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於英語聽力理解成效之影響研究**

**The Effects of Video-Annotated Learning and Review
System with Vocabulary Learning Mechanism on English
Listening Comprehension**

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摘要

隨著全球化的發展，英語可說已是全世界最廣泛被使用的語言。在台灣，學生從小學三年級就開始學習英語，雖然長期學習英語，但是主要著重於英文單字、文法的學習，英語聽力技巧經常被忽視，以至於聽力理解能力普遍不佳，難以在日常生活中順利與外國人進行溝通。

隨著資訊科技的快速發展，電腦輔助語言學習已成為發展趨勢，本研究發展一影片標註學習暨複習系統輔以單字學習機制(Video-Annotated Learning and Review System with Vocabulary Learning Mechanism, VALRS-VLM)，可輔助學習者依據自己的學習需求，進行英語需要聽力重聽段落確定語意的不熟悉單字查詢。為了驗證此一機制對於提升英語聽力的成效，本研究比較使用 VALRS-VLM，以及單純只有重聽影片標註聽力學習暨複習系統而無英語聽力重聽段落單字學習機制(Video-Annotated Learning and Review System without Vocabulary Learning Mechanism, VALRS-NVLM)的學習者，在英語聽力理解成效、學習滿意度、科技接受度、認知負荷，以及學習保留是否具有顯著差異，以驗證強化聽力過程中不熟悉單字是否有助於提升聽力理解成效。此外，也進一步比較不同認知風格學習者（場地獨立型與場地依賴型），分別採用 VALRS-VLM 及 VALRS-NVLM 在英語聽力理解成效、學習滿意度、科技接受度、認知負荷，以及學習保留上是否具有顯著的差異。

研究結果發現，使用 VALRS-VLM 的學習者，其聽力理解成效與學習保留皆顯著優於使用 VALRS-NVLM 的學習者。此外，使用 VALRS-VLM 之場地獨立與場地相依不同認知風格學習者，其聽力理解成效與學習保留皆顯著優於使用 VALRS-NVLM 之場地獨立與場地相依不同認知風格學習者。最後，採用 VALRS-VLM 及 VALRS-NVLM 學習者的學習滿意度、科技接受度，以及認知負荷度不具有顯著差異，但是學習滿意度、科技接受度皆高，並且認知負荷低。

研究結果顯示，學習者使用 VALRS-VLM 輔以英語聽力學習，能有效提昇學習者的英語聽力理解表現。

關鍵詞：影片標註學習暨複習系統輔以單字學習機制、字彙學習、英語聽力學習、聽力理解



Abstract

With the development of globalization, English has probably become the most widely used language around the world. In Taiwan, students begin to learn English from the third grade of primary school. Although they have been learning English for a long time, they usually could not express their meaning and feelings with foreign people in English naturally and well. The main reason is that English listening skills are often overlooked in second language acquisition.

With the rapid development of information technology, computer-aided language learning has become a development trend. Hence, the study proposes a novel video-annotated learning and review system with vocabulary learning mechanism (VALRS-VLM), which can assist learners to mark any listening section that cannot fully understand manually, and then clarify the pronunciation and usage of the unfamiliar vocabulary words appearing in the listening section through an online dictionary with correct meaning and pronunciation for these vocabulary words, so as to enhance learners' English listening performance and perception.

In order to verify the effectiveness of the proposed VALRS-VLM, the study examines the effects of the learners in the experimental group using the VALRS-VLM with those in the control group using the video-annotated learning and review system without vocabulary learning mechanism (VALRS-NVLM) on English listening

comprehension performance, learning satisfaction, technology acceptance, cognitive load, and learning retention. Furthermore, this study also examines the effects of the learners of both groups with different learning styles, field independence and field dependence, on the English listening comprehension performance, learning satisfaction, technology acceptance, cognitive load, and learning retention.

Analytical results show that the learners in the experimental group using the VALRS-VLM achieved remarkably better listening comprehension performance and learning retention than those in the control group using the VALRS-NVLM. Moreover, the field independence and field dependence learners in the experimental group using the VALRS-VLM also had significantly better listening comprehension performance and learning retention than those in the control group using the VALRS-NVLM. In addition, there were no significant differences between both the groups in learning satisfaction, technology acceptance, and cognitive load, but the learning satisfaction and technology acceptance of both the groups are higher than the median (median = 3) of a five-point Likert scale as well as the cognitive load of both the groups is lower than the median (median = 3) of a five-point Likert scale. The study confirms that the proposed VALRS-VLM could effectively assist learners in facilitating English listening comprehension performance as well as satisfied the learners' awareness towards usefulness, helpfulness, and easy to use.

Keywords: video-annotated learning and review system with vocabulary learning
mechanism (VALRS-VLM), vocabulary learning, English listening learning, English
listening comprehension



Contents

CHAPTER 1 INTRODUCTION	5
1.1 Background and Motivation.....	5
1.2 Purpose of the Study.....	7
1.3. Research Questions.....	7
1.4 Limitations of the Study	7
1.5 Definition of Important Terms in the Study	8
CHAPTER 2 LITERATURE REVIEW	12
2.1 English Listening Learning	12
2.2 Computer-Assisted Listening Learning System	14
2.3 Vocabulary Learning for Assisting in Listening Learning.....	17
2.4 Effects of Learners with Different Cognitive Styles on Learning Performance.....	18
CHAPTER 3 RESEARCH METHODOLOGY	20
3.1 Research Architecture	20
3.2 Research Participants.....	22
3.3 Experimental Procedures.....	23
3.4 Research Instruments	25
3.5 Data Analysis	36
CHAPTER 4 EXPERIMENTAL RESULTS.....	37
4.1 The Analysis of Learners' Initial English Proficiency of Both the Groups before the Experiment	37
4.2 Comparisons of English Listening Comprehension Posttest between Both the Groups' Learners.....	38
4.3 Comparison of English Listening Comprehension Posttest between Both the Groups' Learners with Different Cognitive Styles.....	39

4.4 Comparisons of English Learning Satisfaction, Technology Acceptance and Cognitive Load between Both the Groups	41
4.5 Comparisons of English Learning Satisfaction, Technology Acceptance and Cognitive Load between Both the Group's Learners with Different Cognitive Styles	42
4.6 Comparisons of Learning Retention between Both the Groups by Using ANCOVA.....	43
4.7 Comparisons of Learning Retention between Both the Groups' Learners with Different Cognitive Styles	44
4.8 Discussion	46
CHAPTER 5 CONCLUSIONS AND FUTURE WORK	49
5.1 Conclusions.....	49
5.2 Suggestions for the Improvement and Implementation of the VALRS-VLM	50
5.3 Directions for Future Research	52
Reference	54
Appendix A. Group Embedded Figure Test.....	61
Appendix B. English Listening Comprehension Test	70
Appendix C. Learning Satisfaction Questionnaire.....	84
Appendix D: Technology Acceptance Questionnaire	86
Appendix E: Cognitive Load Questionnaire.....	88

LIST OF FIGURES

Figure 3.1 The research architecture of the study.....	20
Figure 3.2 Experimental procedures of the study.....	23
Figure 3.3 The input box of user name in the Video-Annotated Learning and Review System	26
Figure 3.4 The user interface of function setting in the Video-Annotated Learning and Review System	27
Figure 3.5 The user interface of mark and playing setting in the Video-Annotated Learning and Review System	28
Figure 3.6 The user interface of review and mark setting of the immediate review mode in Video-Annotated Learning and Review System.....	29
Figure 3.7 The user interface of the playing setting of the delayed review mode in Video-Annotated Learning and Review System	30
Figure 3.8 The learning interface of unfamiliar vocabulary word identified by a learner from a listening video section played in the Video-Annotated Learning and Review System	32

LIST OF TABLES

Table 4.1.1 The independent-samples t test result of the English vocabulary pretest between both the groups	38
Table 4.2.1 The ANCOVA result of English Listening Comprehension Posttest between both the groups' learners by using the English vocabulary pretest as the covariate	39
Table 4.3.1 The ANCOVA results of English Listening Comprehension Posttest between both the groups' learners with different cognitive styles by using English Vocabulary Pretest as the covariate	40
Table 4.3.2 The ANCOVA results of intra-group comparison of the English listening comprehension posttest between both the groups' learners with different cognitive styles by using English Vocabulary Pretest as the covariate	41
Table 4.4.1 The independent-samples t test results of English learning satisfaction, technology acceptance and cognitive load between the both groups	42
Table 4.5.1 The independent-samples t test results of English learning satisfaction, technology acceptance, and cognitive load between both the groups' learners with different cognitive styles.....	43
Table 4.6.1 The ANCOVA result of the English listening comprehension delayed test.....	44
Table 4.7.1 The ANCOVA results of the delayed posttest of the English listening comprehension performance between both the groups' learners with different cognitive styles by using the English vocabulary pretest as the covariate	45
Table 4.7.2 The ANCOVA results of intra-group comparison of learning retention between both the groups' learners with different cognitive styles by using English Vocabulary Pretest as the covariate.....	46

CHAPTER 1 INTRODUCTION

This chapter aims to explain the research background and motivation, purpose of the study, research questions, research scope and limitations of the research, and important terms used in the research.

1.1 Background and Motivation

With the development of globalization, English probably is the most common used international language around the world. Therefore, English can broaden one's horizon. Dunkel (1991) indicated that listening skill is the “polestar” of second language acquisition. In other words, listening skill is the key to communicate each other (Renukadevi, 2014).

In Taiwan, students begin learning English from Grade 3 of primary school. Although they have learned English for a long time, when they met foreigners, they usually could not express their feelings in English naturally and well (Yang, 2005). The main reason is listening skill is often neglected in second language acquisition (Gilakjani & Ahmadi, 2011), particularly in Taiwan. Renukadev (2014) indicated that communication will not be proceeded smoothly if without good listening skills. Without good listening skills, learners may meet with difficulties in communication process (Hsu, Hwang & Chang, 2014).

Using video in teaching has been proven that it has good performance in promoting English listening comprehension (Chung, 1996; King, 2002; Chai & Erlam, 2008). This is because the content of the video usually is relatively close to learners' daily lives, it could enhance learners' motivation and even improve their interests in learning English (King, 2002). In addition, since sound and picture in a video are presented at the same time, thus leading to the usage of the language in the video is more close to reality and easier to be understood (Allen, 1985). Owing to videos with wealth of contextualized linguistic and realistic view of culture, learners can get familiar with foreign language naturally (Florence, 2009).

Since using video in teaching has a good effect on promoting listening comprehension, many studies further investigated whether the video with subtitle can assist the English listening teaching more effectively than the video without subtitle, and found that the effect of the video with subtitle is better than the video without subtitle (Danan, 2004; Hayati & Mohmedi, 2011; Hsu, Hwang & Chang, 2014). Obviously, a video with aural, visual and textual can aid to provide learners with authentic comprehensible input (Chung, 1996). When learners spend lots of time on listening and watching videos with subtitles, they are accustomed to the foreign language context (Hayati & Mohmedi, 2011) and promote listening comprehension (Rokni & Ataee, 2014). Furthermore, Bonk (2000) indicated that English listening ability is highly related to learners' vocabulary knowledge. If learners have enough relevant background knowledge or been introduced new words before watching a video, they would be able to understand the contents of the video and promote effective listening comprehension learning (Chai & Erlam, 2008). Wang & Shen (2007) also claimed that a video with subtitles can ameliorate learners' ability to master word spelling and word recognition.

Currently, although English listening lessons mainly adopt videos with subtitles to aid listening learning or practices, there has still not been any listening learning method based on enlarging a learner's vocabulary size by extracting unfamiliar vocabularies from the subtitles of a video. Therefore, this study presents the video-annotated learning and review system with vocabulary learning mechanism (VALRS-VLM), which can conveniently aid learners to mark a video section that cannot fully understand manually, to help learners find unclear sounds of vocabulary words and unfamiliar vocabulary words from the video section while using a video to train their listening skills. Through unfamiliar vocabulary learning mechanism, the VALRS-VLM can help learners clarify the pronunciation and usage of the vocabulary words, thereby enhancing their listening comprehension performance.

1.2 Purpose of the Study

The purpose of the study is to confirm whether the learners in the experimental group who used the video-annotated learning and review system with vocabulary learning mechanism (VALRS-VLM) have significantly better effects on the listening comprehension performance, learning satisfaction, technology acceptance, and cognitive load than those in the control group who used video-annotated learning and review system without vocabulary learning mechanism (VALRS-NVLM). Furthermore, the study also confirms whether the effects of the learners with different cognitive styles in both the groups who respectively used the VALRS-VLM and VALRS-NVLM on listening comprehension performance, learning satisfaction, technology acceptance, and cognitive load are significantly different.

1.3. Research Questions

Based on the purpose of the study, three primary research questions of the study are proposed, and listed them as follows.

(1) Are there significant differences in English listening comprehension performance, English learning satisfaction, technology acceptance, cognitive load, and learning retention between the learners who use the VALRS-VLM and VALRS-NVLM to improve their English listening skills?

(2) Are there significant differences in English listening comprehension performance, English learning satisfaction, technology acceptance, cognitive load, and learning retention between the learners with different cognitive styles who use the VALRS-VLM and VALRS-NVLM to improve their English listening skills?

1.4 Limitations of the Study

There are three limitations of the study due to the factors of limited research time, budget, and manpower, and listed them as follows.

(1) The study only recruited four classes of Grade 6 students from a public primary school in New Taipei City, Taiwan as the research subjects. Whether the research results could be inferred ready to the learners from other regions or different age groups needs to be further investigated.

(2) In the content of the course, the study selected an English video associated with moral story with creative common authorization and both English and Chinese subtitles as the learning unit. The contents of other English listening videos with different scopes and different levels of difficulty are not within the considered scope of this study. Whether the results of the research could be inferred ready to other teaching content needs further investigation.

(3) The VALRS-VLM used in this study was developed by the Digital Library and Digital Learning Laboratory of the Graduate Institute of Library, Information and Archival Studies at National Cheng-Chi University. Whether the results can be inferred ready to other similar English listening review and labeling systems needs further investigation.

1.5 Definition of Important Terms in the Study

1.5.1 Video-Annotated Learning and Review System with Vocabulary Learning Mechanism (VALRS-VLM)

The VALRS-VLM is a computer assisted English listening learning system that can aid learners to mark the video sections which they cannot clearly understand and simultaneously extract the English and Chinese subtitles of the video section into a window so that learners can review them immediately or later. The VALRS-VLM provides two review modes — the delayed and immediate review modes. These two review modes allow learners to replay the marked sections of the video starting from the previous five seconds, and learners can go back to review these sections again readily without wasting time to recall or look for their confusing parts. The immediate review mode aims to support a learner to immediately review a video section that cannot comprehend well by self-judgment during listening a video to train listening

skills. The delayed review mode aims to support a learner to record the video sections that cannot comprehend well by self-judgment while listening a video to train listening skills as well as assist the learner to review these video sections efficiently without taking extra efforts to recall or look for after finishing the listening practice of the whole video (Chen & Chen, in press). In addition to the review mechanism, the VALRS-VLM also contains a customized mechanism, called vocabulary learning mechanism. If a learner cannot clearly understand a certain word's meaning in the English subtitle, she/he can click the unfamiliar word twice, then the word will be put in the personal vocabulary list. After that, she/he can click the "inquiry" button and the mechanism will show the pronunciation, meanings and example sentences about the vocabulary word. Through unfamiliar vocabulary learning mechanism, the VALRS-VLM can help learners to clarify the pronunciation and usage of the unfamiliar vocabulary words, thereby enhancing their listening comprehension.

1.5.2 Listening Comprehension

Listening comprehension is an active learning process which a learner picks up a certain aural segment, distinguish phoneme of each word and constructs meaning from the text based on her/his background knowledge (O'Malley, Chamot & Küpper, 1989). In other words, it is a kind of ability that a learner could completely understand the message from the dialogue in a conversation context.

1.5.3 Learning Satisfaction

According to Harvey, Locke and Morey (2002), learning satisfaction is the feeling that learners fulfill the learning needs from the curricular designs and learning activities. In the study, in order to understand the degree of satisfaction of learners who used the VALRS-VLM and VALRS-NVLM for English listening learning, Learners were invited to fill in the learning

satisfaction questionnaire modified from Chen (2016). The score of the questionnaire indicates the learner's satisfaction with the learning method.

