Using sensory approach in classroom: Does it help L2 vocabulary learning?

Fung Hiu Ching
The Hong Kong Institute of Education
ENG4900 Honour Project Report
Supervised by Dr. Xie Qin

Content

List of Tables

List of Appendices

Declaration

I, Fung Hiu Ching, hereby declare that this research report represents my original work under the supervision of Assistant Professor Dr. Xie Qin, and that it has not been submitted previously for examination to any tertiary institution for a degree, diploma or other qualifications.

Signature _____

Fung Hiu Ching

May 2016

Acknowledgements

This study would not have been possible without the support, guidance and participation of many people.

First of all, I would like to thank my supervisor, Dr. Xie Qin who has been giving me enormous help and suggestions throughout my research journey. Dr. Xie has introduced me to various research tools, such as SPSS; and has spent her extra time on providing extra tutorials and consultations, which helped me to overcome all the difficulties and challenges in doing this project.

I would like to thank all the teachers and students who participated in my study. Thank you all for your tie and help in collecting data over a period of six weeks. I would like to express my sincere appreciation to all of them Without their help, this research could not be implemented.

Abstract

This paper reports an experimental study which examined the effectiveness of using the VARK sensory approach (visual, aural, read/write and kinesthetic) in learning L2 vocabulary and investigated which sensory preference (V, A, R or K) was more preferable in primary school setting. Data were collected through four experimental groups with 40 primary students studying in the same school in Hong Kong. They shared the same L2, English, and were divided into four groups randomly. Researcher adopted one of the sensory preferences (V, A, R or K) to teach vocabulary in each group. A pretest was administered 2 weeks before the experimental teaching, a posttest was administered right after the teaching and a delayed posttest was conducted 2 weeks later. Scores were analyzed within and between groups. The study found that aural modality group showed stronger effect on pronunciation while visual and kinesthetic modality groups showed strong delayed effect on meaning. It suggested that multiple modalities should be adopted in the classroom and the teaching strategies should be adjusted based on the students' preferences and abilities.

1. Introduction

Vocabulary is regarded as an essential aspect in learning the second language (L2) and its use of pedagogy is of interest to researchers and teachers. Sensory approach is a teaching strategy which uses all of the usable linkages between vision, audition, and kinesthesis (Orton, 1937). The use of sensory approach was advocated to be used in teaching students with learning or reading disabilities in 1930's (Vaughn & Linan0Thompson, 2003). VARK model proposed by Fleming (2001) is one of the sensory approaches which consists of four sensory preferences, visual(V), aural(A), read/write(R) and kinesthetic(K). Some researchers claimed that visual learning is the most effective as the brain accesses information best when information is transmitted through eyes (Mayzler & McGann, 2010). But others believe that different individuals suit different modalities. Which belief(s) can be applied in the Hong Kong primary school setting?

This study conducted an experiment on a small sample of primary 2 students. The design of the experiment was based on the sensory learning theory, VARK model. Three data collection tests and a 20-minute English class were conducted in a 6-week period. It aimed to look at the effectiveness of using sensory approach in learning L2 vocabulary and the difference among these four modalities. The following section reviews relevant literature on vocabulary learning, learning styles and sensory learning approaches.

2. Literature Review

2.1 Second language vocabulary acquisition

Second language vocabulary learning has been an interestingly interest to researchers as vocabulary learning has been identified as a synergistic association in learning a second language, especially reading (Candy & Huckin, 1997). Ma (2009) described the importance of vocabulary like this, 'if syntax or grammar is the overall structure of the building, then vocabulary is the bricks that are to be fitted into the structure'. Learning vocabulary thus becomes one of the foci in the second language classroom. According to the Hong Kong Education Bureau (EDB, 2004), vocabulary is one of the language forms needed to be teach in English curriculum.

Learners are expected to learn a wide range of vocabulary as reading requires a vocabulary of 3,000 word (Candy & Huckin, 1997). Hong Kong parents are usually described as 'helicopter parents', in which some of them urge children to learn English vocabulary when they are very young. However, study reported that young students are not able to learn a massive of words a day, the best amount is between five to nine new words a day (Beck, 2003). Also, learners are not encouraged to learn all the aspects of an L2 vocabulary immediately. It is suggested that the best way is to connect the word form with its meaning, and leave the other aspects to a later stage, such as other meanings and usages (Kelly, 1985). As forgetting is a common problem that learners face, repetition is needed for enhancing learning throughout their learning journey (Anderson & Jordan, 1928).

2.2 Sensory learning styles

There are a number of definitions of learning styles since 1970s and they are covered in many educational psychology literatures. Learning styles are all related to cognitive thinking and perceptual process. Fleming (2001) defined learning style as an individual's characteristics and preferred ways of gathering, organizing and thinking about the information. Felder and Silverman (1988) got a very similar definition, in which learning style is an individual preference on acquiring, retaining and processing information. Other researchers defined learning styles not only on perceiving new information, but also on interacting with and responding to the learning environment (Keefe & Ferrell, 1990). There are many famous learning style theories, including Kolb's Experiential Learning Theory, Dunn and Dunn, Felder-Silverman Learning Style. Kolb's theory suggested four stages of learning, concrete experience, reflection observation, abstract conceptualization and active experimentation (Moayyeri, 2015). Dunn and Dunn's theory suggested 18 elements which affect one access on new information, including environmental, emotional, sociological, physiological and psychological (Dunn, 1984). Felder-Silverman Learning style suggested four areas of personality which affect one's learning; they are sensing, visual, active and sequential (Felder & Spurlin, 2005). The assumptions and the rules of each theory are different but they all aimed to tell the ways an individual prefer when gaining information and knowledge.

