The Social Sciences Empowered

Editors

Ford Lumban Gaol
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Fong Peng Chew

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Preface

The 7th International Congress on Interdisciplinary Behavior & Social Science 2018 has the theme "Empowered The Social Sciences: Making Knowledge, Innovation and Progress Accessible to All".

As cross-cutting issues of broad relevance, Social Sciences and Humanities are fully integrated to enhance industrial leadership and to tackle every societal challenge. ICIBSoS 2018 provided the economic and social analysis necessary for reforming Humanities issues such as Education, Sociology, Anthropology, Politics, History, Philosophy and Psychology, as well as food security.

Contributions to ICIBSoS 2018 provide a range of insights into the cultural and human dimensions in such diverse subject areas as transport, climate change, energy or agriculture. ICIBSoS 2018 papers also analyse the cultural, behavioural, psychological, social and institutional changes that transform people's behaviour and the global environment. ICIBSoS 2018 authors propose new ideas, strategies and governance structures for overcoming the crisis from a global perspective, for innovating the public sector and business models, for promoting social innovation and fostering creativity in development of services and product design.

One example that was discussed in ICIBSoS 2018 was the evolution of the concept of Ecosystem to a concept that embraces the structures and systems of Society 5.0, that will profoundly contribute to Society and Environment. Issues such as Sharing Economics and the Economics of Disruptive Technology were also discussed during ICIBSoS 2018.

Hence, in ICIBSoS 2018 a discussion was held about shaping new emerging directions, including the knowledge that relates to conception and philosophy issues that in turn concern understanding Social Sciences issues and the relations between people. Constructive interdisciplinary dialogues in support of the development of innovative frameworks and terminologies have become the goal and contribution of ICIBSoS 2018.

Finally, we hope that this book will make a valuable contribution to the fields of social sciences and humanities.

Best regards,

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The techniques employed in teaching technical terms: A study on educators at a tertiary educational institution

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ABSTRACT: It is imperative to examine the strategies or techniques that instructors use in teaching technical vocabulary in order to discover the perception of the teachers towards the teaching methods executed. To address this issue, the present study then aimed at investigating the strategies employed by 29 educators elected as facilitators at *Institut Kemahiran Tinggi* PERDA-TECH, Nibong Tebal in teaching technical terms to the students assigned by their institute for them. Based on the questionnaire survey conducted, the findings indicated that most respondents agreed that they involved the use of Malay translations in teaching technical vocabulary such as the use of Malay synonyms (item 4), which was discovered to be the most preferred method as 69% (M = 3.97, SD = .731) of the respondents revealed practicing this technique. Nevertheless, 41.1% of the respondents (M = 3.03, SD = 1.180) agreed with item 5 about practicing Malay translations sometimes still could not help the respondents' students understand the technical words, particularly difficult words. It is obvious that the techniques preferred by the respondents depend on the effectiveness of them- either they are frequently used or not.

Keywords: Technical words, teaching techniques, English language

1 INTRODUCTION

Technical words are argued by Nation (2001) should be treated as high-frequency words, and in doing so, they should be taught in various methods. With respect to the attempt to discover the preferences for the techniques employed in teaching technical terms among educators at a higher learning institution, the present study was conducted on several lecturers from Institut Kemahiran Tinggi PERDA-TECH. This study intends to investigate if these educators possess any tendency towards practicing certain techniques and if the methods of imparting knowledge about technical terms to their respective students are effective. The results of the study can determine the actions to be taken in improving the pedagogical approach of the teachers in dealing with technical vocabulary.

1.1 *Problem statement*

It is argued by Chung and Nation (2003) that teachers basically face two main difficulties in their attempts to help learners deal with technical terms namely; 1) teachers occasionally do not possess specialist intelligence of their learners' technical fields, 2) technical terms should be worked on in dealing with the specialized areas. As for *Institut Kemahiran Tinggi* PERDA-TECH (PERDA-TECH Higher Skill Institute), Nibong Tebal, Penang, Malaysia, until the last July 2017 session, the problem most frequently had been faced by the lecturers was the failure of their students to complete their log book tasks due to several factors such as there were no additional efforts from their teachers to help them with learning the technical words in the log book as well as there were no stern actions imposed on the students for failing to do the tasks in the book. The lack of vocabulary and self-confidence has been identified as some of the factors contributing to *Institut Kemahiran Tinggi* PERDA-TECH students' weak English. One of the initiatives implemented to improve the students' English proficiency is the introduction of English Log Book Program in the curriculum for the purpose of assisting the students in learning English in terms of expanding their technical vocabulary, as well as improving their

understanding of the meanings of some selected words, and their ability to use the words. The program is run with the help of the lecturers appointed as facilitators specifically for the implementation of it. Since teaching and learning technical words are part of the program, it is thus imperative to discover the techniques used by the instructors at the institute in teaching that category of words. With the data obtained, probably the institute could provide the materials or devices needed for the execution of the techniques.

