

Formula Instruction in English Language Writing: Learnability, Teachability and Learner Variables

Nor Ashikin Ab Manan
noras914@perak.uitm.edu.my
Academy of Language Studies
Universiti Teknologi MARA, Perak, Malaysia

ABSTRACT

This paper discusses pertinent issues in relation to formula instruction. It is based on a quasi-experimental study which was primarily carried out to ascertain whether incorporating formula instruction into an academic writing class is advantageous in improving the participants' academic writing performance. Since time allocated for academic writing at university level is often limited to explicitly teach a large collection of formulaic expressions in English language, the paper attempts to address the issues of 'teachable' and 'learnability' in formula instruction. The paper also highlights the effect of two learner variables namely general English language proficiency level and gender on the participants' post-test performance. Subsequently, the pattern of formula use among the participants from different proficiency levels was examined and discussed. It was concluded based on the findings that formula instruction is beneficial due to the fact that the experimental group outperformed the control group in the post-test. It was found that the effect of proficiency level on the post-test results is significant but the effect of gender is insignificant. Lower level participants were found to have used more target formulas overall and the formulas used were generally high frequency target formulas. On the other hand, higher level participants had utilized mostly low frequency non-target formulas in their post-test.

Keywords: Academic formula instruction; learner variables; proficiency level; gender difference

INTRODUCTION

Many researchers recognized the importance of exposing language learners to formulaic expressions or 'formulas' due to the fact that academic vocabulary consisted of a high number of word combinations (Biber & Barbieri, 2007; Biber, Conrad & Cortes, 2004; Cortes, 2006; Coxhead & Byrd, 2007; Schmitt, 2004). However, as stressed by Granger (2011) there are several factors such as learnability, teachability and learner variables that need to be considered for formula instruction to be effective and practical. This experimental study is a replicate of an earlier study (Ab Manan & Pandian, 2014) which was carried out to determine whether incorporating formula instruction into an academic writing class is advantageous in improving the participants' academic writing performance. Eighty diploma level students (as compared to

sixty in the earlier study) enrolled in an academic writing course from two intact groups had participated in a quasi-experiment which took place over fourteen-week experimental period (as compared to seven-week experimental period during the earlier study). The two groups of students had enrolled in an academic writing class and were assigned as the experimental and control group respectively.

Both groups went through similar academic writing instruction utilizing the same prescribed textbook and instructional materials. The control group was indirectly exposed to the academic formulas in the textbook and instructional materials while the experimental group was directly instructed on how to utilize 30 academic formulas chosen from the Academic Formula List (AFL) compiled by Simpson-Vlach and Ellis (2010) in their academic essays (as compared to 25 formulas chosen for the earlier study). The target formulas chosen were high frequency formulas which can be found in abundant in the prescribed textbook and instructional material for the course. The students' academic writing needs in their content area were also considered when deciding which target formulas to choose. As diploma level students, they are expected to produce lab reports, term papers and written assignments among others.

Since time allocated for academic writing at university level is often limited to explicitly teach a large collection of formulaic expressions in English language, the paper attempts to address the issues of 'teachability' and 'learnability' in formula instruction. The paper also highlights the effect of two learner variables namely general English language proficiency level and gender on the participants' post-test performance. Subsequently, the pattern of formula use among the participants from different proficiency levels was examined and discussed.

LITERATURE REVIEW

Vocabulary in Academic Prose

Recent research carried out the field of corpus linguistics has revealed that academic discourse comprises a high frequency of multiword lexis (Ellis, Simpson-Vlach & Maynard, 2008). Due to this reason, researchers such as Biber (2006), Hyland (2012) and Simpson-Vlach and Ellis (2010) have come out with lists of frequently used multiword expressions in different prose as guides to writing teachers. However, the lists are often long and it is very challenging for academic writing teachers who plan to utilize them in their writing class to decide which formulas to teach and the criteria to use in making the selection. Another issue is whether the expressions can be learned (learnability) in the short time available considering that the students' are of mixed-ability as enrolment into EAP courses at tertiary level is rarely streamed.