2.3 VARK theory

VAK theory, which is the previous edition of VARK theory, was first developed in 1987 by Neil Fleming who was a teacher in secondary and tertiary level. This theory is a classic sensory learning theory which investigates how people use their modality preferences in learning and

communication. A questionnaire was set with a set of questions which mainly targeted for students and teachers. Students can develop learning strategy in a specific preferred mode; while teachers can learn to use other modes in teaching. VARK model, which was developed by Fleming in 1992, was modified based on VAK. one of the classic and popular sensory learning theories. A new learning preference category, the read-writers (R), has been added in it. People prefer read/write (R) access information from displayed words, such as lists, definitions, printed handouts, etc. (Fleming, 1995). For Visual (V), pictures and colours are the most common sources of information but graphs and charts are also considered in this modality. (A) is a modality which is about hearing and speaking. People who have this are often addicted to lectures, radio and music, in which they like to 'sort things out by speaking first, rather than sorting out their ideas and then speaking' (Fleming, 1995). People who prefer kinesthetic (K) modality usually access information through the use of concrete personal experience and practice (Fleming, 2001).

2.4 Sensory learning style and learning achievement

Many researches have been done since 70s, to investigate the relationship between sensory learning style and learners' learning achievement. The learning styles chosen by the teachers do have a real effect on the achievement of students (Cassidy, 2004). The gap between the learners' preferred learning styles and the teacher's teaching style was the main variable factor in most of the researches. Caffeerty (1980) proved that learners got a higher grade point average if the gap is small or no gap was existed. Pizzo (1981) and Shea (1983) also proved that learners scored higher in reading when their learning style preferences matched with the teacher's teaching style. Regardless of the academic achievement, learning attitude was also found as a significant outcome. Learners would show positive learning attitude if they are provided with preferred modality in classroom (Pizzo, 1981). The learners' learning styles and its benefits would not be changed in different subjects (Copenhaver, 1979). There would be many potential consequences if the learning styles of learners differ from the teaching style of the teacher (Felder & Henriques, 1995). Students were proved to have poor tests result, or began to give up the subject. Thus, it would be beneficial for learners if they can learn in the preferred learning modality.

Based on the above-mentioned literature review, this study was set out to investigate the following questions within the context of primary schools in Hong Kong.

1. To what extent does the use of sensory approach affect L2 vocabulary learning, in terms of the immediate effect and the delayed effect?
2. Which sensory modality (visual, aural, read/write or kinesthetic) is the most suitable one to be applied in L2 classroom?

3. The study

3.1 Participants

This study involved 40 participants (20 boys and 20 girls) over a 6-week period. All participants were Primary two students from a government primary school in Kowloon, Hong Kong. They were recruited on a voluntary basis from 5 different classes and each class sent 8 students to join this study. They all shared the same L1 and L2, Cantonese and English respectively. They were randomly mixed and divided into four groups and each group contained 5 boys and 5 girls. The selection and group division aimed at achieving a balanced sample with evenly distributed English language proficiency levels.

A consent form was signed by the school Principal before the study was launched at the school. Students were explained the objectives and processes of the study by the researcher before they took the tests.

3.2 Research Methods and Procedures

There were three data collection points in each experimental group. The first data collection was the pretest (T1) which was conducted in the first week of this study. Two weeks later, the participants were arranged to attend a 20-minute English class. They took the posttest (T2) immediately after the class. Two weeks after taking the T2, they were given the delayed posttest (T3). The participants were tested one after another, were accessed by the researcher. Immediate feedback or hints were all prohibited during the tests.

Four experimental groups were arranged in this study, and researcher adopted one of the sensory preferences in VARK model (*visual, aural, read/write or kinesthetic*) to teach the targeted words in each group. The targeted words were vocabulary of occupation, including dentist, librarian, postman, builder, pilot, housewife, doctor and teacher. According to EDB (2004), the words of occupation are included in the syllables of Key stage 1(Primary 1 to 3).

During the experiment, in group 1 (G2), researcher taught the targeted vocabulary with the use of visual pictures and different colours. In group 2 (G2), song which included the targeted vocabulary and its description is used. In group 3 (G3), participants were given a list targeted vocabulary with the definitions, then they were asked to write the vocabulary once. In group 4 (G4), costumes and props of targeted occupations were shown. Students were asked to categorize the objects and match with the corresponding vocabulary.

3.3 *Instrumentation*

This study used to collect data at three data collection points, in which the content and the design of all the tests were identically the same. The test contained the eight targeted words (*dentist, librarian, postman, builder, pilot, housewife, waiter and teacher*) and two parts were included for each word, the pronunciation of the word (Part A) and its Chinese meaning (Part B). Participants were required to pronounce the eight targeted words and tell its Chinese meaning orally and were tested one by one.

Each item was rated on a 1-point scale for both parts. For part A: 0 (*The participant pronounced wrongly / The researcher had problems in understanding the words*) and 1 (*The participant pronounced accurately / The researcher understood the words*). For part B: 0 (*The participant did not know the meaning / gave totally wrong answer*) and 1 (*The participant gave accurate / acceptable meaning*).

Table 1:Test design

Targeted words	*Tasks*	*Score*	*Weight*
1. Dentist	Part A: Pronunciation	0-8	50%
2. Librarian	Part B: Chinese meaning	0-8	50%
3. Postman			
4. Builder			
5. Pilot			
6. Housewife			
7. Waiter			
8. Teacher			

3.4 Data analysis

SPSS was used for data analysis in this study. The raw scores of all the tests in all the groups were entered into the system. Before analyzing the test results, one-way Anova was conducted to check the assumptions of variances of the tests. The test result should be non-significant ($p \geq 0.05$) which shows that the variances of the four groups were equal and they had similar distribution shape. If it was the cases, the assumption for comparing the medians within group and between groups could be continued. As the sample in each group was relatively small ($N < 15$), non-parametric tests were conducted, which were based on the median of rank.