1.5.4 Technology Acceptance Model

The Technology Acceptance Model (TAM) was developed by Davis (1986). The purpose of TAM is to find an effective behavioral model to explain learners' behaviors in computer technology when they accepted new information systems and analyze factors that affected learners' acceptance. The model provides a theoretical basis for understanding the influence of external factors on learners' beliefs, attitudes and intentions, and thus affecting their use of technology. This model could be widely used to explain or predict the influencing factors of information technology use (Davis, 1986; Lederer, Maupin, Sena & Zhuang, 2000).

The TAM uses cognitive usefulness and cognitive ease of use as independent variables, and user attitudes, behavioral intentions, and usage behaviors are dependent variables. Cognitive usefulness and ease of use would affect learners' attitude of using technology, which in turn affect specific behavioral performance. As for learners' use of information technology maybe is affected by their behavioral intentions (Lederer, Maupin, Sena & Zhuang, 2000). In the study, Hwang, Yang and Wang's technology acceptance questionnaire (2013) was adopted to evaluate learners' perceived usefulness and perceived ease of use after using different review mechanisms to improve English listening skills.

1.5.5 Cognitive Style

Witkin (1977) indicated that cognitive styles can affect people's thoughts and behaviors and can be divided into two type, field-dependence and field- independence. Learners with field-dependence tend to focus on whole thing of the learning materials, whereas learners with field-independence tend to focus on particular point and not distracted by the background or context (Wu, 1987; Richards & Platt, 1992; Xu, 2011). Field-dependent learners are holistic,

uncertain, and dependent upon others. They are socially oriented and less achievement-oriented. In contrast, field-independent learners are analytic, confident, and self-reliant. They are more intrinsically motivated, task-oriented, and competitive (Witkin, 1977).

The study employed Chinese version of Group Embedded Figures Test (GEFT) developed by Wu (1987) to measure learners' cognitive style as field-independence and field-dependence. According to GEFT scores, learners whose GEFT scores are higher than a half standard deviation of the mean are regarded as field-independent learners, whereas learners whose GEFT scores are lower than a half standard deviation of the mean are regarded as field-dependent learners.



CHAPTER 2 LITERATURE REVIEW

This chapter is divided into three sections to address the literatures related to this study. Section 2.1 is about English listening learning, expounding the current situation of English listening learning and the dilemma of English listening learning. Section 2.2 is computer-assisted listening learning system, exploring the relationship between film teaching and English listening learning, discussing listening learning effect of video with subtitles, and investigating the relationship between subtitle and vocabulary in listening learning. Section 2.3 is vocabulary learning, to investigate the relationship between vocabulary learning and English listening learning. Section 2.4 is cognitive style, to explore its significance and effects on influencing learning outcomes

2.1 English Listening Learning

Learning a language involves four language skills, including listening, speaking, reading, and listening (Renukadevi, 2014). Among the four language skills, listening is the most important. Listening is a receptive skill that is the first step to learn target language. Through attentively listen to the sound, rhythm, intonation, and stress of the language, learners can distinguish the meaning of utterances and gain confidence in learning foreign language (Renukadevi, 2014).

According to Dunkel (1991), the ‘polestar’ of second language acquisition is listening skill. Through listening comprehension, it can eliminate learners’ pressure so as to facilitate language skills (Ibrahim, 2017).

2.1.1 The Current Situation of English Listening Learning

Listening is the most important skill in language learning. Renukadevi (2014) claimed that listening is the concrete basis for language learning and it plays a significant role in

communication. It is also the key to provide meaningful and valuable response in a dialogue. Before the 1970s, listening was regarded as a process of passively digesting speaker's speech messages. As Nunan, Miller & Baltova (1997) indicated listening is so-called "Cinderella skill" in language learning and it is often neglected by its big sister- speaking. At present, listening is regarded as a process to interact, reinterpret, and construct meaning from counterpart. When listeners received the message from the speakers, they could actively use their background knowledge to understand the topic of the conversation (Murphy, 1991). Without good listening skills, communication will not be smoothly proceeded (Renukadevi, 2014).

2.1.2 The Dilemma of English Listening Learning

When an EFL learner communicates with a foreigner, she/he often has the illusion that the English spoken by the foreigner is not the same as the English she/he hears from the school curriculum. Additionally, when an EFL learner communicates with a foreigner, if the foreigner speaks fast and combines word and word together, then the EFL learner usually cannot understand each word of the sentence well (lowerdew & Miller, 1996). In addition, because of different pronunciation and local accent, learners cannot link the words spoken by foreigners to what they have heard (lowerdew & Miller, 1996). These difficulties made them confuse, thus leading to the anxiety and difficulty of distinguishing accurately sound and meaning of words (Vandergrift & Larry, 1999; Ping, 2010). Graham (2006) claimed that listening comprehension is easy and natural to native speakers, but it usually becomes a burden for second or foreign language learners.

In English as a second language countries, learners' listening and speaking skills are often weaker than their writing and reading skills (Johnson & Wells, 2014). Particularly, listening skill is an urgent challenge for English as foreign language learners to overcome (Hsu, Hwang & Chang, 2014). However, without effective listening aids, learners may encounter difficulties in listening comprehension, and further feel frustration in learning English (Hsu, Hwang &

Chang, 2014). Hence, it is essential to find out efficient listening aids to facilitate listening comprehension.

2.2 Computer-Assisted Listening Learning System

With the development of globalization, English probably is the most important international language around the world for communicating with each other. Thus, enhancing English listening skills is definitely needed because communication will be invalid without good listening ability. Traditional listening teaching methods have been unable to meet learners' needs of effectively promoting listening abilities. Baltova(1994) indicated that audiovisual materials contain affective, attentional and motivational components to promote listening processing. Hanley and Herron (1992) argued that the use of videos in classroom can offer background information to link learners' prior knowledge, furthermore stimulate four language skills, including listening, speaking, reading, and writing (Hanley & Herron, 1992). As Tutunis (2001) said, using the computer-assisted listening learning system to diagnose the difficulties which learners encountered in the listening class can provide personal help to promote their listening comprehension performances. This is because computer assisted language learning (CALL) can offer perfectly individualized and autonomous learning (Liu & Bu, 2016).

2.2.1 Listening Learning with Film Aid

Many studies have proven that using film as a tool could improve learners' listening skills (Allan, 1985; Stempleski & Tomalin, 1990; Sherman, 2003; Li, 2012). Since the storyline in the film is shown on a screen and the sound appears at the same time, it makes the teaching materials more lively and close to learners' daily life. Moreover, Florence (2009) said that a film can provide a wealth of contextualized linguistic and realistic view of culture which provides insights into the reality of native English speakers' life.

Through visual aids such as character's facial expression and body language, a film can help learners get familiar with the language, and further enrich learning experiences (Allan, 1985; Sherman 2003; Li, 2012). Also, through the film, learners are put in the authentic situations so that they can familiarize the way of foreigner's speaking, and even supply framework and good materials for classroom discussions (Stempleski & Tomalin, 1990; King, 2002; Seferoğlu, 2008; Martín & Jaén, 2009). Learners can guess and predict the content of the film and struggle to understand main ideas of dialogue instead of endless grammar exercises (King, 2002). In consequence, a film can capture learners' attention and increase learners' motivation toward the target language (Tognozzi, 2010; Ruusunen, 2011; Zhang, 2013).

2.2.2 Listening Learning with Video Subtitles

The benefits of using films with subtitles for improving general L2 listening comprehension have been addressed well in several literatures (Krashen, 1985; Markham, 1989; Stewart & Pertusa, 2004; Abdolmajid & Firooz, 2011; Başaran & Köse, 2013; Vanderplank, 2016). Input hypothesis in the second language acquisition theory stated that language must be meaningful, understandable so that learners can pick up the language (Krashen, 1985). Subtitles can help learners understand the language and make it be a valuable resource in the process of language learning (Krashen, 1985). Films with subtitles combined with aural, visual and textual mediums can provide learners with authentic comprehensible input (Chung, 1996). Hence, using subtitles is helpful in enhancing the effectiveness of listening comprehension (Rokni & Ataee, 2014).

Subtitles won't cause visual and auditory interference. Instead, they can improve listening comprehension (Markham, 1989). Borrás and Lafayette (1994) claimed that films with subtitles can help learners swiftly connect aural forms with written forms of words than films without subtitles. In Spanish conversation class, Stewart and Pertusa (2004) found that films with target language subtitle can provide visual reinforcement to facilitate learners' listening skill. In Iran

EFL class, subtitles play a significant role in improving Iranian foreign language learners' listening comprehension, particularly in bimodal subtitling, which L2 audio and L2 subtitle present simultaneously (Rokni & Ataee, 2014). Also, many studies proved that videos with L1 or L2 subtitles are appropriate for beginners instead of advanced learners because they can use their native language to understand the content of the film (Markham, 1989; Hayati & Mohmedi, 2011). With subtitles, the low-intermediate level learners could catch up with their intermediate level peers in the no-subtitles condition (Lwo, 2012; Başaran & Köse, 2013). Many listening comprehension difficulties can be overcome by providing subtitles (Stewart & Pertusa, 2004) so that learners not only enjoy foreign language films but also promote their language skills (Vanderplank, 2016). Listening is a complicated and active interpretation process. Learners need to link what they hear to what they already know. Subtitle is a nice aid to interpret the content of a video into a personal vocabulary and link to learners' background knowledge, making it easier for learners to understand the content of the video and retain more vocabulary (Froehlich, 1988; Buck, 2001; Rost, 2002). Especially, subtitle is a bridge to connect the sound and written form of the language and to build vocabulary for reading and listening simultaneously (Buck, 2001). On this ground, the VALRS-VLM used in the study presents Chinese and English subtitles when learners replay the marked section that they cannot fully understand. Additionally, learners can learn unfamiliar vocabulary words' pronunciation, usage, and spelling from the subtitles of the marked section based on an online dictionary's guidance, so as to promote listening comprehension skills. Obviously, the advantages of subtitles will outweigh the disadvantages.

2.2.3 Video with Subtitles for Assisting Vocabulary Learning in Listening Learning

Many previous studies proved that there is a positive correlation between subtitles and unfamiliar words (Hossein, Mohammad & Zeynab, 2015). Subtitles are very helpful for learners' accidental vocabulary acquisition (Plass, et al. 1998; Wang & Shen, 2007). L1 and L2

subtitles can improve L2 learners to master word spelling and word recognition (Wang& Shen, 2007). Borrás and Lafayette (1994) further pointed out that video with subtitles can help learners verbatim recall and reuse vocabulary in proper context.

Snyder and Colon (1988) claimed that foreign language learners who expose to audiovisual aids perform much better in vocabulary and listening comprehension than learners not exposing to them. Kaboocha's (2016) study in Arabia indicated that videos provide rich information of vocabulary, phrases, and colloquial expressions for learners to acquire language. Ahour and Bargool (2015) confirmed that both listening note and listening summary writings could enhance learners' listening comprehension (Ahour & Bargool, 2015) because annotations helped learners organize aural materials in working memory. Via picture and written annotations, learners can connect information which stays in temporary memory to aural messages, and last store information in long-term memory (Jones & Linda, 2013). In addition, a study conducted in German language courses, learners comprehended the content of text better when they accept visual and verbal annotation aids (Plass, et al. 1998).

2.3 Vocabulary Learning for Assisting in Listening Learning

Several previous studies confirmed that the weakness of listening comprehension is due to the inability to identify the keywords (Palmer& Goetz, 1988), identify the unfamiliar pronunciation (Goh, 2000), and have the limited amount of vocabularies (Vandergrift & Goh, 2012). Actually, listening is a relatively complicated process despite the help of modern technology. This is because learners need to distinguish sound of words, understand the meaning of vocabulary, identify stress, intonation and sentence structure, and the cultural background of the context in performing a listening comprehension process (Vandergrift, 1999). Nation (2001) indicated that vocabulary is necessary for each stage of language learning. As for complete word knowledge, it is composed of word form recognition and using properly

in the context (Nation, 2001; Read, 2000). Besides, several studies revealed that captioned video could stimulate vocabulary learning. (Danan, 1992; Sydorenko, 2010; Chen, 2016).

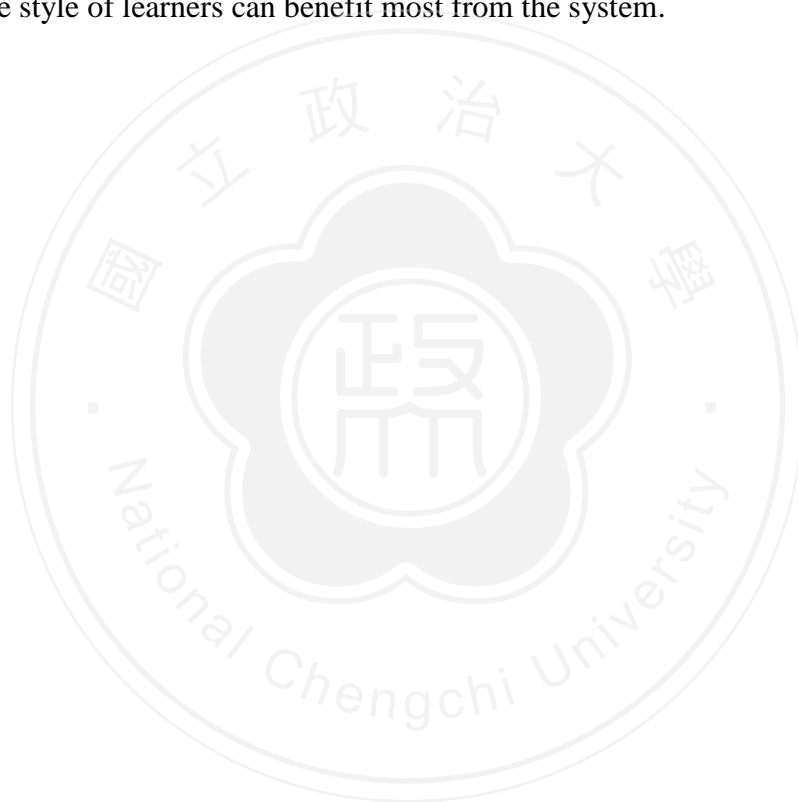
Consequently, video with subtitles assisted vocabulary learning mechanism in language learning is expected to enhance learners' vocabulary acquisition and further improve their listening comprehension.

2.4 Effects of Learners with Different Cognitive Styles on Learning Performance

Learners with different cognitive styles may have different effects on their listening performances while practicing a listening learning with technology support, particularly for field-dependence and field-independence learners. The two cognitive styles are bipolar and stable affecting people's thought and behaviors (Witkin, 1977). Learners with field-dependence tend to focus on whole thing of the learning materials, whereas learners with field-independence tend to focus on particular point and not distracted by the background or context (Wu, 1987; Richards, Platt & Platt, 1992; Xu, 2011). Field-independence learners have analytic, constructive, and confident personality. They are more likely to become excellent listeners since they often use various strategies to solve problems. In contrast, field-dependence learners rely on internal rules depended on others (Wu, 1987; Witkin, 1977; Ahmadi & Yamini, 2003). There is a significant linear relationship between cognitive styles and learning English (Nozari & Siamian, 2014).

In Iranian EFL learners' listening comprehension ability, Yousefi (2011) claimed that higher scores on the GEFT led to an increase in the Field-dependence learners' TOFEL scores. As for Field-independence learners did better on the longer conversations of the second and the third parts of the TOEFL listening test. Besides, cognitive style has strong relationship with learners' translation achievement. Field-independence learners did better on the translation task than Field-dependence learners (Keshmandi, et al. 2015). Also, Nozari & Siamian (2014) indicated that the more field independent, the higher the reading comprehension skills.

Cognitive strategy should be blended in the listening class so as to help learners find solutions to overcome their hearing problems (Mulyadi, Rukmini & Yuliasri, 2017). Recognizing learner's cognitive style, learning preference and learning styles to develop appropriate learning materials and suitable teaching method can promote learners' learning performance and raise their learning motivation (Gilakjani, 2011; Xu, 2011; Hamdani, 2015; Mulyadi, Rukmini, & Yuliasri, (2017). Therefore, developing a better learning method to reduce cognitive burden of learners is what we need to concern. In short, the study aims to assess whether the VALRS-VLM can improve learners' listening comprehension and find out which cognitive style of learners can benefit most from the system.