Definition of Academic Formula

There are many different definitions and characteristics of multi-word expressions or 'formulas'. The term 'academic formula' used in this study is developed from the definition employed by Simpson-Vlach and Ellis (2010) when compiling the Academic Formula List (AFL) as well as the definition proposed by Hyland (2012). The term 'academic formulas' used in this study is defined as multi-word expressions in corpora of written and spoken language which appear significantly more frequently in academic than non-academic discourse and reside in a wide range of academic genres, helping to form meanings in particular contexts as well as providing

coherence to a text.

Knowledge of Formulas and Proficiency Level

According to Boers and Lindstromberg (2012) formulaic language or formulas perform the same roles as individual lexis. Akin to vocabulary knowledge which correlates positively with general language proficiency (Lewis, 2002; Schmitt, Jiang & Grabe, 2011), there is a strong relationship between ESL students' knowledge and use of word combinations with their overall language ability (Namvar, 2012). In a study conducted by Zhang (1993) and Al-Zahrani (1998), it was found that there exists a positive correlation between the students' knowledge of English collocation and their writing ability. Meanwhile, it was also reported that there is a strong linear relationship of $r= 0.68$ between the ESL learners' collocational ability and their general English language proficiency (Keshavarz & Salimi, 2007). On the same note, Kennedy and Thorpe (2007) who carried out an investigation on IELTS writing component, had concluded that compositions which made use of higher number of formulas received higher scores. The same conclusion was made by Hawkey and Barker (2004) who conducted an analysis on a set of essays written by candidates of numerous examinations.

Learner Variables: Gender

Many studies have been carried out to examine the role of gender in vocabulary acquisition. One of the studies was conducted utilizing a test of academic vocabulary recognition, understanding and use by Scarcella and Zimmerman (1998). They found that males scored significantly higher results than females.

In contrast, there have been a few studies which reported that female participants performed better than their male counterparts. Lynn, Fergusson and Horwood (2005) had found that females outperformed their male colleagues in foreign language vocabulary knowledge. Similar results were recorded by Jimenez and Moreno (2004) and Jimenez and Ojeda (2009) who conducted their studies on productive vocabulary size. The former utilized Lex30 (a vocabulary level test) while the latter used a lexical availability test. Both studies found that female participants had performed better than the males. Females were also found to outperform their male counterparts in English language test in the study conducted by Karthigeyan and Nirmala (2012) among secondary school students in India.

Studies were also conducted to determine whether there exists gender difference in different areas of vocabulary knowledge. Research on gender difference in the use of semantic field has concluded that males performed better in vocabulary test associated with geographical facts whereas females outperformed them in vocabulary test associated with story characters (Meunier, 1995). Meanwhile, females were found to be more accurate in using vocabulary related to colours and size (Yang, 2001). These findings were consistent with those reported by Jimenez and Ojeda (2007) who concluded that females have an affinity towards topics related to colours and kinship in contrast to males who prefer topics related to sports. Males were also found to use figures more frequently than females.

However, gender difference has been found to be insignificant in a few studies on

different areas of vocabulary acquisition. It was found that there was no significant difference in receptive vocabulary size of male and female participants in a study by Grace (2000) and Jimenez and Terrazas (2008). Augstin and Terrazas (2012) had also concluded that there is no significant difference between male and female students' conduct in vocabulary learning in their study.

Teachability and Learnability

One of the challenges of formula instruction is deciding what formulas to teach and the number of target formulas considered to be 'teachable'. Since the lists of formulas proposed by researchers such as Biber (2006), Hyland (2012) and Simpson-Vlach and Ellis (2010) are long, ESL writing teachers have to decide on which formulas to teach and the 'appropriate' number of target formulas to teach within the limited time allocated to teaching academic writing at tertiary level. Sinclair and Renouf (1988) proposed that formula instruction should focus on words and phrases which are commonly used in the students' related academic work or what Willis (2003) termed as "pedagogic corpus" (p. 163). Precious time should not be wasted by teaching the students' words and phrases which they would unlikely use or encounter in their content studies. As pointed by Granger (2011) ESL teachers often wasted much of their teaching time by bringing learners' attention on words or phrases that have little value to them. It is obvious that ESL teachers are faced with difficult tasks in deciding what is teachable given the limited time they have for teaching academic writing and what is learnable to the students considering their different level of proficiency.