To address the research question 1, the scores in the three tests were first analyzed within group. Wilcoxon was conducted to compare two related samples each time. T1 and T2 were first compared, then T2 and T3. It showed whether the median of the T1 and T2, as well as that of T2 and T3 differed. The result shows that there is a difference among specific groups if the significance is small ($p < 0.05$). It explained how the use of sensory approach help the immediate effect and delayed effect on retaining the vocabulary. Kruskal-Wallis test was then conducted to compare between groups. It compared two groups each time (G1 vs G2, G2 vs G3, G3 vs G4, G1 vs G4 and G2 vs G4). As there were multiple comparisons, the Bonferroni correction was applied to set the significance cut-off at $\frac{p}{n}$ (Cabin & Mitchell, 2000). Thus, the significance in this test was cut to 0.008 ($\frac{0.05}{6} = 0.008$). It showed which sensory preference (*visual, aural, read/write or kinesthetic)* was more effective in this experiment.

4. Result

In this section, descriptive statistics were reported to examine statistical assumptions and the experiment results. The connection between the results and the two research questions are discussed.

4.1 Significance of The Tests

In this study, there were three tests and each contained two parts in it. Table 2 reported the result for assumption checking for all the test. For T1, the significance of Part A and Part B were 0.861 and 0.696 respectively. For T2, they were 0.818 and 0.345. For T3, they were 0.751 and 0.972. The significance in this test was set to be $p < 0.05$. All the significance of these six

parts were larger than the p; they were non-significant. Thus, the following comparison and tests could be done.

Table 3 reported the standard deviation of all the tests scores. There were four tests which had small standard deviation, they were T1 Part B and T2 Part B in group 1, as well as T1 Part B and T2 Part B in group 4. They were 0.471, 0.483, 0.471 and 0.483 respectively. It indicated that they had a clustered dataset in these specific tests, in which the test scores were very close to the mean. In group 1, the highest score and the lowest score in T2 Part B were 8 and 7 respectively. There was only 1-mark difference, which showed that participants performed very similar in this specific test. There were two tests which had large standard deviation, they were T2 Part A in group 1 and T3 Part B in group 2. It meant that they had a dispersed dataset, in which the test scores were diverse. In group 1, the highest score and the lowest score in T2 Part A were 6 and 3 respectively; In group 2 the highest score and the lowest score in T3 Part B were 7 and 3 respectively.

Table 4 reported the median for all groups at all three data collection points. The medians for all groups at T1 Part A and Part B were exactly the same, 2. It meant that the participants' abilities were very similar. For T2 Part A, group 2 had the highest median, 7. For T2 Part B, group 2 and group 3 had the highest median, 7.5. For T3 Part A, the median of group 2 was 7 which was the highest. For T3 Part B, the median of group 1 and group 4 were also 6 which were the highest among all groups.

Table 2: Assumption Test

	T1		T2		T3	
	Part A	Part B	Part A	Part B	Part A	Part B
significance	0.861	0.696	0.818	0.345	0.751	0.972

Note: The significance is $p<0.05$.

Table 3: Standard Deviation

	T1		T2		T3	
	Part A	Part B	Part A	Part B	Part A	Part B
G1	0.843	0.471	1.033	0.483	0.738	0.738
G2	0.823	0.568	0.739	0.527	0.568	1.333
G3	0.919	0.568	0.823	0.527	0.789	0.816

G4	0.876	0.471	0.699	0.483	0.816	0.816

Table 4: Median

	T1		T2		T3	
	Part A	Part B	Part A	Part B	Part A	Part B
G1	2	2	5.5	7	4	6
G2	2	2	7	7.5	7	5
G3	2	2	4.5	7.5	4	4
G4	2	2	5.5	7	4	6

4.2. Result of the immediate effects

To address the first research question, the immediate effect of using sensory approach would be first focused. The use of Wilcoxon Test aimed at comparing the immediate effectiveness of using specific sensory modality in teaching vocabulary in each group. The hypothesis was: the specific sensory teaching style did not have immediate impact on learning the targeted vocabulary. To test this hypothesis, 2-related sample test was used to compare the result of T1 with T2 within group, which were the test scores of the pretest and the immediate posttest. Results were shown in the Table 5.

Table 5: P-value in Wilcoxon Test (2-related sample test) (T1 vs T2)

	Part A	Part B
	T1 vs T2	T1 vs T2
G1	**	*
G2	**	**
G3	**	**
G4	**	**

Note: ns: $p>0.05$; *$p\leq0.05$; **$p\leq0.01$; ***$p\leq0.001$

All the comparisons for all groups between T1 and T2 (T1 Part A vs T2 Part A; T1 Part B vs T2 Part B) were significant. The null hypothesis was rejected and it could be said that using sensory approach in teaching did have immediate impact on the participants in all groups. For group 1, the median of scores in Part A, the pronunciation of the targeted words, increased from 2 in T1 to 5.5 in T2. In Part B, the Chinese meaning of the targeted words, the median in

T1 was 2 and it dramatically increased to 7 in T2. Participants generally performed better in Part B than Part A in T2 after attending the English class. It showed that using visual pictures and different colours could help them to understand the meaning of the words better than the pronunciation of the words immediately.

For group 2, the median of Part A raised from 2 to 7 in T1 and T2. In Part B, the median of T1, T2 and T3 were 2 and 7.5 respectively. It showed that the use of aural modality did help the participants to learn the meaning and pronunciation of the words as the scores in posttests were higher than that in pretest.

For group 3, the median of Part A increased from 2 in T1 to 4.5 in T2. In Part B, the median in T1 was 2 and it dramatically increased to 7.5 in T2. Participants generally performed better in T2 than T1, and better in the meaning part than the pronunciation part. It showed that using reading and writing could help them to understand the meaning of the words better than the pronunciation of the words.

For group 4, the medians of Part A were 2 and 5.5 in T1 and T2 respectively. In Part B, the medians were 2 and 7 in T1and T2 respectively. It showed that this specific modality had a positive immediate effect on both parts. Participants performed slightly better in the meaning part than the pronunciation part.

