

The effectiveness of using morphological instruction to improve striving ESL students' performance in reading comprehension

Abstract

This paper investigates the effectiveness of morphological instruction intervention programme on improving striving learners' reading performance after a 5-session pulled-out intervention programme for 5 students in a local Hong Kong secondary school where students are of lower English proficiency. Both quantitative data from pretest and posttest, and qualitative data from interview of the intervention group were collected to manifest a comprehensive picture of the programme and its effectiveness.

Results indicated that the intervention was to a large extent ineffective in improving students' reading performance but advanced students' morphological awareness and vocabulary capacity. Longer duration of the programme, explicit and repeated recalling of skills and teacher-centered instruction were identified to be favorable factors for striving learners to benefit most from morphological instruction as such. Results of the study also implicated students' passiveness in English reading is a result of the ineffective and mechanical vocabulary-learning strategies that they were previously taught.

Keywords: morphological instruction, reading comprehension, morphological awareness, Generative Vocabulary Instruction

Introduction

Anyone who is a learner of English, including all EFL, ESL learners or native speakers of English, must have encountered a situation before where unknown words impede comprehension of a text, obscuring the most exciting part of a novel by those few unknown words which could earn a whole world of imagination from readers. Immediately we reflect upon the limited vocabulary bank and feel an urge to study as much vocabulary as possible. The same happens in the study of English and vocabulary has always been the most common baffling challenge for ESL learners in reading comprehension.

Morphological instruction, using morphology to teach vocabulary and relating words which would otherwise appear isolated, expands students' vocabulary capacity from estimates of 3000 total words to be learnt per year (Nagy & Anderson, 1984, cited in Goodwin, 2015) to estimates of 1000 root words to be learnt each year (Biemiller, 2005, cited in Goodwin, 2015). By learning the meaning of a single word root may result in learning a few more, if not the whole word family sharing the same word root.

Morphological instruction can entail a profound impact to all ESL/EFL learners, in particular the striving learners who have been exhausted memorizing vocabulary in a meaningless way. Given the vast literacy benefits suggested in past literature and owing to the fact that morphological instruction is limitedly explored in the ESL context, in particular Hong Kong where English is added a high instrumental value, this current study sets to find out the effectiveness of morphological instruction in improving striving learners' reading performance, as well as factors that help striving learners gain most from the morphological instruction. This study is thus, of particular significance in finding out the application and effectiveness of such morphological instruction in local setting and more importantly, how far the morphological instruction is facilitating Hong Kong striving readers to improve in reading comprehension and other literacy outcomes. Findings of this research may shed lights on the effectiveness of an underdeveloped vocabulary-learning strategies, and if the result is favorable, may provide a new option in teaching and learning English vocabulary in a much more efficient way.

Research Questions

The limited research work on the relationship between morphological instruction and reading comprehension in Hong Kong ESL classroom gives rise to the current research study which purpose is to investigate the effectiveness of morphological instruction in improving striving English learners' reading performance in Hong Kong.

The specific research questions investigated in this study were the following:

1. To what extent is the intervention programme of morphological instruction effective in improving student's performance in reading comprehension based on the morphological knowledge and skills taught in the five morphological classes?

2. What are the favorable factors for striving learners to benefit most in a morphological intervention programme that aims at improving reading performance?

Literature review

Nature of English to form the emergence of morphological instruction

English is a morphophonemic language (Chomsky & Halle, 1968, cited in Claravall, 2016) with approximately 70% of them containing Greek or Latin origins (Nagy & Anderson, 1984, cited in Flanigan., Templeton., & Hayes., 2012). Prefixes, suffixes and root are the common instances of morphology. Most roots are originated from Greek and Latin. In total, there are three components of morphology as stated by Templeton (2012a), including compounding: joining separate words to form a single compound word, inflectional morphology: adding verb tense and number in the word such as *packed/ ostriches*, and derivational morphology: adding suffixes in the word as in *national* and *nationality*.

Some of the Greek or Latin prefixes combined with roots and formed words. These ‘*combinatorial processes*’ (Templeton, 2012a) is the foundation that engenders morphological instruction, also known by other scholars as Generative Vocabulary Instruction, a new pedagogy in teaching vocabulary.

Due to the morphophonemic nature of English, using morphological instruction widely expands students’ vocabulary capacity, downsizing the estimates of 3000 total words to be learnt per year (Nagy & Anderson, 1984, cited in Goodwin, 2015) to an estimates of 1000 root words to be learnt each year (Biemiller, 2005, cited in Goodwin, 2015). By learning just one single root, students will have their vocabulary bank expanded as they will learn a body of different related words that share the same root or prefixes. (Flanigan, Templeton & Hayes, 2012).

Benefits of morphological instruction

One particular benefit brought by the morphological instruction is that it makes students feel in control of their own learning since the vocabulary system in English starts making sense to them, as vividly captured by Flanigan et al. (2012) that ‘*Nothing is more motivating than experiencing this level of control*’ and thus it is, as

commented by Flanigan et al. (2012), ‘*pay[ing] great dividends*’ to nurture independent learners who are motivated to acquire and use words.

Instead of adopting the traditional rote memorization method, morphological instruction provides a systematic and efficient way of mastering spelling of content specific words across other subject areas such as science and social studies (Claravall, 2016). Alongside the assistance to spelling, understanding how roots contribute to the meaning of words also allows students to learn not only more words but more importantly, how words work (Flanigan et al., 2012). Students can then store words more solidly in memory and make connections among words, increasing the breadth and depth of their vocabulary learning (Nagy, Berninger, & Abbott, 2006, cited in Claravall, 2016).

Enhanced morphological awareness, as a result of morphological instruction, contributes to reading ability and hence an improvement in reading performance as the interpretation of unknown words is supported by the ameliorated morphological awareness (Flanigan et al., 2012, Brittain, 1970; Carlisle, 1995; Carlisle, 2000; Deacon & Kirby, 2004; Mahony, Singson, & Mann, 2000; Nagy, Berninger, & Abbott, 2006; Nunes & Bryant, 2006, cited in Kirby, Deacon, Bowers, Izenberg, Wade-Woolley & Parrila, 2012) since students can try identifying the root and suffixes of the unknown multisyllabic words encountered when reading continuous texts and make logical inference for the meaning (Claravall, 2016). Some scholars believe that due to the role of morphemes in giving meanings and forming syntax, reading comprehension ability is believed to be beneficiary benefiting most from morphological awareness (Kuo & Anderson, 2006 & Carlisle, 2003, cited in Kirby et al, 2012).