1.2 *Research objectives*

The objective of a particular study serves as the direction of the study. As for the present study, it attempted to achieve the following objective:

1. To investigate the techniques practiced by the facilitators at *Institut Kemahiran Tinggi* PERDA-TECH in teaching technical terms.

1.3 *Research questions*

A research is incomplete without any issue to unravel or question to answer where the research revolves around. Thus, this study intends to seek the answer to the following research question:

1. What are the techniques practiced by the facilitators at *Institut Kemahiran Tinggi* PERDA-TECH in teaching technical terms?

1.4 *Significance of the study*

This study expects to clarify the issues with technical terms particularly with respect to the techniques to use in teaching technical words. Besides, it is hoped that the data obtained from this research can be another source of knowledge and enlightenment with regard to the issues highlighted.

2 LITERATURE REVIEW

2.1 *Definition of "technical terms" and the size of technical vocabulary*

Nation (2001) classifies vocabulary into four levels namely; high frequency words, academic vocabulary, technical vocabulary, and low frequency words. In describing the types of words used in oral and written texts, Nation (2001) explains that technical words are the words that are very closely related to the subject domains of the texts. "Technical words" are described as words identified with a few features such as being in the category of low frequency words and being limited to a particular discipline where they are used frequently (Nation, 2001; Chung & Nation, 2004). Besides, technical words are also a portion of the taxonomy of information in a particular field (Chung & Nation, 2004). According to Tongpoon-Patanasorn (2018), "Technical words are words whose meanings are related to one specific and specialized subject area, such as Business English (BE)" (p. 45). Technical terms are defined as words that appear in specialized texts and their definitions are specific to certain domains in the academic area (Nation, 2001). Nation (2001) believes that technical words can refer to words that rarely appears in other subject areas (e.g: "cabotage", "amortization") or words that are in the category of high frequency words but they own specialized definitions such as "demand", "supply" and "cost" (used in Economics). Nation (2001) provides the examples of "indigenous", "regeneration", "podocarp", "beech", "rimu" (a New Zealand tree) and "timber" for technical words which are common in this subject field. It is claimed by Nation (2001) with respect to the amount of technical words, it can be assumed that roughly technical dictionaries such as those of Geography, Biology and Applied Linguistics each consists of less than 1000 words.

2.2 *The importance of learning technical words*

It is proposed that semantic nuances and pragmatic uses of technical words are vital for learners to be well-versed in in order for them to be competent in a certain discipline (Tongpoon-Patanasorn, 2018). Being able to use technical words appropriately can be the benchmark for the degree or level of one's subject knowledge and this is also argued can be the foundation in evaluating a learner's subject competence (Gablasova, 2014). In addition, Gablasova (2014) claims that being knowledgeable in specialized or technical vocabulary has the tendency to contribute to greater impact on the learners' development academically.

2.3 *The teaching and learning of technical terms*

Incidental vocabulary learning can occur with respect to learning technical words pertaining to academic study and this frequently includes an activity which is reading to learn (Grabe, 2009). With respect to learning technical words from text books, different lexical familiarization techniques in texts are used by textbook writers in order to familiarize such words to students, thus making the words more understandable and learnable (Gablasova, 2014). With regard to learning technical terms in textbooks and lectures especially, providing definitions are common methods of lexical familiarization (Lessard–Clouston, 2009; Nation, 2001). It is claimed by most textbook writers that learning the definitions of new technical terms is a fundamental part of learning new subject knowledge (Bravo & Cervetti, 2009; Woodward–Kron, 2008).

Chung and Nation (2003) believe that learning common collocations and grammatical elements of the technical words can assist learners in their efforts in learning the words productively. Some techniques that

can be employed by teachers in helping their learners deal with technical terms are providing the means for the learners to obtain the skills of recognizing technical vocabulary, interpreting meanings, linking senses to central meanings, and learning word fragments (Chung & Nation, 2003). According to McLaughlin and Parkinson (2018), in their research on some trainees at a polytechnic institution in New Zealand, with regard to their learning of specialized language of carpentry, it is inferred that this type of learning occurs as part of learners' daily communication on the building site instead of formally learning the language in class.

3 METHODOLOGY

3.1 *Research design*

The study employed a descriptive and quantitative research design through the questionnaire survey on the techniques used by the lecturers at *Institut Kemahiran Tinggi* PERDA-TECH, Nibong Tebal in teaching technical words to their students under the English Log Book Program.