Thus, all the groups improved in T2 which was conducted right after the teaching session. group 2 showed the strongest immediate effect in Part A as the median was increased by 5. Group 2 and group 3 showed the strongest immediate effect in Part B as both of the groups had the highest median scores in T2. Overall, all the groups performed better in Part B than in Part A in T2, in which participants showed more understanding on the meaning of the vocabulary than the pronunciation of the vocabulary.

Another test, Kruskal-Wallis Test, was also conducted to investigate the differences between all groups. Table 6 below showed the result of test by comparing the differences between two sample groups. The null hypothesis of the test was: there was no significant differences between two groups. As there were multiple comparisons, the significance in this test was set at 0.008 based on the theory of Bonferroni correction. There were four comparisons which were significant ($p < 0.008$). They were the Dif. A1 between group 1 and group 2, group

2 and group 3; the Dif. B2 between group 1 and group 3, group 3 and group 4. The significance of Dif. A1 between group 1 and group 2 was 0.001; that between group 2 and group 3 was 0.004. The significance between group 1 and group 2 was smaller than that between group 2 and group 3. It told that the differences between group 1 and group 2 was more significant than the difference between group 2 and group 3. Table 7 showed the difference of the median. The difference of median of group 1 was 3.5; group 2 was 5 and group 3 was 2.5. It again showed that the use of aural modality had the strongest immediate effect on the pronunciation of the vocabulary among all groups.

Table 6: P-value in Krustal-Wallis Test (2-related samples)

	G1 vs G2	G2 vs G3	G3 vs G4	G1 vs G4	G1 vs G3	G2 vs G4
Dif. A1	***	*	ns	ns	ns	*
Dif. A2	ns	ns	ns	ns	ns	*
Dif. B1	ns	ns	ns	ns	ns	ns
Dif. B2	ns	*	*	ns	***	ns

Note:(1) dif. A1 = T2 part A – T1 part A; dif. A2 = T3 part A – T2 part A; dif. B1 = T2 part B – T1 part B; dif. B2 = T3 part B – T2 part B.

(2) The significance is $p < 0.008$.

(3) ns: $p>0.05$; *$p\leq0.05$; **$p\leq0.01$; ***$p\leq0.001$

Table 7: Median Differences

	G1	G2	G3	G4
Dif. A1	3.5	5	2.5	3.5
Dif. A2	-1.5	0	-0.5	-1.5
Dif. B1	5	5.5	5.5	5
Dif. B2	-1	-2.5	-3.5	-1

4.2.2 Discussion on the immediate effects

Based on the above results, the use of sensory approach (V, A, R, K) did have positive immediate impact on participants' vocabulary learning. These findings agree with the proof which emphasized that the sensory learning styles do have effects on the achievement of learners (Cassidy, 2004). Teachers are encouraged to apply sensory approach in their teaching. Using one method only is not recommended anymore in the primary setting anymore. As many

researchers agreed that students' attention span is very short, it is better to stimulate them by using different resources. Sensory approach adaptation can also increase students' learning motivation in L2. Students always feel difficult in understanding the L2, using different sensory stimulus can facilitate their learning. They would be more confident and interested in learning L2 (Moayyeri, 2015). However, the group which was exposed to the aural modality showed more significant improvement. This result rejected the claim suggested by Mayzler and McGann (2010), in which it opposed "visual learning is the most effective approach". According to Willis and Hodson (1999), most of the participants were auditory learners, 34% out of all in their research. Thus, the use of aural modality may correspondingly suit the largest amount of participants. The proportion of using aural modality may be slightly higher than the others.

Surprisingly, all groups showed stronger understanding on the meaning of the vocabulary than the pronunciation of the vocabulary. These findings were consistent with Kelly's (1985) research result which was mentioned in section 2. The best way to learn vocabulary is to learn the meaning first while the other aspects should be learnt in a later stage (Kelly, 1985). It is a good reminder for the English teachers and the school as most of the curriculums aim at teaching higher level of vocabulary. All the aspects of the vocabulary are taught within a short period or even one at a time. But this study suggests that vocabulary meaning should be the first element to be focused in teaching.

4.3.1 Result of the delayed effects

To address the first research question, the delayed effect of using sensory approach would be also analyzed in this part. The comparison between T2 and T3 were focused as it told the differences between the immediate posttest and the 2-week delayed posttest. The use of Wilcoxon Test aimed at comparing the delayed effectiveness of using specific sensory modality in teaching vocabulary in each group. The hypothesis was: the specific sensory teaching style did not have delayed impact on learning the targeted vocabulary. To test this hypothesis, 2-related sample test was used to compare the result of T2 with T3 within group. Results were shown in the Table 8.

Table 8: P-value in Wilcoxon Test (2-related sample test) (T2 vs T3)

	Part A	Part B
	T2 vs T3	T2 vs T3
G1	*	**
G2	ns	**
G3	*	**
G4	*	**

Note: ns: p>0.05; *p≤0.05; **p≤0.01; ***p≤0.001

For Part A between T2 and T3, the p-value for group 1, 3 and 4 were significant. The null hypothesis was rejected and it could be said that there were differences among tests. For group 1, the medians of scores in T2 and T3 were 5.5 and 4 respectively. For group 3, they were 4.5 and 4 respectively. For group 4, they were 5.5 and 4 respectively. For group 2, it was the only group which was not significant, in terms of the p-value between T2 and T3 in the Wilcoxon test. The p-value was 1 which meant that the hypothesis could not be rejected. As the medians of Part A in T2 and in T3 were exactly the same, which were 7, there was no difference.

For Part B between T2 and T3, the comparisons for all groups were significant. It could be also said that there were differences among tests. For group 1, the medians of Part B in T2 and T3 were 7 and 6 respectively. For group 2, the medians were 7.5 and 5. For group 3, the medians were 7.5 and 4. For group 4, the medians were 7 and 6.

