

**IMPROVING VIETNAMESE EFL LEARNERS'
LISTENING ABILITY THROUGH AN OPTIMIZED
PROSODIC APPROACH**



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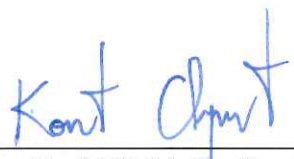
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วิทยานิพนธ์ฉบับนี้ได้ทำการศึกษาผลกระทบของแนวทางสัมผัสพันธ์ที่เหมาะสมที่สุด
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สนใจ และหลักฐานเชิงประจักษ์ล่าสุดเกี่ยวกับกระบวนการทำงานของสมองซีกซ้ายและซีกขวาที่
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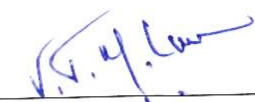
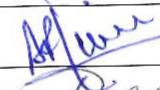
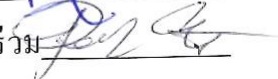
นอกจากนี้ วิทยานิพนธ์ฉบับนี้ได้ศึกษาถึงความสัมพันธ์ระหว่างความสามารถในการฟัง
หน่วยความจำเพื่อใช้งาน ความรู้ด้านคำศัพท์ และความคิดเห็นของผู้เรียนอีกด้วย โดยใช้วิธีการแบบ
ผสมผสานภายในแบบกึ่งทดลองสำหรับผู้เรียนที่ไม่ใช่เอกภาษาอังกฤษชั้นปีที่ 2 จำนวน 65 คน จาก
มหาวิทยาลัยในนคร โฮจิมินห์ ซิตี้ เป็นระยะเวลา 10 สัปดาห์ โดยแบ่งออกเป็น 2 กลุ่ม ได้แก่
กลุ่มทดลอง ซึ่งใช้แนวทางสัมผัสพันธ์ที่ฝังอยู่บนแพลตฟอร์มการฟังออนไลน์ด้วยตนเอง และกลุ่ม
ควบคุม ซึ่งใช้วิธีการสอนการฟังแบบปกติจากผู้สอนในห้องเรียน

ผลการวิเคราะห์การทดสอบบ่งชี้ว่า กลุ่มทดลองมีประสิทธิภาพในการฟังดีกว่ากลุ่มควบคุม
อย่างมีนัยสำคัญ การค้นพบนี้เน้นย้ำถึงคุณค่าของการจัดลำดับความสำคัญของสัมผัสพันธ์ โดยใช้
เทคนิคที่พัฒนาขึ้นในการศึกษานี้ ได้แก่ การฟังเสียงที่กรองความถี่ต่ำ การทำซ้ำในการซิงโครไนซ์
กับการเคลื่อนไหวของร่างกาย และการทำตามเพื่อเพิ่มความเข้าใจในการฟัง สำหรับหน่วยความจำ
เพื่อใช้งาน กลุ่มทดลองมีคะแนนสูงกว่ากลุ่มควบคุมอย่างมีนัยสำคัญ ซึ่งให้เห็นว่าการฝึกปฏิบัติ
โดยใช้แนวทางสัมผัสพันธ์ มีผลดีต่อวิธีที่ผู้เรียนใช้ในการจัดการและประมวลผลสัญญาณเสียง
ที่ได้ยิน ซึ่งสะท้อนให้เห็นถึงความยืดหยุ่นของระบบประสาทหน่วยความจำเพื่อใช้งานหรือ
ประสิทธิภาพที่ได้รับจากการฝึกหน่วยความจำเพื่อใช้งาน อย่างไรก็ตาม การพัฒนานี้สามารถสังเกต
ได้เฉพาะในหน่วยความจำภาพและหน่วยความจำพื้นฐานของการได้ยิน แสดงให้เห็นว่ารูปแบบ
การนำเสนอที่แตกต่างกันสามารถส่งผลต่อความแตกต่างกันในวิธีการจัดการกับสิ่งเร้าของผู้เรียน

นอกจากนี้ การวิเคราะห์เชิงสหสัมพันธ์แสดงให้เห็นว่า ความสามารถในการฟัง มีความสัมพันธ์กับความรู้ด้านคำศัพท์อย่างมีนัยสำคัญในระดับปานกลาง อีกทั้ง มีการค้นพบ ความสัมพันธ์ระดับปานกลางระหว่างความสามารถในการฟังและหน่วยความจำเพื่อใช้งานของผู้เรียนที่มีทักษะการฟังที่มากขึ้น หรือกลุ่มทดลอง นอกจากนี้ ผลการวิเคราะห์ข้อมูลจากแบบสอบถาม การสัมภาษณ์แบบกึ่งโครงสร้าง บันทึกของผู้เรียน และจากการสังเกตหลังจากผ่านไป 10 สัปดาห์ พบว่า กลุ่มทดลองมีความคิดเห็นเชิงบวกเกี่ยวกับแนวทางนี้ ในประเด็นที่เกี่ยวข้องกับประสิทธิผลและประสิทธิภาพ ซึ่งความร่วมมือกันนี้เป็นผลมาจากการฝึกฝนด้วยแนวทาง สัทสัมพันธ์ ที่สามารถพัฒนาความเข้าใจในการฟัง การออกเสียง ความรู้ด้านคำศัพท์ และ หน่วยความจำเพื่อใช้งาน กลุ่มทดลองยังเห็นพ้องต้องกันว่า แนวทางสัทสัมพันธ์นี้ สามารถช่วย พัฒนาการเรียนรู้เป็นอย่างดีเป็นอิสระ ใช้ฝึกการฟังด้วยตนเองได้ และมีศักยภาพที่จะถูกนำไปใช้อย่างแพร่หลายในการสอนการฟัง



สาขาวิชาภาษาต่างประเทศ
ปีการศึกษา 2563

ลายมือชื่อนักศึกษา 
ลายมือชื่ออาจารย์ที่ปรึกษา 
ลายมือชื่ออาจารย์ที่ปรึกษาร่วม 

VY MAI THI LUU : IMPROVING VIETNAMESE EFL LEARNERS'
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PROSODY/AUDITORY PERCEPTION/LISTENING SKILLS/
VERBOTONAL APPROACH/ WORKING MEMORY

This dissertation investigated the effects of the Optimized Prosodic Approach for improving Vietnamese EFL learners' listening ability as well as their working memory capacity. This approach was developed on the basis of the underlying principles of a theory of language learning proposed by Lian and Sussex (2018), a theory of perception – verbotonalism, a theory of selective attention, and the latest empirical evidence in lateralization related to language learning. At the same time, this research also examined the relationship between listening ability, working memory, and vocabulary knowledge. Besides, students' opinions about this approach were also explored. The study employed a mixed-methods approach within a quasi-experimental design. 65 second-year non-English major students in a college in Ho Chi Minh City participated in the study. One class was randomly assigned as the experimental group and the other as the control group. For 10 weeks, while the control groups were taught listening in a traditional, teach-led, and classroom-based approach, the experimental group practiced listening with the OPA.

Results of T-tests analysis indicate that the experimental group significantly outperformed the control group in their listening performances. This finding underlines the value of prioritizing prosody by using the techniques developed in the study such as listening to low-pass filtered audio, repetition in synchrony with body movements,

and shadowing to enhance listening comprehension. Regarding working memory, the findings suggest that practicing with the OPA had a positive effect on how the students managed and processed auditory signals, reflecting the neuroplasticity of the working memory or the efficiency gains from working memory training. However, the improvement was observable only in the visual memory tasks and the auditory simple memory tasks, indicating that different modalities of presentation mode can have a different bearing on how learners manipulate stimuli. Furthermore, correlational analysis shows that listening ability was significantly moderately correlated with vocabulary knowledge. A moderate connection between listening ability and working memory was also detected in the case of the experimental group. Data analysis from the questionnaire, semi-structured interviews, students' journals, and observation reveal that after 10 weeks' intervention, the experimental group had positive opinions about this approach in terms of their listening comprehension, their pronunciation, their vocabulary knowledge, their working memory, and their learning autonomy.

Overall, the results of this thesis offer not only insights into the nature of the listening process from a perceptual perspective, but also make significant theoretical contributions to the field of language learning and teaching, prompting the rethinking of the current approaches to the teaching of listening.

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LIST OF ABBREVIATIONS

EFL	English as Foreign Language
OPA	Optimized Prosodic Approach
CEFR	Common European Framework of Reference for Languages
CALL	Computer-Assisted Language Learning
HOTEC	Ho Chi Minh City Technical Economical College
ESL	English as Second Language
L1	Native Language
L2	The Second Language
WM	Working Memory
PWM	The Phonological Short-term Memory or Phonological Memory
EWM	The Central Executive
SPSS	Statistical Package for the Social Sciences
IELTS	The International English Language Testing System
TOIEC	Test of English for International Communication
PTE	Pearson Tests of English
FCE	First Certificate in English
PET	Preliminary English Test
fMRI	functional Magnetic Resonance Imaging
ERP	Event-Related Potential
VSPT	The Vocabulary Size Placement Test
PVST	The Picture Vocabulary Size Test
KET	Key English Test

CHAPTER 1

INTRODUCTION

The present study aims at improving the listening comprehension of Vietnamese EFL learners applying the prosodic-driven approach called the Optimized Prosodic Approach. This chapter is an introduction to the study beginning with a background and a context for carrying out the study. Then, it continues by presenting the problem statement, the rationale, the significance, the objectives of the study, the research questions, definitions of key terms, and ends with the scope and limitations of the study.

1.1 Background of the study

1.1.1 English teaching and learning in the Vietnamese context

Despite the important role of English in the current transitional state of the country, Vietnamese learners are still facing a lot of obstacles in achieving a certain level of English language competence to communicate effectively, especially their listening skills. Since the 1980s, Vietnam has witnessed sweeping market reforms, and consequently, now with a surging economy, it has transformed from one of the world's poorest nations to a lower middle-income country, according to an overview report of the World Bank (2019). In line with this remarkable development, Vietnam is destined to upskill its labor forces to meet the needs of the current situation in which

transnational cooperation and exchanges with countries like Australia, the U.S, Japan, and Germany are promoted (Trines, 2017). Consequently, one of the paramount objectives of the government is to expand access to education and vocational training. According to the statistics of the World Education News and Review (2017), the number of students in higher education has grown from around 133,000 in 1987 to 2.12 million by 2015. At this point, the process of globalization and internationalization requires these students to have a good command of English so that they can compete in regional and global markets. Recognizing that English proficiency is a core skill in this situation, in 2008, the Vietnamese government launched the National Foreign Languages 2020 Project to enhance the foreign language communicative competence of young Vietnamese graduates. One of the aims of the project was to provide Vietnamese students of all educational levels the ability to use English independently and confidently in communication, study; and to work in an international environment with multi-languages and multi-cultures (Degree 1400, 2008). This policy has exerted a big impact on Vietnamese English Language Teaching methods and practice since it is based on the Common European Framework of Reference for Languages (CEFR) - to assess both teachers' and students' language competency. As a result, teachers as well as students have been going to great lengths to improve their English. Despite their considerable effort, the announcement of the failure of Project 2020 was made by Mr. Phung Xuan Nha - Minister of Education Training in November 2016. Yet, instead of giving up the project, the government has emphasized its strong commitment to

language education by adjusting and prolonging it for the next period 2017-2025. However, questions about the underlying reasons behind this failure have been raised among researchers and educational experts.