RESEARCH METHODOLOGY

A quasi-experimental study was conducted among two intact groups of diploma level students (forty students in each group) enrolled in an academic writing course. The groups were assigned as the experimental and control group respectively. All of them had passed two levels of proficiency English course which were the beginner level English and intermediate level English. The participants in this study were homogeneous in terms of their ethnic group, mother tongue, age groups, field of studies and length of exposure to formal ESL instructions. However, due to the fact that the participants originated from intact groups, both the experimental and control groups comprised learners of mixed-ability and coincidentally, there were more female than male participants in both groups.

The participants' performance in the proficiency level English course (coded as PE 2) which they had attended one semester before the experiment became the basis of classifying them into three different proficiency levels, 'Advanced', 'Intermediate' and 'Beginner'. The participants who received 80% and above in the overall scores are labeled as 'Advanced' while those who received between 70%-79% marks are labeled as 'Intermediate' and finally those who scored between 50%-69% are labeled as 'Beginner'.

Table 1
The Participants' Demography in terms of Proficiency and Gender

Proficiency Level	Experimental	Control
Advanced	3	4
Intermediate	24	23
Beginner	13	13
Total (N)	40	40
Gender	Experimental	Control
Male	14	15
Female	26	25
Total (N)	40	40

Table 1 presents the participants' demography in terms of proficiency level and gender. Based on the table it can be observed that both the experimental and control groups comprise of more females than males. The experimental group consists of 14 males and 26 females while the control group has 15 males and 25 females. Three participants from the experimental group are advanced learners, 24 participants are intermediate level learners while 13 are beginner level learners. The control group consists of four advanced learners, 23 intermediate level learners and 13 beginner level learners.

Data Collection

At the beginning of the study period (week 1, both the experimental and control groups sat for a pre-academic writing test. They were given two academic texts of about 800 words each on the same theme. Based on the two texts, they were given two hours to write a discussion-type essay of about 350 to 400 words on the issues mentioned in the two texts given. Subsequently, both groups went through similar academic writing instruction two hours per week for the duration of twelve weeks.

Table 2
The Target Formulas

(1) in relation to	(11) can be/ is/ are affected by	(21) due to the fact that
(2) in response to	(12) give rise to	(22) as a consequence
(3) (from)(the) point of view (of)	(13) as well as[13]	(23) as a result of
(4) to distinguish between	(14) more/less likely to	(24) due to the
(5) the relationship between	(15) there are (three/a	(25) can be achieved
(6) in conjunction with	few/many)	(26) appears to be/ does not appear
(7) according to the	(16) there are several	to be
(8) can be considered	(17) there is/are no	(27) there has been/there have
(9) a variety of	(18) on the basis of	been
(10) with regard to	(19) in terms of (the)	(28) a large number of
	(20) in accordance with	(29) the number of
		(30) (there) are a number (of)

Both groups had utilized the same prescribed textbook and instructional materials. The control group was indirectly exposed to the academic formulas in the textbook and instructional

materials when they went through the process writing activities which included brainstorming, planning, drafting and editing. On the other hand, the experimental group was directly instructed on how to utilize 30 academic formulas selected from the AFL in their academic essays. Table 2 shows the target formulas selected for the study.

The same writing test was utilized as the post-test and was conducted at the end of the fourteen-week study period (fourteenth week). The results of pre and post-tests were analyzed using **SPSS 22 for Windows**. In addition to the test scores, the amount of target academic formulas appropriately used in the post-test was manually calculated. Two participants from each proficiency level were interviewed and their post-test scripts were scrutinized and the number of academic formulas used was recorded.

DATA ANALYSIS AND DISCUSSION

Results of Post-Test

Table 3 shows the descriptive statistics for the post-test scores. The mean for the experimental group is 64.9. This is higher than the mean for the control group which is 53.7. The standard deviation for the experimental group is 14.1 while the standard deviation for the control group is 11.6.

Table 3
 Descriptive Statistics for Post AEW Test Scores

Group	N	Mean	SD
Experimental	40	64.9	14.1
Control	40	53.7	11.6

In order to determine whether the difference in the means is significant, an analysis of covariance (ANCOVA) was conducted. This statistical analysis was employed to ensure that there is minimal error due to individual differences in the samples, and to ascertain that the variance between the means of the experimental group and the control group is attributable solely to the treatment.

