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THE NEED FOR TECHNICAL COMMUNICATION PEDAGOGICAL MODULE FOR 21ST **CENTURY LEARNING IN TVET INSTITUTIONS: LECTURERS' TYPICAL INSTRUCTIONAL** STRATEGIES

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ABSTRACT

This paper emphasises on the needs analysis for the development of Technical Communication Pedagogical Module (TCPM) which could be adopted by the lecturers in skill-based higher learning institutions to teach technical communication. About 81% of the respondents indicated that fresh graduates lack communication skills. In addition, the total unemployment rate in June 2018 was recorded at 3.4%. Most of the employers as well as the graduates themselves reported that fresh graduates are unable to secure an employment due to poor communication skills. This raises the curiosity in determining the reasons for the ineffective course of study which supposed to be producing work-ready graduates. Therefore, before developing a technical communication pedagogical module which the educators could adopt to teach technical communication, it is crucial to determine lecturers' typical instructional strategies for teaching technical communication. Survey questionnaires were distributed to 30 lecturers and the findings revealed that most of the lecturers over-rated themselves for all the five aspects in the questionnaire which are (1) subject matter knowledge, (2) instructional planning and strategies, (3) assessment, (4) learning environment and (5) effective communication.

Keywords: Technical Communication Pedagogical Module, TVET, Automotive Industry

INTRODUCTION

The implementation of the tenth Malaysia plan was a success (Jabatan Perdana Menteri (JPM), 2015). However, the evaluation of tenth Malaysia plan, opened up a platform for analyses to be done to examine the challenges which are being encountered by learners, lecturers, TVET providers and etc. It was found that uncoordinated governance, lack of acknowledgment for technologist, non-standardized TVET delivery and skill gaps among instructors are the four main challenges which need to be addressed in Eleventh Malaysia Plan 2016-2020 (JPM, 2015). Lack of industry input in the curriculum or modules used in the TVET institutions produces incompetent and not work-ready graduates. Content that is learned and practiced within the classroom context has become out of date and no longer suitable to be used in real-life work environment.

This could be clearly seen in the field of automotive as it plays a significant role in transforming Malaysia from agricultural to an industrial country (Hooi, 2016). 'Automotive' is one of the fields that is experiencing a drastic change in its practice due to significant advancement in science and technology.

New inventions are changing the way certain actions are performed. For instance, with the existence of advanced technology, cars are now fitted with GPS, anti-skid braking, smart key, autonomous vehicles and etc. Workers are expected to be competent with the latest advancement as automotive industry prefers skilled workers with good technical skills (Kamin & Ahmad, 2014). Moreover, skill-based workers are currently regarded as the backbone of an organization (Lamos, Simon, & Waits, 2010; Chang, Rynhart & Huynh, 2016). In Malaysia, there are 72 higher learning institutions such as colleges, institutes, polytechnics, and university offering automotive programmes for skill-based learners (as of 31 October 2018).

However, it was found that lecturers and content of syllabus taught are not up-to-date with current practices, procedures and techniques (Kamin & Ahmad, 2014). Therefore, learners gain limited or no experience of practicing hands –on skills and cover less relevant contents during teaching and learning (Kamin & Ahmad, 2014). Due to insufficient exposure to real-life industry exposure during a course study, many learners are unable to communicate technical information within and outside the organization (Donnell, Aller, Alley, Kedrowicz, 2011).

Statement of problem

According to the stakeholders in the labor market, lack-of quality skills-based and job relevant training, outdated curricula and poor soft skills especially declining English proficiency are the three main skills challenges in Malaysia (Song & Tang, 2016). Besides that, an employability survey was conducted by TalentCorp among employers in Malaysia in 2014. About 81% of the respondents indicated that fresh graduates lack communication skills (Song & Tang, 2016). In addition, the total unemployment rate in June 2018 was recorded at 3.4% (Department of Statistics Malaysia, 2019). Most of the employers as well as the graduates themselves reported that fresh graduates are unable to secure an employment due to poor communication skills.