Specifically, a number of studies have been conducted to investigate the factors inhibiting the quality of English language teaching from different perspectives in the Vietnamese context (Nguyen, 2017; Nguyen et al., 2015; Tran, 2013). From the students' viewpoints, this unsuccessful implementation is due to large class size, mixed-level class, poor teaching resources, limited teaching time, the exam-oriented, and grammar-focused teaching (Tran, 2013). Similarly, the teachers in the study of Nguyen et al. (2015) shared the same opinions but added two more elements: lack of teacher training and professional development and, the students' motivation. In a recent case study, Nguyen (2017) also made an attempt to explain the failure of Project 2020 by analyzing the Vietnamese national high school graduation examination results. He ascribed students' low performance to the lack of qualified teachers, lack of teaching materials, and the inadequate implementation of new pedagogical approaches. Apparently, the current English language learning and teaching practices in Vietnam are likely to face many obstacles, and the most prominent problem seems to stem from the traditional pedagogical practice which still depends on content-based and examination-based curricula, mainly grammar-focused (Ngo, 2015). Suffice it to say, it is a daunting challenge for Vietnamese learners to develop their English language competence, especially their English listening skills in a learning environment

embracing a traditional teaching method being used in Vietnam. In many Vietnamese high schools, little attention has been paid to teaching English listening skills (Luu & Quynh, 2013). According to Miller (2014), listening is considered the most difficult language skill and needs more investment, particularly in Vietnam. The findings of Vu and Shah's (2016) study reveal that Vietnamese students in surveyed universities are likely to lack awareness of learning English listening skills in a self-directed way and need instruction from teachers as they admitted having no clues of how to improve their listening skills. Furthermore, according to Ngo (2015), some students can employ listening strategies to enhance their listening skills, but these strategies are not used efficiently. She attributes this insufficient competence to the teaching methods which do not provide learners with communicative skills. Again, the current teaching and learning approach seems to be one of the salient contributing factors for Vietnamese students' difficulties to master listening skills. Under this circumstance, thus, there is a pressing need for reconceptualizing the teaching and learning approach in order to help improve the Vietnamese learners' listening skills.

1.1.2 The importance of prosody for improving listening skills

Evidence from literature has shown that the improvement in pronunciation is likely to facilitate listening comprehension, especially prosody or suprasegmentals awareness-raising (Ak, 2012; Han, 1996; Kissling, 2018; Tezi, 2007; Xiaoyu, 2009). This trend is originally based on the idea that prosodic features make a major contribution to the meaning-making mechanisms during aural comprehension. For

instance, Yang (2016) posits that conversational prosody is vital for language learning because it focuses on the key important points in a conversation and enhances comprehensibility. Another argument by Gilbert (2008) is that prosodic signals can help the listener follow the intentions of the speaker in a conversation. Gilbert (2008) argues that listeners usually understand the prosodic features even when they do not catch the actual sounds. Moreover, prosodic elements affect directly how listeners chunk and interpret discourse segments (Lynch,1998). Meanwhile, according to Wennerstrom (2001), prosody is both universal and language-specific. It is universal in terms of being used to convey the emotion of the speakers; however, not all languages share the same intonation system and distribution of rhythm. It is language-specific because languages differ in the intonation patterns they use and in the extent to which they rely on intonation to convey aspects of meaning. Thus, given the importance of prosody in aural comprehension and its diversity in various languages, it is essential to sensitize language learners to prosodic elements in the target language so that they construct their meanings more effectively.

In the case of Vietnamese learners, it is obvious that they come from a language background that is quite different from that of native English speakers. Vietnamese belongs to the Austro-Asiac language family under the group of Viet-Muong on the Mon-Khmer branch and it is a tonal language (Ngo & Setter, 2011). In a tonal language, a syllable conveys different meanings depending on the tone in which it is said. In other words, Vietnamese language uses tone lexically. In contrast, English

is a stressed-time language and its intonation system constitutes the most important and complex part of prosody. This discrepancy is likely to cause trouble for Vietnamese learners as a result of prosodic transfer at both phonological and phonetic levels (Nguyen & Dao, 2018). Vietnamese learners would subconsciously apply their Vietnamese rhythm and stress patterns to any new language they are learning. Moreover, the rhythmic structure in English is considered one of the most challenging areas to master and it is often the guide to the structure of information in the auditory signal. According to Brown's explanations (1997), rhythm is intimately bound in with the whole muscular movements in the body and it is based on stress, which characterizes the speakers of different languages. If so, the rhythmic beats of Vietnamese would be dissimilar to those of English, which means that Vietnamese learners must adopt a new rhythmic pattern to achieve communicative competence. Specifically, what Vietnamese learners must do is to adjust and keep their body motions in synchrony with English rhythms instead of maintaining their own native rhythmic patterns. The underlying reason is that there are harmonious or synchronous organizations of change between body motion and speech both intra-individual and interactional behavior (Gassin, 1990). As the speaker dances in time with his/her speech, the body of the listener should dance in rhythm with that of the speaker, too (Condon & Ogston, 1966). The more precise the coordination, the more effective the communication. Under this circumstance, if Vietnamese learners can acquire the English prosodic structures, this will facilitate their English learning including their

listening skills. In addition, English makes more elaborate use of prosody to signal meanings than do most other languages. According to Wells (2006), by exploiting the prosodic features, it is possible to convey a wide range of meanings such as attitudinal, grammatical, focusing, discoursal, psychological and indexical functions, which are demonstrated by the tone, tonality and tonicity. Since these signals provide cohesion and contrast of the incoming speech, they are helpful for listeners in making connections and in following conversations. An effective listener is supposed to be able to read these prosodic cues to achieve good aural comprehension.

Furthermore, prosody is fundamentally superimposed on the utterance but when listening to the spoken discourse, learners often pay attention to individual words and rarely attend aurally to the overriding characteristics of utterances. According to Eastman (1991), low proficiency listeners seem to direct their attention at decoding the signal at the segmental level like lexical words. He argues that the listeners' tendency to translate what they hear into their mother tongue is due to the mechanism of memory and attention, anxiety, inadequate teaching and learning, and their expectations. This problem has not only grown out of the habit of perceiving speech in their first language or any other language but also the habit of learning a foreign language that has been fitted into the well-worn grooves established through many years of teaching practice in schools (Mueller, 1958). As stated in Xie (2018), L2 learners tend to rely on the neural network of the native language to learn and process L2. Therefore, the listeners' perception has been conditioned and influenced by their previous habits, which is likely

to cause negative repercussions in the case of learning new languages. In order to become effective listeners in a new language, they need to change these old habit patterns, their auditory perception. In other words, from a neurolinguistic perspective, learners have always had their left hemisphere activated, which favors linguistic representations, while the right brain which works well with intonation patterns has been untouched (Kemmerer, 2015). To illustrate, in traditional classrooms, in the early stages, learners have been taught to focus primarily on linguistic features such as phonetics, morphology, syntax, and semantics while prosodic aspects have been overlooked. This is also supposed to be mistaken as according to McGilchrist (2019), in reality, global attention comes first and takes precedence over local attention. This means that it is more scientific and reasonable to prioritize prosodic features rather than segmental features in acquiring new knowledge. Moreover, activating the right brain will help learners to become familiar with new verbal input more easily as it is argued by McGilchrist (2019) that any new input must be processed by the right hemisphere first before any other mechanism comes into play. He also claims that the right hemisphere specializes in interpreting meanings from intonation and from pragmatics, which is necessary for the process of making meaning. In terms of the theory of language teaching and learning, all these revelations seem remarkable in contributing to the underlying principles of the approach proposed in the current study. By emphasizing the importance of prosody in listening, the present study favors the necessity to activate the right brain rather than focus only on the left brain traditionally.

Furthermore, the current study aimed to implicitly exert some influence on learners' auditory perceptions by using an unconventional way of teaching listening through the use of low pass filtered audio and other techniques with the intention that this new input would be processed more effectively by the right brain.

1.1.3 A proposal for an alternative approach

Given the abovementioned constraints in the current English teaching and learning in the Vietnamese context from both teachers' and learners' perspectives, the current study proposed the Optimized Prosodic Approach (OPA) to teaching listening skills for Vietnamese learners. Basically, the OPA takes the key principles from the verbotonal approach on the grounds of the neuroscientific explanations mentioned above and to be described further in this study. The OPA emphasizes the unconscious development of listening through repeated exposure while making use of prosodic features to influence the listener's perceptions at the level of the brain. The main point is that learning listening should be implicit and intuitive via persistent exposure through repetition and imitation. Besides, learners' auditory perception should be modified through prosodic-driven activities by using some specific optimizing techniques such as listening to filtered audio, repetition with synchronized body movements, and shadowing. All these techniques, which are based on findings in neuroscience about lateralization of brain functions, are expected to sensitize learners to new prosodic patterns and at the same time, help them to internalize these structures. Given these

new, multi-channel, and perceptual experiences, learners are expected to improve their listening skills significantly.

Based on the principles in the proposed approach, a web-based platform was built for learners to get access to the listening materials and engage in the necessary practice during the listening course. Since computer-assisted language learning (CALL) has reached the stage of normalization and become naturalized in the era of technological advances (Thomas et al., 2013), it is possible to utilize its affordances to facilitate learners' listening comprehension. CALL in teaching and learning foreign languages is not a new trend but the fundamental theoretical assumptions underlying each study may be quite different. In the current study, a CALL system plays a pivotal role in creating a learning environment that can apply the principles of the Optimized Prosodic Approach to achieve the best outcomes. With the assistance of the CALL system, it not only lessens the teacher's role but also maximizes the learner's autonomy. Moreover, the massed practice with the enhancement of a CALL system can promote the automatization of input processing significantly.

1.2 Statement of the problem

As discussed in the preceding section, the listening skill has been neglected in the Vietnamese context despite its dominant and influential role among the four skills. Specifically, most of the listening activities in the textbooks tend to be product-oriented rather than process-oriented. Also, the current pedagogical practices in Vietnam still

depends on an examination-based curriculum. Results of some previous studies also show that Vietnamese students are facing many listening problems from both internal and external sources (Quyen & Dan, 2018; Vu & Shah, 2016).

Besides, the surveys conducted by the researcher at Ho Chi Minh City Technical Economical College in Ho Chi Minh City show a general picture of the current listening teaching and learning (see Appendix A, page 240). From the teachers' point of view, an online survey administered among teachers working at Ho Chi Minh City Technical Economical College and some at other colleges in Ho Chi Minh City revealed how the listening skill is taught in classrooms. The majority (about 64%) reported that their current teaching method consisted of three main stages: pre-while-post. It can be said that the approach that these teachers used was product-oriented and mainly to test students' comprehension instead of teaching them to listen. Other respondents (30%) indicated that teaching listening was labor-intensive and that they just followed the curriculum and played the recordings to students. The most striking finding from the data was that only a small number of respondents (3%) stated that a certain emphasis should be placed on teaching students' pronunciation to improve their listening skills. Apparently, among these teachers, there was little recognition of the importance of pronunciation in teaching listening. For this reason, it is necessary to raise more awareness about the connection between teaching listening skills and pronunciation, especially prosodic features.

From the learners' viewpoints, an open-ended questionnaire in relation to listening comprehension problems was administered among 50 students at Ho Chi Minh City Technical Economical College (see Appendix B, page 242). The qualitative data uncovered that the most common factor (85% of participants) inhibiting their listening comprehension is a lack of vocabulary. Speech rate occupies the second position with 65% and then followed by pronunciation with 35%. Overall, these students are still facing several listening problems and need an effective method to help them improve their listening skills.