3.2 *Participants*

The respondents involved the present study were 29 Malay instructors teaching at *Institut Kemahiran Tinggi* PERDA-TECH and they specialize in several disciplines. The demographic details of the respondents are presented in Table 1.

The respondents were also the facilitators chosen for the English Log Book Program. The content of the English Log Book is based on the concept of vocabulary enrichment which requires the students to complete five levels throughout their duration of study at *Institut Kemahiran Tinggi* PERDA-TECH. The English Log Book involves 5 levels with respect to the levels of difficulty of several selected words, while Level 6 contains some reading materials for the students. The division of the log book is shown in the table below:

Table 2. Content of english log book.

Level	Content/Types of Words	Number of Words
Level 1 & 2	Common words included in the general studies	100 (50 words for every level)
Level 3 & 4	Words related to instructors' respective fields (technical words)	100 (50 words for every level)
Level 5 & 6	Common phrases and conversations	Depending on necessity of use

3.3 *Instrument*

The instrument used in the present research was a 16-item questionnaire involving self-reporting statements pertaining to the techniques practiced by the respondents in teaching technical words. Questions regarding the respondents' demographic profiles were also included in the designing of the questionnaire. The questionnaire developed for this research offered item measurement mainly in the form of percentages in terms of to what extent the respondents' level of agreement or disagreement with the statements

Table 1. Demographic profiles of the respondents.

Respondents (29 PERDA-TECH Lecturers)						
		Gender		Teaching experience		
Specialization (discipline)		Male	Female	Year(s) of teaching	Number of lecturers	Age
Multimedia	2	11	18	2	1	21-47
Information Technology	3			3	3	
Manufacturing Engineering	4			4	4	
Mathematics	2			5	7	
Physics	1			6	2	
English	1			7	3	
Agriculture Engineering	3			8	5	
Automotive	3			10	1	
Mechanical	1			12	2	
Welding technology	1			16	1	
Computer Technology	2					
General Studies	3					
Fashion Design	3					
TOTAL	**29**	**29**			**29**	

(whichever that applied to the respondents) could be revealed by them. The levels of their agreeing and disagreeing with the 16 statements in the questionnaire were represented by the 5-point Likert scale as follows: Strongly disagree = 1; Disagree = 2; Undecided = 3; Agree = 4; and, Strongly agree = 5.

3.4 *Data collection method*

The respondents completed the questionnaire administered to them within the duration of one hour with the presence of the researchers should the respondents needed any explanation or clarification regarding the items in the questionnaire. The researchers explained to the respondents the purpose of the study and data collection prior to the administration of the questionnaire to make sure the respondents were clear about the nature of the research and that they were prepared for answering the questionnaire.

3.5 *Data analysis*

The data obtained was computed into the Statistical Package for Social Sciences (SPSS) version 20 for numerical data generation. Data such as frequencies and percentages, mean scores and standard deviation scores were extracted from the software for a more comprehensive statistical analysis of the findings of the present study.

4 FINDINGS AND ANALYSES

4.1 *Internal consistency of the pilot test*

Table 3. Cronbach's alpha reliability coefficient for the construct investigated and reliability statistics: Items about the respondents' techniques in teaching technical terms.

N = 10		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.753	.782	16

A pilot test was done for the objective of assessing the reliability of the items in the questionnaire involving 10 respondents of 5 male and 5 female facilitators. The Cronbach's alpha value, 0.753 produced by SPSS represented an acceptable value that indicated the questionnaire was reliable to be utilized for the study. Besides, this value also implied that the questionnaire was generally true about the items it intended to measure and that the items were comprehensible for the respondents. The alpha coefficient for the 16 items was .753, suggesting that the items possessed relatively high internal consistency. A reliability coefficient of .70 or higher is considered "acceptable" in most Social Science studies and this value is also a standard benchmark. Nunnaly (1978) proposed 0.7 to be an acceptable reliability coefficient but lower thresholds are also occasionally used in the literature.

4.2 *Frequency (f) distribution (%) for the items of the respondents' techniques in teaching technical terms*

Table 4 presents the Skewness values range from -1.177 to .951 and the Kurtosis values range -1.400 to 5.284. These values of Skewness and Kurtosis obtained were within the recommended values of -2 to 2 to (Burns & Burns, 2008). These values generated implied that the respondents had given acceptable feedback in terms of the relationship between the items in the questionnaire and the variable investigated to form a bell curve.