This raises the curiosity in determining the reasons for the ineffective course of study which supposed to be producing work-ready graduates. Researchers in the past have identified various factors which contribute to the challenges faced by learners in technical and vocational colleges, polytechnic, university and skills institutions. Possessing poor language proficiency (Tati, Paul & Golingi, 2016; Murali, 2015; Khatib & Maarof, 2015; Shamsuddin et al., 2013; Abdullah & Majid, 2013), inappropriate attitudes of learners' towards learning English (Abdullah & Majid, 2013; Ustati & Ismail, 2013; Mutalib et al., 2014), lack of confidence among TVET learners (Abdullah & Majid, 2013; Sanmugam & Harun, 2013), possessing low self-efficacy beliefs (Khatib & Maarof, 2015) and lack of exposure to English language (Kim, Azmi & Teh, 2017) are some of the challenges faced by the learners in learning communication skills in TVET related fields. Apart from that, learners' negative perceptions towards TVET enrolment have also been highlighted by the past researchers (Ismail & Hassan, 2013). Based on the past research evidence, it can be clearly seen that these factors are greatly affecting fresh graduates' efficiency and competency at workplace. This becomes even worse in skill-based industry such as automotive. Graduates are not only required to master relevant technical skills, but they are also expected to equip themselves with appropriate workplace competencies such as technical communication skills (Jamaludin, Alias, & DeWitt, 2018). Technical communication is defined as a process of gathering, organizing, presenting and refining information (Collier & Toomey, 1997). In a technical field such automotive, information is communicated via short and long reports on projects, technical articles, operation manual, website and many more. Therefore, DiSanza & Legge (2002) drew a more specific definition of technical communication as "scientific, technological, engineering, business, legal, regulatory, managerial or social scientific information". Kimball (2017) rescoped technical communication and defined it as "technical communication is not just a profession, but an activity that manages technological action through communication technologies, including writing itself, in a particular setting and for particular purposes" (p. 345). Not being able to communicate technical information using correct technical terms and managing technical processes using technological tools in the automotive industry leads to mishaps and inefficiency. This reduces fresh graduates' employability opportunities in the automotive industry. Therefore, to increase skill-based graduates' employability, industry-based curriculum should provide enriched resources and flexibility to adapt to the changing

needs of the automotive industry (Jamaludin, Alias, & DeWitt, 2018). Lessons are expected to be taught differently to provide significant learning experiences to the students in TVET institutions based on the industry needs to learn technical communication skills. As such, before developing a technical communication pedagogical module which the educators could adopt to teach technical communication, it is crucial to determine lecturers' typical instructional strategies for teaching technical communication. In other words, it attempts to answer the following research question: what extend are the instructional practices of the lecturers to teach technical communication?

METHODOLOGY

This study employs descriptive quantitative research design which examines the instructional practices of the lecturers.

Sampling

The present study used purposive sampling procedure. Survey questionnaires were distributed to 30 randomly chosen lecturers who have been teaching Technical Communication / Technical English / English courses in institutions which are offering skill-based programmes. This is to identify the kind of instructional strategies used by the lecturers to conduct their classes.

Instrument

Self-assessment Instrument for Teacher Evaluation survey questionnaire which was developed by Akram and Zepeda (2015) was used to determine lecturers' typical instructional strategies in the teaching of technical English or technical communication. The 5-point likert scale survey questionnaire consists of 5 main elements. They are:

(1) Subject Matter Knowledge
(2) Instructional Planning and Strategies
(3) Assessment
(4) Learning Environment
(5) Effective Communication

Teachers are encouraged to use this questionnaire to evaluate their own performances as it has been tested and proven to be valid and reliable at a scale of α=.94. The Cronbach alpha reliabilities of the scales were assessed for all the five main elements as: subject matter knowledge (.89), Instructional Planning and Strategies (.86), Assessment (.83), Learning environment (.75), and effective communication (.73). This indicates that the reliability of the items in the survey is high. In this study, all these elements are maintained with minor modifications to suit best to the current study. The term 'technical communication' and related concepts are applied in the questionnaire to ensure that its suitability to this study. The response scales ranged from the lowest to highest as 1= Never, 2= Rarely, 3= Sometimes, 4= Often, or 5= Always. It was assumed that the teachers who always practice tangible behaviors would be highly effective or vice versa (Akram & Zepeda, 2015).