Taken all together, it is necessary to propose an alternative approach to alleviate the reality of both learning and teaching the listening skill in this context. As a result, the Optimized Prosodic Approach was proposed to help both teachers and learners in Ho Chi Minh City Technical Economical College in particular and hopefully for the EFL learners in general.

1.3 Rationale of the study

The researcher conducted the present study for the following reasons:

First, given the current Vietnamese teaching and learning situation, the study offers an alternative approach to teaching listening in order to help Vietnamese learners overcome their listening difficulties and develop their listening skills.

Second, Vietnamese teachers have not given enough attention to prosody in their teaching of listening despite its importance in facilitating aural comprehension as well

as achieving communicative competence. Specifically, an examination of textbooks used by students of English in the Vietnamese context discloses that intonation teaching highlights a few points restricted to grammatical functions such as a rise for yes/no questions, and a fall for WH-questions and statements (Ngo & Setter, 2011).

Third, there is a dearth of research on prosody to enhance listening comprehension as well as on applying verbotonal techniques for improving listening comprehension, especially in the Vietnamese context.

Fourth, the relationship between Working Memory capacity and listening comprehension still lacks consistency throughout the literature. Besides, the issue of choosing which modality (e.g., visual or auditory) to use for conducting the memory span tests in foreign language teaching and learning is still in need of empirical verification.

Fifth, there has been no general agreement on the construct of listening itself as well as the best method for teaching listening comprehension in contemporary literature. It seems that current teaching approaches cannot meet learners' needs regarding their listening ability. According to Worthington and Bodie (2018), the definition of listening has been debatable in the listening literature for three decades. Despite a recent resurgence in listening research, the understanding of the listening processes remains controversial. As a result, many scholars suggested that investigators should explore more theoretical frameworks appropriate for the study of listening (Witkin, 1990; Wolvin, 2010; Worthington & Bodie, 2018). For these reasons, the

present study serves as a response to the current compelling needs in listening pedagogies in EFL contexts by making a theoretical contribution to fill this gap.

In sum, the study is of relevance because of the abovementioned reasons. The alternative approach proposed in the study is not only for promoting learners' listening comprehension but also for facilitating the journey of learning a foreign language in ESL/EFL contexts.

1.4 Objectives of the study

The main goal of the study was to improve the listening ability, together with the Working Memory capacity of EFL learners at Ho Chi Minh City Technical Economical College using the OPA. Specifically, the objectives are as follows:

- To investigate the effectiveness of the OPA in improving listening comprehension of EFL learners
- To investigate the effectiveness of the OPA in improving the Working Memory capacity of EFL learners
- To investigate the relationship between listening comprehension, WM capacity, and vocabulary knowledge
- To explore students' opinions about the OPA

1.5 Research questions

The purpose of the current study was to investigate the effects of the OPA on listening skills, together with Working Memory capacity. In order to do that, an attempt was made to answer the following research questions:

1. What are the effects of the OPA on EFL learners' listening comprehension?
2. What are the effects of the OPA on EFL learners' Working Memory capacity?
3. What is the relationship between listening comprehension, Working Memory, and vocabulary knowledge?
4. What are the opinions of EFL learners on the OPA?

Based on the research questions, the study makes some predictions about the expected outcome, illustrated in the following directional hypothesis:

- H1: Students learning with the OPA will have higher listening scores than those learning with the traditional approach.
- H2: Students learning with the OPA will achieve higher working memory span tasks than those learning with the traditional approach.
- H3: There will be a close connection between listening ability, working memory, and vocabulary knowledge
- H4: Students will have a positive attitude toward the OPA

1.6 Significance of the study

The current study makes original contributions to several important areas. These are summarized below:

First, the study enhances the understanding of the pivotal role of the listeners in the listening process in terms of the underlying theory as well as the teaching approach. By adopting a more holistic view and, in a sense, a more abstract view of the listening process, a new model of that process will emerge and emphasize the unpredictability of communicative contexts and the idiosyncratic characteristics of individual learners.

Second, the study provides additional evidence with respect to the close connection between listening comprehension and prosodic features. In the study, the learners will be involved in massive exposure to auditory prosodic input through the use of a number of optimizing techniques such as listening to filtered recordings, repetition of text in synchrony with body movements, and shadowing. As a result of these activities, the learners are expected to adjust their habitual, entrenched, first language listening habits, and develop new listening habits in the target language based on both rhythmic and intonation patterns. By internalizing these patterns, learners are expected to improve their listening.

Third, the research extends the knowledge of the relationship between Working Memory capacity and listening comprehension. Findings emerging from earlier studies remain conflicting and inconsistent regarding the proficiency level of learners as well as the task type provided in the listening test. Besides, the choice of the modality of the

memory span task (visual or auditory) is still controversial. By testing both sensory channels, the study will offer more empirical data about this connection.

Fourth, the study, for the first time, demonstrates the fundamental value of adopting an interdisciplinary perspective in listening pedagogy utilizing related remarkable discoveries of neuroscience. All techniques used to internalize the auditory input in the experiment are supported by scientific outcomes relating to brain mechanism, especially hemispheric activation and neuroplasticity.

Fifth, the study adds to a growing body of literature on the value and effectiveness of verbotonal principles in language learning and teaching. A major underlying belief of these principles is that perception precedes production. Therefore, it is beneficial for learners to receive adequate perceptual instruction as a part of their language learning process. This is likely to be applicable to the mastery of any skill in the early stages of learning a new language.

Sixth, this work is likely to make noteworthy contributions to the current listening teaching and learning situation by offering practical solutions to both teachers' and learners' problems. Limited time for relatively ineffective formal classroom teaching of listening can be replaced by a distributed practice course that is accessible to learners at their discretion. Learners will gain continuous exposure to more authentic-like input. At the same time, there will be ample opportunity for developing and fostering autonomous learning beyond the walls of the traditional classrooms. As a result, the

teacher-centered focus will be minimized and give way to a learner-centered focus where students' needs are more likely to be met.

Finally, the above contributions may lead to significant changes in the conceptualization of what a language-learning structure may look like. For instance, they may result in the creation of more flexible, dynamic, and adaptable learning systems where students' specific learning needs may be met more effectively and where teachers' roles will evolve from that which they currently occupy. In certain educational institutions, there may be less emphasis on a fixed curriculum, processes, and lock-stepped synchrony and greater regard for more autonomous learning.

1.7 Definitions of key terms

- **The listening process** refers to the process of making sense of auditory signals under the influence of the perceptual filter called “the operational history”, an individual's idiosyncratic characteristics, previous experiences and knowledge since their birth

- **Listening comprehension** refers to the level of understanding of learners based on the product of the listening process mentioned above.

- **Verbotonalism/ Verbotonal Approach** is originally designed for the rehabilitation of hearing-impaired persons by Petar Guberina (1913-2005). It then became a tool for teaching foreign languages. **Verbo** refers to speech and **tonal** is based

on frequencies that the ear is sensitive to. The main goal of this method is to reeducate the learners' ears to improve their perception.

- **Perception** is the cognitive process of constantly interpreting incoming signals in the light of previous experience

- **Vocabulary knowledge** refers to the aural receptive vocabulary knowledge or the aural vocabulary size of the learners

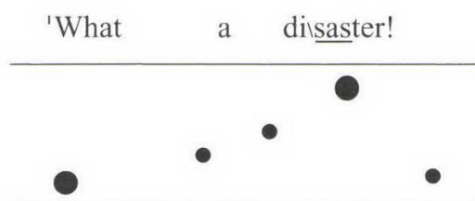
- **Opinions** refer to learners' beliefs, feelings or views and evaluations about the implementation of the OPA

- **Prosody and prosodic features** are used to refer to **stress, rhythm and intonation** of spoken text. In other studies, it is also described as suprasegmental features

- **Rhythm** refers to the pattern of a combination of stressed and unstressed syllables, as illustrated below (Chun, 2002, p.117). The capital letter stands for the stressed syllable

Word level comPUter
Sentence level: The KIDS might have LIKED the DOGS

- **Intonation** refers to the overall framework created by the interplay of accented, stressed and unstressed syllables, as illustrated below (Wells, 2006,p.19)



- **Shadowing** refers to the technique which requires learners to repeat what they hear simultaneously and as accurately as possible
- **Fluency or Automaticity** refers to the rapid and smooth processing of aural language without or with less rehearsal, preparation and conscious effort
- **Working Memory** refers to the mental processes responsible for the temporary storage and manipulation of information in the course of on-going processing
- **The Forward Digit Span task** is a simple working memory test as a measure of short-term memory capacity involving the recall of sets of numbers presented in either written or aural mode.
- **The Backward Digit Span task** is a complex working memory test that involves both storage and processing of working memory. In this task, a sequence of spoken or aural random digits are presented and the participant repeats or writes the numbers in reverse order
- **Low pass filtered audio, filtered sentences, or recordings** refer to the audio from which segmental features are removed including lexical and syntactic cues and whose prosodic characteristics such as pitch, stress patterns, rhythm, and tempo are preserved.
- **CALL** represents Computer-assisted language learning. In the study, it refers to a language learning system including some prosody-based listening activities designed for learners to practice.

- **Neuroscience** is the discipline dedicated to the study of the structure and function of the brain and nerves using empirical and theoretical methods.

1.8 Scope and limitations of the study

Regarding the participants, in the present study, they were first- and second-year students from two intact classes at Ho Chi Minh Economic Technical College in Ho Chi Minh City, Vietnam. These students came from different backgrounds and various provinces in Vietnam.

Concerning identified factors influencing the listening process, the study only covered three variables which are: educational background knowledge, language proficiency, and vocabulary knowledge at the beginning of the experiment. Given the complexities of the listening process, other elements such as intelligence, strategy knowledge, etc. should be taken into consideration.

Besides, the selection of the sample was not explicitly randomized or normalized. Therefore, findings from this study should be treated with caution in generalizing the results in teaching listening to EFL learners.

CHAPTER 2

LITERATURE REVIEW

This chapter offers a review of the literature concerning the current study. It consists of five sections. The first section covers several aspects related to L2 listening including definitions, barriers, and pedagogies. The second section is a general review of approaches to teaching pronunciation with a focus on prosody and related studies. After that, the relationship between working memory capacity and L2 listening is presented in the third section. The chapter continues to explore the history, principles, and previous research of verbotonalism in the fourth section. And the chapter ends with the fifth section synthesizing and summarizing the key points.

2.1 L2 listening

2.1.1 Processes of L2 listening

Among other skills, listening has been considered the most internalized and individual activity as it is impossible to read the listener's mind during the process of meaning-making of the input signal (Buck, 2001; Field, 2009). Besides, listening to a foreign language may require more effort as our focused attention is divided between the meaning and the language sounds, which is often the biggest hindrance for non-native listeners (Anderson & Lynch, 2003). What is more, listeners are also under the

influence of many other factors such as their native language (Cutler, 2012), their language proficiency (Joyce, 2019), their working memory capacity (Satori, 2012), to name but a few. In another scenario, there may even be some unknown elements intervening in this meaning-making process (Lian, 2011). Additionally, according to Ockey and Wagner (2018), listening can be considered as a prerequisite skill to the four skills and can even greatly facilitate second language learning because it enables learners to internalize the core linguistic and cognitive processing skills which are essential to successful language use. In line with this view, Byrnes (1984) expresses that listening comprehension precedes production in all cases of language learning. He also argues that comprehension is the basic mechanism for listeners to absorb the rules of language. Byrnes's proposal (1984) for the process of listening comprehension has three steps: the semantic decoding phase, the anticipatory feed-forward phase, and the discrepancy feedback phase. It is clarified that to enter a new meaning system, listeners must try to break up the existing one of the first language which is also the cause of negative repercussions listeners may face during the process (Byrnes, 1984). Then, if their anticipations are a mismatch with what they actually receive, they will resolve the differences by accepting or learning. It can be said that, Byrnes's proposition does provide a clear account of the mechanism, especially how listeners deal with unexpected incidents while listening. Yet, it seems that for him, each language has its own meaning system and the mastery of that system may guarantee good comprehension.