In addition, scholars also believe that morphological instruction brings a positive effect on literacy learning and is a useful way to help students of diversified abilities, particularly struggling readers, to decode unfamiliar words in reading comprehension which contain taught roots and affixes (Baumann et al., 2002; Henry, 1993; Reed, 2008, cited in Flanigan et al., 2012; Goodwin & Ahn, 2010, cited in Goodwin, 2016) as the ameliorated morphological awareness help readers make more accurate inference of the meaning of unknown words more efficiently (Elbro & Arnbak 1996 & Nagy et al., 2006, cited in Kirby et al, 2012)

Morphology as the least exploited aid to fluent comprehension

In view of the vast benefits of the Generative Vocabulary Instruction, it should be promoted in the English curriculum and be part of a multifaceted approach which has a focus on engaging students in word learning by incorporating a great amount of language-rich reading texts at student's independent or instructional level with content-specific and general academic words (Graves, 2006; National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010; Stahl & Nagy, 2006, cited in Flanigan et al., 2012). Yet, morphological instruction is underutilized notwithstanding its instructional value for literacy achievement (Berninger, Abbot, Nagy, & Carlisle, 2010) as Proust (2007) mentioned morphological instruction in her book as '*one of the least exploited aids to fluent comprehension*'. Likewise, the case is no different in Hong Kong.

In a study carried out by Hong (2008) on an investigation on the most frequently-used and most useful vocabulary language learning strategies among post-secondary students in Hong Kong, the top three strategies remain breaking the word in sound segments, repeatedly spelling the word in mind and asking classmates for the meaning while strategies involving morphological knowledge in learning vocabulary is of very low frequency and usage, if any.

Previous intervention programmes investigating on the effectiveness of morphological instruction

Despite the overt vast benefits of the morphological instruction, there is no shortage of research to conduct intervention programmes to test for the effectiveness of morphological instruction on facilitating students' reading performance or other literacy outcomes, with intervention programmes of different duration.

The effect of the morphological instruction to improving reading performance varies, however, with some generating significant differences such as the study by Leong (1998) who found that the knowledge of derivational suffixes to be a strong factor affecting comprehension, which distinguish strong and striving readers, echoing some previous research findings that good readers outperformed striving readers in morphological awareness tasks (Liberman, 1995; Nunes, Bryant, & Olsson, 2003; & Champion, 1997, cited in Kuo & Anderson, 2006). However, there is also a considerable amount of research concluding that morphological intervention programme may bring possible advances in spelling, phonological and morphological awareness but does not guarantee significant positive effects on reading performance

is (Goodwin 2015; Pany, Jenkins & Schreck, 1982; & Baumann, Edwards, Boland, Olejnik, & Kame'enui, 2003, cited in Kuo & Anderson, 2006).

Notwithstanding the result of the intervention, it is surprising to find that such intervention on investigating morphological instruction on students' reading performance are limitedly researched in the ESL or EFL context and, to the knowledge of the author, such intervention targeting on evaluating the improvement of students' reading performance as a result of morphological instruction is also not conducted in Hong Kong.

Given the positive impacts of the instruction suggested in past literature, the current study sets to explore the effectiveness of morphological instruction in improving Hong Kong ESL learners' reading performance, drawing insights on how striving readers in Hong Kong can benefit from the instruction.

Methods

Participants

The participants were 20 secondary school students in a Secondary 3 class from a Hong Kong local secondary school in Tin Shui Wai in which the researcher had conducted a 4-month teaching practicum. Five students, aged from 14-15 including three female students and two male students, in the class were chosen as the intervention group, and all returned their signed permission forms. All students in the intervention group participated in the intervention lessons, despite the fact that not all students from the intervention group joint together for the intervention classes at the same time, all participants from the intervention group completed all five sessions of the intervention programme.

Procedures

After a month of observation from the teacher with regard to student's reading comprehension abilities, a pre-test was given to the whole class to identify potential students for the intervention programme.

The pre-tests was in a form of a short passage of around 150 words, followed by 6 questions covering both the students' understanding of the text and the uninstructed words were given to the whole class to be completed in 35 minutes. Based on teacher's observation and the pre-test results, five students from the class who scored

the lowest in the pre-test were selected to join an after-school voluntary pull-out intervention class for a total of 5 sessions with each lasted for 30 minutes.

Upon the completion of the five intervention session, both the comparison and the intervention groups were given a post-test with strict adherence to the format of the pre-test to ensure consistency in the data collection. A group interviews with three members of the intervention group was conducted to understand their opinions regarding the intervention.

Instruction and content of the intervention programme

A total of 5 sessions were conducted during the intervention programme, each lasted for 35 minutes, a duration informed by research studies for similar purposes, which had the duration of each intervention session ranging from 20-30 minutes (Nicol, Graves & Slater, 1984, cited in Baumann, Edwards, Font, Tereshinski, Kame'enui, & Olejnik, 2002; Wysocki & Jenkins, 1987, cited in Baumann,et. al, 2002).

Four morphological items were taught in the five 35-minute intervention sessions, including two word roots (*-sta/st-* and *vid-/vis*) and two prefixes (*mis-* and *inter-*) (For instructional content, see appendix 1). The target vocabulary items were taught in a form of a root web as informed by research on instructional activities on teaching morphology (Buggey, 2007; Goodwin, 2016) (for details, see appendix 2).

Data analysis:

Quantitative data to compare the difference between pre-test and post-test in three aspects including total test scores, reading comprehension performance and word knowledge was collected and analyzed using SPSS 22.0 (IBM Corp., 2013).

Meanwhile, semi-structured interviews with participants from the intervention group was conducted to collect qualitative data about the effectiveness of the intervention and participants' viewpoints about the instruction. Full translated transcription of the data collected was produced and used to facilitate later analysis. All key points mentioned by the interviewees, which could be possible factors affecting the effectiveness of the programme were taken out in the first round of analysis.

In the second round, all the possible factors were then grouped into two big groups, either the group of factors affecting the effectiveness or factors affecting the comprehension. These factors, in the third round, were then compared among the

three interviewees. The three most frequently-mentioned were then picked as the factors affecting the effectiveness.