Data Collection

Survey questionnaires were sent via email and hardcopies were given by hand to lecturers who are teaching technical English or technical communication at colleges and universities which offer automotive related programmes.

Data Analysis

Descriptive and inferential statistics was used to analyse the collected data via survey questionnaires. To be specific, Statistical Package for the Social Sciences (SPSS) Version 21 was used as a tool to run descriptive statistics to determine lecturers' competency on teaching technical communication.

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FINDINGS

Profile of Experts: To determine the lecturers' typical instructional strategies, 11 male and 19 female lecturers participated in this survey. Since Technical English and English related courses are not offered in all private skill-based institutions all over Malaysia, only 30 lecturers took part in this survey. They were from various private skill-based institutions which are located in Perak, Selangor, Kuala Lumpur, Malacca and Negeri Sembilan.

Table 1
Number of Lecturers

Gender	N	Percent
Male	11	36.7
Female	19	63.3
Total	30	100.0

A total of 29 lecturers stated that they do not collaborate with any of their industry partners to develop their English teaching module. Of 30 lecturers, only one lecturer collaborates with the industry to develop module to be used in the English class (see Table 1).

Table 2
Collaboration with Industry for Module Development

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	29	96.7	96.7	96.7
	Yes	1	3.3	3.3	100.0
	Total	30	100.0	100.0	

The statements in the survey questionnaire were categorised into five parts: (1) subject matter knowledge, (2) Instructional Planning and Strategies, (3) Assessment, (4) Learning Environment and (5) Effective Communication.

Subject Matter Knowledge

A total of eight statements were included in the questionnaire to identify the lecturers' subject matter knowledge (see Table 3). 'Linking content with real-life skill-based learning experiences' recorded the highest mean which is 4.20 with standard deviation value at 0.66. The least mean value was recorded at 3.80 for 'demonstrating accurate knowledge of technical communication' and 'demonstrating a variety of skills teaching technical discourse' with standard deviation value at 0.81 and 0.81 respectively. Based on the table 3 below, it can be concluded that, the lecturers moderately equip themselves with relevant subject matter knowledge and often demonstrate it in the class.

Table 3

Subject Matter Knowledge

Statements	N	Mean	SD
I demonstrate accurate knowledge of technical communication.	30	3.8000	.80516
I link content with real-life skill-based learning experiences.	30	4.2000	.66436
I demonstrate a variety of skills teaching technical discourse.	30	3.8000	.80516
I communicate technical content in ways that students can understand.	30	4.0000	.58722
I use institution resources to help students understand the application of technical terms.	30	3.9000	.54772
I teach technical communication according to the intellectual, emotional needs of the students.	30	3.9667	.61495
I effectively address appropriate curriculum standards for technical communication.	30	3.9667	.71840
I base instruction on goals that reflect high expectations.	30	3.9000	.66176

Instructional Planning and Strategies

Table 4 below depicts the instructional planning and strategies used by the lecturers. The highest mean was recorded at 4.03 for "I understand individual differences of students and teach accordingly" with standard deviation value of 0.67. Using strategies to enhance students' understanding of technical terms and engaging, motivating, and maintaining students' attention to learn technical communication recorded a total mean of 4.00 with standard deviation of 0.74 and 0.69 respectively. Majority lecturers agreed that they are using existing module to teach English with appropriate technical materials. However, collaborating with the industry to develop modules to teach English recorded the least mean value which is at 3.23 and standard deviation of 1.10. Therefore, it can be concluded that most of the respondents often opt for appropriate instructional planning and strategies.