CHAPTER 3 RESEARCH METHODOLOGY

Based on the quasi-experimental design method and questionnaire survey, the study confirmed whether learners who used the VALRS-VLM to support English listening learning could have significantly better effects on the listening comprehension performance, learning satisfaction, technology acceptance, and cognitive load than those who used the VALRS-NVLM. This chapter contains six sections including the research architecture, research design, research participants, experimental procedure, research instruments, and data analysis schemes. They are detailed as follows:

3.1 Research Architecture

The research architecture of the study is shown as Figure 3.1 and the detailed descriptions of variables considered in the research architecture are explained as below.

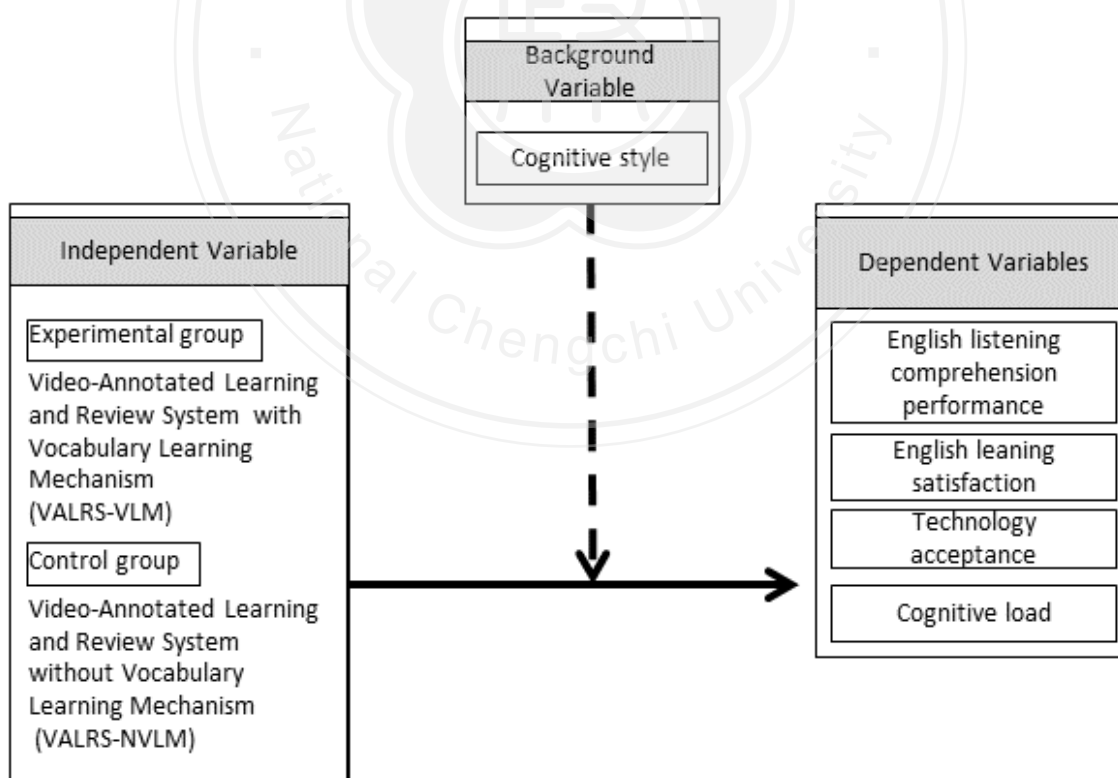


Figure 3.1 The research architecture of the study

3.1.1 Independent Variable

The independent variable of the study is a video-annotated learning and review system with or without vocabulary learning mechanism. The experimental group used the video-annotated learning and review system with vocabulary learning mechanism (VALRS-VLM) to review the listening content of a video, whereas the control group used video-annotated learning and review system without vocabulary learning mechanism (VALRS-NVLM) to review the listening content of a video.

3.1.2 Dependent Variable

The dependent variables of the study contain the English listening comprehension performance, cognitive load, English learning satisfaction, and technology acceptance. Each dependent variable is detailed as below.

(1) English listening comprehension performance: this dependent variable is the most important variable of the study. The assessment of English listening comprehension performance in this study was divided as two rounds. Summarized assessments were carried out after the end of listening text in each round. Through these assessments, this study examined if different listening review mechanisms would affect learners' English listening comprehension performance.

(2) Cognitive load: The cognitive load scale could measure learners' mental load and mental effort of using different listening review mechanisms.

(3) English learning satisfaction: based on the learning satisfaction questionnaire adapted from Chen's (2016) learning model satisfaction questionnaire and Chu, Hwang, Tsai & Tseng's (2010) questionnaire items for perception of participating in the u-learning activity, this study investigated learners' learning satisfaction toward using different listening review mechanisms.

(4) Technology acceptance: through technology acceptance questionnaire adapted from Chen (2016), this study examined learners' technology acceptance including cognitive usefulness and cognitive easiness toward using different listening review mechanisms.

3.1.3 Background Variable

Cognitive Style: The study adopted the Group Embedded Figures Test (GEFT) from Wu (1987) which was adapted from Witkin, Oltman, Paskin and Karp (1977) to identify students as field-independent and field-dependent cognitive styles. The learners were identified as field-dependence if the GEFT scores that they got are higher than a half standard deviation of the mean. Conversely, learners were identified as field-independence if the GEFT scores that they got are lower than a half standard deviation of the mean. The aim was to examine if learners with different cognitive styles using different listening review mechanisms to proceed English listening learning affected their listening comprehension performance, learning satisfaction, technology acceptance, and cognitive load.

3.2 Research Participants

A total of seventy four Grade 6 students aged from eleven to twelve were randomly chosen from four classes of a public primary school in Northern Taiwan as the research participants in the study. According to the English Basic Competence Test for Elementary School, they have the same initial English listening proficiency.

Two classes with thirty eight students were randomly assigned to the experimental group using the VALRS-VLM to support English listening learning, while the other two classes with thirty six students were assigned to the control group using VALRS-NVLM to support English listening learning. Additionally, the research participants were requested to fill out the GEFT to identify their cognitive styles as field-independent (FI) or field-dependent (FD) cognitive style before performing the instructional experiment. As the result, there were forty three students as field-independent and the other thirty one students as field-dependent. In the period

of the instructional experiment, both the groups listened to the same English listening video but used different listening review mechanisms to support English listening learning.

3.3 Experimental Procedures

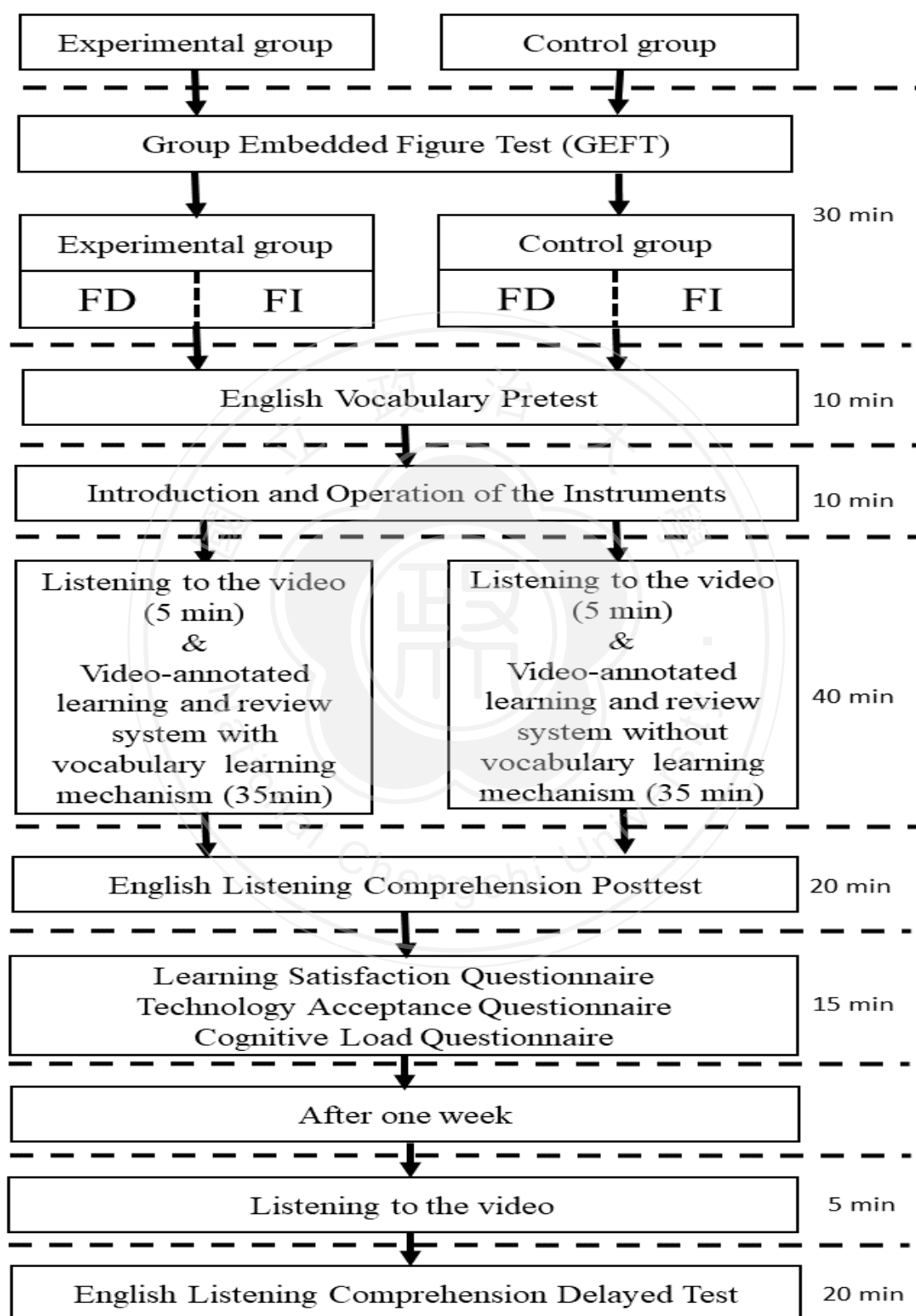


Figure 3.2 Experimental procedures of the study

A total of seventy four primary school students from four classes participated in the research. Two classes were randomly assigned as the experimental group who used the VALRS-VLM as an assisted tool to support their English listening learning. The other two class were assigned as the control group who used the VALRS-NVLM as an assisted tool to support their English listening learning.

In the beginning of the instructional experiment, the researcher introduced what the experiment would be carried out, including the purpose of the experiment for five minutes. After that, learners in both the groups would fill in Group Embedded Figure Test (GEFT) in thirty minutes. The test aimed to identify learner's cognitive styles and further examine whether using different video-annotated listening review mechanisms generated different effects on listening comprehension performance for learners with FI and FD cognitive styles. English vocabulary pretest was carried out in ten minutes afterwards. The test aimed to examine whether both the groups were at the same level of English listening proficiency before performing the instructional experiment.

Before the formal experiment, this researcher would introduce the whole procedures about the instructional experiment to learners in both the groups so as to help them clearly understand the details of the research so that the experimental procedures could be in progress smoothly and successfully. Besides, the researcher would demonstrate how to operate VALRS-VLM and VALRS-NVLM for the experimental group and control group, respectively. Both the groups had five minutes to get familiar with the listening review mechanisms respectively used.

During the formal experiment, two groups watched the same video for five minutes in order to have whole picture about the contents conveyed from the video. After that, there were given thirty five minutes to review the content of the video with VALRS-VLM or VALRS-NVLM support. In the reviewing time, both the groups could use all of the functions provided by the VALRS-VLM or VALRS-NVLM such as clicking the "pause" button when learners could not catch up the contents of the video and repeated the unfamiliar sections immediately

or later by using the two review modes and clicking on the button of the subtitle to enable or disable displaying English or Chinese translation.

As for the experimental group, there was a specific mechanism to assist their listening learning. While clicking on the “mark the present time and immediately replay” button for a video section, the system would immediately replay the video section and display its English and the corresponding Chinese subtitles. Learners could annotate the unfamiliar words from the English subtitles by clicking with the mouse, and then they would be collected into a personal vocabulary word list. These unfamiliar words could be looked up by using the on-line dictionary. Via using the mechanism, learners not only could understand the meaning and the usage of the vocabulary word but also clarify the pronunciation of the vocabulary word. After finishing the review time, learners would conduct an English listening comprehension posttest immediately to assess their listening comprehension performance. Finally, all of the learners were invited to fill in the learning satisfaction questionnaire, technology acceptance questionnaire, and cognitive load scale.

The duration of the experiment lasted for two weeks from the beginning “the introduction and operation of the instruments” to the end “the English listening comprehension delayed test.” Learners in both the groups could use the listening review system to annotate their unfamiliar sections for reviewing the video sections once a week. In order to examine the listening comprehension performance without any scaffolding support, i.e. different listening review mechanisms, after one week, both the groups just listened to the video again and took the English listening comprehension delayed test immediately without any review time.

3.4 Research Instruments

3.4.1 Video-Annotated Learning and Review System

The Video-annotated learning and review system, abbreviated to VALRS, is an online English listening learning review system executed only by Google Chrome browser due to

using some functions provided by this kind of browser. Learners can give a URL address of a video from the Internet and play it on the system for English listening learning. While playing the video, if learners cannot clearly understand what a video section in the video says, then they can click on the “mark the present time” button to mark the present time of the video section into a playing list. Chinese and English subtitles for the video section would appear below the system if a learner enables the setting of displaying subtitle. Learners could choose replay the video sections marked immediately or later. The main features of this mechanism were shown in the following figures.

Before entering the VALRS, a pop-up window with an input box will come into a learner’s view as shown in Figure 3.3. The learner needs to input her/his names to the input box in order to create the learning portfolio of the learner.

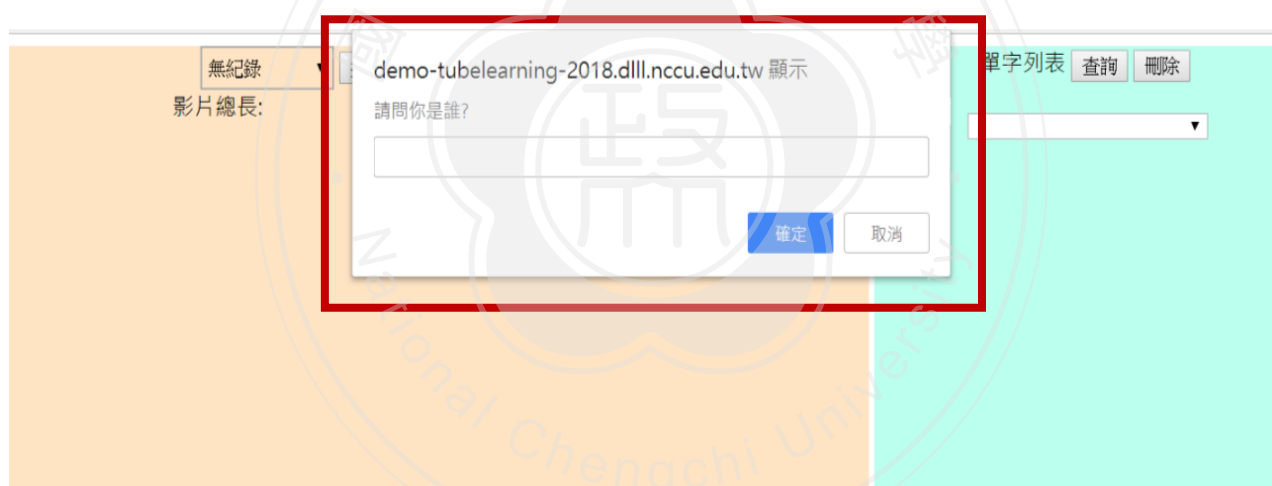


Figure 3.3 The input box of user name in the Video-Annotated Learning and Review System

There were two main features in the user interface of the VALRS, one is function setting, and the other one is review mark and playing setting.

3.4.1.1 The Function Setting of the System

As revealed in Figure 3.4, when a learner logs in the system, the learner’s name and the length of the video are displayed at the top area of the window. The video is played in the middle area of the screen. After playing the video for a listening practice, a learner can

determine whether the video or subtitles (Chinese and English) are displayed on the corresponding area of the screen or not by setting the corresponding check boxes for enabling or disabling these functions. Also, the learner can adjust the volume at any time when she/he wants; the current volume value will be displayed at the top area of the window.