About a decade later, another framework for the listening process was proposed by Celce-Murcia et al. (1996). According to Celce-Murcia et al. (1996), listeners make sense of the incoming stream of speech by using their prior knowledge. This process only includes two steps: perceiving and segmenting. In order to do that, listeners employ four strategies that focus on the stress and intonation of the utterances. Celce-Murcia et al. (1996) argue that listeners' habit of using their native language tends to distort their perception when listening. Therefore, improving pronunciation skills may facilitate listening comprehension. Although Celce-Murcia et al.'s explanations (1996) have pointed out the link between stress and intonation with listening comprehension, they still espoused the idea that the signal carries the meaning itself and the listener's characteristics only have a minor part to play.

Contrary to this argument, Brown (1997) draws more attention to the vital role of listeners in the process of listening. In his opinion, each human being has a unique experience of life and a unique cast of minds. It is their previous beliefs that frame their expectations which outweigh the details of the incoming speech. As a result, different interpretations of the same input will be produced by different listeners. Simply put, for Brown (1997), listeners use all relevant knowledge to make meanings from the input signals by monitoring it, then shaping and confirming their expectations. No detailed explanations were given for the process, but this view shares some commonalities with Byrnes (1984) regarding the role of personal experience. They both highlight the influence of listeners in making meanings. In terms of intonation, like

Celce-Murcia et al. (1996), Brown (1997) emphasizes its function and he also points out the crucial function of the rhythm of different languages, especially English rhythm which is considered as the guide to the structure of the information in acoustic signals.

Furthermore, from a simplistic point of view, Buck (2001) describes listening as a process of taking the acoustic signals and constructing the meaning based on listeners' knowledge. Again, he emphasizes that the meaning is not what is extracted from the incoming data but what is constructed in the listener's mind. This process is based on inferencing and hypothesis-building, which occurs in a context that he calls a cognitive environment. Moreover, the knowledge of listeners that he mentions covers knowledge of the language, experience, current thoughts, feelings, intentions, personality, intelligence, and, especially, the ability to process the language automatically in real-time. His descriptions have highlighted the individual and personal factors of listening. If so, this can be influenced by any other unknown and unique elements related to a specific listener, which might be unable to be listed or categorized. Besides, he seems to fail to describe the impact of the external context-bound nature of listening due to his principal focus on the cognitive environment.

Unlike Buck (2001), Anderson and Lynch (2003) proposed a more complicated process of listening which is made up of four steps: identifying the spoken signal, recognizing the continuous stream of speech, grasping the syntax of the utterances, and applying linguistic knowledge to construct meanings. In this case, listeners activate all kinds of knowledge and apply all relevant internal information to

construct their own interpretations of the signal. Anderson and Lynch (2003) argue that some aspects related to this process such as the procedures and the inhibiting factors that operate may be discovered by examining listeners' responses, but they seem to be mere deductions. Even though this argument may be true in terms of the mystery of the listener's minds, it also depends on the requirements of the tasks that listeners receive. If appropriate instructions are given, it is likely to be possible to understand how listeners construct the meanings.

Later, with the acknowledgment of the intricacy of listening, it seems that researchers begin to approach listening skills with a more collective perspective based on preceding hypotheses. For instance, Flowerdew and Miller (2010) proposed a pedagogic model following a comprehensive literature review. First, they categorized research into listening into four main types based on the research, namely measurement, analysis, identification of strategies, and perceptions. Given the complexity of issues involved in researching second language listening, they also address an urgent need to look for certain criteria to research listening. Their model covers eight dimensions that listeners are supposed to encounter in contemporary society: affective dimension, cross-cultural aspects, individual variation, strategic dimension, contextualized dimension, social dimension, critical dimension, intertextual dimension. Indeed, Flowerdew and Miller (2010) have set some standards for conducting listening research by acknowledging the complication of listening constructs. However, their model is based on the categorization of meanings listed in Flowerdew and Miller's book

(2005), which seems to reflect the same pattern of thinking about listening as a passive skill like earlier scholars.

Meanwhile, Vandergrift (2011) examined listening using an integrated model to frame the process of listening by identifying three interdependent factors: presage, process, and product. Based on previous studies in literature, his model explains that, on the one hand, the presage variables including listener, task, and context, have influences on the quality of the listening process and resulting product. On the other hand, the product, which Vandergrift (2011) refers to the comprehension by giving correct answers, will interact by affecting presage variables and listeners' efforts at processing subsequent input. His arguments describe a thorough relationship among the constituents as well as challenges arising during each phase. Yet, his propositions are based on Anderson's differentiation (1995) of listening comprehension which consists of three steps: perceptual processing, parsing, and utilization. Generally speaking, these steps suggest that listeners first recognize the categories of the language, segment them into meaningful units that are used to interpret implied meanings, and to create a representation of what listeners understand. It seems that his argument again has fallen into the old track of embracing the idea that listeners make meanings at a more local level by matching and meshing the acoustic signal with their own prior knowledge.

From a different angle, Rost (2016) defines listening in terms of four overlapping types of processing: neurological, linguistic, semantic, and pragmatic. He

highlights the influence of native language patterns by describing the mechanism of neural commitment together with the native listener hypothesis which states that L2 listening is done through the “screen” of the native language. Although this idea is not a novel concept, Rost (2016) gives his justifications with neurological illustrations, which is quite convincing. Moreover, he also gives a minute account of what listeners do to understand speech. Specifically, they will make an effort to maximize the use of available acoustic information to reconstruct the meanings of the utterances while trying to accept the vagueness and avoid grouping the acoustic input as much as possible. These two techniques Rost (2016) called maximization of recognition and minimization of categorization respectively. Despite these well-organized speculations, the key issue here is that his explanations for listening comprehension still revolve around the fact that the incoming speech carries its own meaning that listeners must decode the message to comprehend under the influences of certain variables.

Taken all together, the brief review above has shown a continuous development of understanding the process of listening. From a rudimentary view to a more composite perspective, all the researchers have tried to conceptualize the construct of listening to serve the goal of assisting non-native listeners in their journey of mastering a foreign language. Due to the internal nature of listening, what occurs inside the head of the listener is quite opaque and complex. However, despite their diverse epistemological beliefs in giving interpretations about the listening process, they can be grouped into three positions: listening as bottom-up processing, listening

as top-down processing, and listening as integrative processing. According to the bottom-up model, communication is considered as an act of transmitting information and listeners build understanding by starting with the smallest units of the acoustic message (Flowerdew & Miller, 2005). By contrast, the top-down models highlight the influence of previous knowledge. Listeners exploit pre-established patterns or structures of expectations such as schema, frame, script, and scenario, which helps listeners to predict the meanings of the utterances (Flowerdew & Miller, 2005). This model is suggested to compensate for the problems faced in the bottom-up model based on contextual clues. However, a model that can offer a more intelligible pathway for understanding the trait of listening is the combination of both bottom-up and top-down processing. According to Lynch (2006), comprehension can only be achieved by parallel interactive processing. This interactive model is considered to be beneficial for listeners as it allows for the possibility of individual variation in linguistic processing (Flowerdew & Miller, 2005). This means that listeners may rely on a certain model depending on their learning styles, their proficiency, or even their preferences. Moreover, according to Siegel (2015), the relationship between bottom-up and top-down processing can be described as converging, sequencing, or overlapping while Field (2009, 2004) argues that the two processes are highly interdependent.

In all likelihood, according to Worthington and Bodie (2018), no single definition of listening is practical or even desirable. Besides, although considerable attempts have been made in research into listening, the conceptualization and the

process of listening have not been explored thoroughly (Yuksel & Inan-Karagul, 2018). Therefore, investigators are encouraged to take their research goals as guiding principles when deciding how listening should be conceived and operationalized so that new theoretical orientations can be born. This idea was already reflected a long time ago by Witkin (1990) who suggested that an alternative to looking at the definition or entity called listening, would be the way of taking a system view of listening. In this case, this system is composed of many interrelated and dynamically interacting subsystems. Its emphasis is placed on the fact that researchers can define their own boundaries of the system under a study. Recognizing this theoretical debate, the researcher attempts to propose an alternative perspective to understand the process of listening based on the principles of the meaning-making mechanism in a theory of learning by Lian and Sussex (2018), together with the theory of selective attention, and then rigorously test it with a corresponding conceptual framework with the hope of finding a more effective way to help improve learners' listening comprehension.

2.1.2 Factors affecting L2 listening

Due to the internal and complex nature of the listening process, many scholars in L2 listening have attempted to identify what factors affect the process as well as the product of listening comprehension. Initially, Samuels (1984) diagnosed possible causes for poor listening comprehension resulting from two interacting sources: inside-the-head and outside-the-head of listeners. Inside listeners' heads, the inhibiting factors include intelligence, language facility (e.g., accuracy and

automaticity; vocabulary; syntax; dialect and idiolect; anaphoric terms), background knowledge and schema, speech registers and awareness of contextual influences, metacognitive strategies, kinesics, and motivation. For outside-the-head constituents, the list consists of discussion topics; speaker awareness of audience needs; clarity and speaker effectiveness; and context. He argues that these factors can help fix communication breakdown. Indeed, Samuels's framework (1984) has covered a wide range of elements influencing listening, but they are just his presuppositions, which still requires further empirical evidence.

Later on, sharing the same ideas with Samuels (1984), Dunkel (1991) also argues that it is essential to pinpoint the factors inside and outside the head of listeners that may enhance or depress comprehension of L2 input for improving listening competence. He claims that what interferes with the native listening process would also hinder listeners from L2 comprehension. About L1, Eastman (1991) endeavored to identify the underlying reasons why L2 listeners tend to resort to translating to L1 while listening in the early stages. The strategy which is widely used is defined as online-translation by Eastman (1991). However, he argues that this strategy is supposed to limit listeners' comprehension most of the time. He explains that while trying to translate the aural input into L1, listeners may have difficulties in making sense of the signal because their divided attention leaves less time for constructing meanings. He also claims that this choice is often made due to the following psychological and pedagogical factors: memory and attention mechanism; arousal and anxiety; inadequate

and inappropriate teaching; transferring from a reading comprehension strategy; inadequate learning; lack of context and expectations. With his identification, it is expected that listeners can steer themselves from this habit of online-translation in order to aim for an interpretation rather than a 'slavish transliteration'.

Apparently, many factors have been pointed out to cause difficulties in listening comprehension, but they are merely assumptions based on logical grounds or based on parallel findings in reading research. Recognizing this irrelevance, Rubin (1994) has reviewed over 130 studies on research in listening comprehension and gave a summary of five major factors that researchers believe affect listening comprehension. Those include the characteristics of text, interlocutor, task, listener, and process. This review is comprehensive enough to give a detailed account of factors influencing listening comprehension that reflect previous researchers' viewpoints. After a while, more researchers have attempted to explore the features contributing to this difficulty by collecting data from descriptive statistics (Chang et al., 2013; Chao et al., 2013; Graham, 2006; Nowrouzi et al., 2015) and inferential statistics (Anderson, 2017; Bonk, 2000; Fay & Buchweitz, 2014; Vandergrift, 2006). In respect to descriptive analysis, specifically, the main difficulties discovered from Graham's survey (2006) are speed of delivery of text, inability to decode words in a stream of speech, and making sense of the words whereas the most frequently encountered listening problems by college EFL learners in Chao et al.'s findings (2013) are input and listener factors. In the same manner, based on previous research, Chang et al.