Table 4

Instructional Planning and Strategies

Statements	N	Mean	SD
I use strategies to enhance students' understanding of technical terms.	30	4.0000	.74278
I change teaching methodology to make technical writing relevant.	30	3.8667	.77608
I understand individual differences of students and teach accordingly.	30	4.0333	.66868
I use appropriate technical material to teach technical communication.	30	3.8667	.62881
I engage, motivate, and maintain students' attention to learn technical communication.	30	4.0000	.69481
I teach technical communication using existing module.	30	3.8667	.86037
I collaborate with industry to plan the content of technical communication module.	30	3.2333	1.10433

Assessment

The table 1.5 below shows lecturers' way of assessing their learners' learning. The highest mean values were recorded for 'conducting class tests / quizzes to monitor student performance', 'evaluating students' performance and providing feedback' and 'keeping official record of students' learning

progress' at 4.17, 4.13 and 4.10 respectively. Maintaining students' results and use for future improvement' and 'revising content to enhance students' achievement' recorded the least mean value of 4.03. Overall, it can be concluded that the respondents often use appropriate assessments to evaluate the students' competency.

Table 5
Assessment

Statements	N	Mean	SD
I conduct class tests / quizzes to monitor student performance.	30	4.1667	1.01992
I evaluate students' performance and provide feedback.	30	4.1333	.68145
I maintain students' results and use for future improvement.	30	4.0333	.76489
I revise content to enhance students' achievement.	30	4.0333	.71840
I keep official record of students' learning progress.	30	4.1000	.88474

Learning Environment

Table 6 depicts the learning environment that the lecturers create during their teaching and learning in the classroom. Majority of the lecturers agreed that they ensure students' participation in the learning process. This recorded the highest mean at 4.23 with standard deviation value of 0.63. Most lecturers also agreed that they create a climate of mutual trust and respect in classroom. This statement recorded mean value of 4.13. 'Maintaining a classroom setting that minimizes disruption' and 'creating friendly and supportive technical communication classroom environment recorded a total mean value of 4.17. However, 'encouraging students to use technical terms to exchange information respectfully' recorded the least mean value of 3.97. Overall, it can be concluded that the respondents often create a suitable learning environment for the students to learn.

Table 6
Learning Environment

Statements	N	Mean	SD
I create a climate of mutual trust and respect in classroom.	30	4.1333	.57135
I maintain a classroom setting that minimizes disruption.	30	4.1667	.64772
I create friendly and supportive technical communication classroom environment.	30	4.1667	.59209
I ensure students' participation in the learning process.	30	4.2333	.62606
I encourage students to use technical terms to exchange information respectfully.	30	3.9667	.66868

Effective Communication

Table 7 below shows effective communication established by the lecturers. 'Using correct technical vocabulary and grammar in speaking & writing' recorded the highest mean value at 4.13. Whereas the least mean score was recorded for 'explaining technical terms according to the ability of students' at 3.97. 'Responding to students' questions using appropriate technical terms' has recorded mean value of 4.00. Overall, it can be summarised that most respondents agreed that they often practice effective communication in the class.

Table 7
Effective Communication

Statements	N	Mean	SD
I use correct technical vocabulary and grammar in speaking & writing.	30	4.1333	.62881
I explain technical terms according to the ability of students.	30	3.9667	.66868
I respond to students' questions using appropriate technical terms.	30	4.0000	.69481

DISCUSSION

To determine the lecturers' typical instructional strategies for teaching technical communication, a total of 30 lecturers teaching English language-related courses in skill-based institutions took part in a self-assessment survey. Overall, most lecturers over-rated themselves for all the five aspects in the questionnaire.