Results

Table 1: *t*-Test Results and Student Pretest and Posttest Mean Scores of the intervention group

Intervention group	Pretest mean (<i>SD</i>)	Posttest mean (<i>SD</i>)	<i>N</i>	<i>t</i>	<i>df</i>	<i>p</i>
Total scores	26.67 (9.13)	46.67 (21.73)	5	-2.06	4	0.11
Reading performance	33.33 (23.57)	66.67 (23.57)	5	-1.83	4	0.14
Word knowledge	20.0 (29.82)	26.67 (27.89)	5	-1.00	4	0.37

Table 2: *t*-Test Results and Student Pretest and Posttest Mean Scores of the comparison group

Comparison group	Pretest mean (<i>SD</i>)	Posttest mean (<i>SD</i>)	<i>N</i>	<i>t</i>	<i>df</i>	<i>p</i>
Total scores	50.0 (20.23)	51.67 (25.31)	15	-2.61	19	0.80
Reading performance	55.56 (16.27)	73.33(28.73)	15	.604	14	0.55
Word knowledge	60.0 (25.82)	33.37 (35.64)	15	2.70	14	0.02

Means and standard deviation of all pre- and post-test measures for both intervention and comparison group are presented in Table 1 and Table 2 respectively. A paired-samples t-test for the intervention group in the comparison of Pre-test and Post-test indicated that scores were higher for the post-test yet insignificantly ($M = 46.7$, $SD = 21.7$) than in the pre-test ($M = 26.7$, $SD = 9.13$), $t(4) = 2.06$, $p = 0.11$. Similarly, the paired samples t-test for the comparison group in its pre-test and post-test performance also indicated that despite a slight increase in the post-test ($M = 51.7$, $SD = 25.3$) compared with the pre-test ($M = 50.0$, $SD = 20.2$), the difference is still not statistically significant $t(19) = 0.261$, $p = .797$.

In answering the first research question about the extent of effectiveness of the intervention programme in improving student's reading comprehension performance, results are also presented in Table 1 and 2. A paired-samples t-test for the intervention group in reading comprehension performance in their pre-test and post-test was conducted. As indicated in the table below, although scores were higher in the post-test ($M = 66.7, SD = 23.6$) than in the pre-test ($M = 33.3, SD = 23.6$), $t(4)=1.83, p = 0.14$, the leap in the post-test is not considered statistically significant. This shows that the intervention programme of morphological instruction used in this study was ineffective to a large extent in improving students' reading comprehension performance.

Despite the slight effectiveness of the programme in improving the reading comprehension performance of the intervention group, it is interesting to find that the programme brings the intervention group a slight improvement in the word knowledge compared to the comparison group. As presented in table 1, the paired-samples t-test for the intervention group in word knowledge performance in their pre-test and post-test indicated that the scores were higher in the post-test ($M = 26.7, SD = 27.9$) than in the pre-test ($M = 20.0, SD = 29.8$), $t(4)=1.00, p = 0.37$, although the leap is not considered statistically significant. However, the case is a complete opposite for the comparison group.

In the comparison group, the post-test scores concerning the word knowledge is considerably lower than that of the pre-test. As indicated in the paired-samples t-test, the pre-test scores of the comparison group in word knowledge ($M = 60.0, SD = 25.8$) was higher than the post-test scores in the same area ($M = 33.4, SD = 35.6$), $t(14)=2.70, p = .002$, and this difference is considered statistically significant.

This shows that although the intervention programme of morphological instruction used in this study was ineffective to a large extent in improving students' reading comprehension performance, the programme remained positive in enhancing the word knowledge of the intervention group when compared to the comparison group whose scores dropped significantly in the post-test in the part of the word knowledge.

Despite the statement that the intervention programme made significant improvement in the word knowledge is inconclusive as the difference is proven insignificant by the *p* value, the increase in post-test scores suggests that the intervention programme did enhance the word knowledge of a few participants in the intervention group. Thus, it can be concluded that the intervention programme is not effective to a large extent in improving learners' reading performance but remain a vocabulary-building strategy due to the enhanced morphological knowledge of the intervention group.

While the first research question about the effectiveness of the intervention is answered in the quantitative findings, insights and findings to answer another research question about the favorable factors for a successful implementation of the intervention were found in participants' response in the group interview.

When asked if the participants had used the skills taught when completing the post-test, most of the interviewees reported that they did not think of the skills and '*just complete it like how I used to*' or '*completely forgot to use the skills*'. One interviewee also pointed out the difficulty of applying the skills in actual reading practices as she explained '*...it is quite hard for me to link up the knowledge I learnt or to realize that I can in fact apply this knowledge during reading. It's not easy for me to remember that I actually have learnt this skills..*' The two interviewees agreed unanimously that they would be using the skills they learnt in the programme if they were reminded before the test. This shows that frequent and explicit revision to ensure a retention of the morphological skills taught is an important factor helping striving learners to get most from the programme.

Albeit a fair tendency in the application of morphological knowledge, interviewees had high evaluation of the intervention programme when they were asked to rate the programme. One interviewee expressed '*I really feel it (learning of word roots) helps and passage has become easier for me to understand*' While another interviewee agreed the programme helped her in understanding the texts as she can split words that she does not know, which is easier for her to guess or derive the meaning of the word. Given that learners were aware of the benefits of morphological knowledge in reading, the ambiguity of not being able to see the effect of the morphological instruction on reading but enjoying the course may indeed be attributed to the failure

in the application of the skills due to an inadequate exposure time to practice the morphological analysis skills.

Discussion

More obvious improvement in morphological awareness than in reading

To respond to the first research question about the extent of effectiveness of the programme, it is concluded that the intervention is ineffective to a large extent in improving students' reading performance but is beneficial for an enhanced morphological awareness and vocabulary expansion. This result indeed replicates with similar past studies which explored the literacy outcomes of morphological instruction.

One of the causes noted to account for the ineffectiveness in this programme on improving reading performance is the inadequate time for students to get exposed to morphological instruction and retain the skills in their reading. A similar study conducted by Goodwin (2016) of an intervention programme of four thirty-minute sessions on reading comprehension strategy instruction and morphological problem-solving resulted in no significant difference in the reading comprehension performance, yet similar to findings of this study, a gain in vocabulary knowledge and generation of morphologically related words. Likewise, overt improvement of reading performance is still not noticeable in a 12-hour intervention programme of similar purpose except gains in spelling, phonological awareness and vocabulary abilities (Bangs & Binder, 2016).

While vocabulary expansion is expected in a morphological intervention programme as such, improvement in reading performance as a result of the morphological instruction may take a longer time for its effect to come into play, as Bowers & Kirby (2010) commented on their intervention programme that '*hope may well be too high*' for students to be able to derive words using their morphological knowledge during reading, after a 20-session intervention.

Frequent recycling of skills and step-by-step guidance to achieve atomization of skills

Lengthening the investigation period to include more intervention sessions is one of the favorable factors making the morphological instruction more effective to the striving learners, frequent revision of the skills, on the other hand, is also another factor to maximize the benefit of the programme brought to striving learners. Comments from participants of the intervention programme that the morphological skills was not retrieved during reading comprehension process and the skills appeared to be hard to apply in actual reading suggest that automatization of the morphological skills has not occurred during the time of the post-test.

More practices to familiarize learners with the application of the skills is a crucial step to achieving automatization of skills. Apart from more intervention sessions that focus mainly on teaching one or two particular morphemic item per session, morphological instruction can be extended to English lessons, for instance, by scrutinizing the root of a particular word encountered in reading passages and its related words sharing the same root. Embedding the practice of morphological skills to daily routine on incidental basis can inform learners of the application of the skills across different texts, alongside providing more practice for learners to internalize the skills.