Table 5 shows the findings that represent the items investigated to answer the research question. A large number of the respondents, 19 (65.5%, M = 2.24, SD = .786) disagreed with item 1 ("Teaching technical terms to my students is something that is difficult for me"). The majority of the participants, 15 or 51.7% again assigned "disagree" to item 2 ("I often have problems explaining technical terms involving abstract concepts"). This item also had the most respondents (11 or 37.9%) that assigned "undecided" to it of all the items in the questionnaire.

As for the techniques preferred to be used by the respondents, it was discovered that 15 (51.7%) and 9 (31%) of them respectively revealed they agreed and disagreed with item 3 that constituted using examples of sentences in teaching technical words. Most respondents agreed that they involved the use of the students' mother tongue, Malay in teaching technical vocabulary. For example, the Malay word equivalent usage (item 4) was the most preferred technique as 69% (M = 3.97, SD = .731) of the respondents revealed practicing this method. However, 41.1% (M = 3.03, SD = 1.180) agreed with the statement, "Malay translations sometimes still cannot help my students understand the technical terms, especially the terms that are hard to understand" (item 5). 37.9% (M = 3.17, SD = 1.197) of the respondents assigned "agree" to item 14 ("I find the majority of my students find it easier to remember the English technical words taught in Malay compared to English").

With respect to using teaching aids or materials, the majority of the respondents, 13 (44.8%) agreed that they frequently used dictionary in the classroom when teaching technical terms. Besides, more than half of the participants, 15 people or 51.7% agreed they usually used graphic aids with their students. In contrast, 15 respondents (M = 1.66, SD = .614) disagreed with item 8 which indicated they did not solely depend on the materials supplied by their

Table 4. Independent samples test.

N = 29

Items	Mean	Std. Dev	Kurtosis Stat	Kurtosis Std. Error	Skewness Stat	Skewness Std. Error
1. Teaching technical terms to my students is something that is difficult for me.	2.24	.786	.959	.845	.951	.434
2. I often have problems explaining technical terms involving abstract concepts.	2.48	.688	.021	.845	.420	.434
3. I always use examples of sentences for the technical terms that I teach my students to make them understand the words better.	4.07	.842	.813	.845	-.907	.434
4. I always use the same Malay synonyms for English technical terms I teach (e.g: 1) English: “carburettor”, Malay: “karburator”; 2) English: “mechanic”, Malay: “mekanik”).	3.97	.731	2.431	.845	-1.124	.434
5. Malay translations sometimes still cannot help my students understand the technical terms, especially the terms that are hard to understand.	3.03	1.180	-1.359	.845	-.071	.434
6. I always ask my students to refer to the dictionary when I teach technical terms in the classroom.	3.28	1.099	-.016	.845	-.769	.434
7. I usually use graphic aids (e.g: pictures, diagrams etc) when teaching technical terms to my students.	4.14	.833	1.298	.845	-1.068	.434
8. I only rely on materials that have been provided by my institution without any additional materials when teaching technical terms to my students.	1.66	.614	-.556	.845	.349	.434
9. I ask my students to memorize each of the technical words that they have learned along with the meanings of the words.	4.03	.731	2.944	.845	-1.232	.434
10. I use the method of assigning tasks to small groups with my students to improve their understanding of the technical words taught.	3.90	.817	1.370	.845	-1.067	.434
11. I use teaching aids like PowerPoint presentations in teaching technical words to my students.	4.28	.649	4.055	.845	-1.174	.434
12. Sometimes I bring students to real locations such as workshops or laboratories to show the real technical equipment when teaching certain technical words.	4.17	.889	.604	.845	-1.015	.434
13. I like to use teaching tools in their forms of word games to enhance my students’ understanding of the technical words taught.	3.52	1.090	-.477	.845	-.314	.434
14. I find the majority of my students find it easier to remember the English technical words taught in Malay compared to English.	3.17	1.197	-.835	.845	-.356	.434
15. I ask my students to write the words taught in their respective notebooks.	3.83	.759	.944	.845	-.746	.434
16. I give technical word exercises to my students.	4.00	.802	1.148	.845	-.893	.434

institution without making any initiative for additional materials. As for using PowerPoint presentations as teaching tools (item 11), 62% (M = 4.28, SD = .649) revealed they preferred such electronic materials. Vocabulary games were also preferred teaching tools by most of the respondents as 15 (9+6) of them agreed and strongly agreed with item 13.

The other techniques mostly employed by the respondents were lexical memorization as 20 or 69% of them agreed with item 9, small group tasks (item 10) since a large number of the participants, 19 (M = 3.90, SD = .817) agreed they practiced this pedagogical method, and trips to real premises where the same number of respondents, 12 or 41.4% respectively assigned “agree” and “strongly agree” to item 12. Other teaching techniques employed by the respondents were writing technical terms in notebooks and word exercises where 18 (62.1%) and 17 (58.6%) respondents agreed with item 15 and 16 respectively.