Table 4
 Summary of ANCOVA Results

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	R ²	Adjusted R ²
Pre-Test	6753.33	1	6753.33	83.50	.000	0.60	0.59
Instruction	2474.10	1	2474.10	30.59	.000		

Dependent Variable: Post-test Scores

As depicted in Table 4, it can be seen that the probability value obtained for 'Pre-Test' is 0.000. This value is smaller than the preset alpha value of 0.05 which implies that the difference in the means between the experimental and control groups is significant when the students' prior knowledge is statistically controlled.

Next, the probability value obtained for ‘instruction’ is 0.000 which is also smaller than the preset alpha value of 0.05. In the analysis, ‘instruction’ refers to direct and indirect formula instruction. Thus, it can be inferred from the result that the difference in the means between the experimental and control groups according to methods of instruction is also significant. Although the control group had been indirectly exposed to the target formulas, the experimental group had outperformed them in the post-test. Both the present and earlier study (refer to Ab Manan & Pandian, 2014) have indicated that simply exposing the students to the formulas in academic texts does not necessarily transfer into the language used in the students' written output. Explicit teaching may be required to accelerate student writers' acquisition of the target formulas.

It can be deduced from the ANCOVA results that formula instruction is beneficial. However, the value of adjusted R^2 is 0.59 which suggests that the independent variable (instruction) can account for only 59 % of the variance in the dependent variable (Post-Test scores). This implies that, there are other variables that may have influenced the post-test scores.

Influence of Proficiency Level and Gender on Post-Test performance

Two variables that may have some influence on the participants’ academic writing performance were their ‘gender’ and ‘proficiency level. Thus, further analysis was conducted on the post-test results of the experimental group. Table 5 shows the descriptive statistics for post-test and the PE 2 final grades (general proficiency level) while table 6 shows descriptive statistics for the post-test scores in relation to gender.

Table 5
 Descriptive Statistics for PE2 Final Grades and Post-test Scores (Experimental Group)

Test	N	Mean	SD
PE 2 Grades (Proficiency)	40	61.8	8.8
Post -Test	40	65.1	14.2

According to table 5 the mean score and standard deviation for PE 2 are 61.8 and 8.8 respectively while the mean score and the standard deviation for the post-test are 65.1 and 14.2 respectively. Meanwhile, it can be seen from table 6 that the mean score for male students is lower than the female students. The former recorded the mean score of 59.1 while the latter recorded the mean score of 68.1.

Table 6
 Descriptive Statistics Based on Gender (Post-test)

Gender	Mean	Std. Deviation	N
Male	59.1	16.7	14
Female	68.1	11.6	26
Total	64.9	14.1	40

However, to determine whether the difference of these means is significant, an analysis of covariance (ANCOVA) on the post-test scores for the experimental group with the

participants' PE 2 grades used as covariates was carried out. Table 7 shows the result of the analysis.

Table 7
Summary of ANCOVA Results

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Proficiency	1196.43	1	1196.43	7.63	.009
Gender	489.67	1	489.67	3.12	.085

Dependent Variable: Post-test Scores (Experimental group)

The results of ANCOVA show that the probability value obtained for 'gender' as depicted in table 7 is 0.085. This value is larger than the preset alpha value of 0.05 which inferred that the difference in the mean scores between male and female participants is insignificant when 'proficiency level' is statistically controlled. However, the probability value attained for 'proficiency' is 0.009, which is less than the preset alpha value of 0.05. This means that the difference in the mean score according to students' proficiency is significant. Thus, it can be concluded that the effect of gender on the post-test scores is insignificant but the effect of proficiency level is significant.

Target Formula Use in the Post-Test

Table 8 shows the total number of target formulas used in the post-test. It can be seen that the experimental group utilized more target formulas in their post-test essays as compared to the control group. However, it is not clear how the participants from different proficiency levels used the target formulas in their essays. Thus, two participants from each proficiency level were interviewed. Their post-test scripts were scrutinised to determine whether there is any pattern in the use of the target formulas according to proficiency levels.