In addition, the findings of this study also suggests that close monitoring and scaffolding are needed to support striving readers to maximize the usefulness of morphological skills to them. Albeit the learners were informed of the meaning of morphological instruction and were taught meanings of some suffixes and roots, most striving learners, as shown in the findings, were less autonomous in learning and required repeated, step-by-step guidance to apply the skills they learnt. For instance, the interviewer asked learners to apply their morphological knowledge of the prefix *-un* which they had learnt during the intervention.

I: Can you guess the meaning of 'unknowingly'?

S1,2,3: Don't know..

I: Can you chop it for me?

S1: -un means no, don't have

S2: -know means got it, understand, comprehend

S1: -ly...like an adjective, I forgot the name

I: examples of this is happily, friendly...like I played happily.

S3: 'dei' (地)

I: Yes, it's called adverb.

S1: So it means not knowing something.

I: Interviewer S: student

Despite the fact that learners had already been taught the meaning or the prefix *-un* and the skills to compartmentalize the unknown words, learners still required prompt reminder (segmentation of the word) to activate their knowledge of the this skills and to gradually derive the meaning based on the instructor's hints, echoing remarks by Baddeley (1990, cited in Sökmen, 1997)

Successfully recalling...increases the chance that that item will be remembered...because it acts as another learning trial, since recalling the item leads to better retention...it appears that the retrieval route to that item is in some way strengthened by being successfully used. (p.242)

The extra scaffold from instructors for prior knowledge activation and application of skills in reading facilitates the comprehension of the word and the texts, as well as raising striving learners' self-efficacy in English reading despite previous reading failure and frustration. Such a repeated rich instruction remains a long-term influence benefiting learners' reading and the learning of English as the instruction develop not only a deep understanding of words but also a generative interest in the study of words (Bowers & Kirby, 2010), which lead on to an enthusiasm in and a growth of confidence in reading.

Implications

During the process of evaluating the effectiveness of the intervention programme, ineffective vocabulary and reading pedagogies were identify to play a role in forming a passive reading habit. All interviewees who were also members of the intervention group agreed unanimously at the beginning of the interview that they did not enjoy reading in English and preferred choosing materials with less words as they recognized their limited vocabulary bank as the biggest challenge in reading English texts. Looking up for meanings in the dictionary whenever they encounter a new word during reading is the way interviewees cope with the problem, since the way they used to learning a new English vocabulary is by merely checking from dictionary and

copying down the meaning on a notebook, contrasting with previous study that explores the vocabulary-learning style of Hong Kong students, which found a rare use of the repetition strategies or rote memorization strategies among Hong Kong students (Fan, 2003).

Well-acknowledged is the fact that vocabulary capacity plays an important role in reading comprehension ability, yet, from the findings, it is noteworthy that not only does the inappropriate pedagogies in teaching vocabulary and reading impede their ability for independent learning, but the fact that not being able to grasp effective reading skills misleads them to believe that English reading is merely a process of meaning-checking, making them passive readers, which gives rise to the avoidance of reading English text.

The vicious cycle of daunting reading performance, limited reading and a scant vocabulary capacity will be reinforced to continue, echoing an idea from Kuo & Anderson (2006) that the relationship between morphological awareness and learning to read is indeed reciprocal and that the two factors are co-varying with each other. Since the interest and engagement in the study of words are encouraged in the morphological instruction (Bowers & Kirby, 2010) and it has been recognized for its contribution to a more accurate inference of meanings and syntactic roles of unknown words in a more efficient way during process of comprehension (Elbro & Arnbak 1996 & Nagy et al., 2006, cited in Kirby et al, 2012), the instruction, emphasizing on the formation of words, may rekindle learners' joy in reading.

In addition to igniting the passion for reading, through acquiring a sense of control over the comprehension of the text with the help of the morphological skills, the generative vocabulary instruction may raise confidence and performance in reading as Flanigan et al. (2012) commented that '*Nothing is more motivating than experiencing this level of control*'. It is with all the potential gains offered by the generative vocabulary instruction that the instruction truly deserves further scrutiny in future studies. Longitudinal studies are suggested for future research to identify, in particular, duration for the instruction to benefit reading performance and its effective application to ESL striving readers and learners in English.

Limitation

Two main limitations in this study involved the research design and the sampling size. As discussed in the above section, duration of the programme is an important issue in this research. Five sessions with a duration of 30 minutes each is not enough for actual literacy outcomes in reading to come into play. The sampling size, on the other hand, is another important limitation of this study. Only 20 samples were collected with 5 participants placed as the experimental group and the rest as controlled group owing to the pre-set class size of the researcher's placement school.

The two limitations may shed lights on future study to include a larger sample size to include at least 100 participants and to lengthen the duration of the intervention, both in terms of the investigation period and duration of each session, to generate findings of higher representation.

Conclusion

In this study of investigating the effectiveness of a morphological instruction-based intervention programme on improving reading performance, no significant improvement in reading as shown in the posttest result suggests that the intervention programme is ineffective in improving striving learners' reading performance. Yet, results also indicated that the intervention group experienced advances in morphological knowledge and vocabulary capacity. In addition, findings in this research also highlight favourable factors such as lengthened duration of the programme, explicit and repeated recalling of skills and teacher-centered instruction to make striving learners benefit most from morphological instruction as such.

References

- Alyousef, H. S. (2006). Teaching reading comprehension to ESL/EFL learners. *Journal of Language and Learning*, 5(1), 63-73.
- Bangs, K. E., & Binder, K. S. (2016). Morphological Awareness Intervention: Improving Spelling, Vocabulary, and Reading Comprehension for Adult Learners. *Journal of Research and Practice for Adult Literacy, Secondary, and Basic Education*, 5(1), 49.
- Baumann, J. F., Edwards, E. C., Font, G., Tereshinski, C. A., Kame'enui, E. J., & Olejnik, S. (2002). Teaching morphemic and contextual analysis to fifth-grade students. *Reading Research Quarterly*, 37(2), 150-176.
- Berninger, V. W., Abbott, R. D., Nagy, W., & Carlisle, J. (2010). Growth in phonological, orthographic, and morphological awareness in grades 1 to 6. *Journal of psycholinguistic research*, 39(2), 141-163.
- Bowers, P. N., & Kirby, J. R. (2010). Effects of morphological instruction on vocabulary acquisition. *Reading and Writing*, 23(5), 515-537.
- Buggey, T. (2007, Summer). A Picture Is Worth *Journal of Positive Behavior Interventions*, 9(3), 151-158. Retrieved December 14, 2007, from Academic Search Premier database.
- Buggey, T. (2007, Summer). Storyboard for Ivan's morning routine. Diagram. *Journal of Positive Behavior Interventions*, 9(3), 151. Retrieved December 14, 2007, from Academic Search Premier database.
- Claravall, E. B. (2016). Integrating Morphological Knowledge in Literacy Instruction. *Teaching Exceptional Children*, 48(4), 195-203.