(2013) have developed a questionnaire to diagnose the listening inhibiting factors of L2 learners. Data collected from a large sample of 1065 college freshmen performed by exploratory factor analysis revealed six elements: text, input channel and surroundings, relevance, listener factor, speakers, and task characteristics. All constituents seem to be uncontrollable by listeners except the listener factor. Similarly, in reference to Anderson's model (1995), Nowrouzi et al. (2015) found out the most dominant problems including distraction, misperceiving, chunking, sentence forgetting, and confusion about the main idea.

By the same token, Goh (2000) also applies Anderson's model of language comprehension to analyze listening difficulties faced by a group of ESL learners. However, instead of using a survey, she gathered data from learners' self-reports through diaries, group interviews, and immediate retrospective verbalization. Her study is supposed to provide rich data on contextualized real-time listening problems. Half of the ten problems discovered were perceptual processing elements emerging from failure in word recognition and ineffective attention. Regarding the level of listeners, the study reveals that both high and low ability listeners shared similar difficulties, but low ability listeners tend to have more low-level perception problems. In the same manner, Ardila (2013) contributes to this mainstream by exploring inhibiting factors through non-participant observations and semi-interviews. The results of the study reveal seven learners' listening problems: motivation, paralinguistic features,

vocabulary, concentration, teacher's methodology, the use of material, and learners' background.

Even though these studies succeeded in identifying all the fundamental factors contributing to the listeners' problems, there is still a pressing need of confirming the relationship of these factors with listening comprehension by empirical evidence. As a result, more studies have been carried out to collect inferential data by placing the focus on a certain individual variable's influence on listening comprehension such as speech rate (McBride, 2011; Rahimi & Chalak, 2017), topic familiarity (Perry et al., 2018; Schmidt-Rinehart, 1994) linguistic knowledge (Bonk, 2000), strategy instruction (Azevedo & Buchweitz, 2015; Chen, 2013), task and listener characteristics (Brunfaut & Révész, 2015), working memory capacity (Fay & Buchweitz, 2014; Gu & Wang, 2007; Satori, 2012), native language (Cutler, 2000; 2012), language proficiency (Joyce, 2019). Indeed, a mass contribution has been made to suggest that listening comprehension is under the influence of both external and internal components. In respect to the present study, the emphasis was placed on the inside-the-head elements which are supposed to be uncontrollable and unpredictable. Yet, this does not mean that the researcher overlooks the effects of external factors such as variability of aural input including rate, phoneme modification, type, and so forth. These characteristics are supposed to be manipulated to minimize their effects as much as possible. Moreover, these features of input are likely to be natural and flexible in real life listening. With the proposed approach in the study, listeners were allowed to

familiarize themselves with those attributes unconsciously while immersing in repeated exposure with aural input. The next section will cover some identified internal variables that are argued to have a considerable impact on the process and performance of listening comprehension by earlier researchers.

2.1.2.1 The native language

The most common factor that may interfere in the process of meaning-making during listening is the native language of listeners. The mother tongue is the first symbolic system to which any learner will be exposed since being in a womb regarding listening. As a result, in the early stages of learning a new language, it is unavoidable for learners to listen to that language with the “ears” of their first language (Cutler, 2000). Subsequently, these experiences with their mother tongue may facilitate or interfere with their learning of the new language (Gimson, 1970). This also means that a new language learned late will be harder to process. In terms of listening, L2 learners tend to consciously perceive and interpret the aural input by making associations with anything relevant to the intelligibility of the first language. For instance, concerning the sound patterns, if the native bias has become a habit while listening to a non-native language, listeners need to develop a new sound pattern by practicing and getting new “ears” to be successful in L2 listening comprehension (Mueller, 1958). Besides, according to Cutler (2012), listening is a mix of language-universal and language-specific processes. Therefore, not only the framework of the

first language but also that of any other systems in the listeners' repertoire may have a part to play in aural comprehension.

2.1.2.2 L2 proficiency

If the role of language experience is so crucial, it means that L2 linguistic knowledge is also crucial for listening comprehension. Empirical evidence has strongly suggested that L2 proficiency is a contributing factor to successful listening comprehension. One of the studies is conducted by Vandergrift (2006) who collected data from 75 eighth-grade English speaking students learning French. The findings of the study provided some initial insights into the relationship between L1 ability and L2 proficiency with L2 listening. Both variables are discovered to contribute to L2 listening comprehension ability, especially L2 proficiency. In terms of question types, L2 proficiency appears to be a significant predictor for L2 interfering ability whereas L1 comprehension ability does not. In the same manner, Anderson (2017) has conducted her study to determine which areas of auditory skill and listening comprehension Grade 1 ESL learners have experienced the most difficulties. She found out that the major hindrances are not from the environmental factor but from the students' English language proficiency. Recently, Joyce (2019) has added more evidence to support this view by selecting a number of linguistic and psycholinguistic sub-skills related to L2 listening proficiency and administering them to 443 Japanese university students. The results indicate that listeners at different proficiency levels process the language in decidedly different ways. Specifically, there is a tendency to

rely on the lowest level processing among less proficient learners while more proficient learners can make the most of both low- and high-level processing. Based on the data analysis, Joyce (2019) concludes that developing a generalized knowledge of grammar and connected speech would help comprehend auditory signals.

2.1.2.3 Vocabulary knowledge

According to Milton (2013), L2 listeners were found to be highly dependent on the linguistic and psycholinguistic subskills that lay closest to the surface of the message such as phonological awareness and L1 working memory. Therefore, vocabulary knowledge is considered as a good predictor of performance in the four skills, especially the listening skill (Milton, 2013). The more vocabulary learners know, the better they are likely to perform through the medium of the foreign language. One of the previous studies discovering that vocabulary knowledge is believed to most strongly support L2 listening comprehension was conducted by Wang and Treffers-Daller (2017). They explored the impact of individual differences in general language proficiency, vocabulary knowledge and metacognitive awareness on learners' listening comprehension. The three variables were suggested to make a unique contribution to the understanding of the auditory signals. The results reveal that the size of lexical resources and general language proficiency in L2 were found to be the most influential, followed by metacognition. Similarly, the role of vocabulary knowledge in listening comprehension is confirmed through studies conducted by Stæhr (2008, 2009) with

EFL Danish learners. The findings suggest that vocabulary size might be a major contributing factor to successful listening comprehension in EFL.

Yet, the concern is whether L2 learners' vocabulary knowledge for reading comprehension is the same as that for listening comprehension. For instance, Van Zeeland (2013) argues that listeners may encounter problems when listening to aural input due to speech characteristics such as its variabilities, lexical embedding, and its continuous nature. He also explained that L2 learners may not recognize all the words they know when they listen to ongoing speech. Learners' vocabulary knowledge likely differs between written and the spoken text. For example, some words may not be recognized in their written but not their spoken form and vice versa. What is more, there is often a difference between learners' knowledge of isolated spoken word forms and their knowledge of these same forms in continuous speech. For these reasons, some researchers conducted investigations into the effects of two different forms of vocabulary knowledge: written form or orthographic vocabulary and aural form or phonological vocabulary.

A study by Atsushi and Taiko (2008) attempted to compare aural and written vocabulary knowledge size of Japanese university EFL learners and investigate their relationship to listening with 332 students. The outcome shows that irrespective of the aural or written version, vocabulary size test has a strong relationship with listening. Less proficient learners have difficulty in connecting the sound of some words with its meaning even when they can do so in the written form. In contrast, in the study

by Milton et al. (2010), it was found that learners appear to possess an orthographic recognition vocabulary larger than their phonological recognition vocabulary which produced significant correlations with the listening scores in an IELTS tests. In Matthews and Cheng's investigation (2015), 167 Chinese EFL learners took the IELTS test and the word recognition of speech test which required them to write an orthographic representation of the recognized word. The results show that the ability to recognize high frequency words from speech has good utility in the prediction of listening comprehension. In other words, being able to recognize the phonological form of high frequency words provide a broad coverage of the spoken language and establishes a strong platform of linguistic knowledge.

Later, Li and Zhang (2019) investigated how three dimensions of vocabulary knowledge (breadth, depth and fluency) are associated with L2 listening comprehension with 290 participants. The findings reveal that vocabulary size, or the breadth dimension plays the most important role in L2 listening. During listening, if the meaning of an oral vocabulary item is not retrieved fast enough, comprehension of subsequent elements of the discourse may be affected since cognitive resources are still focusing on meaning retrieval of the vocabulary item in question. The results of the study by Cheng and Matthews (2018) show that the receptive orthographic measure of vocabulary knowledge contributed very little or not at all to the predictive power of regression models seeking to explain variance observed within L2 listening scores. Recently, a meta-analysis by Zhang and Zhang (2020) demonstrate that L2 listening

was found to have a higher correlation with auditory vocabulary knowledge measures or listening seems to have a closer relationship with form recall knowledge. Yet, according to Aizawa, Iso, and Nadasdy (2017), the aural version would be a better predictor of listening comprehension.

These inconsistencies may be explained by Han's findings (2017) which reveal that this relationship between vocabulary knowledge and listening proficiency can change positively along with the development of a learner's proficiency level. Especially, for low proficiency level learners, vocabulary knowledge was found to be determinant (Miralpeix & Muñoz, 2018). What is more, according to Zhang and Graham (2020), learners' vocabulary size may not be a wholly reliable indication of their ability to understand spoken input. A vocabulary test might not have fully captured learners' ability to recognize vocabulary in connected speech and some L2 listeners seem to cope better with unknown vocabulary than others.

Taken all together, the researcher decided to choose the aural vocabulary size measure for the current study because the language proficiency level of the participants was pre-intermediate. They were likely to pay attention to the content of individual words. Besides, the teaching context in which the study was conducted tends to focus on the visual vocabulary size. Therefore, the aural vocabulary size test may reflect its correlation with listening comprehension clearer.

2.1.2.4 Background knowledge

Other aspects that also receive much attention from several scholars are listeners' backgrounds and experiences. Due to the unique features of prior knowledge in each person, its effect on listening comprehension has been stressed by several researchers (e.g. Anderson & Lynch (2003), Brown (1997), Buck (2001), Byrnes (1984)). According to these advocates, listeners construct meanings by combining new information in the incoming signal with their background knowledge, which may operationalize in a variety of ways: linguistics, cultural, technical, strategic, topic familiarity, and contextual knowledge. Brown and Yule (1988) called all these kinds of organized knowledge the schemata of listeners. They argued that the schemata may lead listeners to expect or predict while interpreting the input. Specifically, Schmidt-Rinehart (1994) conducted a study to investigate the effects of background knowledge in the form of topic familiarity on second language listening comprehension. By letting university students of Spanish at three different course levels listen to two passages, one of which is an unfamiliar topic, they assessed students' listening comprehension through a native language recall protocol procedure. It is uncovered that topic familiarity affects the scores of the recall measure regardless of their course level. Based on this analysis, they concluded that topic familiarity is a powerful factor at all levels of proficiency. Although their results offered some insights into the relationship between topic familiarity and listening comprehension, the listening measure and materials in the study raised some concerns. Only immediate

recall was used to test listening and students listened to long passages only twice, which may undermine the reliability of test results and the role of short-term memory of the participants. Lately, another attempt was made by Ovilia (2019) to explore the contribution of topic familiarity with listening comprehension. Her findings confirmed previous work by showing that the more listeners know about the topic, the higher scores they get in a listening comprehension test.