Figure 3.4 The user interface of function setting in the Video-Annotated Learning and Review System

3.4.1.2 Review, Mark and Playing Setting of the System

There are two different functions of this part. Those are review mark setting and playing setting, which are as shown in Figure 3.5.

Feature 2



Figure 3.5 The user interface of mark and playing setting in the Video-Annotated Learning and Review System

3.4.1.2.1 The Review and Mark Setting of the Immediate Review Mode

The review and mark setting of the immediate review mode is consisted of three functions. One is “play/pause”, another one is “mark the present time for delayed review”, the other one is “mark the present time and immediately replay” as shown in Figure 3.6.

While playing a video, a learner can mark the present time and immediately replay if she/he cannot clearly understand the current content of the video section that is playing. Also, the learner can only mark the present time as well as automatically record the present time and put the time stamp of the present time into the “review time list” without replaying the video for reviewing them later by clicking on the corresponding time stamp.

As using “mark the present time and immediately replay” button, the learner can mark any video section which she/he feels hard to understand and replays it repeatedly until she/he clicks on “remove replay” button, the video will play it backward.



Figure 3.6 The user interface of review and mark setting of the immediate review mode in Video-Annotated Learning and Review System

3.4.1.2.2 The Playing Setting of the Delayed Review Mode

As revealed in Figure 3.7, the playing setting of the delayed review mode is consisted of three functions, which are respectively “play the marked section”, “delete the marked section” and “replay all the marked sections.” When a learner proceeds to review the video sections marked by herself/himself, the learner can pick up the time stamp from the “review time list” and click on “play the marked section” button. The system will immediately jump to the marked section and play the video section. Also, the learner can click on “replay the marked section” button to clarify uncertain part anytime until she/he makes fully sense of the part. Then, she/he can click on the “delete the marked section” to remove the recorded time stamp if she/he has understood the video section already. Through this mechanism, the learner can be apparently aware of the progress in the listening ability.



Figure 3.7 The user interface of the playing setting of the delayed review mode in Video-Annotated Learning and Review System

3.4.1.3 The Vocabulary Learning Mechanism

The vocabulary learning mechanism from Cambridge online dictionary, which combines the experience and expertise of two world-leading departments of the University of Cambridge, is specially designed for learners to clarify unfamiliar vocabulary meaning and pronunciation that appear in a listening video section as shown in Figure 3.8. First, a learner can mark a listening video section that cannot fully understand, and then the system will show the Chinese and English subtitles of the video section immediately if the learner enables the settings of displaying the Chinese and English subtitles. Second, the learner can click on the unknown English vocabulary word twice by using the mouse, and then the system will collect the word into the personal vocabulary list on the right side area of the user interface. Next, if the learner chooses the word from the personal vocabulary list and clicks on the “Inquire” button, then the Cambridge online dictionary will receive the inquired word from the learner and will provide the Chinese translation, explanation, pronunciation, and usage examples of the word. Besides, if the learner marks the same word in the different video sections, then the system will display the frequency of the word that is selected as unfamiliar word on the top area of the personal vocabulary list. If the learner has already acquired the word, she/he can click on the “Delete” button. The word will be remove from the personal vocabulary list.

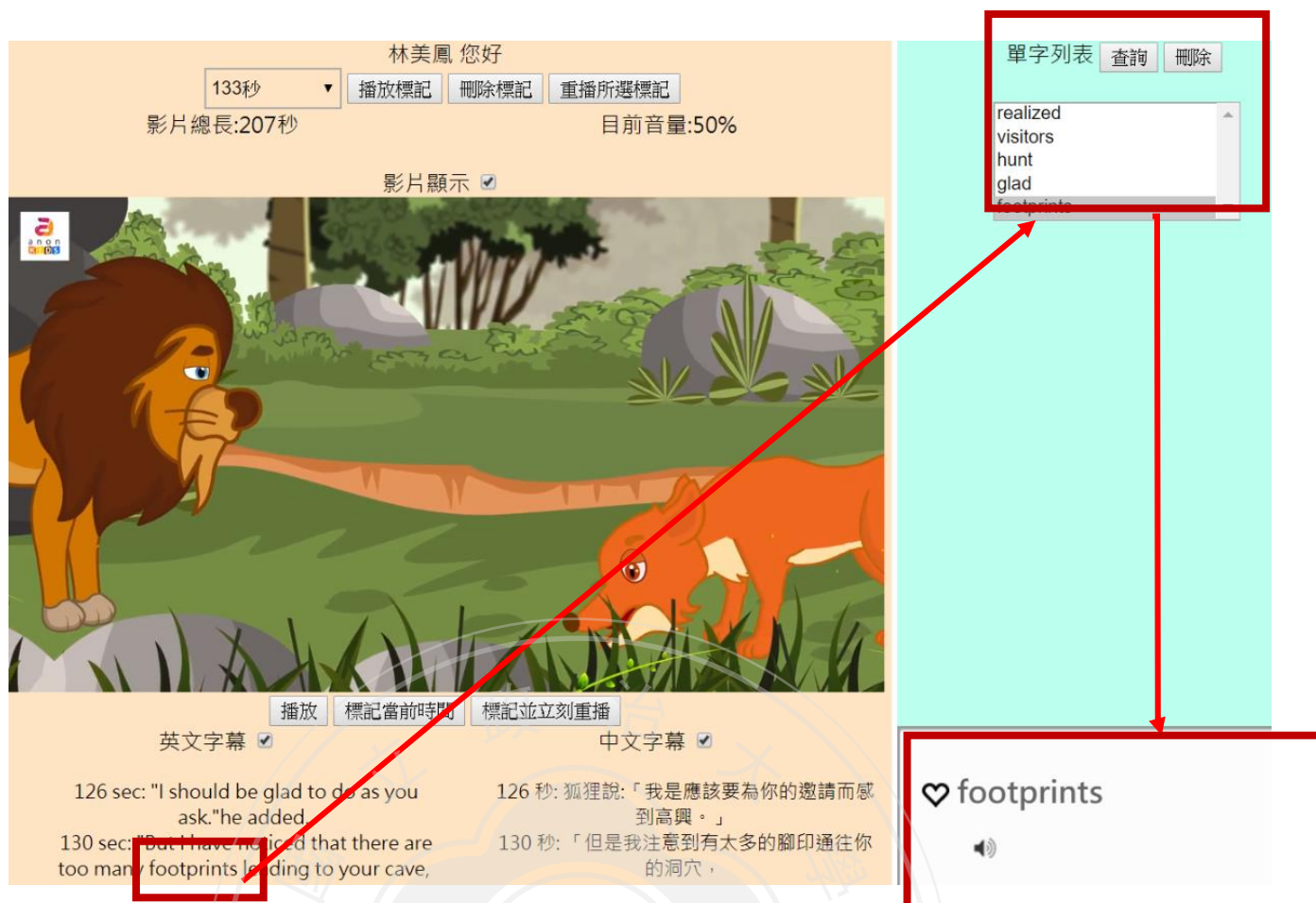


Figure 3.8 The learning interface of unfamiliar vocabulary word identified by a learner from a listening video section played in the Video-Annotated Learning and Review System

3.4.2 English Listening Material

The English listening video used in the study as a listening material was chosen from YouTube as well as the video should meet three conditions. One is the video should be creative common without copyright problems. Second is the video provides with Chinese and English subtitles simultaneously. Last, considering that the research participants are primary school students, the listening video is a short moral story and meets their English listening levels.

In the instructional experiment, the learners in both the groups participated in two rounds of listening training. Each training round includes one English listening video and its corresponding English listening comprehension test. The length of each English listening video is about three to five minutes and the video materials were chosen from YouTube. According to Krashen's input hypothesis, learners' language competence will be improved when they

receive second language “input” that is one step beyond their linguistic competence of the current stage (Krashen, 1977). Therefore, the contents of all English listening videos are one step beyond learners’ current English competence and the questions of English listening comprehension tests are from the same English listening video. The learners in the control group and experimental group listened to the same listening English videos and conducted the same English listening comprehension tests.

3.4.3 Group Embedded Figure Test (GEFT)

The Group Embedded Figure Test (GEFT) used in this study is a group personality test complied by scholar Wu (1987) and modified by Witkin (1977). GEFT has good reliability of 0.82. The purpose of GEFT is to identify learners’ cognitive style into field-independent and field-dependent learners. The field-independent learners have clear perception and are less affected by the external environment. They focus on internal thinking. On the other hand, field-dependent learners are easily affected by external environment.

The GEFT (see Appendix A) was divided into three parts. The testing time of the first part is four minutes. It contains seven simple questions for practicing so that learners get familiar with question type. The first part is not considered as the test’s score. The second and the third parts are the formal tests. There are nine questions for each part, and the testing time is eight minutes. There is a simple graphic number code below the complex graphic of each question. When answering, learners can turn to the cover to see the overall simple figure. Learners need to find out all the hidden simple graphs from the complex graph. The hidden simple graphs, in the size, proportion, and direction, are the same with the simple graphs on the cover. In order to get the score, learners need to outline the simple graph with a pencil. The test score is out of eighteen points. One correct answer gets one point. The scores of the second and third parts are learners’ test scores. The higher score that learners get represents the more independent personality characteristic they have. This study classified learners into three different cognitive

styles via the result of the test. If learners' test scores are equal or higher than mean score, the learners will be identified as field-independent learners. If learners' test scores are lower than mean score, the learners will be identified as field-dependent learners. The others are identified as intermediate learners.

3.4.4 English listening comprehension tests

English listening comprehension tests included English vocabulary pretest, English listening comprehension posttest and English listening comprehension delayed test. The English vocabulary pretest was composed of twelve multiple choice questions and the test time lasted for ten minutes. Both the experimental group and control group carried out the test before the experiment. As for English listening comprehension posttest and English listening comprehension delayed test, they were composed of twenty- twenty-two multiple choice questions and the test time of each comprehension test lasted for twenty minutes. Both the experimental group and control group carried out the test after they finished listening to the video.

The format of these English listening comprehension tests were similar to General English Proficiency Test (GEPT) (see appendix B). The purpose of the tests is to examine the effects of two different review mechanisms on the participants' listening comprehension.

3.4.5 Learning Satisfaction Questionnaire

The purpose of the learning satisfaction questionnaire is to examine learners' attitude toward using two different review systems. The questionnaire was adapted from Chen et al. study (2016) (see appendix C). Six questions are included in the questionnaire. All of the questions are evaluated based on five-point Likert scale, ranging from "strongly agree" with five points to "strongly disagree" with one point. On the last day of the instructional experiment,

the test was conducted after the research participants finished English listening comprehension test.

3.4.6 Technology Acceptance Questionnaire

The purpose of the technology acceptance questionnaire is to examine learners' usage perception toward the user interface of VALRS-VLM and VALRS-NVLM. The questionnaire was adapted from Chen et al. study (2016) (see appendix D). Five questions are included in the questionnaire. The experimental group needed to answer extra one question about the usage of VALRS-VLM. All of the questions are evaluated based on five-point Likert scale, ranging from "strongly agree" with five points to "strongly disagree with one point." The test was conducted after finished the experiment. The Cronbach's alpha value of the questionnaire examined by the research subjects of the study was 0.858. The result confirms that the technology acceptance questionnaire used in the study has satisfied reliability.

3.4.6 Cognitive Load Scale

The purpose of the cognitive load scale is to examine learners' mental load and mental effort toward using the user interface of VALRS-VLM and VALRS-NVLM. The questionnaire was adapted from Chen et al. study (2016) (see appendix E). There are six questions included in the questionnaire. These questions are evaluated based on five-point Likert scale, ranging from "strongly agree" with five points to "strongly disagree with one point." The test was conducted after finished the experiment. The Cronbach's alpha value of the questionnaire examined by the research subjects of the study was 0.666. Although the Cronbach's alpha value of the questionnaire is lower than 0.7, the value is very close to 0.7. The result shows that the cognitive load scale used in the study has a pretty good reliability.

3.5 Data Analysis

The purpose of the study was to investigate whether there are significant differences in English listening comprehension performance, English learning satisfaction, technology acceptance, and cognitive load between the learners and learners with different cognitive styles in the experimental group and control group respectively using VALRS-VLM and VALRS-NVLM for English listening learning. The statistical analysis methods used to examine the above research questions are described as follows.

First, the study adopted the independent samples t-test to examine whether the learners in both the groups have the same initial level of English listening proficiency before performing the instructional experiment. Second, in order to investigate whether there are significant differences in English listening comprehension performance, English learning satisfaction, technology acceptance, cognitive load, and learning retention between the learners in both the groups who respectively used the VALRS-VLM and VALRS-NVLM for English listening learning. The study used analysis of covariance (ANCOVA) to assess the difference in English listening comprehension performance between both the groups as well as used independent sample t-test to assess the difference in English learning satisfaction, technology acceptance, and cognitive load between both the groups.

Also, in order to investigate whether there are significant differences in English listening comprehension performance, English learning satisfaction, technology acceptance, cognitive load, and learning retention between the learners with different learning styles in both the groups who respectively used the VALRS-VLM and VALRS-NVLM for English listening learning. The study used ANCOVA to assess the difference in the English listening comprehension performance between both the groups as well as used independent sample t-test to assess the difference in English learning satisfaction, technology acceptance, and cognitive load between both the groups.

CHAPTER 4 EXPERIMENTAL RESULTS

The purpose of this study is to investigate the differences of learners' English listening comprehension performance, learning satisfaction, technology acceptance, cognitive load, and learning retention between the experimental group learners using the VALRS-VLM and the control group learners using the VALRS-NVLM for English listening learning.

In this chapter, the comparisons of English listening comprehension performance, learning retention, learning satisfaction, technology acceptance questionnaire, and cognitive load between the VALRS-VLM group and the VALRS-NVLM group and between the two groups with different cognitive styles were conducted. At the end, the discussion was made according to the results of the experimental analysis.

4.1 The Analysis of Learners' Initial English Proficiency of Both the Groups before the Experiment

To examine whether learners of the VALRS-VLM group and the VALRS-NVLM group had the same initial English proficiency before the experiment, the independent-samples *t* test analysis was first employed to compare learners' English listening comprehension scores of the English vocabulary pretest scores between the two groups. The results are presented in Table 4.1.1.

As shown in Table 4.1.1, the English vocabulary pretest score of the VALRS-VLM group ($M=16.71$, $SD=3.17$) and that of the VALRS-NVLM group ($M=16.75$, $SD=2.91$) did not differ significantly ($t=-.06$, $p=.956 > .05$) either, indicating that the initial vocabulary levels of both the groups before the experiment were the same.

Table 4.1.1 The independent-samples t test result of the English vocabulary pretest between both the groups

Assessment	Group	N	M	SD	<i>t</i>	<i>p</i>
English vocabulary pretest	VALRS-VLM	38	16.71	3.17	-.06	.956
	VALRS-NVLM	36	16.75	2.91		

4.2 Comparisons of English Listening Comprehension Posttest between Both the Groups' Learners

One-way analysis of covariance (ANCOVA) herein was conducted to examine whether there were significant differences in learners' English listening comprehension posttest between the learners in the VALRS-VLM group and the VALRS-NVLM group. The English vocabulary pretest was used as the covariate in the analysis. The result of ANCOVA was presented as follow.

4.2.1 Comparison of English Listening Comprehension Posttest between Both the Groups' Learners by Using ANCOVA with the English Vocabulary Pretest as the Covariate

Before conducting ANCOVA, the homogeneity of regression coefficients was analyzed first. The result shows the assumption of homogeneity of regression coefficients was supported ($F=.04$, $p=.835 > .05$). The ANCOVA was then proceeded by using pretest of the English vocabulary as the covariate in the analysis. The result is shown in Table 4.2.1. After controlling the effect of learners' pretest of the English vocabulary, the mean score of the VALRS-VLM group was significantly higher than that of the VALRS-NVLM group ($F=16.61$, $p=.000 < .01$). The result shows that excluding pretest differences, learner's English listening comprehension posttest of the VALRS-VLM group was significantly superior to that of the VALRS-NVLM group.