Elbro, C., & Arnbak, E. (1996). The role of morpheme recognition and morphological awareness in dyslexia. *Annals of dyslexia*, 46(1), 209-240.

Fan, M. Y. (2003). Frequency of use, perceived usefulness, and actual usefulness of second language vocabulary strategies: A study of Hong Kong learners. *Modern Language Journal*, 222-241.

Flanigan, K., Templeton, S., & Hayes, L. (2012). What's in a word? Using content vocabulary to generate growth in general academic vocabulary knowledge. *Journal of Adolescent & Adult Literacy*, 56(2), 132-140.

Goodwin, A. P. (2016). Effectiveness of word solving: Integrating morphological problem-solving within comprehension instruction for middle school students. *Reading and Writing*, 29(1), 91-116.

Green, J. D. (2015). Language Detectives. *The Reading Teacher*, 68(7), 539-547.

Hong, L. P. C. (2008). Investigating the Most Frequently-used and Most-useful Vocabulary Language Learning Strategies among Chinese EFL Postsecondary Students in Hong Kong. In *Global Practices of Language Teaching: Proceedings of the 2008 International Online Language Conference (IOLC 2008)* (p. 209). Universal-Publishers.

IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.

Kirby, J. R., Deacon, S. H., Bowers, P. N., Izenberg, L., Wade-Woolley, L., & Parrila, R. (2012). Children's morphological awareness and reading ability. *Reading and Writing*, 25(2), 389-410.

Kuo, L. J., & Anderson, R. C. (2006). Morphological awareness and learning to read: A cross-language perspective. *Educational Psychologist*, 41(3), 161-180.

Leong, C. K. (1998). Strategies used by 9-to 12-year-old children in written spelling. *Reading and spelling: Development and disorders*, 421-432.

Nagy, W., Berninger, V. W., & Abbott, R. D. (2006). Contributions of morphology beyond phonology to literacy outcomes of upper elementary and middle-school students. *Journal of Educational Psychology*, 98(1), 134.

Pany, D., Jenkins, J. R., & Schreck, J. (1982). Vocabulary instruction: Effects on word knowledge and reading comprehension. *Learning Disability Quarterly*, 5(3), 202-215.

Proust, W. M. (2007). The squid: The story and science of the reading brain.

Sökmen, A. J. (1997). Current trends in teaching second language vocabulary. *Readings in Methodology*, 152.

Templeton, S. (2012a). Teaching and Learning Morphology: A Reflection on Generative Vocabulary Instruction. *Journal Of Education*, 192(2/3), 101-107.

Templeton, S. (2012b). The vocabulary-spelling connection and generative instruction: Orthographic development and morphological knowledge at the intermediate grades and beyond. In J. F. Baumann & E. J. Kame'enui (Eds.), *Vocabulary instruction: Research to Practice* (2nd ed., pp. 116-138). New York, NY: Guilford Press

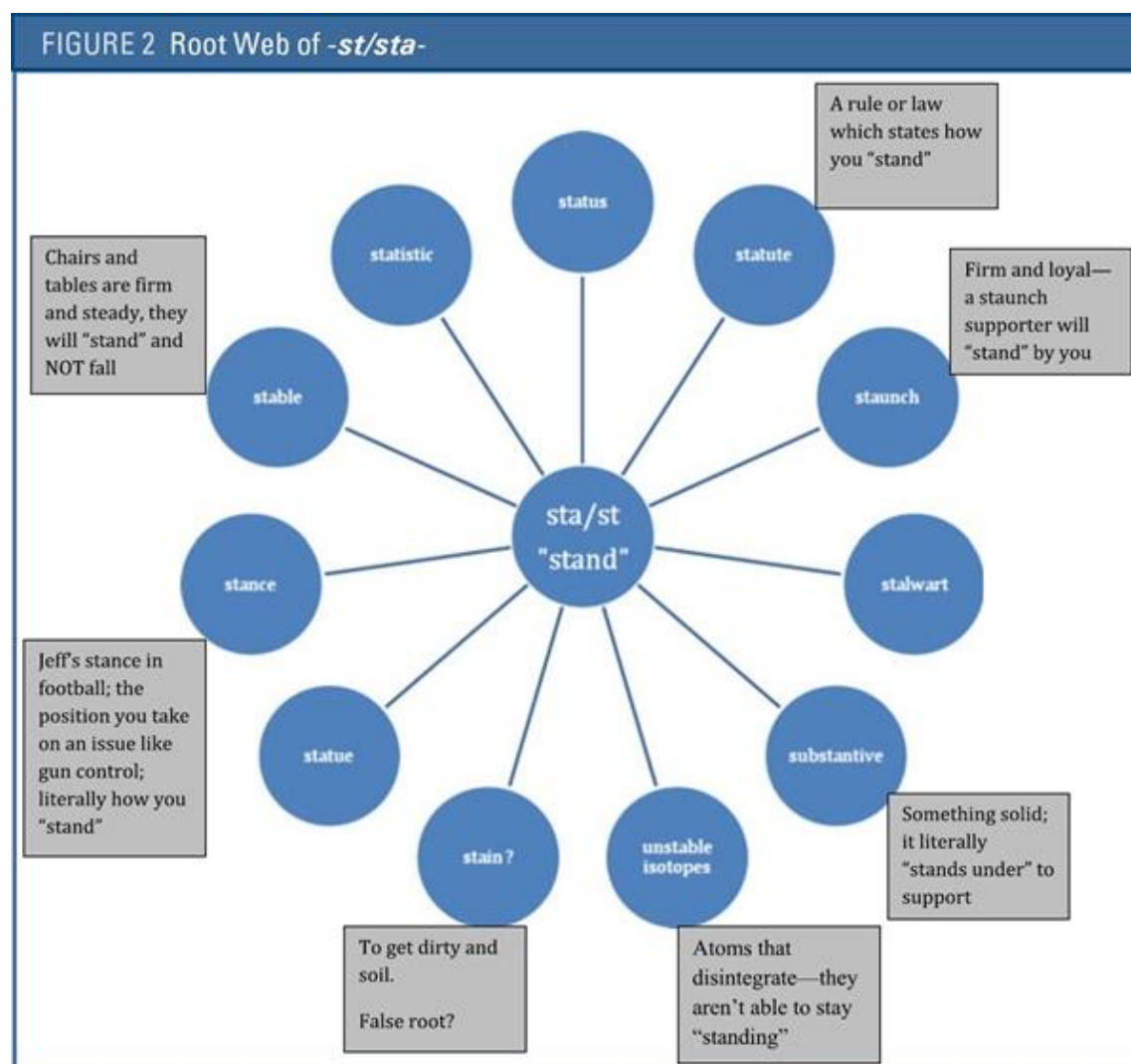
Appendix 1: Instructional content in the intervention programme

Prefixes			
Target vocabulary item	Meaning	Target words/ Lesson words ¹	Transfer words ²
Mis-	Bad, wrongly	Mistrust Misspell Misunderstand Mistake	Misuse
inter-	Again, more than once	Interview Interrelated International internet	Interact
Roots			
-sta/ st-	To stand, do not fall down	stadium Stable Staunch Stage	Standard
Vid/vis-	To see	Visible Video Visual Visualizer visit	Vision

¹ Words that the intervention group are exposed to during the intervention session.