Table 8
The Total Amount of Target Formula Used in the Post-Test

Experimental Group	Control Group	Total
209	106	315

The Use of Formulas by Advanced Level Participants

Table 9 shows the use of formulas by the advanced level participants. According to the findings of past research, the use of formulas in writing correlates positively with proficiency levels (Namvar, 2012). However, this is not the case for the current study. In the study it was found that advanced participants made use of less number of formulas (overall) in their essays compared to the intermediate level participants but had used more formulas than the beginner level participants. It is important to note that the advanced participants had utilized very few target formulas. Instead they had made use of more low-frequency non-target formulas. Advance Subject 1 used only 5 target formulas in his essay which were 'according to' (twice), 'as a consequence' (once), 'a variety of' (once) and 'due to' (once) while Advance Subject 2 had only used 2 target formulas which were 'according to' (twice) and 'as a result' (once). However, they

had utilized other low-frequency non-target formulas as depicted in the same table. This implies that instruction has not benefitted them.

Table 9
Formula Use by Advanced Participants

Participants	Target formula used	Non-Target formula Used	Incorrect Use of formulas
Advance 1	according to (twice), as a consequence (once), a variety of (once) and due to (once)	the role of (once), the issue of (twice), the notion of (once), in a nutshell (once), a slap on the wrist (once)	
Advance 2	according to (twice) and as a result (once)	take into account (once), to ensure that (twice), the onus is on us (once), on the other hand (once), at the end of the day (once), in a nutshell (once)	
Total	8	13	0

Findings from Interview (Advanced)

The participants from the advanced group did not use many target formulas in their post-tests although they claimed that they found formula instruction beneficial. Based on the interview conducted with two participants from the advanced group, it can be concluded that they perceived the target formulas chosen as too common which explained why they avoided using them in their essays. They were informed by their writing teacher that in order to score high marks in the essay they need to utilize low-frequency expressions. The participant labelled as ‘advance 1’ stated that, “... *I want to try ‘powerful’ phrases to score higher marks. The list given ...I mean the phrases not power...*”. The participant labelled as ‘advance 2’ had this to say, “...*teacher said if we use vocab... that not common we got high marks...*” It is clear from the interview that the advanced participants have already acquired many expressions and are able to use these expressions productively. They have acquired many of the low-frequency expressions on their own and although they claimed that the formula instruction was beneficial, they did not use many of the target expressions in their post-test essays.

Table 10
Formula Use by Intermediate Participants

Participants	Target formula used	Non-Target formula Used	Incorrect Use of formulas
Intermediate 1	‘according to’ (trice), ‘can be considered’ (once), ‘there are several’ (once), ‘appears to be’ (once), ‘as a result’ (once), ‘due to’ (once), ‘in relation to’ (once), ‘as a consequence’	‘the difference between’ (once), ‘in some cases’ (once), ‘can be found’ (once),	

	(once), 'a variety of' (once)	
Intermediate 2	'there are several' (once), 'according to' (twice), 'as well as' (once), 'due to' (once), 'more likely to' (once), 'as a consequence' (once), 'a variety of' (once)	'it is necessary' (once), 'this means that' (once), 'can easily be' (once), 'to ensure that' (once)
Total	19	7

Findings from Interview (Intermediate)

During the interview, participants from the intermediate level had claimed to have used many target formulas in their essays and this was substantiated by the number of target formulas found in their post-test scripts. According to the participant labeled 'intermediate 1', he had followed the teacher's advice by incorporating many target expressions in the post-test essays. He claimed that, "...I followed teacher advice and use the phrase that I remember to make essay clear". The participant labelled as 'intermediate 2' also reflected the same sentiment in his response. "...I tried to use (the target formulas)...like teacher said". It is also interesting to note that both of them have acquired the target formulas and were able to use these formulas correctly in their post-test essays. In addition to the target formulas they had also used a few non-target formulas which they had acquired on their own.

The Use of Formulas by Beginner Level Participants

Table 11 shows the use of formulas by the beginner level participants. It can be seen that beginner level participants had attempted to use many target formulas. However, many of the formulas were incorrectly used. The participant labelled as 'beginner 1' had used six target formulas correctly but 'beginner 2' managed to correctly use only three target formulas. They had attempted to use 13 formulas in their essay but had used them incorrectly. The beginner level learners seem to have difficulty in 'stringing' the words to form the correct expressions. This implies that the exposure they received during instruction was insufficient for learning.