Table 4.2.1 The ANCOVA result of English Listening Comprehension Posttest between both the groups' learners by using the English vocabulary pretest as the covariate

Assessment	Group	N	Pretest M	Pretest SD	Posttest M	Posttest SD	<i>F</i>	<i>p</i>
English Listening Comprehension Posttest	VALRS -VLM	38	16.71	3.16	27.81 ^a	3.8	16.61***	.000
	VALRS -NVLM	36	16.75	2.91	25.07 ^a	4.01		

*** $p < .001$; ^a =adjusted mean

4.3 Comparison of English Listening Comprehension Posttest between Both the Groups' Learners with Different Cognitive Styles

To investigate whether the VALRS-VLM and the VALRS-NVLM benefit differently for both the groups' learners with different cognitive styles, the English listening comprehension scores of both the groups' learners with different cognitive styles were compared by using ANCOVA. The learners' cognitive styles were identified by their GEFT scores. Learners were classified as field-independent (FI) cognitive style if their GEFT scores were equal or higher than the average score of their group; learners were classified as field-dependent (FD) cognitive style if their GEFT scores were lower than the average score of their group. The English vocabulary pretest was used as the covariate in the analysis. The ANCOVA results of the English listening comprehension posttest of both the groups' learners with different cognitive styles were presented as follows.

4.3.1 Comparisons of English Listening Comprehension Posttest between Both the Groups' Learners with Different Cognitive Styles by using the English Vocabulary Pretest as the Covariate

Before conducting ANCOVA, the homogeneity of regression coefficients was examined first. The result shows the assumption of homogeneity of regression coefficients was supported for both the groups' learners with field-independent and field-dependent cognitive styles ($F=.11, p=.774 > .05$; $F=.62, p=.438 > .05$). The ANCOVA was then proceeded by using the

English vocabulary pretest as the covariate in the analysis. The results are shown in Table 4.3.1. After controlling the effect of learners' pretest of the English vocabulary, the mean scores of the VALRS-VLM group were significantly higher than that of the VALRS-NVLM group for both the groups' learners with field-independent and field-dependent cognitive styles ($F=7.32$, $p=.01<.05$; $F=9.14$, $p=.005<.01$). These findings also confirmed that learners' English listening comprehension could be promoted significantly when they used VALRS-VLM for English listening learning regardless of their cognitive styles as field-independence and field-dependence.

Table 4.3.1 The ANCOVA results of English Listening Comprehension Posttest between both the groups' learners with different cognitive styles by using English Vocabulary Pretest as the covariate

Cognitive Style	Group	N	Pretest M	Pretest SD	Posttest M	Posttest SD	<i>F</i>	<i>p</i>
Field-Independence	VALRS-VLM	21	17.1	3.46	28.44 ^a	3.58	7.32*	.01
	VALRS-NVLM	22	17.59	3.19	26.12 ^a	4.12		
Field-dependence	VALRS-VLM	17	16.24	2.77	26.92 ^a	4.10	9.14**	.005
	VALRS-NVLM	14	15.43	1.83	23.53 ^a	3.04		

* $p<.05$; ** $p < .01$; ^a =adjusted mean

4.3.2 Intra- comparisons of English Listening Comprehension Posttest between Both the Groups' Learners with Different Cognitive Styles by using the English Vocabulary Pretest as the Covariate

Before conducting ANCOVA, the homogeneity of regression coefficients was examined first. The result shows the assumption of homogeneity of regression coefficients was supported for both the groups' learners with field-independent and field-dependent cognitive styles ($F=.48$, $p=.493 >.05$; $F=.34$, $p=.563 >.05$). The ANCOVA was then proceeded by using the English vocabulary pretest as the covariate in the analysis. The results are shown in Table 4.3.2.

After controlling the effect of learners' pretest of the English vocabulary, the mean scores of the VALRS-VLM group were not significantly different from those of the VALRS-NVLM group for both the groups' learners with field-independent and field-dependent cognitive styles ($F=.09$, $p=.761>.05$; $F=1.62$, $p=.212>.05$). These findings confirmed that there was no difference in the intra-group performance between two groups learners with different cognitive styles.

Table 4.3.2 The ANCOVA results of intra-group comparison of the English listening comprehension posttest between both the groups' learners with different cognitive styles by using English Vocabulary Pretest as the covariate

Group	Cognitive Style	N	Pretest M	Pretest SD	Posttest M	Posttest SD	<i>F</i>	<i>p</i>
VALRS-VLM	Field-Independence	21	17.1	3.46	27.91 ^a	3.58	.09	.761
	Field-dependence	17	16.24	2.77	27.64 ^a	4.10		
VALRS-NVLM	Field-Independence	22	17.59	3.19	25.64 ^a	4.12	1.62	.212
	Field-dependence	14	15.43	1.83	24.21 ^a	3.04		

4.4 Comparisons of English Learning Satisfaction, Technology Acceptance and Cognitive Load between Both the Groups

To evaluate whether there were significant differences in the English learning satisfaction, technology acceptance, and cognitive load between the VALRS-VLM and VALRS-NVLM groups, the independent-samples *t* test was employed to analyze the data.

As shown in Table 4.4.1, the mean scores of learners' English learning satisfaction ($t=.10$, $p=.918>.05$), technology acceptance ($t=.46$, $p=.65>.05$) and cognitive load ($t=-.62$, $p=.535>.05$) of the VALRS-VLM group were not significantly different from those of the VALRS-NVLM group. The results indicate that no matter which the listening comprehension learning schemes considered in this study had the same degree of English learning satisfaction, technology acceptance, and cognitive load. Additionally, the mean scores of learners' English learning

satisfaction and technology acceptance were higher than the median (median = 3) of a five-point Likert scale for both groups, indicating that both the groups' learners satisfied the VALRS and perceived the system as helpful and easy to use for learning, regardless of VALRS with or without VLM. Additionally, both groups' mean scores of cognitive load were lower than the median (median = 3) of a five-point Likert scale, indicating that when learners used either VALRS-VLM or VALRS-NVLM, they did not experience a high level of mental load and would not have to devote too much mental effort that they might feel less stressful in using the systems.

Table 4.4.1 The independent-samples *t* test results of English learning satisfaction, technology acceptance and cognitive load between the both groups

Assessment	Groups (N)	N	M	SD	<i>t</i>	<i>p</i>
English Learning Satisfaction	VALRS-VLM	38	3.64	.56	.10	.918
	VALRS-NVLM	36	3.62	.99		
Technology Acceptance	VALRS-VLM	38	3.85	.67	.46	.65
	VALRS-NVLM	36	3.75	1.11		
Cognitive Load	VALRS-VLM	38	2.63	.66	-.62	.535
	VALRS-NVLM	36	2.74	.77		

4.5 Comparisons of English Learning Satisfaction, Technology Acceptance and Cognitive Load between Both the Group's Learners with Different Cognitive Styles

To evaluate whether there were significant differences in the English learning satisfaction, technology acceptance, and cognitive load between both the groups' learners with different cognitive styles, the independent-samples *t* test was employed to analyze the data. As shown in Table 4.5.1, the mean scores of learners' English learning satisfaction, technology acceptance, and cognitive load of the VALRS-VLM group were not significantly different from those of the VALRS-NVLM group, regardless of both the groups' learners with field-independent or field dependent cognitive style.

Table 4.5.1 The independent-samples t test results of English learning satisfaction, technology acceptance, and cognitive load between both the groups' learners with different cognitive styles

Assessment	Cognitive Style	Groups (N)	N	M	SD	<i>t</i>	<i>p</i>
English Learning Satisfaction	Field-Independence	VALRS-VLM	21	3.63	.52	-.62	.539
		VALRS-NVLM	22	3.46	1.12		
	Field-Dependence	VALRS-VLM	17	3.66	.63	-.88	.387
		VALRS-NVLM	14	3.87	.73		
Technology Acceptance	Field-Independence	VALRS-VLM	21	3.71	.77	-.16	.872
		VALRS-NVLM	22	3.76	1.15		
	Field-Dependence	VALRS-VLM	17	4.01	.48	.95	.348
		VALRS-NVLM	14	3.73	1.1		
Cognitive Load	Field-Independence	VALRS-VLM	21	2.54	.59	-.83	.41
		VALRS-NVLM	22	2.70	.70		
	Field-Dependence	VALRS-VLM	17	2.75	.73	-.13	.895
		VALRS-NVLM	14	2.79	.90		

4.6 Comparisons of Learning Retention between Both the Groups by Using ANCOVA

One-way analysis of covariance (ANCOVA) was used to examine whether there was significant difference in the learning retention between both the groups. The English vocabulary pretest was used as the covariate in the analysis. The result of ANCOVA was presented as follow.

4.6.1 Comparisons of Learning Retention between Both the Groups' Learners by using ANCOVA with English Vocabulary Pretest as the Covariate

Before conducting ANCOVA, the homogeneity of regression coefficients was analyzed first. The result shows the assumption of homogeneity of regression coefficients was supported ($F=.03$, $p=.862 > .05$). The ANCOVA was then proceeded by using the pretest of the English vocabulary as the covariate in the analysis. The result is shown in Table 4.6.1. After controlling the effect of learners' pretest of the English vocabulary, the mean score of the VALRS-VLM group was significantly higher than that of the VALRS-NVLM group ($F=6.59$, $p=.012 < .01$). This finding also confirmed that learners' learning retention was promoted significantly when

they used VALRS-VLM for English listening learning.

Table 4.6.1 The ANCOVA result of the English listening comprehension delayed test between both the groups' learners by using the English vocabulary pretest as the covariate

Assessment	Group	N	Pretest M	Pretest SD	Delayed test M	Delayed test SD	<i>F</i>	<i>p</i>
English listening comprehension delayed test	VALRS-VLM	38	16.71	3.16	26.84 ^a	.63	6.59*	.012
	VALRS-NVLM	36	16.75	2.91	24.51 ^a	.65		

* $p < .05$; ^a =adjusted mean

4.7 Comparisons of Learning Retention between Both the Groups' Learners with Different Cognitive Styles

One-way analysis of covariance (ANCOVA) was conducted to examine whether there were significant differences in learners' learning retention performance between both the groups' learners with different cognitive styles. The English vocabulary pretest was used as the covariate in the analysis. The results of ANCOVA were presented as follows.

4.7.1 Comparisons of Learning Retention between Both the Groups' Learners with Different Cognitive Styles by Using ANCOVA with the English Vocabulary Pretest as the covariate

Before conducting ANCOVA, the homogeneity of regression coefficients was examined first. The result shows the assumption of homogeneity of regression coefficients was supported for both the groups' learners with field-independent and field-dependent–cognitive styles ($F=.09$, $P=.761 > .05$; $F=.01$, $p=.927 > .05$). The ANCOVA was then proceeded by using the English vocabulary pretest as the covariate in the analysis. The results are shown in Table 4.7.1. After controlling the effect of learners' English vocabulary pretest, the mean score of the

English listening comprehension delayed test of the VALRS-VLM group's learners with field independence was significantly higher than that of the VALRS-NVLM group's learners ($F=4.16, p=.048<.05$). Besides, the mean score of the VALRS-VLM group's learners with field-dependence was not significantly different from the VALRS-NVLM group's learners with field-dependence ($F=2.21, p=.149>.05$). The result shows that the VALRS-VLM group with field-independence style had significantly better learning retention than the VALRS-NVLM group with field-independence style on the listening comprehension performance.

Table 4.7.1 The ANCOVA results of the delayed posttest of the English listening comprehension performance between both the groups' learners with different cognitive styles by using the English vocabulary pretest as the covariate

Cognitive Style	Group	N	Pretest M	Pretest SD	Delayed test M	Delayed test SD	<i>F</i>	<i>p</i>
Field-Independence	VALRS-VLM	21	17.1	3.46	27.88 ^a	4.10	4.16*	.048
	VALRS-NVLM	22	17.59	3.19	25.79 ^a	4.61		
Field-dependence	VALRS-VLM	17	16.24	2.77	25.27 ^a	6.01	2.21	.149
	VALRS-NVLM	14	15.43	1.83	22.82 ^a	4.81		

* $p < .05$; ^a =adjusted mean

4.7.2 Intra- comparisons of Learning Retention between Both the Groups' Learners with Different Cognitive Styles by using the English Vocabulary Pretest as the Covariate

Before conducting ANCOVA, the homogeneity of regression coefficients was examined first. The result shows the assumption of homogeneity of regression coefficients was supported for both the groups' learners with field-independent and field-dependent cognitive styles ($F=1.72, p=.199>.05$; $F=.37, p=.549>.05$). The ANCOVA was then proceeded by using the English vocabulary pretest as the covariate in the analysis. The results are shown in Table 4.7.2. After controlling the effect of learners' pretest of the English vocabulary, the mean scores of the VALRS-VLM group were not significantly different from those of the VALRS-NVLM

group for both the groups' learners with field-independent and field-dependent cognitive styles ($F=.64$, $p=.431>.05$; $F=1.37$, $p=.251>.05$). These findings confirmed that there was no difference in the intra-group performance between two groups learners with different cognitive styles.

Table 4.7.2 The ANCOVA results of intra-group comparison of learning retention between both the groups' learners with different cognitive styles by using English Vocabulary Pretest as the covariate

Group	Cognitive Style	N	Pretest M	Pretest SD	Delayed test M	Delayed test SD	<i>F</i>	<i>p</i>
VALRS-VLM	Field-Independence	21	17.1	3.46	27.28 ^a	.87	.64	.431
	Field-dependence	17	16.24	2.77	26.24 ^a	.96		
VALRS-NVLM	Field-Independence	22	17.59	3.19	25.18 ^a	.86	1.37	.251
	Field-dependence	14	15.43	1.83	23.51 ^a	1.09		

4.8 Discussion

This study adopted quantitative approach to examine how the VALRS-VLM influences learners' English listening comprehension performance, learning retention, English learning satisfaction, technology acceptance, and cognitive load. Analytical results are summarized and discussed as follows.

4.8.1 Learners Using the VALRS-VLM Had Significantly Better English Listening Comprehension Performance than those using the VALRS-NVLM

The experimental results indicate that the learners' English listening comprehension performance of the VALRS-VLM group was significantly better than that of the VALRS-NVLM group. It reveals that learners who used video-annotation with vocabulary learning mechanism for English listening learning outperformed those who only used video-annotation

without vocabulary learning mechanism. Because learners of the VALRS-VLM group used the VALRS supported with vocabulary learning mechanism, learners could search and clarify unclear words in a timely manner during the listening learning process. The finding is consistent with the previous study (Bonk, 2000), which said that English listening ability is highly related to learners' vocabulary knowledge. Also, the previous studies (Krashen, 1985; Xu, 2009) indicated that clarifying meanings of the words which became comprehensible input could promote learners' English listening performance.

4.8.2 Learners of VALRS-VLM Group with Different Cognitive Styles Outperformed those of VALRS-NVLM Group with Different Cognitive Styles

Analytical results revealed that no matter whether the learners of the VALRS-VLM group with field-independent or field-dependent cognitive style had significantly better English listening comprehension performance than those of the VALRS-NVLM group with field-independent or field-dependent cognitive style. The finding echoed the previous studies (Lin, 2019; Hsieh, 2011), indicating that learners with different cognitive styles benefit from the tech tools. Therefore, practicing listening with the help of technology outperforms that with the traditional method (Chen, 2016; Basaran & Köse, 2013; Yang, 2005).

4.8.3 Learners Using the VALRS-VLM for English Listening Learning Had No Significant Differences in English Learning Satisfaction, Technology Acceptance, and Cognitive Load Compared to Those Using the VALRS-NVLM

In this research, the English learning satisfaction, technology acceptance, and cognitive load of both the groups did not differ significantly. According to the mean scores of the questionnaire results, both the groups had positive English learning satisfaction and technology acceptance and low level of cognitive load. The findings are consistent with the previous study

(Chen, 2016), indicating that most learners had positive perceptions toward VALRS as a learning tool and toward playing a positive role in supporting learning.



CHAPTER 5 CONCLUSIONS AND FUTURE WORK

In this chapter, the analytical results of quantitative data are summarized first. Next, several suggestions for the improvement and implementation of the VALRS-VLM are proposed. Lastly, several research directions are considered for future study.

5.1 Conclusions

The purpose of the study is to examine the effects of using VALRS-VLM and VALRS-NVLM on learners' English listening comprehension performance, learning satisfaction, technology acceptance, and cognitive load. According to the analysis of the experimental results, three major conclusions are summarized, and listed them as follows.