Some groups showed stronger delayed effects on Part A while some groups on Part B. For group 1 and group 4, the participants retained the Chinese meaning better than the pronunciation. The medians between T2 ad T3 in Part B were decreased by 1 only in both groups; while that in Part A were decreased by 1.5. It showed that the use of visual modality and kinesthetic modality helped the participants to retain the Chinese meaning of the vocabulary better than the pronunciation of the vocabulary. These findings were consistent with the findings in the Kruskal-Wallis Test. (See Table 6 & 7) The significance of Dif. B2 between group 1 and group 3, as well as group 3 and group 4, were 0 and 0.001 respectively. The difference of median in T2 and T3 in group 1 was -1, group 3 was -3.5 and group 4 was -1. It can be noticed that the difference in group 3 is the biggest and the difference in group 1 and 4 is the smallest. The larger the difference was, the smaller the sustained effect was. As the comparison was made between the posttest and the delayed posttest, the retention of the

vocabulary was shown. The groups using visual modality and kinesthetic modality were able to retain more vocabulary than the other groups.

However, for group 2 and group 3, the participants retained the pronunciation better than the Chinese meaning. For group 2, there was no difference between T2 and T3 in Part A; while the median between T2 and T3 in Part B was decreased by 2.5. For group 3, the median between T2 and T3 in Part A was decreased by 0.5; while that in Part B was decreased by 3.5. It showed that the use of aural modality and read/write modality helped the participants to retain the pronunciation of vocabulary better than the Chinese meaning of the vocabulary.

4.3.2 Discussion on the delayed effects within group

Overall, all groups participants' performances declined in T3, except group 2 in Part A. It showed that participants' retention of the words was short and they generally forgot the pronunciation and the meaning of the words after two weeks. These findings agreed with the research conducted by Anderson and Jordan (1928), which claimed that forgetting occurs right after learning and the rate of forgetting becomes slower. In their research, tests were conducted right after learning, 1-week later, 3-week later and 8-week later. The taught knowledge the participants retained were 66%, 48%, 39% and 37% respectively. This results suggested lost of memory is a common phenomenon among learners.

Surprisingly, group 2 was the only group which performed similar in Part A in both T2 and T3. The medians of T2 and T3 were also 7; which meant that participants were able to remember the similar amount of vocabulary pronunciation in T3 even it was conducted two weeks later. As mentioned in the beginning of this paper, visual learning was proved to be the most effective approach (Mayzler & McGann, 2010). However, the result of group 2 rejected this claim again. It could be explained that using aural modality, especially songs, in teaching vocabulary helped participants to remember the pronunciation of the words easily. As they were invited to sing along the songs together within the 30-minutes teaching, they were given more opportunities to speak and practice the words than the other groups. These findings were consistent with another researcher's claim, in which songs were found to be useful in teaching vocabulary as it can help learners to improve pronunciation and listening skills (Millington, 2011). A mini follow-up interview was conducted to one of the participants in this group, after the data was calculated, he claimed that he could easy remember the lyrics and sometimes sang

it at home. It was found that songs contain rhythm and melody which could attract young learners (Purcell, 1992).

To strengthen the delayed effect on L2 vocabulary learning, there are several suggestions based on the above findings. First, repetition should be used in teaching vocabulary. The retention of vocabulary is always a problem for L2 learners. The more words they can remember; the more words they can use. But, they usually have difficulties in remember the vocabulary, either the pronunciation or the meaning, or both. Researcher suggested to adopt repetition in teaching L2, in which teachers are recommended to revise and repeat the concepts time by time (Sökmen, 2006). Teachers should recap and repeat the teaching materials as soon as possible, in order to help the learners to retain the knowledge (Anderson & Jordan, 1928). Hong Kong teachers always claimed that they have a tight teaching schedule and they are not able to cover every bite in the teaching syllable. It would be even hard for them to spend time repeating the concepts again and again. Repetition can be done easily and quickly in the classroom. Teachers can simply spend one fourth of the lesson to revise the prior knowledge, which is very worth to do so. Students have to build on the prior knowledge to learn deeper in L2.

Second, songs should be also used in teaching vocabulary. As it is proved that participants showed the best retention of vocabulary pronunciation after learning with songs in this study. Songs are highly recommended as a teaching tool in strengthening learners' pronunciation and listening skills. However, it is also reminded that teachers have to select the song and the lyrics carefully for teaching target vocabulary (Millington, 2011). Sometimes, some re-writings may be needed for better outcome.

5. Limitations

The first problem of this study is that there were only ten participants in each group, which is a relatively small sample. Using a small sample may affect the true effect of the experiment. The reliability of this study is relatively low, compared with other studies. The findings may be dominated by the small groups of participants' own preferences, but not reflecting the true results. Research should conduce future experiment with a larger sample. The second problem is that only nouns are being investigated in this study. The eight targeted vocabulary used in the experiment is examples of occupations which are all nouns. Noun is the easiest word form

which is suitable for research, as it is concrete and it can be shown in the form of picture. Other words forms are not investigated in this study which could not show whether the sensory approach could facilitate learners' learning as well. For further studies, researchers should try to investigate the effectiveness of sensory approach on different forms of words as all the forms of words are also important in English.

6. Conclusions

In this study, the use of sensory approach in teaching vocabulary was found to be effective. There was a strong positive impact, both immediate and delayed effects, on learning and retaining the pronunciation of the vocabulary by using aural modality in teaching. The use of visual and kinesthetic modality also carried a strong positive delayed effect on retaining the meaning of vocabulary. However, the retention of vocabulary was overall short among all the participants. Teachers are recommended to pay more efforts on revising the knowledge and to strengthen their retention ability. Meanwhile, there is no one perfect sensory modality which could suit all the learners in the L2 classroom. As the results above showed, none of the modalities could carry positive influences on both immediate and delayed effects, as well as on both pronunciation and meaning. Thus, multiple modalities are highly recommended to be used in the classroom, in order to cater for the learners' diversity. Students are unique and they may have different learning style preferences; teachers should be resourceful and flexible to utilize the sensory approach.

