most students (35.6%) are not hindered in class discussions because of poor English language skills, as indicated by item 4. Therefore English language usage in classroom communication is an area that needs further investigation.

FUTURE WORK

Two areas of improvement have been identified at the conclusion of this study. Firstly, the number of questions for each domain could be increased so that the assessment of each domain is more thorough. This, however, has to be considered in tandem with the average respondent's attention span so that the respondent remains interested and committed to provide reliable answers throughout the survey. Secondly, a pre-test of the survey to a small group of selected respondents could be conducted ahead of the actual full-scale dissemination of the survey. Such a pre-test could be done to evaluate the respondent's comprehension of each question, ensuring it is aligned with the survey's intention. The questions could then be rephrased or reworded if the need arises.

CONCLUSIONS

In summary, some notable insights in classroom communication of final-year Electrical and Electronic engineering students at UKM have been obtained through this study. One of the most compelling is that some students are not comfortable in using English in the classroom. In addition, students seem to have some difficulties in explaining and expressing their ideas, particularly by giving class presentations. Furthermore, some students experience difficulty in participating actively class discussions. Conversely, the majority of students exhibit good non-verbal communication techniques.

In closing, more research needs to be done to uncover classroom communication issues in student learning among Electrical and Electronic engineering students at UKM. This could be done with interviews, or with a more refined questionnaire that includes open-ended questions that might uncover previously unknown issues. In addition, in-class participant observation could also be used to study communication dynamics in the classroom.

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DECLARATION OF COMPETING INTEREST

None

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