5.1.1 The VALRS-VLM Can Better Facilitate English Listening Learning

The research results show that learners who used VALRS-VLM significantly performed better than those who used the VALRS-NVLM in English listening comprehension performance. Besides, the research results also show that learners who used VALRS-VLM had significantly higher long-term retention of English listening learning than those who used the VALRS-NVLM. Whereby, this study supported that VALRS-VLM had positive effects on facilitating English listening comprehension.

5.1.2 The VALRS-VLM Can Better Promote Learners' English Listening Comprehension than the VALRS-NVLM did for both Field-Independent and Field-Dependent Cognitive Styles Learners

The analysis results show that the field-independent and field-dependent learners exhibited better English listening performance when they used VALRS-VLM than those who used VALRS-NVLM

In addition, excluding pretest of English vocabulary test differences, the result shows that the VALRS-VLM group with field-independence style had better learning retention than the

VALRS-NVLM group with field-independence style on the listening comprehension performance. Whereby, the study supported that VALRS-VLM could help learners with different cognitive styles to facilitate English listening comprehension.

5.1.3 Learners Who Used the VALRS-VLM for English Listening Learning Showed No Significant Differences in Learning Satisfaction, Technology Acceptance, and Cognitive Load Compared to Those Who Used the VALRS-NVLM

The results show no significant differences between the VALRS-VLM group and the VALRS-NVLM group in their learning satisfaction, technology acceptance, and cognitive load. According to the mean scores of the questionnaires, both the groups showed positive learning satisfaction and technology acceptance and perceived low cognitive load while using both the systems. This shows that the adding of vocabulary learning mechanism in the VALRS remarkably promoted learners' English listening comprehension and provided them with a good learning experience.

5.2 Suggestions for the Improvement and Implementation of the VALRS-VLM

5.2.1 The Vocabulary Learning Mechanism Can Be Enhanced by Identifying Content Words and Function Words

During the experiment, several learners responded that they could not find the meanings of certain words using the dictionary provided in the VALRS-VLM. Those words were found to be auxiliary verbs, which are one kind of function words carrying only grammatical meanings. In contrast, content words are those have real meaning in the sentences. In other words, content words give listeners the most important information while function words are used to stitch those words together. Compared to the function words, the content words are generally increased their stress of pronunciation by a speaker in conversation. In Rhythm Rule,

speakers want listeners to be able to quickly grasp the main content of the story. They would add stress on the content words so that the key contents can be emphasized.

Consequently, it would be better if the dictionary provided in the VALRS-VLM could provide the identification between the content words and the function words. With the function, learners could more easily distinguish function words and content words from different stress of pronunciation. It would help learners effortlessly understand the main idea of the listening materials.

5.2.2 The Need for Detailed Instruction of the VALRS-VLM Functions

During the experiment, it was observed that many learners were confused about the “play the marked section” button and the “replay the marked section” button. The “play the marked section” button lets learners play the video from a marked section and continue the video after the section is played. The “replay the marked section” button allows learners to play a marked section repeatedly until the learners click “stop replay” button; then the video will play forward. The differences of these two buttons are easily getting confused to learners. It is suggested to provide more detailed instruction about the function of these two buttons and allow learners to practice and get familiar with them before using the VALRS-VLM

5.2.3 The VALRS-VLM Can Be Applied in Both Schools and at Home

According to the research findings of the study, the learners who used the VALRS-VLM had better English listening comprehension performance than those who used the VALRS-NVLM. They also showed positive learning satisfaction and technology acceptance of using VALRS-VLM. These results implied that the VALRS-VLM has high potential in assisting English listening learning because of its effectiveness, ease of use, and usefulness. In addition, the VALRS-VLM is a personalized learning system that learners can listen to the video with their own pace with the support of vocabulary annotations and online dictionary consulting.

Learners can not only use it in school, but also use it at home for self-learning. Therefore, the VALRS-VLM has the high potential to be broadly applied to assist English listening learning for formal learning at school and informal learning at home.

5.3 Directions for Future Research

In this study, the effectiveness of the VALRS-VLM to promote English listening comprehension was confirmed. To make better use of the VALRS-VLM, how learners use the system and what other factors may affect their learning results will need to be investigated in future research, and listed them as follows.

5.3.1 Extending the Experimental Time

In this study, the effectiveness of VALRS-VLM has been confirmed. However, the study was restricted by practical consideration of experimental time and cost, the experimental treatments of the present study only lasted for two weeks. The experimental period is short. Long-term experimental treatment may have deeper and more persuasive effects on learners' listening learning performance toward using the VALRS-VLM.

5.3.2 Analyzing Learners' English Learning Processes

By recording and analyzing learners' learning process of using the VALRS-VLM based on xAPI (experience API), their learning behaviors and strategies can be explored. How their learning behaviors correspond to their learning outcomes can also be further investigated. It may provide useful information to modify system interface or functions according to the analytical results of learners' learning behaviors.

5.3.3 Exploring the Roles of Content Words and Function Words in Learners' English Listening Learning when Using the VALRS-VLM

According to the definition from Merriam-Webster dictionary, content words primarily express lexical meaning in a sentence. In contrast, function words express a grammatical relationship. Exploring the influence of content words and function words on learners' English listening comprehension performance by analyzing the frequency of looking up the meaning of content words and function words in the learning process should be considered as a valuable future study.

5.3.4 Investigating the Effects of the VALRS-VLM for Learners with Different Ages

The study randomly recruited seventy-four sixth grader from four classes of an elementary school in New Taipei city, Taiwan to conduct the instruction experiment; therefore, this study focused only on specific age groups. Thereby, future study might confirm whether different ages of research subjects with the support of VALRS-VLM for listening improvement have different listening comprehension performance and whether this system is suitable for people of all ages.

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Appendix A. Group Embedded Figure Test

團體嵌圖測驗(吳裕益修訂)

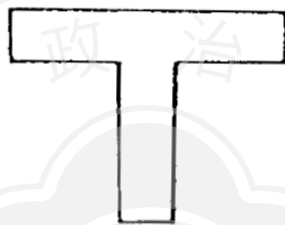
姓名：_____ 座號：_____ 性別：_____

簡單圖形

(一)



(二)



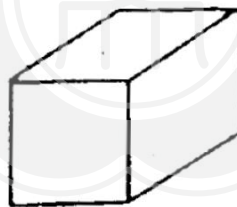
(三)



(四)



(五)



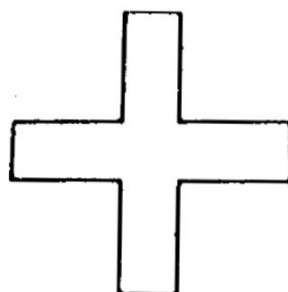
(六)



(七)

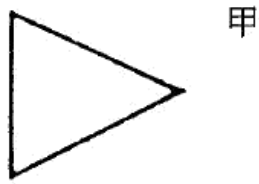


(八)

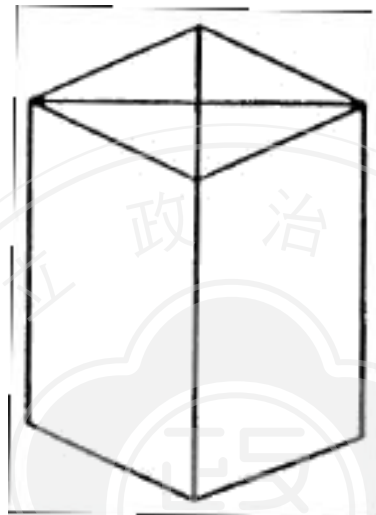


本測驗是在測量你從複雜圖形中，找出隱藏在其內的簡單圖形之能力。

下面是一個簡單圖形，我們稱它為「甲」：



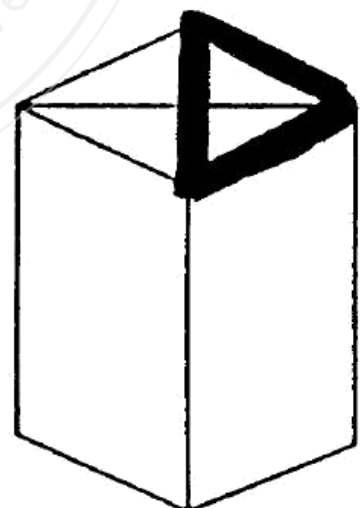
「甲」這個簡單圖形，隱藏在下面這個複雜圖形之內：



請在複雜圖形之內，找出「甲」這個簡單圖形，並用鉛筆把它描出來。要注意到複雜圖形內所隱藏的簡單圖形，必須與他單獨出現時的大小、比例和方向完全相同。

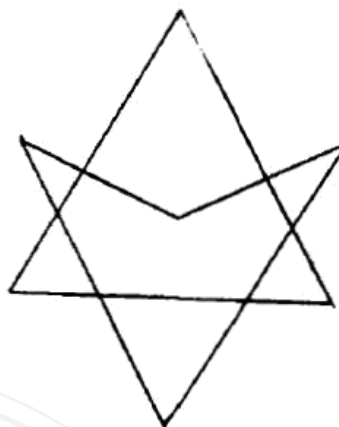
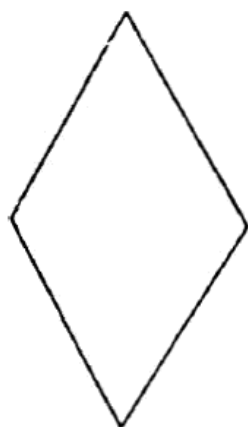
上圖所描出的圖形即為正確的答案。

要注意到右邊頂端的那個三角形才是正確的答案。雖然左邊在大小和比例上完全一樣，不過它的方向剛好相反，所以不是正確的答案。



現在讓我們來做另一個練習題。請從下面那個複雜圖形中，找出「乙」這個簡單圖形束，並用鉛筆把它描出來。

乙



答案：



從下頁開始，有很多像前面所做過的問題。每一題有一個複雜圖形，以及所要找出的簡單圖形的數字代號。作答時可以翻到前面去看每一題所要找出的是那種簡單圖形。

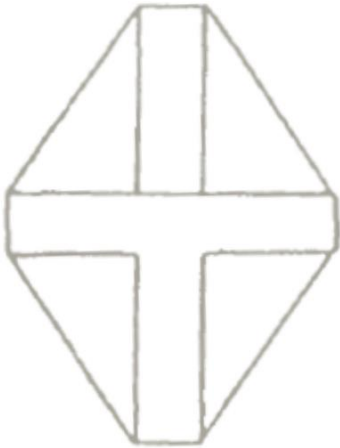
注意以下各點：

1. 只要你覺得需要，隨時都可以翻到封面的地方去查看簡單圖形。
2. 如果描錯，請用橡皮擦拭乾淨。
3. 依照題號的順序作答，除非你實在不會作答，否則不要跳過任何一題。
4. 每一題只描出一個簡單圖形，有的問題你可能可以找出兩個以上的答案，但只要描出一個就可以。
5. 複雜圖形內所隱藏的簡單圖形，在大小、比例和方向上均與封面的簡單圖形完全一樣。
6. 第一部分作答的時間是 4 分鐘。

現在開始作答第一部分。

第一部分(作答時間 4 分鐘)

1. 找出簡單圖形(二)



2. 找出簡單圖形(七)



3. 找出簡單圖形(四)



4. 找出簡單圖形(五)



5. 找出簡單圖形(三)



6. 找出簡單圖形(六)

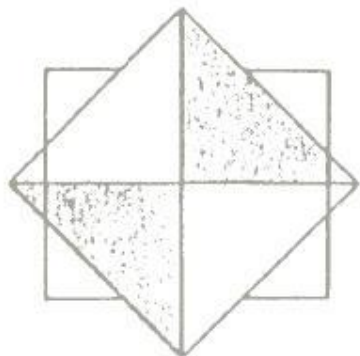


7. 找出簡單圖形(一)



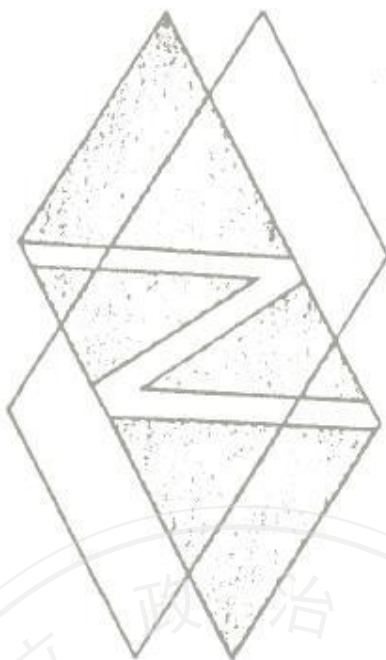
第二部分(作答時間 8 分鐘)

1



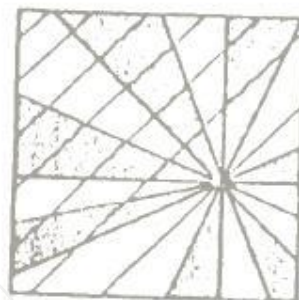
1. 找出簡單圖形(七)

2



2. 找出簡單圖形(一)

3



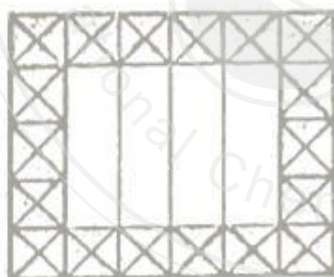
3. 找出簡單圖形(七)

4



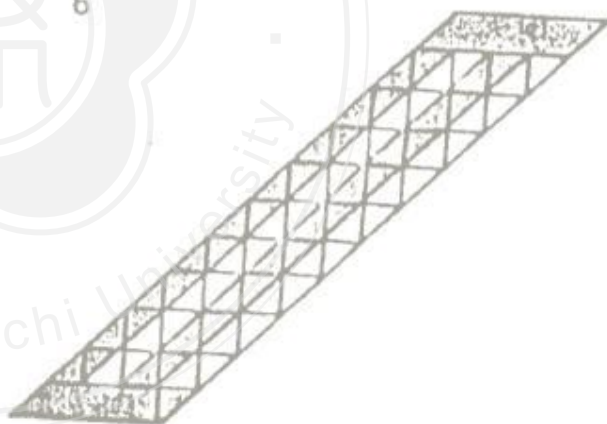
4. 找出簡單圖形(五)

5



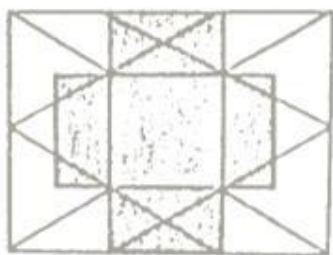
5. 找出簡單圖形(二)

6



6. 找出簡單圖形(三)

7



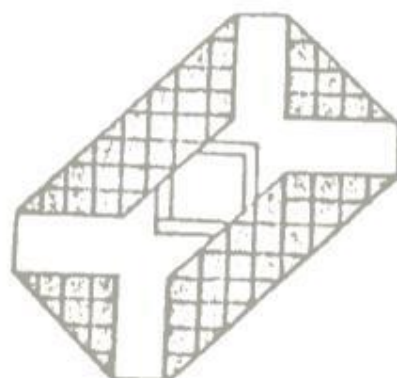
7. 找出簡單圖形(五)

8



8. 找出簡單圖形(四)

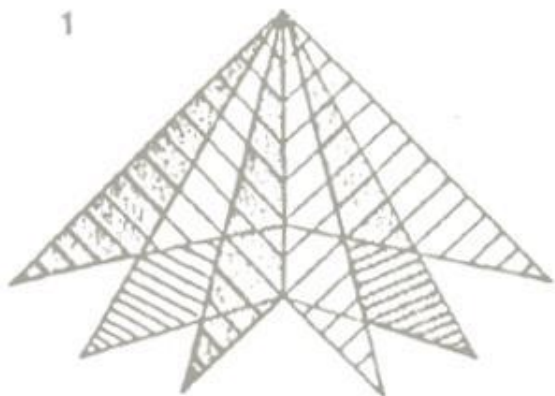
9



9. 找出簡單圖形(八)