References

Anderson, J. P. & Jordan, A. M. (1928). Learning and retention of Latin words and phrases. *Journal of Education Psychology. 19*:485-496.

Beck, L. (2003). *Child Development*. 6th Edition. Boston: Allyn and Bacon.

Cabin, R. J., & Mitchell, R. J. (2000). To Bonferroni or not to Bonferroni: when and how are the questions. *Bulletin of the Ecological Society of America*, *81*(3), 246-248.

Cafferty, E. (1980). *An analysis of student performance based upon the degree of match between the educational cognitive style of the teachers and the educational cognitive style of the students.* Unpublished doctoral dissertation, University of Nebraska.

Cassidy, S. (2004). Learning styles: an overview of theories, models and measures. *Educational Psychology, 24*(4). 219-244.

Coady, J., & Huckin, T. (1997). *Second language vocabulary acquisition: A rationale for pedagogy*. Cambridge University Press.

Copenhaver, R. (1979). *The consistency of student learning styles as students move from English to mathematics*. Unpublished doctoral dissertation, Indiana Unviersity.

Dunn, R. (1984). Learning style: State of the science. *Theory into practice*, *23*(1), 10-19.

EDB. (2004). *English Language Education Key Learning Area: English Language Curriculum Guide (Primary 1-6)*.

Felder, R. M., & Henriques, E. R. (1995). Learning and teaching styles in foreign and second language education. *Foreign Language Annals*, *28*(1), 21-31.

Felder, R. M. & Silverman, L. K. (1988). Learning styles and teaching styles in engineering education. *Engineering Education, 78*(7). 674-681.

Felder, R. M., & Spurlin, J. (2005). Applications, reliability and validity of the index of learning styles. *International journal of engineering education*, *21*(1), 103-112.

Fleming, N. D. (1995). I'm different; not dumb. Modes of presentation (VARK) in the tertiary classroom. In *Research and Development in Higher Education, Proceedings of the 1995 Annual Conference of the Higher Education and Research Development Society of Australasia (HERDSA), HERDSA* (Vol. 18, pp. 308-313).

Fleming, N. D. (2001). *Teaching and learning styles: VARK strategies*. Christchurch, New Zealand: N.D. Fleming.

Keefe, J. & Ferrell, B. (1990). Developing a defensible learning style paradigm. *Educational Leadership, 48*(2), 57-61.

Kelly, P. (1985). *A dual approach to FL vocabulary learning: the con-joining of listening comprehension and mnemonic practices*. Unpublished doctoral thesis, Catholic University of Louvain, Belgium.

Ma, Q. (2009). *Second language vocabulary acquisition* (Vol. 79). Peter Lang.

Maqzler, A. & McGann, A. (2010). *Tutor in a book: better grades as easy as 1-2-3*. Avon, MA: Adams Media.

Millington, N. T. (2011). Using songs effectively to teach English to young learners. *Language Education in Asia*, *2*(1), 134-141.

Moayyeri, H. (2015). The Impact of Undergraduate Students' Learning Preferences (VARK Model) on Their Language Achievement. *Journal of Language Teaching and Research*, *6*(1), 132-139.

Orton, S. T. (1937). *Reading, writing and speech problems in children.* New York: Norton.

Pizzo, J. (1981). *An investigation of the relationships between selected acoustic environments and sound, an element of learning style, as they affect sixth grade students' reading achievement and attitudes*. Unpublished doctoral dissertation, St. John's University.

Purcell, J. M. (1992). Using songs to enrich the secondary class. *Hispania, 75*(1), 192-196.

Shea, T. C. (1983). *An investigation of the relationship among preferences for the learning style element of design, selected instructional environments and reading test achievement of ninth grade students to improve administrative determinations concerning effective educational facilitates*. Unpublished doctoral dissertation, St. John's University.

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

Willis, M., & Hodson, V. K. (2013). *Discover your child's learning style: children learn in unique ways—here's the key to every child's learning success*. Reflective Educational Perspectives.

Vaughn, S., & Linan-Thompson, S. (2003). What is special about special education for students with learning disabilities?. *The Journal of Special Education*, *37*(3), 140-147.

Appendix A – Consent forms

School Consent Form

THE HONG KONG INSTITUTE OF EDUCATION

DEPARTMENT OF LINGUISTICS AND MODERN LANGUAGE

CONSENT TO PARTICIPATE IN RESEARCH (FOR *PRINCIPAL*)

Using sensory approach in classroom: Does it help L2 vocabulary learning?

I am a student in the Hong Kong Institute of Education. I am now conducting a project titled *Using sensory approach in classroom: Does it help L2 vocabulary learning?* as my undergraduate research project. This study is supervised by Dr. Xie Qin who is the assistant professor of the Department of Linguistics and Modern Language in The Hong Kong Institute of Education . I would like to invite your students to participate in the project.

The purpose of this study is to investigate how the use of sensosry approach helps the students in learning vocabulary. I will teach eight targeted vocabulary with different use of sensory preferences in class. Students will be invited to take an oral pre-test, an immediate post-test and a delayed post-test. Tests will remain anonymous and the results of the tests will not affect their academic results at school.

Please understand that your students' participation is voluntary. They have every right to withdraw from the study before or during the measurement without penalty of any kind. All information related to your students will remain confidential, and will be identifiable by codes known only to the researcher.

If you have any concerns about the conduct of this research study, please do not hesitate to contact the Human Research Ethics Committee by email at _____ or by mail to Research and Development Office, The Hong Kong Institute of Education .

If you would like to obtain more information about this study, please contact me at telephone number or my supervisor Dr. Xie Qin at telephone number .
Thank you for your interest in participating in this study.

Fung Hiu Ching

5 October, 2015

Using sensory approach in classroom: Does it help L2 vocabulary learning?

I agree that the captioned research project can be carried out at this school.