In the first part of the questionnaire analysis, academicians do not engage in collaborative activities with industry experts to design teaching modules. Of the 30 respondents, a total of 29 of them agreed that they do not collaborate with the industry to develop teaching modules. When this was asked again under the instructional planning and strategies, collaborating with the industry to develop modules to teach English, recorded the least mean value. This indicates that lecturers give least importance to establishing collaboration with the industry. Visionaries are already moving towards industry revolution 5.0 while most companies have just started adopting the principles of Industry revolution 4.0 (Piccarozzi, Aquilani & Gatti, 2018; Demir & Cicibaş, 2017). The application of human intelligence and cognitive computing demands highly competent workforce that meets the current and future industry needs. As such, designing teaching modules based on insights gained through collaborative activities with the industry is crucial to bring transformation in the educational qualities and skills emphasised in the TVET programmes (Ismail et al., 2016; Ismail et al., 2019, Rosly et al., 2019). Lack of interaction and collaboration with stakeholders and industry employers for current input for English for Specific Purposes curriculum development has become one of the major concerns of the lecturers (Ahmad, Muhammad & Jamil, 2019). Hence, TVET lecturers need to establish a good relationship with the related industries to enhance their organisational culture, capability in innovation and actual work operations (Chua & Jamil, 2017; Mohamad, Saud, & Ahmad, 2017). Therefore, academicians are reminded to have a frequent talk with the automotive industry experts in Malaysia to understand the changes in technology and skills needed to evaluate and enhance existing modules or customise the syllabus (Chan & Balaraman, 2019; Wijayanto, 2017; Grapragasem, Krishnan & Mansor, 2014).

Besides that, it was found that lecturers moderately equip themselves with relevant subject matter knowledge. Most lecturers agreed that they often link content with real-life skill-based learning experiences. This is in line with Kanwar, Balasubramanian and Carr's (2019) argument on integrating informal and non-formal learning in TVET systems. According to Kanwar, Balasubramanian and Carr (2019), educators should place a special focus on new models for work-based learning which can promote transformative learning that will help them to function as required at their workplace. Apart from that, it can be noted that, lecturers face challenges in demonstrating accurate knowledge of technical communication and a variety of skills teaching technical discourse. Imparting knowledge of technical communication has been the biggest challenge for most lecturers (Hanapi, Nordin & Khamis, 2015).

Majority of the lecturers agreed that they understand individual differences of students and teach accordingly. Despite being aware of individual differences in the classroom, there was no evidence found in revising the existing module to cater to the needs of the students. Majority of the lecturers are still using the existing module which was prepared some time ago. To provide functional and meaningful learning experiences to the TVET learners, academicians are urged to revise TVET curriculum from time

to time by making a closer link with the industry (Hussin et al., 2016; Chinedu & Wan-Mohamed, 2017; Amin, 2016; Rasul et al., 2015; Spöttl & Becker, 2016; Ahmad et al., 2017; Abdullah & Majid, 2013; Grapragasem.et.al, 2014). According to Amin (2016), lack of industry input curriculum design has resulted in mismatch of skills required by industry and the skills attained by TVET graduates.

Majority of the participants agreed that they ensure students' participation in the learning process. They also agreed that they create a climate of mutual trust and respect in classroom, maintain a classroom setting that minimises disruption and create friendly and supportive technical communication classroom environment. However, they viewed encouraging students to use technical terms to exchange information respectfully as a least important aspect in their teaching.

It was found that most respondents prefer conducting class test/ quizzes to monitor students' performance. They agreed that they evaluate students' performance to provide feedback and keep official record of their learning progress. However, they agreed that they give least importance to maintaining students' results to use for future improvement.

CONCLUSION

This study aimed to determine lecturers' typical instructional strategy for teaching technical communication. A total of 30 lecturers from private skill-based institutions participated in a survey. The findings revealed that, most of the lecturers over-rated themselves for all the five aspects in the questionnaire which are (1) subject matter knowledge, (2) instructional planning and strategies, (3) assessment, (4) learning environment and (5) effective communication. TVET institutions should provide relevant instructional support and should encourage the academicians to work closely with the industry experts to determine the current needs and practices that will enable them to design and develop a reliable module. Academicians should develop modules that emphasises on the correct use of technical terms as a gesture of keeping the terms in automotive original. This will improve their competency and increase their employability skills.

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