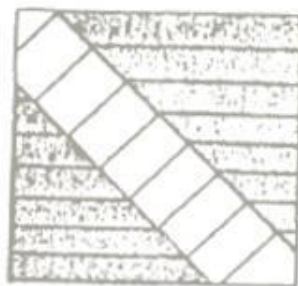
第三部分(作答時間 8 分鐘)

1



1. 找出簡單圖形(六)

2



2. 找出簡單圖形(七)

3



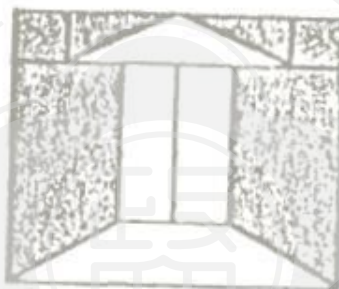
3. 找出簡單圖形(三)

4



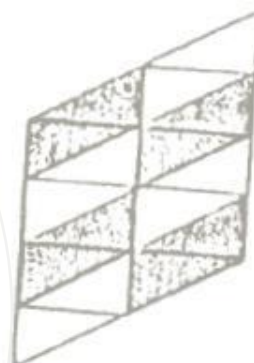
4. 找出簡單圖形(五)

5



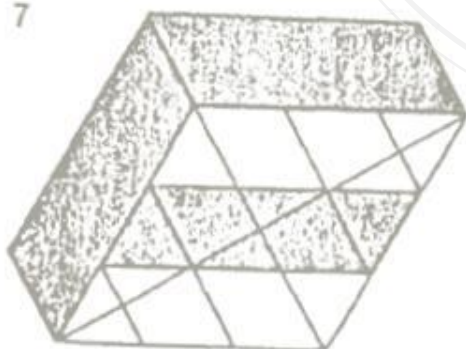
5. 找出簡單圖形(二)

6



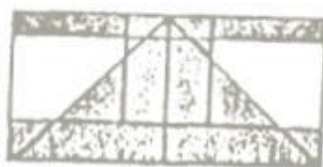
6. 找出簡單圖形(五)

7



7. 找出簡單圖形(一)

8



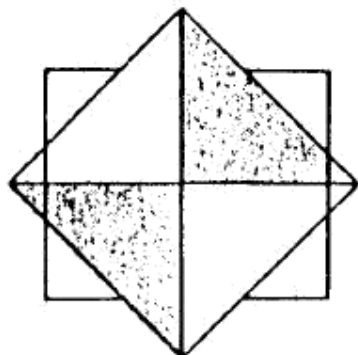
8. 找出簡單圖形(三)

9



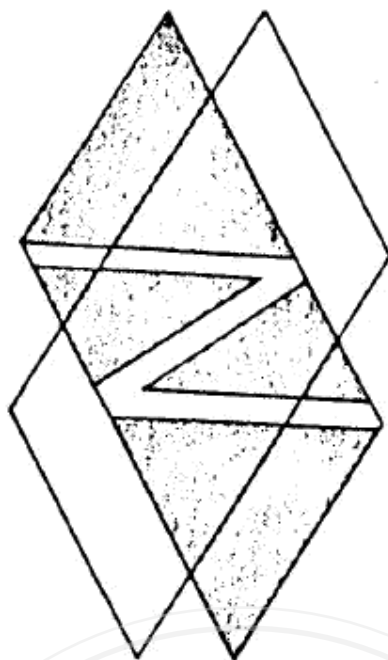
9. 找出簡單圖形(一)

1



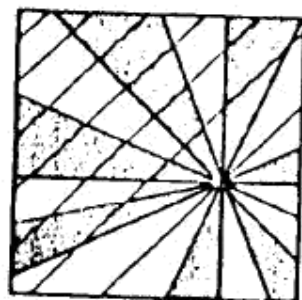
找出簡單圖形(七)

2



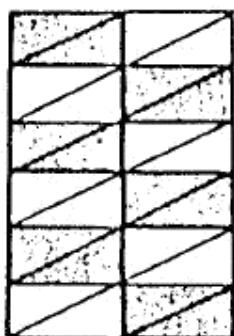
找出簡單圖形(一)

3



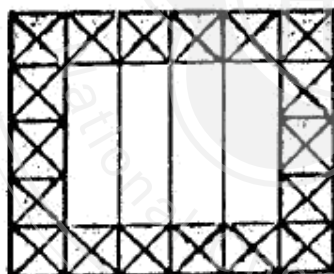
找出簡單圖形(七)

4



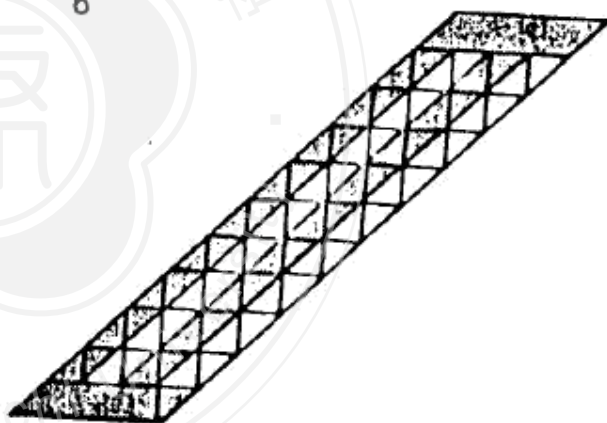
找出簡單圖形(五)

5



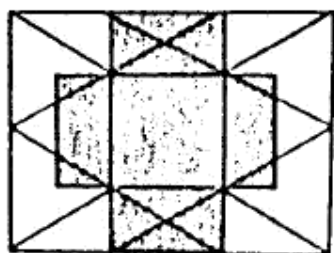
找出簡單圖形(二)

6



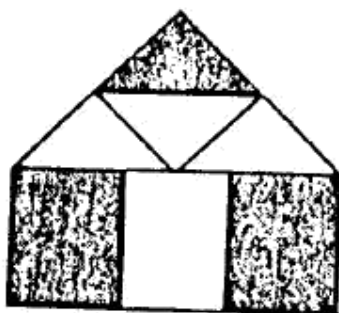
找出簡單圖形(三)

7



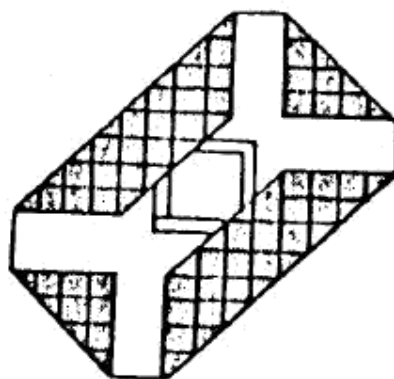
找出簡單圖形(五)

8



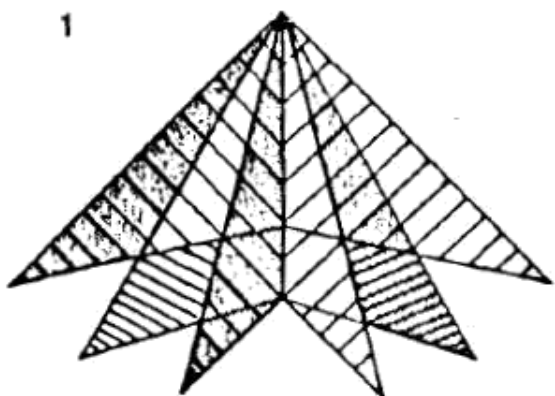
找出簡單圖形(四)

9



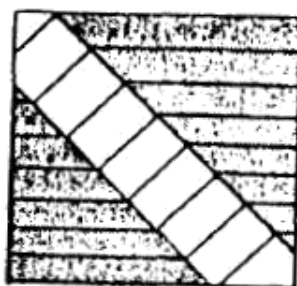
找出簡單圖形(八)

1



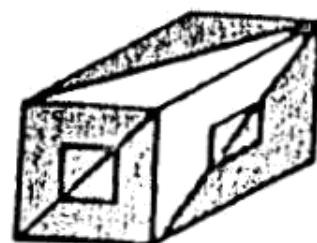
找出簡單圖形(六)

2



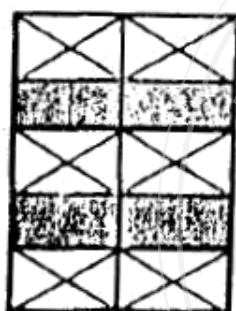
找出簡單圖形(七)

3



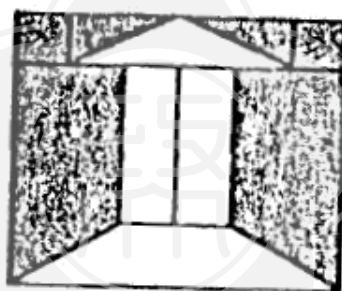
找出簡單圖形(三)

4



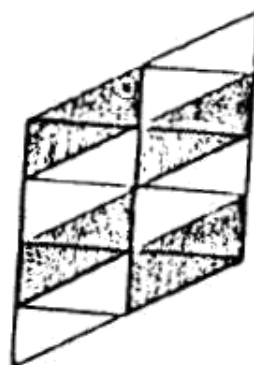
找出簡單圖形(五)

5



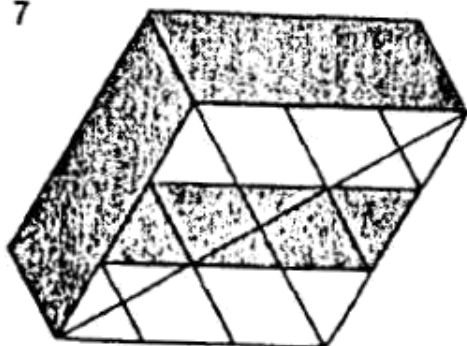
找出簡單圖形(二)

6



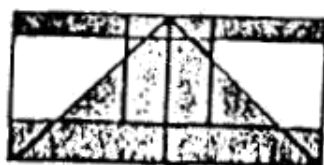
找出簡單圖形(五)

7



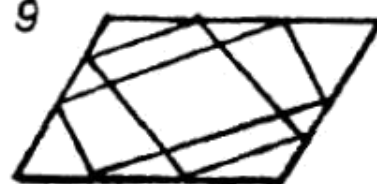
找出簡單圖形(一)

8



找出簡單圖形(三)

9



找出簡單圖形(一)

Appendix B. English Listening Comprehension Test

English Vocabulary Pretest

班級: _____ 座號: _____ 姓名: _____ 性別: _____

作答說明:

各位同學:你們好!

這是一份英語聽力理解的學習單，主要目的是要了解你們的聽力學習狀況，請盡力回答所有的問題，這份學習單的成績不會列入學期成績計算。

本測驗包含三大題，一共 12 題，作答時間約 10 分鐘。

每一題請根據題目跟問題，選擇一個正確或最適當的答案，如果需要修改答案，請使用橡皮擦擦乾淨。

****請注意!每一題都要回答，不要跳過或遺漏任何題目，謝謝!**

單字聽力與字義辨析

本部份有 3 大題，共 12 小題，電腦會依序播出 4 個單字，請根據聽到的單字順序填寫單字對應的英文編號，4 個單字的編號依序填寫完之後，在單字的右邊圈選對應的中文字義，每題會播出兩次。

例:

(看) 題目: (A) apple (B) banana (C) orange (D) pear (E) strawberry

(聽) apple → orange → banana → pear

(作答)

聽到的單字編號

圈出正確的中文字義

(1) _____ A _____

☒ 蘋果

香蕉

橘子

草莓

梨子

(2) _____ C _____

蘋果

香蕉

☒ 橘子

草莓

梨子

(3) _____ B _____

蘋果

☒ 香蕉

橘子

草莓

梨子

(4) _____ D _____

蘋果

香蕉

橘子

草莓

☒ 梨子

1. 題目: (A) worn (B) hunt (C) wise (D) visit (E) footprints

(聽) worn → wise → footprints → hunt

聽到的單字編號

圈出正確的中文字義

- (1) _____ A _____ 獵食 聰明的 磨損的 腳印 拜訪
- (2) _____ C _____ 獵食 聰明的 磨損的 腳印 拜訪
- (3) _____ E _____ 獵食 聰明的 磨損的 腳印 拜訪
- (4) _____ B _____ 獵食 聰明的 磨損的 腳印 拜訪

2. 題目: (A) sick (B) sympathy (C) summon (D) safe (E) pretend

(聽) sympathy → sick → summon → pretend

聽到的單字編號

圈出正確的中文字義

- (1) _____ B _____ 召集 同情 生病的 假裝 安全的
- (2) _____ A _____ 召集 同情 生病的 假裝 安全的
- (3) _____ C _____ 召集 同情 生病的 假裝 安全的
- (4) _____ E _____ 召集 同情 生病的 假裝 安全的

3. 題目: (A) animal (B) caught (C) cave (D) fool (E) claw

(聽) fool → caught → cave → claw

聽到的單字編號

圈出正確的中文字義

- (1) _____ D _____ 抓住 動物 洞穴 愚弄 爪子
- (2) _____ B _____ 抓住 動物 洞穴 愚弄 爪子
- (3) _____ C _____ 抓住 動物 洞穴 愚弄 爪子
- (4) _____ E _____ 抓住 動物 洞穴 愚弄 爪子

English Listening Comprehension Posttest

班級：_____ 座號：_____ 姓名：_____ 性別：_____

作答說明：

各位同學：你們好！

這是一份英語聽力理解的學習單，主要目的是要了解你們這幾堂課聽力學習的成果，請盡力回答所有的問題，這份學習單的成績不會列入學期成績計算。

本測驗包括三部份，一共 22 題，作答時間約 20 分鐘。

每一題請根據題目跟問題，選擇一個正確或最適當的答案，如果需要修改答案，請使用橡皮擦擦乾淨。

****請注意！每一題都要回答，不要跳過或遺漏任何題目，謝謝！**

第一部分：單字聽力與字義辨析

本部份有 3 大題，共 12 小題，電腦依序播出 4 個單字，請根據聽到的單字順序填寫單字對應的英文編號，4 個單字的編號依序填寫完之後，在單字的右邊圈選對應的中文字義，每題會播出兩次。

例：

(看) 題目：(A) apple (B) banana (C) orange (D) pear (E) strawberry

(聽) apple → orange → banana → pear

(作答)

聽到的單字編號

圈出正確的中文字義

(1) _____ A _____

☒ 蘋果

香蕉

橘子

草莓

梨子

(2) _____ C _____

蘋果

香蕉

☒ 橘子

草莓

梨子

(3) _____ B _____

蘋果

☒ 香蕉

橘子

草莓

梨子

(4) _____ D _____

蘋果

香蕉

橘子

草莓

☒ 梨子

1. 題目：(A) animal (B) caught (C) cave (D) fool (E) claw
(聽) claw → fool → cave → caught

聽到的單字編號 圈出正確的中文字義

- (1) _____ E _____ 愚弄 抓住 動物 爪子 洞穴
- (2) _____ D _____ 愚弄 抓住 動物 爪子 洞穴
- (3) _____ C _____ 愚弄 抓住 動物 爪子 洞穴
- (4) _____ B _____ 愚弄 抓住 動物 爪子 洞穴

2. 題目：(A) pretend (B) sympathy (C) summon (D) sick (E) safe
(聽) pretend → sick → summon → sympathy

聽到的單字編號 圈出正確的中文字義

- (1) _____ A _____ 召集 安全的 同情 假裝 生病的
- (2) _____ D _____ 召集 安全的 同情 假裝 生病的
- (3) _____ C _____ 召集 安全的 同情 假裝 生病的
- (4) _____ B _____ 召集 安全的 同情 假裝 生病的

3. 題目：(A) footprints (B) hunt (C) visit (D) wise (E) worn
(聽) hunt → wise → worn → footprints

聽到的單字編號 圈出正確的中文字義

- (1) _____ B _____ 腳印 獵食 拜訪 聰明的 磨損的
- (2) _____ D _____ 腳印 獵食 拜訪 聰明的 磨損的
- (3) _____ C _____ 腳印 獵食 拜訪 聰明的 磨損的
- (4) _____ A _____ 腳印 獵食 拜訪 聰明的 磨損的

第二部份：看圖辨義

本部份共 3 題，每題有 3 張圖片，請根據聽到的敘述句，選一個最符合的圖片，將答案寫在括弧()內。每題的題目會播放兩遍。

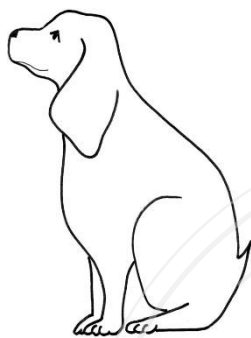
例：(聽) This is a dog.