Table 11
Formula Use by Beginner Participants

Participants	Target formula used	Non-Target formula Used	Incorrect Use of formulas
Beginner 1	'as a result' (once), 'according to' (twice), 'more likely to' (once), 'as well as' (once), 'due to' (twice), 'there are several' (once)	'it is difficult' (twice),	'there is number of' (once), 'can effect by' (once), 'as a consequent' (once), 'in the relationship to' (once), 'in respond to' (once), 'in nutshells' (once),

Beginner 2	‘according to’ (twice), ‘there are several’ (once), ‘a variety of’ (once)	‘the difference between the’ (once)	‘there are large of number’ (once), ‘is effect by’ (once), ‘from viewpoint’ (once), ‘with regarding to’ (once), ‘there has being’ (once), ‘as consequently’ (once), ‘the relation between’ (once)
Total	12	3	13

Findings from Interview (Beginner)

During the interview with beginner level participants, it was found that they tried to use the expressions they had been directly taught during their writing class. However, both of them admitted that they had not acquired the expressions to productively use them in their essays. The participant labelled as ‘beginner 1’ confessed that, “*I try to use but sometimes I forgot long phrase. I also not sure... example ‘are affected’ or ‘are effected’... I weak in English so difficult to remember long phrase*”. The participant labelled as ‘beginner 2’ lamented the same problem, “*I also follow what Madam Indra say but I don’t remember some of the phrase...I just ‘hentam’ ((giggle))*.” It is clear that the beginner level participants required more time and exposure to the formulas before they can productively use them in their writings. Furthermore, given the limited time allocated for formula instruction in the academic writing class, thirty target formulas were probably too many for the beginner level writers to handle.

CONCLUSION AND RECOMMENDATIONS

Based on the discussion carried out in this article it is concluded that incorporating academic formula instruction in the academic writing class is beneficial in improving ESL learners’ academic writing performance. This finding is consistent with the finding of earlier study (Ab Manan & Pandian, 2014). It is also concluded that there is no significant difference between male and female in acquiring the academic formulas which is consistent with the conclusions made in earlier studies by Grace (2000); Jimenez and Terrazas (2008) and Augstin and Terrazas (2012).

Although it has been reported that there is a strong relationship between ESL students’ knowledge and use of word combinations with their overall language proficiency (Namvar, 2012), in this study it was found that intermediate level participants had used more formulas overall (26 times) as compared to the advanced participants who had used the formulas 21 times overall. Thus, it can be concluded that formula instruction is beneficial in encouraging the intermediate and beginner level learners to use the target formulas in their writings. It is also concluded that formula instruction has benefitted the intermediate level participants and to a certain extent the beginner level participants as well. The intermediate level participants had utilized more *target formulas* in their essays compared to advanced level participants. Advanced level participants did not use many *target formula* because they already had in their repertoire

many low and high-frequency formulas. This is consistent with the finding of a study conducted by Staples et al. (2013) which results indicate that lower level learners used more multi-word expressions overall. The lower proficiency learners tend to rely on a few high frequency expressions to provide coherence to their writing while the use of formulas among advanced learners seem to be more varied. Advanced learners have already acquired many low-frequency formulas which they had utilized in their essays. The use of low-frequency formulas has contributed to their high scores in the post-test. Finally, the beginner level participants attempted to use many of the target formulas but had used them incorrectly. They have not acquired the target formulas and need more exposure to these formulas before they can productively use them in their essays. This finding resonates the finding by Qin (2014) who suggests that there may be a developmental sequence for some aspects of formulaic language use.

Finally, it is recommended that ESL teachers incorporate formula instruction in their academic writing class. However, target formula selection has to take into consideration the issues of teachability and learnability. Owing to the limited time normally allocated for academic writing instruction at tertiary level the number of target formulas selected for direct instruction has to be 'teachable'. However, there is no hard and fast rules on the number of expressions considered 'teachable' during the limited time allocated for teaching writing. ESL teachers' discretion is highly required in making the decision. Additionally, since ESL learners at tertiary level are rarely streamed, target formula selection should include both high and low frequency formulas to accommodate learners from different proficiency levels and to ensure 'learnability'.

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About the Author

Nor Ashikin Ab Manan holds a Doctoral degree in English Language Studies from Universiti Sains Malaysia and a Master degree in TESOL from the University of Stirling, Scotland. She is a Senior Lecturer at Universiti Teknologi MARA, Perak Campus. Her research interests include academic writing and reading.