Additionally, Perry et al. (2018) proved that prior knowledge has a bearing on how listeners make sense of the input. Their study disclosed that listening to unfamiliar speech is likely to increase comprehension difficulty. It seems that any relevant information or any kind of experience from a topic, accent to context, can be exploited by listeners to facilitate their meaning-making process. Another kind of prior knowledge that also receives a growing interest in listening research is strategic knowledge. The benefits of knowing strategies have been reflected by several proponents through the strategy-based approach in listening research (e.g. Azevedo & Buchweitz, 2015; Chen, 2013; Mendelsohn, 2006; Siegel, 2015; Thompson & Rubin, 1996). It is argued that after being involved in strategy instructions, listeners began to become aware of their weaknesses and problems while listening. As a result, they can consciously employ these strategies to remove these obstacles (Chen, 2013).

Moreover, it is also believed that explicit training in listening strategies can have a direct influence on learners' success in listening comprehension (Azevedo & Buchweitz, 2015). Yet, there is a contrary belief that strategic knowledge

does not always seem beneficial for the process of making meanings. Indeed, it is undeniable that activating prior knowledge may help listeners to some extent, like reducing the memory load; yet, too much reliance on some familiar topics may distort the interpretations of the incoming signal with their own pre-existing beliefs and values (Wilson, 2008). Moreover, referring to the new definition of listening in the current study, making meaning is a dynamic process, which leads to the possibility that listeners may encounter any kind of anomalies or something unexpected happening. Therefore, depending too much on predictions and expectations to deal with unknown variables seems to be not a wise decision.

2.1.2.5 Memory capacity

Memory capacity is also an important cognitive factor in listening comprehension. Due to the real-time nature of aural input, the role of automatic processing and the capacity of working memory seems prominent for listening comprehension (Buck, 2001). This view is reflected in a study by Vandergrift and Baker (2015) who made an attempt to explore the relationship between L2 listening comprehension and the cognitive learner variables including L1 and L2 listening ability, L1 and L2 vocabulary knowledge, auditory discrimination ability, metacognitive awareness of listening and working memory capacity. They administered 7 instruments corresponding with 7 chosen variables on 157 grade-seven students in the first year of the French immersion program. Data collected were calculated using path analyses based on hypothesized relationships suggested by recent

theory and research. The findings resulted in a model that uncovers relationships between the variables in determining listening comprehension ability. According to the model, the two most influential skills are auditory discrimination and working memory, followed by specific language skills. As working memory is a complex variable on which the current study aims to exert some influence by trying the proposed approach in teaching listening, the researcher will devote a separate section for previous research investigating the relationship between working memory and listening comprehension (see page 81).

2.1.2.6 Operational histories

According to Lian and Sussex (2018), operational history refers to “a meaning-making device or filter which decides whether a signal is to be processed and, will help to give meaning to that signal”. In this case, it includes all the factors that are supposed to be involved in the process of generating meanings. Those factors are unpredictable because it is likely to be determined or chosen by each listener based on how much relevance they are in order to produce a response to the stimuli with an interpretation. The choice can be consciously or unconsciously made depending on the listening ability or proficiency of each listener. For instance, some intervening variables are uncontrollable for the listener who achieves a certain level of proficiency. Put it simply, every listener has his/her own history or unique experience as a consequence of engaging in daily activities since birth. These consist of all kinds of prior experiences and all features of individual differences such as background, world knowledge,

linguistic knowledge in L1, L2, or any other languages, listening ability, intelligence, working memory capacity, personality, and so on. It might be impossible to itemize all the variables while listening because they characterize a specific individual. The variable that participates in making meanings is considered as operational or active at that specific time. In the case of the listening process, there will be always a simultaneous interaction between many variables or the operational histories with the external signals to make sense of the input. In sum, the notion of operational histories tends to emphasize the dynamic and unpredictable feature of the meaning-making mechanism, especially in L2 listening comprehension.

In brief, given the complexities of the listening process, the review is by no means comprehensive. Based on the proposed listening model, an attempt to identify all contributing factors may be unfeasible. For this reason, the concept of operational histories is utilized to showcase the dynamic features of the listening process. However, empirical evidence above demonstrates that some identified factors may influence listening comprehension performances; therefore, at the beginning of the experiment, learners' L2 proficiency and vocabulary knowledge were evaluated. Besides, learners' backgrounds were collected while listening materials were carefully chosen to suit the level of the students. In the case of WM capacity, it was measured at the outset and the end of the intervention as a dependent variable in the study.

2.1.2.7 The listening process

The theory of learning of Lian and Sussex (2018) suggests that language and meaning have been traditionally determined by external objective criteria and that the relationship between language and meaning should be fundamentally idiosyncratic and ever-changing. Such linguistic features as semantics and schemata are dynamic and are constantly being constructed, reconstructed, and modified by each person at all times allowing for alternating situations (Lian, 2014). In this sense, the process of language learning should be defined as a process of accumulating history and establishing relationships. The act of understanding is personal and shaped by social conventions and the daily routines of that person. Therefore, meaning should be understood to be constructed internally as a result of the simultaneous management of both known and unknown elements from multi-channel experience. In other words, the “operational histories” and internal logical and representational systems interact to create meanings.

It can be said that the concept of “operational histories” was developed based on the sociological concept of “habitus” created by Bourdieu (1977), which has laid the foundation for a lot of research to explore human reactions in many fields (e.g. Belland, 2009; Costa & Murphy, 2015; Morrison, 2017; Ngarachu, 2014; Turnbull et al., 2019). Generally speaking, habitus or set of dispositions of a person, formed throughout life since birth, is an internal archive of personal experiences rooted in the distinct aspects of individuals’ social journey (Costa & Murphy, 2015). Habitus

is considered a mechanism that generates repertoires of behaviors directed towards specific fields. Since habitus conditions the thought and practice of individuals such as acting, thinking, perceiving, etc. within a specific context, it has a part to play in learning a new language. Overall, the habitus has accounted for the principles of making meaning in terms of the emphasis of unconscious choice, the unique accumulated experiences of an individual, the spontaneity of communicative contexts, and the need for challenging the pre-conceived beliefs and knowledge within an individual. Having said that, meaning is subjective, individual, distinctive and the result of a dynamic process; and it is “shared” by means of a symbolic system called language (Lian, 2011). In a FL/SL context, learners generate meanings from forms and several communicative variables at the same time. These variables are context-bound and unpredictable. It is emphasized by Lian (2000) that the notion of context in this situation covers the interpretative mechanisms and the “operational histories” of a unique entity and its relation to anything or anyone involved in that event. During this process of generating meanings, these context-dependent variables are characterized as inconstant, unstable, volatile and even unknowable. Bearing these principles in mind, in terms of the listening process, those aforementioned arguments of previous researchers are likely to be framed in two basic schools of thought. The first one tends to embrace the fact that language and meaning are inseparable, whereas the others believe that meaning making takes place inside the listener’s head under the influence of several identified variables.

For this reason, it is essential to put forward an alternative model of listening process which embraces the role of the “operational histories” of each listener.

As hearing, serving as a precursor, provides a foundation for listening, it is essential to make a basic distinction between the two concepts. According to Rost (2016), hearing is the primary physiological system that allows for receiving and converting sound waves that are transmitted from the outer ear through the inner ear to the auditory cortex of the brain. The difference between hearing and listening lies at a degree of intention which is an acknowledgment of a lateral source and a willingness to be affected by this source (Rost, 2016). In other words, this process involves the amount of attention that the listeners pay to a signal. From a cognitive perspective, attention is concerned with how information is selected at the bottlenecks, which refers to a point at which it is impossible to process signals in parallel (Anderson, 2015). As regards auditory attention, the filter theory or early-selection theory (Broadbent, 1966) suggests that all sensory information passes through the system until the bottleneck is reached. At this point, the information is filtered out based on some physical properties such as loudness, pitch, etc. In contrast, the late-selection theory (Deutsch & Deutsch, 1963) proposes that all the stimuli are processed more deeply before some are blocked based on the meaning. This filtering is due to the limited capacity of memory. The big difference between the two theoretical explanations lies at the moment when the action of filtering happens and the criteria for filtering. Recently, a multi-level account of selective attention (Serences & Kastner, 2014) argues

that the mechanism of selective attention operates flexibly and adaptively, depending on task demands. Results based on neuroimaging and electrophysiology data have discovered that early selection will be encouraged by tasks that demand highly focused attention on a specific location. On the contrary, tasks requiring less attentional focus will allow for late selection. This means that the level of attention may depend on the effort the listeners make, relying on not only the external stimuli but also the conditions. Overall, these views have demonstrated how selective attention deals with the auditory stimuli. Yet, it should be borne in mind that they only focus on the general process. Therefore, in the case of FL/L2 listening, the researcher adopted the multi-level view because it could be used to support the dynamic features of the proposed listening model.

Given the principles of Lian and Sussex (2018) based on the multi-level view of selective attention, listening is described as the process of making meaning which is activated once a person picks up a certain signal. Different signals stimulate different reactions. In other words, at this level, different sources of sound will be discriminated and classified into non-speech or speech as a function of the human brain (University of Maryland, 2018). Simply put, when a language is recognized, the brain quickly shifts to pay attention and process the speech sounds in a language-related way by trying to figure out the type of the language, which is represented by a symbolic or semiotic system. The mechanism for choosing a signal to be processed and the meaning to be given to that signal depends on each person's past

experience or their “operational histories” (Lian & Sussex, 2018). The operational histories of a learner can be simply understood as all experiences related to all aspects, covering all variables which are involved in the process of making meaning. Under any circumstances, operational histories function as a perceptual filter and are always active in the process of constructing any meaning.

In the case of L2 listening, the meaning-making mechanism, therefore, involves the interaction between the operational histories and internal logical and representational systems including all related symbolic systems such as L1, L2, or other languages. An attempt to identify all the variables affecting this mechanism is likely to be impossible because of the idiosyncratic features of a human being and the spontaneity of the interactive contexts. Instead, its dynamic attribute should be highlighted. However, some typical variables can be pointed out, such as native language, L2 language proficiency, working memory, background knowledge, and so on, while keeping in mind that there exist other unknown variables. This process for generating meanings in L2 or FL listening can be illustrated in Figure 2.1

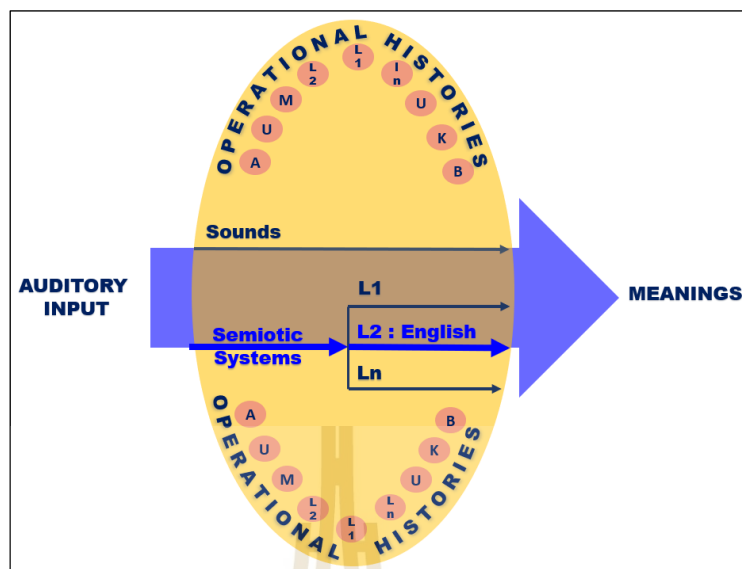


Figure 2.1 An alternative model of the listening process (created by the researcher)

The big arrow represents the meaning-making mechanism process, which is activated once a certain auditory input is picked up. The thin arrow symbolizes a specific case of generating meaning which is decided by the listener. In the case of semiotic systems or languages, especially in the EFL context, the listener's attention is supposed to be drawn to English. This is concurrently interfered with or facilitated by the native language (L1) or any other languages (Ln) known by the learners. The big oval covering the whole process of making meaning stands for the operational histories of the listener. All decisions that the listener makes to come up with any meaning is affected by several variables including the known ones such as L1, Ln, the focus of attention (A), working memory capacity (M), L2 linguistic knowledge (L2), the background (B), prior knowledge (K); and one or many unknown ones (U). The identified variables in the models which belong to individual differences are the results

of a comprehensive review of literature relating to factors affecting L2 listening comprehension.