(看)

(A)

(B)

(C)



正確答案為 A

Question 1()

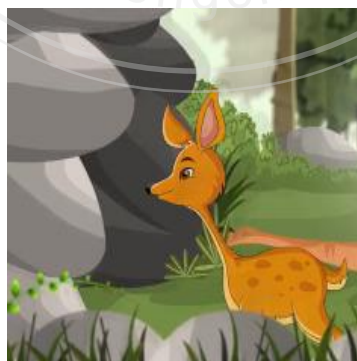
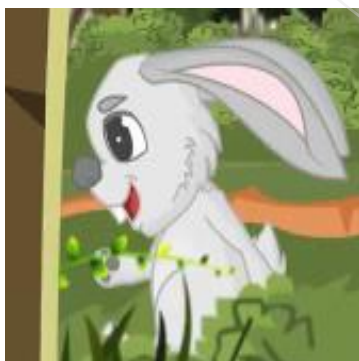
(聽) The goat come to the lion's cave.

(看)

(A)

(B)

(C)



正確答案為 C

Question 2()

(聽) The fox told everyone what the lion was doing.

(看)

(A)



(B)



(C)



正確答案為 B

Question 3()

(聽) The lion got an idea.

(看)

(A)



(B)



(C)



正確答案為 B

L

第三部份：故事內容

本部份共 7 題，每題會唸一段或一句影片中的內容，每題題目會播放兩次，聽完內容後，請根據題目上的問題，從 A、B、C 三個選項中選出一個最適合的答案，填寫在括弧()內。

例：

(聽) Amy likes to eat apples and Danny likes to eat apples, too.

(看) Question: What does Danny like to eat?

(A) Danny likes to eat apples.

(B) Danny likes to eat potatoes.

(C) Danny likes to eat pineapples.

正確答案為 A

1.() (聽) The goat came to the lion's cave to offer its sympathy. When the goat walked in, the lion caught and ate him.

(看) Question: What happened? What happened 發生了什麼?

(A) The goat went back.

(B) The lion ate the goat.

(C) The lion sent a message to everyone in the village.

正確答案為 B

2.() (聽) The lion's teeth and claws were worn with old age. He couldn't hunt for food anymore.

(看) Question: Why couldn't the lion hunt for food anymore?

(A) The lion was cautious.

(B) The lion was lazy. lazy 懶惰

(C) The lion was old.

正確答案為 C

3.() (聽) The fox said to the lion: "There are too many footprints leading to your cave but there are no marks of anyone coming out."

(看) Question: After animals visited the lion, what happened?

animal 動物, visited 拜訪, What happened 發生什麼事情呢?

(A) The lion caught and ate the animals.

(B) The lion couldn't hunt for food.

(C) The lion had grown very old.

正確答案為 A

4.() (聽) The lion pretended to be sick and summoned everyone to come and visit him.

(看) Question: Was the lion sick?

- (A) Yes, he was sick.
- (B) No, he was not sick.
- (C) I don't know.

正確答案為 B

5.() (聽) The lion asked the fox to step in for a moment. The fox wisely stayed outside, thanking the lion very kindly for the invitation.

(看) Question: What did the fox do?

- (A) The fox stepped in the cave.
- (B) The fox stood at a safe distance from the cave.
- (C) The fox accepted the lion's invitation.

accepted 接受

正確答案為 B

6.() (聽) The lion realized that he couldn't fool the fox, who was very wise too.

(看) Question: What did the lion realize?

- (A) The fox was wise.
- (B) The fox could fool the lion.
- (C) The lion could fool the fox.

realize 明白

正確答案為 A

7.() (聽) The lion caught and ate the goat. The next day, a deer came to the cave. The lion got him and ate him as well!

(看) Question: Who came first to visit the lion?

first 第一個, visit 拜訪

- (A) The deer.
- (B) The goat.
- (C) The deer and the goat visit the lion together.

正確答案為 B

- 試題結束 -

English Listening Comprehension Delayed Test

班級: _____ 座號: _____ 姓名: _____ 性別: _____

作答說明:

各位同學:你們好!

這是一份英語聽力理解的學習單，主要目的是要了解你們這幾堂課聽力學習的成果，請盡力回答所有的問題，這份學習單的成績不會列入學期成績計算。

本測驗包括三部份，一共 22 題，作答時間約 20 分鐘。

每一題請根據題目跟問題，選擇一個正確或最適當的答案，如果需要修改答案，請使用橡皮擦擦乾淨。

****請注意!每一題都要回答，不要跳過或遺漏任何題目，謝謝!**

第一部分:單字聽力與字義辨析

本部份有 3 大題，共 12 小題，電腦依序播出 4 個單字，請根據聽到的單字順序填寫單字對應的英文編號，4 個單字的編號依序填寫完之後，在單字的右邊圈選對應的中文字義，每題會播出兩次。

例:

(看) 題目: (A) apple (B) banana (C) orange (D) pear (E) strawberry

(聽) apple → orange → banana → pear

(作答)

聽到的單字編號

圈出正確的中文字義

(1) _____ A _____ ☐ 蘋果 香蕉 橘子 草莓 梨子

(2) _____ C _____ 蘋果 香蕉 ☐ 橘子 草莓 梨子

(3) _____ B _____ 蘋果 ☐ 香蕉 橘子 草莓 梨子

(4) _____ D _____ 蘋果 香蕉 橘子 草莓 ☐ 梨子

1. 題目：(A) summon (B) sympathy (C) pretend (D) safe (E) sick
(聽) pretend → sick → sympathy → summon

聽到的單字編號 圈出正確的中文字義

- (1) _____C_____ 假裝 安全的 同情 生病的 召集
- (2) _____E_____ 假裝 安全的 同情 生病的 召集
- (3) _____B_____ 假裝 安全的 同情 生病的 召集
- (4) _____A_____ 假裝 安全的 同情 生病的 召集

2. 題目：(A) wise (B) worn (C) visit (D) footprints (E) hunt
(聽) worn → wise → hunt → footprints

聽到的單字編號 圈出正確的中文字義

- (1) _____B_____ 獵食 聰明的 磨損的 拜訪 腳印
- (2) _____A_____ 獵食 聰明的 磨損的 拜訪 腳印
- (3) _____E_____ 獵食 聰明的 磨損的 拜訪 腳印
- (4) _____D_____ 獵食 聰明的 磨損的 拜訪 腳印

3. 題目：(A) claw (B) caught (C) fool (D) cave (E) animal
(聽) fool → caught → cave → claw

聽到的單字編號 圈出正確的中文字義

- (1) _____C_____ 動物 愚弄 爪子 洞穴 抓住
- (2) _____B_____ 動物 愚弄 爪子 洞穴 抓住
- (3) _____D_____ 動物 愚弄 爪子 洞穴 抓住
- (4) _____A_____ 動物 愚弄 爪子 洞穴 抓住

第二部份：看圖辨義

本部份共 3 題，每題有 3 張圖片，請根據聽到的敘述句，選一個最符合的圖片，將答案寫在括弧()內。每題的題目會播放兩遍。

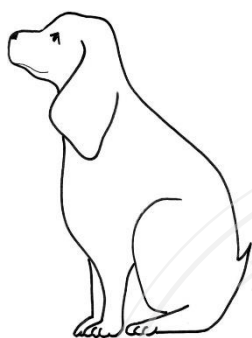
例：(聽) This is a dog.

(看)

(A)

(B)

(C)



正確答案為 A

Question 1()

(聽) The lion got an idea.

(看)

(A)

(B)

(C)



正確答案為 A

Question 2()

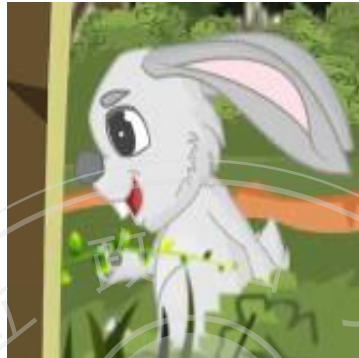
(聽) The goat come to the lion's cave.

(看)

(A)



(B)



(C)



正確答案為 C

Question 3()

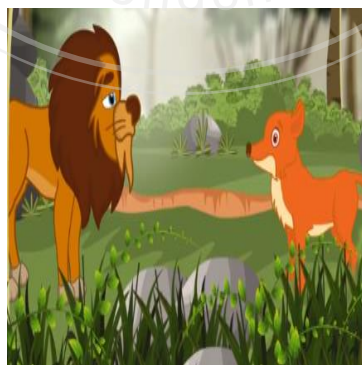
(聽) The fox told everyone what the lion was doing.

(看)

(A)



(B)



(C)



正確答案為 C

L

第三部份：故事內容

本部份共 7 題，每題會唸一段或一句影片中的內容，每題題目會播放兩次，聽完內容後，請根據題目上的問題，從 A、B、C 三個選項中選出一個最適合的答案，填寫在括弧()內。

例：

(聽) Amy likes to eat apples and Danny likes to eat apples, too.

(看) Question: What does Danny like to eat?

(A) Danny likes to eat apples.

(B) Danny likes to eat potatoes.

(C) Danny likes to eat pineapples.

正確答案為 A

1.() (聽) The lion asked the fox to step in for a moment. The fox wisely stayed outside, thanking the lion very kindly for the invitation.

(看) Question: What did the fox do?

(A) The fox accepted the lion's invitation.

(B) The fox stood at a safe distance from the cave.

(C) The fox stepped in the cave. accepted 接受

正確答案為 B

2.() (聽) The goat came to the lion's cave to offer its sympathy. When the goat walked in, the lion caught and ate him.

(看) Question: What happened? What happened 發生了什麼？

(A) The lion ate the goat.

(B) The goat went back.

(C) The lion sent a message to everyone in the village.

正確答案為 A

3.() (聽) The fox said to the lion: "There are too many footprints leading to your cave but there are no marks of anyone coming out."

(看) Question: After animals visited the lion, what happened?

animal 動物, visited 拜訪, What happened 發生什麼事情呢?

(A) The lion had grown very old.

(B) The lion couldn't hunt for food.

(C) The lion caught and ate the animals.

正確答案為 C

4.() (聽) The lion's teeth and claws were worn with old age. He couldn't hunt for food anymore.

(看) Question: Why couldn't the lion hunt for food anymore?

(A) The lion was lazy.

(B) The lion was old. lazy 懶惰

(C). The lion was cautious

正確答案為 B

5.() (聽) The lion pretended to be sick and summoned everyone to come and visit him.

(看) Question: Was the lion sick?

(A) I don't know.

(B) Yes, he was sick.

(C) No, he was not sick.

正確答案為 C

6.() (聽) The lion caught and ate the goat. The next day, a deer came to the cave. The lion got him and ate him as well!

(看) Question: Who came first to visit the lion?

first 第一個, visit 拜訪

(A) The goat.

(B) The deer.

(C) The deer and the goat visit the lion together.

正確答案為 A

7.() (聽) The lion realized that he couldn't fool the fox, who was very wise too.

(看) Question: What did the lion realize?

realize 明白

(A) The fox was wise.

(B) The fox could fool the lion.

(C) The lion could fool the fox.

正確答案為 A

- 試題結束 -

Appendix C. Learning Satisfaction Questionnaire

親愛的小朋友，你好：

這份問卷是想要了解你在使用 VALRS 影片系統學習英語時的感受或感想。這不是考試，答案沒有對錯之分，請你仔細閱讀每個題目，並依據自己實際情況作答。

1. 班級： 三年_____班 姓名：_____座號：_____

2. 性別： ☐ 男 ☐ 女

填答說明：

每個問題有五個選項：

5 表示你「非常同意」這個敘述

4 表示你「同意」這個敘述

3 表示你對這個敘述「同意和不同意的程度一樣」

2 表示你「不同意」這個敘述

1 表示你「非常不同意」這個敘述

請你圈選出你覺得最適合的選項。

例如：下面的敘述，如果你非常同意，則把數字 5 圈起來，⑤，依此類推。

例題：我很喜歡上英語課。非常同意，則把數字 5 圈起

學習模式的滿意度						
題目編號		非常同意	同意	同意和不同意的程度一樣	不同意	非常不同意
例:	我很喜歡上英語課。	5	4	3	2	1
1.	使用 VALRS 讓我更快速且正確地學習英語聽力	5	4	3	2	1
2.	使用 VALRS 可以幫助我發現自己英語聽不懂的地方。	5	4	3	2	1
3.	我喜歡用 VALRS 學習英語聽力。	5	4	3	2	1
4.	我希望以後還有機會可以使用 <u>VALRS</u> 學習英語聽力。	5	4	3	2	1
5.	我會推薦 <u>VALRS</u> 給其他同學使用。	5	4	3	2	1
6.	我願意持續使用 <u>VALRS</u> 學習英語聽力。	5	4	3	2	1

Appendix D: Technology Acceptance Questionnaire

親愛的小朋友，你好：

這份問卷是想要了解你在使用 VALRS 影片系統學習英語時的感受或感想。這不是考試，答案沒有對錯之分，請你仔細閱讀每個題目，並依據自己實際情況作答。

1.班級： 三年_____班 姓名：_____座號：_____

2.性別： ☐ 男 ☐ 女

填答說明：

每個問題有五個選項：

5 表示你「非常同意」這個敘述

4 表示你「同意」這個敘述

3 表示你對這個敘述「同意和不同意的程度一樣」

2 表示你「不同意」這個敘述

1 表示你「非常不同意」這個敘述

請你圈選出你覺得最適合的選項。

例如：下面的敘述，如果你非常同意，則把數字 5 圈起來，⑤，依此類推。

例題：我很喜歡上英語課。非常同意，則把數字 5 圈起

科技接受度						
題目編號		非常同意	同意	同意和不同意的程度一樣	不同意	非常不同意
例	我很喜歡上英語課。	5	4	3	2	1
1.	我覺得使用 VALRS ，對於英語聽力複習很有幫助。	5	4	3	2	1
2.	VALRS 針對我影片中聽不懂的地方提供標註複習，讓我的學習更為順暢。	5	4	3	2	1
3.	VALRS 幫助我遇到困難時，獲得有用的學習幫助。	5	4	3	2	1
4.	在使用 VALRS 過程中，系統的操作並不困難。	5	4	3	2	1
5.	我覺得 VALRS 系統 介面很容易使用。	5	4	3	2	1
*6	我覺得 VALRS(輔以文字萃取機制) 幫助我更加理解英語單字。	5	4	3	2	1

Appendix E: Cognitive Load Questionnaire

親愛的小朋友，你好：

這份問卷是想要了解你在使用 VALRS 影片系統學習英語時的感受或感想。這不是考試，答案沒有對錯之分，請你仔細閱讀每個題目，並依據自己實際情況作答。

1.班級： 三年_____班 姓名：_____座號：_____

2.性別： ☐ 男 ☐ 女

填答說明：

每個問題有五個選項：

5 表示你「非常同意」這個敘述

4 表示你「同意」這個敘述

3 表示你對這個敘述「同意和不同意的程度一樣」

2 表示你「不同意」這個敘述

1 表示你「非常不同意」這個敘述

請你圈選出你覺得最適合的選項。

例如：下面的敘述，如果你非常同意，則把數字 5 圈起來，⑤，依此類推。

例題：我很喜歡上英語課。非常同意，則把數字 5 圈起。

認知負荷						
題目編號		非常同意	同意	同意和不同意的程度一樣	不同意	非常不同意
例	我很喜歡上英語課。	5	4	3	2	1
1.	使用 VALRS 輔助英語聽力學習，對我而言是困難的。	5	4	3	2	1
2.	使用 VALRS 輔助英語聽力學習，讓我花很多時間，才能達成學習目標。	5	4	3	2	1
3.	使用 VALRS 輔助英語聽力學習，讓我感到很累、很挫折。	5	4	3	2	1
4.	使用 VALRS 輔助英語聽力學習，我覺得時間不夠完成學習目標	5	4	3	2	1
5.	我覺得 VALRS 系統 介面很容易使用。	5	4	3	2	1
6	使用 VALRS 輔助英語聽力學習，我很難把所學到的知識串連在一起。	5	4	3	2	1