Signature: _____
Name: _____ (Dr/Mr/Mrs/Ms/Miss*)
Post: _____
Name of School: _____
Date: _____

Parental Consent Form

THE HONG KONG INSTITUTE OF EDUCATION
DEPARTMENT OF LINGUISTICS AND MODERN LANGUAGE

CONSENT TO PARTICIPATE IN RESEARCH

Using sensory approach in classroom: Does it help L2 vocabulary learning?

I _____ hereby consent to my child participating in the captioned research supervised by Dr. Xie Qin and conducted by Ms. Fung Hiu Ching.

I understand that information obtained from this research may be used in future research and may be published. However, our right to privacy will be retained, i.e., the personal details of my child will not be revealed.

The procedure as set out in the **attached** information sheet has been fully explained. I understand the benefits and risks involved. My child's participation in the project is voluntary.

I acknowledge that we have the right to question any part of the procedure and can withdraw at any time without negative consequences.

Name of Parent or Guardian _____

Signature of Parent or Guardian _____

Date _____

Information Sheet

INFORMATION SHEET

Using sensory approach in classroom: Does it help L2 vocabulary learning?

You are invited to participate with your child in a project supervised by Dr. Xie Qin and conducted by Ms. Fung Hiu Ching, who are staff / students of the Department of Linguistics and Modern Language in The Hong Kong Institute of Education.

The purpose of this study is to investigate how the use of sensosry approach helps the students in learning vocabulary. I will teach eight targeted vocabulary with different use of sensory preferences in class. Students will be invited to take an oral pre-test, an immediate post-test and a delayed post-test. Tests will remain anonymous and the results of the tests will not affect their academic results at school.

Please understand that your child's participation is voluntary. They have every right to withdraw from the study before or during the measurement without penalty of any kind. All information related to your child will remain confidential, and will be identifiable by codes known only to the researcher.

If you would like to obtain more information about this study, please contact me at telephone number or my supervisor Dr. Xie Qin at telephone number .
Thank you for your interest in participating in this study.

If you or your child have/ has any concerns about the conduct of this research study, please do not hesitate to contact the Human Research Ethics Committee by email at _____ or by mail to Research and Development Office, The Hong Kong Institute of Education.

Thank you for your interest in participating in this study.

Ms. Fung Hiu Ching
Principal Investigator

Appendix B – Descriptive Statistics

Descriptive Statistics					
		Max	Min	Median	SD
G1	T1 Part A	4	2	2	0.843
	T1 Part B	3	1	2	0.471
	T2 Part A	6	3	5.5	1.033
	T2 Part B	8	7	7	0.483
	T3 Part A	5	3	4	0.738
	T3 Part B	7	5	6	0.738
G2	T1 Part A	4	1	2	0.823
	T1 Part B	3	1	2	0.568
	T2 Part A	8	6	7	0.738
	T2 Part B	8	7	7.5	0.527
	T3 Part A	8	6	7	0.568
	T3 Part B	7	3	5	1.333
G3	T1 Part A	4	1	2	0.919
	T1 Part B	3	1	2	0.568
	T2 Part A	6	4	4.5	0.823
	T2 Part B	8	7	7.5	0.527
	T3 Part A	5	3	4	0.789
	T3 Part B	5	3	4	0.815
G4	T1 Part A	4	1	2	0.876
	T1 Part B	3	1	2	0.471
	T2 Part A	7	5	5.5	0.699
	T2 Part B	8	7	7	0.483
	T3 Part A	5	3	4	0.816
	T3 Part B	7	5	6	0.816

Appendix C – SPSS Tests Results

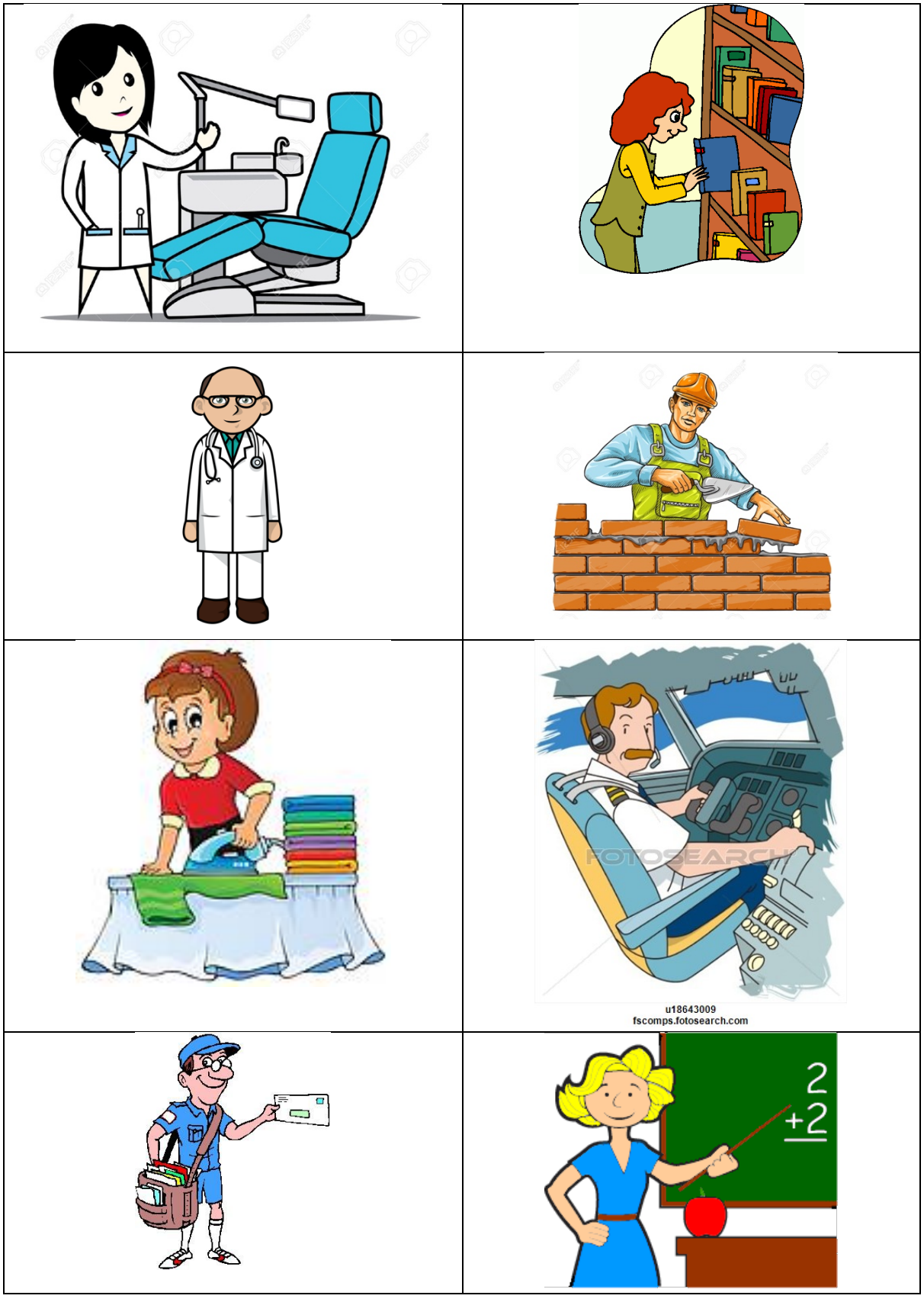
Assumption Test						
	T1		T2		T3	
	Part A	Part B	Part A	Part B	Part A	Part B
significance	0.861	0.696	0.818	0.345	0.751	0.972
Note: The significance is p<0.05.						