2.1.3 L2 Listening pedagogies

Several competing pedagogical approaches to listening have been proposed to find an effective method for enhancing listening comprehension skills (Siegel, 2013). Broadly speaking, these pedagogic developments for listening can be grouped into the following categories: listening to literary texts, the comprehension approach, the taxonomy-driven sub-skills approach, the process approach, the extensive listening, and the strategy approach (Siegel, 2015). As stated by Siegel (2015), even though there has been an evolution of methodologies in teaching listening, there is still no consensus on a consistent, focused method in the mainstream of L2 listening.

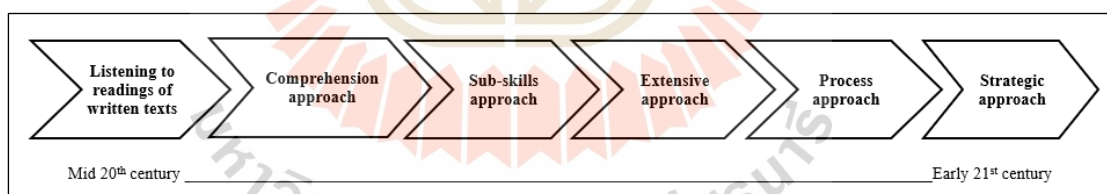


Figure 2.2 Timeline for L2 listening pedagogy (adapted from Siegel, 2015)

2.1.3.1 Listening to readings of written texts

In this approach, learners listen to readings of written texts which can be narrative or expository languages (Diakidoy, 2014; Horowitz & Samuels, 1985). This method is believed to help learners to improve both their listening and reading comprehension at the same time. Obviously, this practice seems to support the unitary

process view that general language comprehension ability underlines both listening and reading comprehension (Sticht, Beck, & Hauke, 1974). Besides, listening to readings of written texts is unlikely to help improve listening skills because the characteristics of spoken and written texts rarely bear any resemblance (Campos, 1992). This means that the listening resources are unlikely to meet the requirement of authenticity which has become one of the prioritized elements in language teaching to help learners develop their language competence (Ockey & Wagner, 2018).

2.1.3.2 The comprehension approach

In the comprehension approach, it seems that a typical procedure in teaching has been framed into a ‘listen, answer, check’ sequence (Siegel, 2015). Its emphasis is put more on the product of listening than the process. Even though this approach has a clear structure, it still assumes that by practicing listening with such a magic sequence, the listening skill can be improved. Yet, with a set of multiple-choice, fill-in-the-blank, and matching questions, this approach is supposed to exploit a testing technique, not a teaching technique (Anderson & Lynch, 2003). Furthermore, Field (2009) pointed out a few shortcomings of the comprehension approach. First, he argues that listening comprehension has been treated the same as reading comprehension with the assumption that evidence of achievement can be evaluated by correct responses to questions. However, despite some commonalities with reading, listening is completely different in terms of its unique features described as non-recursive and ephemeral (Lund, 1991). Second, the approach centers upon the quantity of listening exposure but

not the quality and methodology. This also leads to the third defect which questions the true meaning of comprehension. Field (2009) claims that listening competence cannot be demonstrated by the right answers which can be achieved using test wise strategies. Besides, the results seem superficial judgments rather than an aid to listeners' problems.

Moreover, according to Field (2009), the comprehension approach which reflects a teacher-centered view is unlikely to fit into a pedagogy that prioritizes communicative purpose. Finally, the most prominent weakness of the approach that Field (2009) identified is its impracticality for listening in real life. What listeners practice in the classroom is not helpful in a real-life context. Instead of providing learners with listening strategies, this approach facilitates the listening process by simplifying the input or reducing the speed of delivery, all of which seem improbable. According to Field (2009), although the comprehension approach raises many concerns, it proves to be beneficial in terms of two aspects. First, it makes sense when emphasizing exposure and experience to achieve better listening because only extensive practice in listening can bring about automaticity during the process. The only problem is that it requires considerable time and commitment of listeners. Additionally, it is an effective method for training listeners for examinations in test-oriented learning and teaching culture.

2.1.3.4 The sub-skills approach

In the sub-skills approach, the listening skill is broken into more manageable components with a series of short listening exercises, which can be

practiced separately. It seems that more attention has been drawn to the process of listening rather than only the product. Originally, this method has been used solely in teaching reading comprehension and then transferred into listening (Field, 1997). There would be a collection of mini listening exercises and practice for each subskill in turn. According to this view, once practiced, the subskills would be combined and applied to longer listening texts (Field,1997). One of the frameworks for sub-skills is the taxonomies of micro-skills of Richards (1983). The taxonomies have identified a list of micro-skills that are required for learners using for conversational and academic listening based on need analysis and discourse analysis.

Unlike Richards (1983), Shohamy and Inbar (1991) divided listening comprehension into two dimensions: global and local about the strategies used for text processing. This notion of sub-skills has been used widely in language assessment and teaching listening due to its capability of assisting learners to fix certain listening problems (Goh & Aryadoust, 2014). According to Field (2009), this componential approach may enable novice listeners to solve their diagnosed obstacles by following a particular listening training focusing on each element step by step. This view is also supported by Wilson (2018) who argues that with the focus on micro-skills, teachers can create detailed syllabi concentrating on the specific challenges of listening in real-time. This also suggests that listening can be teachable rather than merely testable. Yet, one of the concerns related to this approach is that students' needs are diverse, and one-size does not fit all (Murdoch & Wilson, 2008). Likewise, Field (2009) still

questions the effectiveness of this small-scale practice by raising some reservations. First, he argues that as this method is transferred from reading comprehension, it needs more empirical research to prove its reliability. A recent study by Wolf et al. (2018) showed that reading and listening comprehension are not two versions of the same general comprehension skills. Although they share some similar skills, some components are modality-specific.

Furthermore, Field (2009) emphasizes the fact that listeners have difficulties in understanding not because of unknown words but because of known words that they cannot recognize. In this case, the mastery of the sub-skill may not work for listeners. Another concern is the vagueness of the term 'sub-skill'. According to Field (2009), the diversity of listening contexts requires a more detailed categorization of sub-skills. It sounds incorrect to apply a generalized taxonomy for all situations of listening. Last but not least, Field's skepticism (2009) is about its validity when applying it to real-life listening. In his opinion, what listeners are taught is the seeming abilities separately that they need to own to implement an activity without any guarantee about the occurrence of the actual processing.

2.1.3.5 The extensive approach

The next approach is extensive listening which refers to the accessing of massive amounts of aural comprehensible input through media for pleasure (Chang, 2018). According to this view, the more learners are exposed to listening, the more automatic processing improves. According to Chang's arguments (2018), extensive

listening may help to develop aural lexical resources as listeners can practice making sense of the words by auditory channel. What is more, while listening to a lot of meaningful, enjoyable, and comprehensible spoken texts, their world knowledge is enriched, which can contribute to their meaning building (Renandya & Farrell, 2011). Another supporter of this approach is Stephens (2011) who highlights the primacy of extensive listening regarding the significance of extensive reading. He argues that L1 learners establish oral skills before literacy skills; therefore, in the case of L2 learners, both skills are sometimes taught separately or simultaneously. Instead, L2 learners should be provided with patterns of intonation and rhythm before or while learning to read. Extensive listening should be concurrently developed with extensive reading. This belief is corroborated by the findings of Chang and Millett's study (2014). The study adopted a technique called linked skills which combines reading and listening skills as much as possible. Chang and Millett (2014) exposed three groups of EFL university students in Taiwan to different input modes: reading group only, reading while listening group, and the listening only group. After the intervention, the reading plus listening group produced the most consistent and significant outcome in their listening comprehension test. The results indicate that abundant input and consistent practice are essential to improve listening fluency, especially with the concomitant use of reading and listening before focusing on listening only.

All things considered; any kind of extensive practice would bear fruits whichever the channel is, visual or auditory, though a combination is more

favorable. However, this process requires both a substantial quantity and a sufficient quality to yearn for the best effect (Chang & Millett, 2016). It seems that the essence of this approach is the emphasis on the repeated exposure to listening input and the significance of experience and practice, which is likely to be self-evident. Besides, extensive listening also focuses on the pleasure of listening as well as the comprehensibility of the input. In the end, it still demands considerable time and effort from the teachers and learners. Additionally, in terms of individual differences, it is quite challenging to select any specific topic to fit in with each listener's interests. The big question is what input is considered comprehensible to a listener to be adopted while the assessment of listening comprehension is still controversial regarding its validity.

2.1.3.6 The process approach

The process approach is another one that has caught a lot of researchers' attention in the literature. This approach is a contradiction to the product approach which is likely to fail to provide learners with the guidance to develop their listening skills. Therefore, this problem has sparked more interest in centering on the process of listening. According to Field (2009), this approach still maintains the idea of using sub-skills to teach learners, but it is different in terms of underlying principles. While the sub-skills approach tends to try to arm learners with an entirely new set of capabilities in L2, the process approach aims to help learners transfer their L1 listening competence into the process of L2 listening. In other words, the purpose of practice is not completely about learning new skills but 'to adapt existing ones to make them

relevant to the different circumstances of a second language' (Field, 2009). To put it differently, as Porter-Szucs (2018) stated, routine processes that have been developed by listeners in their mother tongue can be utilized and modified in the new language. Moreover, a new process can be acquired through intensive practice. As processes are the center of the approach, Field (2009) categorizes them into decoding and meaning-building processes. In his arguments, building up the listeners' decoding processes should be prioritized in the early stages of listening instruction. Then, for constructing meanings, listeners should consider the contexts and make use of their world knowledge and background in L1. For this reason, he claims that it is more practical to train learners to develop their listening skills by breaking down skills into manageable elements.

A recent article by Delve (2017) also favors this approach by proposing a series of micro-listening activities into a listening syllabus in a Japanese university for beginners. By pointing out the inappropriateness of the comprehension approach in the current situation in the Japanese context and the discrepancies in phonology between Japanese and English, Delve (2017) posits that applying the process approach to teach listening may help listeners increase the speed and accuracy of their decoding skills. He also suggests building a bank of decoding activities and employing listening transcripts for a more flexible and responsive style of teaching. In sum, it can be said that a procedure in the process approach is similar to the product approach with pre-while-post listening activities and this approach can be considered as another

version of the sub-skills approach which means that its effectiveness and practicality is still questionable.