² Words no students are exposed to before. They are unfamiliar vocabulary items to both the comparison and the intervention group.

Appendix 2: A sample of a root web to be used in the intervention classes



Source from:

Buggey, T. (2007, Summer). Storyboard for Ivan's morning routine. Diagram. *Journal of Positive Behavior Interventions*, 9(3), 151. Retrieved December 14, 2007, from Academic Search Premier database.

Appendix 3: Sample teaching materials for intervention session

Name: _____ Date: _____

Lesson 1: inter and Sta/ st

Inter – between/ among

Interview

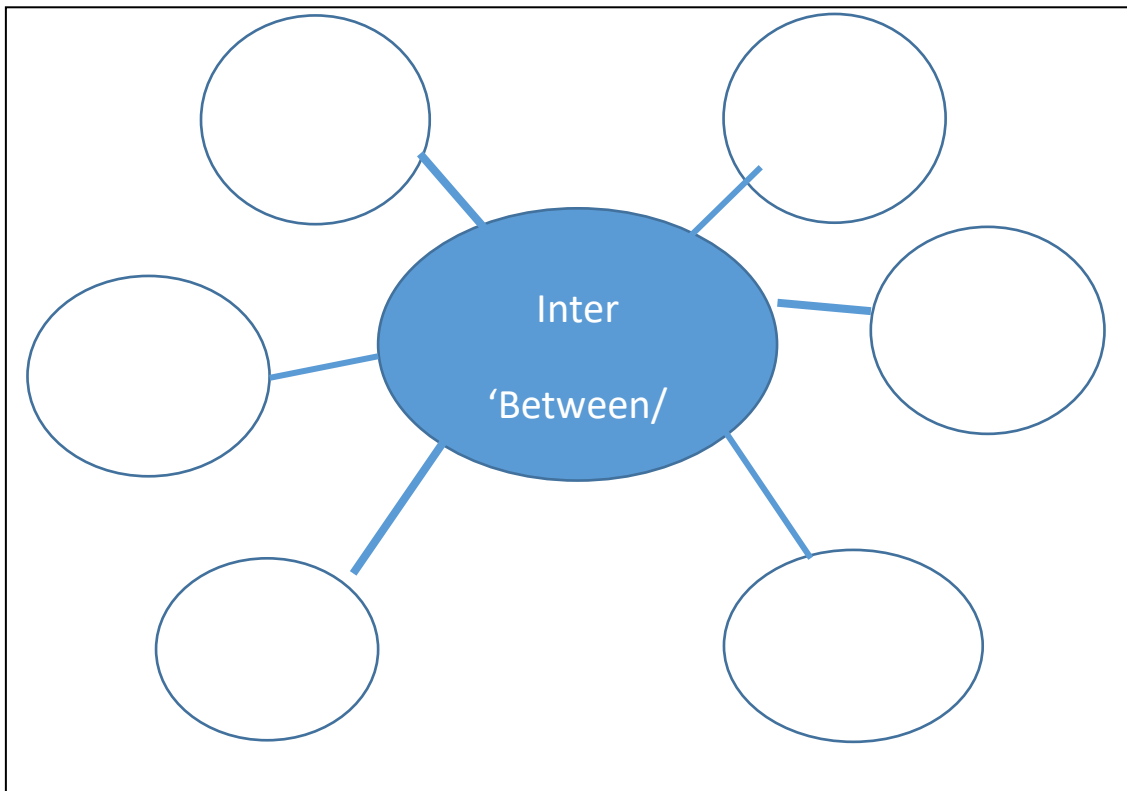
International

interior

Internet

interest

Interclass



I love being a teacher because I like watching my students grow and become better, both in their studies and in their personality. Being a good teacher does not only mean to teach them knowledge but also to interact with them, to truly understand them.