Table 5. Independent samples test.

N = 29

Items	Response options									
	SD		D		U		A		SA	
	f	%	*f*	%	*f*	%	*f*	%	*f*	%
1. Teaching technical terms to my students is something that is difficult for me.	3	10.3	19	65.5	4	13.8	3	10.3	0	0
2. I often have problems explaining technical terms involving abstract concepts.	1	3.4	15	51.7	11	37.9	2	6.9	0	0
3. I always use examples of sentences for the technical terms that I teach my students to make them understand the words better.	0	0	2	6.9	3	10.3	15	51.7	9	31
4. I always use the same Malay synonyms for English technical terms I teach (e.g: 1) English: “carburettor”, Malay: “karburator”; 2) English: “mechanic”, Malay: “mekanik”).	0	0	2	6.9	2	6.9	20	69.0	5	17.2
5. Malay translations sometimes still cannot help my students understand the technical terms, especially the terms that are hard to understand.	2	6.9	11	37.9	2	6.9	12	41.1	2	6.9
6. I always ask my students to refer to the dictionary when I teach technical terms in the classroom.	3	10.3	3	10.3	8	27.6	13	44.8	2	6.9
7. I usually use graphic aids (e.g: pictures, diagrams etc) when teaching technical terms to my students.	0	0	2	6.9	2	6.9	15	51.7	10	34.5
8. I only rely on materials that have been provided by my institution without any additional materials when teaching technical terms to my students.	12	41.4	15	51.7	2	6.9	0	0	0	0
9. I ask my students to memorize each of the technical words that they have learned along with the meanings of the words.	0	0	2	6.9	1	3.4	20	69.0	6	20.7
10. I use the method of assigning tasks to small groups with my students to improve their understanding of the technical words taught.	0	0	3	10.3	2	6.9	19	65.5	5	17.2
11. I use teaching aids like PowerPoint presentations in teaching technical words to my students.	0	0	1	3.4	0	0	18	62.1	10	34.5
12. Sometimes I bring students to real locations such as workshops or laboratories to show the real technical equipment when teaching certain technical words.	0	0	2	6.9	3	10.3	12	41.4	12	41.4
13. I like to use teaching tools in their forms of word games to enhance my students’ understanding of the technical words taught.	1	3.4	4	13.8	9	31.0	9	31.0	6	20.7
14. I find the majority of my students find it easier to remember the English technical words taught in Malay compared to English.	3	10.3	6	20.7	6	20.7	11	37.9	3	10.3
15. I ask my students to write the words taught in their respective notebooks.	0	0	2	6.9	5	17.2	18	62.1	4	13.8
16. I give technical word exercises to my students.	0	0	2	6.9	3	10.3	17	58.6	7	24.1

5 DISCUSSION

It can be deduced from the findings that the respondents in majority are more likely to favour teacher-centred teaching techniques as they admitted implementing a variety of teaching methods on their part as teachers. Besides, the teachers in majority also admitted the use of their first language, Malay which is also the official language of Malaysia. With respect to using Malay equivalents for the English technical terms taught, apparently using translation in both the teachers’ and students’ mother tongue is a popular technique. According to Nation

(2005), one of the methods that can contribute to providing attention to words is to rapidly supply the definitions of the words in L1 translations. In addition, it seems that the lecturers of *Institut Kemahiran Tinggi* PERDA-TECH really make use of various teaching aids available in teaching technical terms to their students either electronic or non-electronic ones.

6 CONCLUSION

Nation (2001) believes that technical terms require specialist knowledge of certain domains and teachers need to employ the strategies that can help their students understand and remember the words more effectively. Based on the results of the present study, some techniques such as the use of Malay language in teaching technical words and the use of sample sentences for the technical terms taught are perceived to be effective in making the students remember and understand this category of words better. This is probably due to the fact that Malay is the lecturers' and students' mother tongue and thus code-switching to the language they are familiar with can help in the students' learning of technical words. As for the examples of how the technical terms are used in sentences, these sentences perhaps involve objects or ideas that the students can relate to that can make them understand the terms better.

As it is vital for educators to be well-informed of which strategies of teaching technical words are effective for them, according to Nation (2001), instructors should practice the strategies that are able to make their students understand and remember the words better. Therefore, further research could perhaps be performed in order to discover which technical term teaching strategies could benefit learners successfully in making learning technical vocabulary more effective. In conclusion, effective teaching strategies should always be studied and tried with learners for the objective of finding the ones that can suit the learners the best.

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