Table 4: Wilcoxon Test (2-related sample test)				
	Part A		Part B	
	T1 vs T2	T2 vs T3	T1 vs T2	T2 vs T3
G1	0.004	0.018	0.04	0.006
G2	0.005	1	0.004	0.006
G3	0.005	0.047	0.004	0.004
G4	0.005	0.011	0.004	0.01
Note: The significance is p<0.05.				

Kruskal-Wallis Test (Overall test)	
	G1, G2, G3 & G4
Dif. A1	0.003
Dif. A2	0.07
Dif. B1	0.645
Dif. B2	0.002
Note: (1) dif. A1 = T2 part A – T1 part A; dif. A2 = T3 part A – T2 part A; dif. B1 = T2 part B – T1 part B; dif. B2 = T3 part B – T2 part B. (2) The significance is p < 0.05.	

Krustal-Wallis Test (2-related samples)						
	G1 vs G2	G2 vs G3	G3 vs G4	G1 vs G4	G1 vs G3	G2 vs G4
Dif. A1	0.001	0.004	0.115	0.06	0.815	0.044
Dif. A2	0.081	0.203	0.185	0.205	0.722	0.015
Dif. B1	0.306	0.861	0.45	1	0.45	0.306
Dif. B2	0.462	0.022	0	0.903	0.001	0.414
Note:(1) dif. A1 = T2 part A – T1 part A; dif. A2 = T3 part A – T2 part A; dif. B1 = T2 part B – T1 part B; dif. B2 = T3 part B – T2 part B. (2) The significance is p < 0.008.						

Appendix D – Experiment Instrument for Group 1



Appendix E – Experiment Instrument for Group 2

song lyrics:

1. Do you know the dentist, The dentist, the dentist? Do you know the dentist, who takes care of your teeth? Yes I know the dentist, The dentist, the dentist. Yes I know the dentist, Who takes care of your teeth.	2. Do you know the librarian, The librarian, the librarian? Do you know the librarian, who helps you find a book? Yes I know the librarian, The librarian, the librarian. Yes I know the librarian, Who helps you find a book.
3. Do you know the doctor, The doctor, the doctor? Do you know the doctor, who takes care sick people? Yes I know the doctor, The doctor, the doctor. Yes I know the doctor, Who takes care sick people.	4. Do you know the builder, The builder, the builder? Do you know the builder, who builds a house? Yes I know the builder, The builder, the builder. Yes I know the builder, Who builds a house.
5. Do you know the housewife, The housewife, the housewife? Do you know the housewife, who takes care of her home? Yes I know the housewife, The housewife, the housewife. Yes I know the housewife, Who takes care of her home.	6. Do you know the pilot, The pilot, the pilot? Do you know the pilot, who flies an airplane? Yes I know the pilot, The pilot, the pilot. Yes I know the pilot, Who flies an airplane.
7. Do you know the postman, The postman, the postman? Do you know the postman, who delievers letters? Yes I know the postman, The postman, the postman. Yes I know the postman, Who delivers letters.	8. Do you know the teacher, The teacher, the teacher? Do you know the teacher, who teaches children? Yes I know the teacher, The teacher, the teacher. Yes I know the teacher, Who teaches children.

Appendix F – Experiment Instrument for Group 3

Word list

1._____ (takes care of your tenth)

2. _____ (helps you find a book)

3. _____ (takes care sick people)

4. _____ (builds a house)

5. _____ (takes cares of a house)

6. _____ (flies an airplane)

7. _____ (delivers letters)

8. _____ (teaches children)

Appendix G – Experiment Instrument for Group 4

Appendix H: Interview Transcript

A: Researcher
B: Interviewee (one of the participants in group 2)

A: Hello. I have some questions for you. Please try to recall your memory and answer it.
B: Ok.
A: Do you like the song we sang in the class?
B: Yes.
A: Why?
B: Because…song is not…boring.
A: Singing song is not boring?
B: Yes.
A: Do you still remember the song?
B: Do you know the dentist? The dentist, the dentist? Do you know the dentist who…
A: Who takes care of your tenth.
B: (Nobs his head)
A: You are excellent! You can remember most of the lyrics! Did you sing this song at home?
B: Sometimes.
A: Wow. Very good! One last question, do your English teacher sing with you guys in the lesson?
B: Er… No.
A: Ok. Thanks for your help. You are such a good boy.