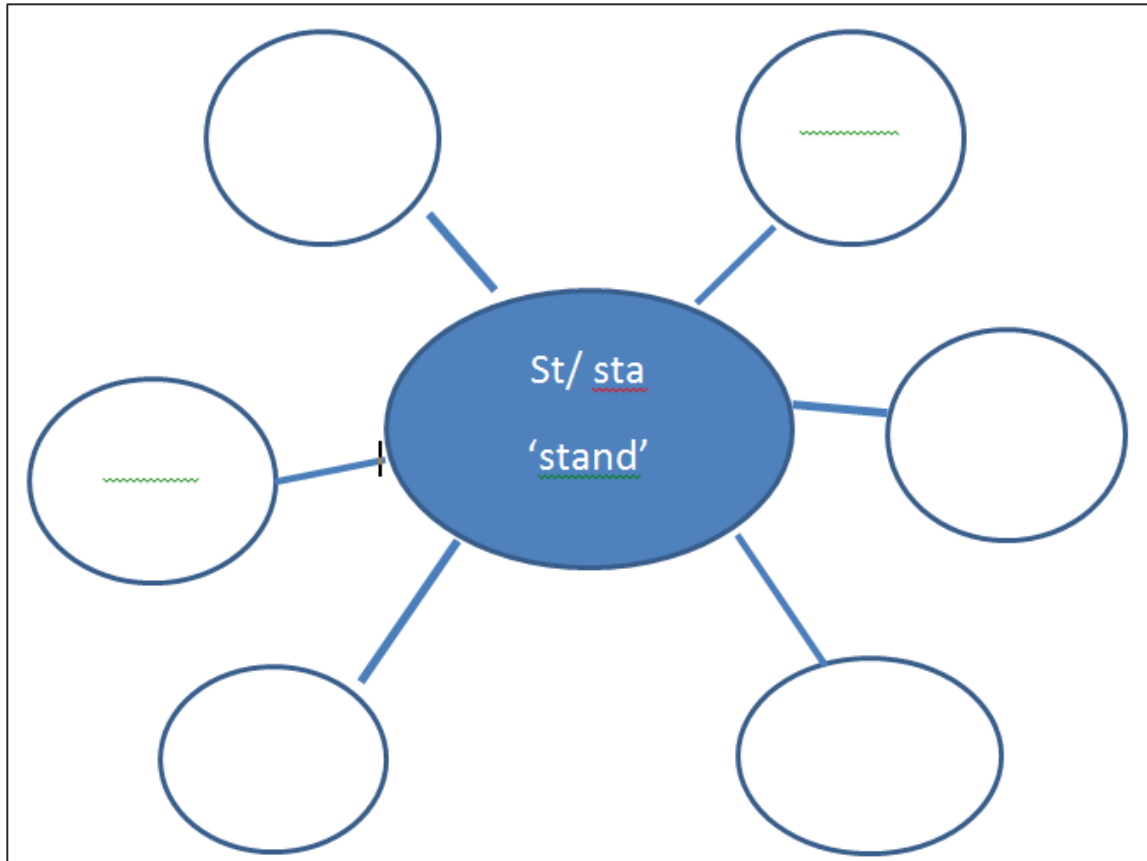
What does interact mean? _____

Sta/ st – stand

Statue stain

Stance stable

stand



When I look for a job, I will choose some that can offer me stable salaries because I need to take care of my family. Getting a lot of money this month or very little money next month cannot give my family a sense of security.

What does stable mean? _____

Appendix 4: Interview guide for the semi-structured interview

1) Do you enjoy reading in English? Why?

S1: Not really. I don't quite comprehend those difficult texts in English

S3: If it's really English, I prefer animation more. Less words, at least I understand what it means.

2) For you, what is the biggest challenge when reading a text in English?

3) You have completed the morphological instruction classes, what have you learnt in the 5 sessions?

4) How do you like the class, as in teaching you the prefix and roots of some words? Why?

5) Did you apply the skills you learnt in the morphology classes when you were completing the post-test?

6) Here is the text for the post-test, can you guess the meaning of 'unknowingly'?

7) Do you think the morphology classes help you do better in reading comprehension? Why?

8) Do you want to have more sessions of this type of morphological classes?

1 Appendix 5: Pre-test paper

2 **April Fool's Day**

3 April Fool's Day started in the sixteenth century in Europe. Before that time, New
4 Year's Day was celebrated on April 1st. Then a new calendar was introduced called
5 the *Gregorian* calendar. January 1st became the first day of the year, but many people
6 did not know about it. So those who were unaware of the change and continued to
7 celebrate New Year's Day on April 1st were teased. They were called fools.

8 Nowadays we play jokes on people on April 1st. For example, someone might put salt
9 in the sugar container so another person could inadvertently put it in their coffee. Or
10 someone might change the time on another person's alarm clock so that person would
11 unknowingly wake up earlier or later than planned. Or maybe a person would tell a lie
12 to make someone else shocked.

13 After we play the trick, we say "April Fool." Then the poor person realizes he was
14 fooled. It is generally done in the spirit of fun and doesn't cause any real harm to
15 anyone.

16

17

18

19 (Text extracted from <http://www.5minuteenglish.com/apr1.htm>)

Name: _____ Class: _____ Class no.: ()

Answer the questions below. Circle the correct answers for the MC questions.

1. When did The April Fool's Day start in Europe?

2. in line 5, 'unaware of' may mean

- a) to believe
- b) not knowing
- c) do not like
- d) unhappy about

3. After the introduction of the *Gregorian* calendar, how were people who still thought The New Year's Day was on April 1 called?

4. In line 8, 'inadvertently' means

- a) feeling disappointed
- b) happily
- c) accidentally
- d) sadly

5. What should you say after playing a joke on someone on The April Fool's Day?

6. In line 10, 'unknowingly' means

- a) did not know before
- b) being cheated
- c) sleepy
- d) give thanks to

Appendix 6: Post-test paper

Name: _____ Class: _____ Class no: ()

Answer the questions below. Circle the correct answers for the MC questions.

Television Shows

My mother was telling me about how she and her family got their first television when she was a teenager. Of course it was black and white. When I was young, we had only about 3 or 4 different channels. My sisters and I would sometimes fight about which channel to watch. But we usually enjoyed the same shows.

Nowadays we can get hundreds of channels on TV. I can't believe it! There are channels with old movies and channels with cooking. It's amazing! There is a channel for everything. However, some cooking channels also show children's cartoons. Some producers misuse the channel just to fit things in.

These days I notice families are having 2 or 3 television sets in their homes. I guess the reason why television is so popular among us is that it gives us a vision of different things and places that we do not know much about. More importantly, we feel ourselves interacting with the characters in the drama, sharing the happy and sad memories together.

1) How many channels were there when the writer was young?

2) What does the word 'misuse' in line 7, paragraph 2 mean?

- a. To change
- b. To use in a clear way
- c. To use in a wrong way
- d. To use happily

3) As what the writer noticed, how many TV set do families have these days?

4) What does the word 'vision' in line 10, paragraph 3 mean?

- a. Something to see
- b. Something to listen to
- c. Something to know
- d. Something to make

5) How many TV channels do we have now?

6) What does the word 'interacting' in line 11, paragraph 3 mean?

- a. To look at each other
- b. To do something together
- c. Two things/ people talking to each other
- d. To show something to each other

Appendix 7: Translated interview transcript

1) Do you enjoy reading in English? Why?

S1: Not really. I don't quite comprehend those difficult texts in English

S3: If it's really English, I prefer animation more. Less words, at least I understand what it means.

Interviewer: Have you ever encountered a situation of which even when you know every single words in the sentence, you still cannot comprehend the meaning of that sentence?

S1&3: No. Seldom.

Will you check the dictionary when you encounter a difficult word?

S1: Yes, using mobile phone.

S2, yes, along with reading.

9) For you, what is the biggest challenge when reading a text in English?

S1: The biggest challenge is the comprehension of the text because there are so many new, unfamiliar and difficult words that I don't know.

Interviewer: Can you sometimes comprehend the meaning of the text after reading the whole sentence even if you don't know a few difficult words within that sentence?

S1&3: Yes, sometimes. When I re-read the sentence, based on the clues given the near phrases, I can still get the meaning of the whole sentence.

10) You have completed the morphological instruction classes, what have you learnt in the 5 sessions?

11) Did you apply the skills you learnt in the morphology classes when you were completing the post-test? / Did you use the morphological knowledge you learnt from the intervention programme in the test you took this morning?

S1: Yes, for the last question. (Interacting)

Interviewer: So you are saying that you did not use the skills when you were doing question 2 and 4?

S3: I completely forgot to use this skills.

S1: I don't think I need this skills when completing the test this morning.

S3: Because I thought I just compete it like how I used to do comprehension questions.

S1: I only used it for the last question as I really don't know the meaning of the word. Because for the words in Q2 and 4, just by looking at the previous words and words at the back, I could guess the meaning of the word.

S2: I didn't use any. I didn't think of the skills when I was doing the test.

[All Three students really remember the meaning of the five word roots introduced to them during the intervention programme]

What if I tell you before you do the test. Do you think you would then use the skills?

S2&3: Yes.

How do you like the class, as in teaching you the prefix and roots of some words? Why?

S1: After learning about the word root, I really feel it helps and the passage becomes easier for me to understand. Because for comprehension of the text, the key is to decode the words. With the knowledge of the word root, together

with the nearby phrases (contextual clues), then I can understand the meaning of the passage.

S2: I like the programme because it helps me. I now think it's easier for me to understand the texts as I can split words that I don't know to see if I can derive their meaning. It's easier for me to guess the meaning of the word.

Interviewer: So can I say that you like the programme and you like that I teach you about the word roots? If it's put on a 10-point scale, how much do you like this programme?

S3: 10. Because you explained very well and you are so patient to teach us. I really like you explaining and teaching me. Very useful.

S1: I would give it 8 points.

S2: I would rate it 5 points. Although it's easier for me to read passages in English after the programme, from time to time, it's quite hard for me to link up the knowledge I learnt/ to realize that I can in fact apply this knowledge during reading. It's not easy for me to remember that I actually have learnt this skills to facilitate my reading in English.

Interviewer: Do you mean the meaning of the word roots are not easy to remember? Or the fact that you actually learnt this method of comprehension is not easy to remember?

S2: BOTH.

12) Here is the text for the post-test, can you guess the meaning of 'unknowingly'?

ALL: Don't know.

Can you guess the meaning of 'unknowingly'?

S1,2,3: Don't know..

I: Can you chop it for me?

S1: -un means no, don't have

S2: -know means got it, understand, comprehend

S1: -ly...like an adjective, I forgot the name

I: examples of this is happily, friendly...like I played happily.

S3: 'dei' (地)

I: Yes, it's called adverb.

S1: So it means not knowing something.

Interviewer: If I run the programme again, what else can I do to further help you with comprehension in English texts?

S3: As long as you are still the teacher, everything will be fine for me.

S2: Don't talk in a boring way. More fun!

S3: More revision worksheets.

S1: Directly give us an English texts, incorporate some words derived from those word roots taught. Then teach us the meaning of those word roots before we ourselves explain the meaning of the whole text with the knowledge of that word root.

Interviewer: Well actually, every time when I introduce you to the new word roots, I will give you examples of the usages along with those roots. Do you think it helps? Or is it enough? Or are the examples too short in length?

S1: For me, I think those examples are enough to make understand and apply the root knowledge. Although my English is not that good, with the help of the nearby words and the root knowledge, I can comprehend the text fairly easily.

Interviewer: But you think if the text is a longer one covering the word root, it will help further?

S1: Yes.

13) Do you think the morphology classes help you do better in reading comprehension? Why?

14) Do you want to have more sessions of this type of morphological classes?

All: Yes.

S2: I would prefer to have learn the different meaning of the same English words. Like Japanese, the same word may carry different meanings depending on the contexts, so if we can go deep and learn more about other meanings of words, that would be great!

S3: Actually, in this programme, only we five learn about the word roots, but other students in the class do not. That's why I think it will be better if this can be taught during lessons so that would be fairer to other students as well.

Interviewer; Did teacher who taught you English in the past, taught you about the word roots in the past.

S3: Our class teacher did tell us some. Those are some slangs or English idioms. I didn't quite get it. But at least, here in this programme, I understand what you are trying to teaching us.

Interviewer: Usually when teachers teach you new vocabulary, do they just introduce the word, write that on the blackboard?

S1: They will ask you to check the dictionary for the meaning.

Interviewer: Ok...check the dictionary. Is it easy to remember?

S1: usually, we are asked to copy down the word and the meaning in a small notebook.

S3: Yea, I will copy too. Some I understand but some I really cannot.

Interviewer: But word roots is a skills/ technique, once you learn it, you can apply it to all other contexts instead of just mere memorizing them. For instance, =Mis is the word roots and there so many other words that have the root of –mis. If you learn the skills of compartmentalizing the word, you can make logical guess on the meaning of the word instead of barely memorizing all the English words in the world.

S1: yea, it's good to have this kind of intervention as vocabulary is also my weakest aspects in learning English.

S1: In fact, I am aware of using the word knowledge to complete this reading test. For Q.2 and Q.4, I can just do it based on my understanding of the previous sentences or words at the back. I only used the word root knowledge only until Q.6.

S2: Actually, before I join this programme, my mum has already taught me something like that (morphological knowledge) when I was small, just that I don't know when to use/ apply it, so I forgot about the skills. But of course, those taught by my mother was not as organized as your teaching and materials.

[End of transcript]

Appendix 8: Analysis table of qualitative data

First round of findings collected from the interview:

- Tendency to avoid reading texts with many English words
- Meaning checking for each words
- Reading skills not well-taught
- Limited vocabulary impedes comprehension
- Limited vocabulary as the biggest challenge in reading
- Part of inferencing mastered
- Requires explicit reminder of skills
- Internalization has not occurred
- Contextual clues/ inferencing is highly-valued
- Contradiction: Know how good it is (word root) but didn't use in reading
- Positive attitude to the instructor
- Close guidance and monitoring
- Forms of practices
- All students liked the intervention programme
- Backward vocabulary-building intervention (isolated manner)

Second round of findings

Factor affecting comprehension #1: Number of words

Factor affecting comprehension #2: Limited vocabulary

Factor affecting comprehension #3: the mastery of inferencing/ using contextual clues

Factor of effectiveness #1: to be reminded of the skills

Factor of effectiveness #2: easier to guess- using inferencing

Factor of effectiveness #3: positive attitude to the teacher (2)

Factor of effectiveness #4: need more chance to link up/ applying the skills (2)

Factor of effectiveness #5: Close guidance needed to derive words

Factor of effectiveness # 6: organized teaching materials

Round 3

	Student 1	Student 2	Student 3
Factor comp #1: Number of words	YES	YES	YES
Factor comp #2:	YES	YES	YES

Limited vocabulary			
Factor comp #3: mastery of inferencing	YES		
Factor of eff #1: to be reminded of the skills	YES	YES	YES
Factor of eff #2: using inferencing	YES		
Factor of eff #3 positive attitude to teacher			YES
Factor of eff #4 application of the skills	YES	YES	YES
Factor of eff #5: Close guidance	YES	YES	YES
Factor of eff #6 teaching materials		YES	

Finalized findings to be put in the report:

Factor affecting the effectiveness:

- Be reminded of the skills –frequent recalling of skills
- Practice for the application of skills
- Close guidance needed