2.1.3.7 The strategic approach

Another approach that has been occupying an extensive literature review for many years and is witnessing a growing interest among scholars is the strategy-based or strategic approach. The essence of this method lies in the idea introduced by Rubin (1975) who suggested that strategies used by expert listeners can be identified and taught to less successful listeners to facilitate their listening comprehension. According to this method, listeners will be armed with instructions about how to listen instead of merely being exposed to aural input (Mendelsohn, 1998). Moreover, these instructions should be explicit and explained clearly regarding the procedures, applications, and purposes (Mendelsohn, 2006).

The first longitudinal, classroom-based experiment to prove the positive effect of strategy instructions was conducted by Thompson and Rubin (1996). In their paper, they confirmed that systematic instruction in the use of cognitive and metacognitive strategies will result in the improvement of listening comprehension. Later on, in another experiment by Vandergrift (1997), it was found that metacognitive strategies have great potential for enhancing success in listening. Vandergrift (1997) explained that learners are able to be aware of how the listening process is working if they effectively employ metacognitive strategies.

In the same manner, by pointing out the link between strategy instruction and autonomy, Grenfell and Vee Harris (2002) emphasize the benefits that would be brought to language learners if they had a wider repertoire of strategies. Due to the axiomatic advantages of strategies in terms of reflecting communicative views, Grenfell and Vee Harris (2002), then, proposed a list of principles for teaching strategies effectively including the explicitness of the purpose of strategy instruction, the involvement of collaborative learning, maximizing the use of the target language as the tool for giving instructions, and taking learners' level and needs into consideration. One year later, by the same token, Graham's review (2003) also stresses the significant role of metacognitive strategies and the need for more investigation of how listeners employ those techniques. She asserts that a good model for strategy training needs to focus on encouraging learners to assess their success as well as to discuss their used strategies.

It seems that what strategies should be taught is already apparent, gradually more attention is drawn to how the strategies should be instructed. One of the contributors to this theme is Reinders (2004) who shows some practical ways of implementing strategies teaching into the curriculum. Regarding the degree of integration, he proposed two options: dedicated instruction with an exclusive focus on strategies and adjunct instruction devoting a specific time in normal lessons to deal with strategies. Then, to ensure its effectiveness, Reinders (2004) insists on following a cycle for teaching strategies: awareness-raising, modeling, practicing, evaluating, and

encouraging transfer to new contexts. In line with this, Griffiths's exploration (2015) of how strategies might be taught more effectively has verified the teachability of strategies. She also attempts to rationalize strategy theory which is supposed to be influenced by interlocking theoretical perspectives such as Behaviorism, Information Processing theory, Schemata theory, Sociocultural theory, Activity theory, Chaos theory, Individual Difference theories, to name but a few. Bearing in mind these complex and eclectic features, Griffiths (2015) argues that a flexible and holistic approach should be taken for teaching strategies. This approach should include key elements like awareness-raising, practice and evaluation and should make use of both explicit and implicit instructional techniques in order to achieve the desired outcomes. At the same time, individual learner differences together with the learning contexts and learning targets should be considered. It appears that Reinders (2004) and Griffiths (2015) are on the same wavelength about the implementation of teaching strategies. Yet, the latter seems to be more aware of the dynamic attributes of language teaching and puts more emphasis on the combination of explicitness and implicitness of giving instructions. With respect to explicitness, a recent study was also conducted by Azevedo and Buchweitz (2015) to investigate the performance scores on standardized proficiency exam after two months of explicit training on listening comprehension strategies. After the intervention, the experimental group achieved better scores in their exam, which indicates that explicit instructions and extra hours of practice affect directly students' performances.

Likewise, Siegel (2015) carried out a project to explore the effectiveness of listening strategy instruction based on the process approach in the Japanese context from an action research perspective. The study relies on data collected from both students and teachers via questionnaires and interviews along with information obtained from classroom observations, pre-/post-semester test scores, and research journals. Altogether, this evidence was analyzed to discover the viability of strategy instruction from many participant lenses. Again, the findings confirm the usefulness, practicality, and benefits of listening strategy instruction for language learners. Indeed, this is the first multi-faceted investigation with the longest duration of intervention lasting over three semesters and with the combination of several data corroborated from quantitative and qualitative stances. Despite being implemented on a local scale, these results have offered valuable insights into the potency of the strategic approach in a broader context. What is more, what has been discovered in Nguyen and Abbott's study (2017) lends support to Siegel's view (2015). Their survey reveals that there is a clear dominance of product-oriented approaches for teaching listening in ESL/EFL contexts. Therefore, it is suggested to make a shift to a process-oriented method by providing learners with strategies to handle comprehension problems during the listening process.

Unlike previous researchers, López (2017) focuses on the impact of the listening strategies instruction on learners' general strategic behavior rather than their listening performance. By gathering and analyzing data from self-reported

questionnaires, López (2017) found out that there are minor changes regarding general listening strategic behavior after the intervention in both experimental and control groups. López (2017) argues that learners may need to spend more time reflecting on, practicing, evaluating, and transferring the use of listening strategies. It seems that whatever approach is taken, practice is the key factor for success and it is also a matter of time and depends on learners' characteristics.

It is undeniable that raising students' awareness and extending their repertoire of strategies is of value; yet, there are still controversies over its feasibility. For instance, Littlejohn (2008) expressed doubts in terms of three aspects. First, the fact that decisions about learning processes depend on cognitive analysis is questionable. Regarding aural comprehension, this would assume that listeners can be rational in choosing their strategies in all situations, which is quite different from reality. Another problem lies in the instruments in the listening research. Littlejohn (2008) argued that making use of introspection to collect data seems objective and unreliable due to the mystery of the human brain. Furthermore, a question was raised about the Hawthorne effect. According to Littlejohn (2008), in laboratory conditions, it is no surprise that positive outcomes are reported in those experiments. The premise of his arguments is that strategy training is unlikely to bring about any substantive change or improvement in learners if they are not willing or ready to modify their learning habits. In this case, learner disposition which is developed through experience over time has come into play to shape their habit day by day. For aural comprehension, this habit is the barrier that

needs breaking or at least a new habit needs adopting if listeners want to develop their listening skills.

In the same manner, Ridgway (2000) also shows his skepticism about the feasibility of the strategic approach in listening pedagogy. He reasons that if strategy use involves a certain degree of conscious awareness of learners, then, there is no point in employing overt instructions for teaching them. Moreover, because the complex nature of listening tasks often requires full attention, it would be a challenge for listeners while listening and putting into operation a conscious strategy at the same time. There would be no time, space or mental capacity for considering strategy options as pay attention to the auditory input already demands a far greater load on the memory and attention in real-time listening. Besides, he claims that with the differences between listening and reading skills, the possibility of breaking listening into component subskills and strategies is unlikely to happen. As a result, direct listening strategies are impossible and impractical. The only strategy he believes to be necessary is knowing how to control the distribution of the attention to incoming signals that listeners are trying to construct meanings with a particular purpose. After all, in Ridgway's opinion (2000), mastering strategies is helpful as long as enough practice is applied. However, in the end, regarding a methodological approach for teaching listening, they seem not useful concepts. Instead, according to Ridgway (2000), learners should spend time working with texts. In this case, listeners would rather practice dealing with auditory input. Again, practice is always the best policy but Ridgway (2000) emphasizes

familiarizing learners with the features of input to help them internalize the new language patterns via the aural channel.

To sum up, the pedagogic review above has shown a constant effort from scholars in looking for the most effective and efficient approach to teaching listening skills. Given the sheer complexity of the listening process, the debate among these researchers remains vigorous. Each approach embraces a distinct perspective although some may have overlapping viewpoints. In a general sense, practice will make perfect but what matters is what kind of practice, how to practice, and how much time is needed for practice. It is of little value when just saying that massive and continued exposure will improve listening skills. This idea seems quite fundamental and axiomatic, but pedagogically ambiguous for listeners. What is more, using written materials for teaching listening, by all means, offers little aid for listening in the early stages. Instead, spoken language should be prioritized for communicative purposes. Furthermore, perhaps the most challenging issue is how to mitigate the influence of the product-oriented approach in test-oriented teaching culture. With its prevalence, the genuine meaning of teaching listening is likely to be vague and fuzzy. Later, with the appearance of the sub-skills approach, skill practice has been divided into more manageable components by helping listeners with their diagnosed listening problems. It appears to be more practical, but listeners may question the certain number of subskills essential for full comprehension and the right moment to make use of these techniques during their listening. Regarding the mystery of meaning-making

mechanisms, the unique characteristics of each listener together with various contexts in real-life listening, a prescriptive set of sub-skills seems less functional in this case. Afterward, to solve this intuitive problem, the process approach comes into play with the emphasis on transferring L1 listening ability to L2 one. Despite some major demands for adapting specific skills, this approach has presented a less burdensome target for listeners with the idea that at least they have owned some capabilities. Having said that, the primary concern is how to make this shift while listeners have no ideas what they are listening to rather than just a burst of sound. Bearing this in mind, extensive listening has stepped in and offered a solution to deal with it. With extensive listening, practice again becomes the main theme but with intense involvement with comprehensible input. This approach seems to meet the emotional and motivational needs of listeners as their proficiency and interests are respected. However, this method is more favorable for extra practice instead of main activities for a teaching program. Under any circumstance, the “comprehensible input” for listeners is unlikely to measure due to the controversial method of testing listening comprehension. As a result, choosing a proper topic to satisfy all listeners is quite a daunting task. At this point, the process approach comes into play by placing more emphasis on the process of listening rather than the product of listening, which makes a considerable contribution to the listening pedagogies. However, this approach is unlikely to escape the big shadow of the sub-skill approach despite the different focus. Later, the strategic approach has received more attention from several scholars with its efficiency. However, one of the

main concerns is whether students can use strategies during their listening when they cannot understand anything from the auditory input in real-life contexts. Having said that, regarding these abovementioned approaches, one seems to neglect real-world listening, another still requires a lot of effort from teachers, and the others tend to be unable to meet the learners' personal needs. Therefore, the researcher attempted to build an Optimized Prosodic Approach as an alternative one hopefully to help to improve learners' listening skills.

2.2 Pronunciation and L2 listening

2.2.1 Approaches in teaching pronunciation

According to Pennington and Rogerson-Revell (2018), pronunciation is a type of linguistic skill that involves learning to articulate and discriminate the individual sound elements making up the system of consonants and vowels of a language, referred to as segmental phonology, and features of connected speech making up its prosodic system referred to as suprasegmental phonology. The prosodic system includes tone, intonation, rhythm, and stress. In respect to pronunciation instruction, EFL teachers have adopted different approaches, which reflect their beliefs and attitudes towards the role as well as the importance of pronunciation. The two major mainstreams are the bottom-up approach emphasizing single sounds and words; and the top-down approach prioritizing the rhythm and intonational patterns (Chun, 2002). As described by Dalton and Seidlhofer (2001), the distinction between the two directions lies in the

pedagogic assumption about dependency and the focus of attention. Regarding dependency, it conveys the fact that certain aspects of pronunciation need to be overtly taught to build conditions while the others are covertly learned. In the bottom-up approach, segments are taught while the suprasegmental features will take care of themselves. This view is similar to the principle of a structural approach to teaching the grammatical and lexical features of language. In contrast, the top-down approach begins with prosodic features, followed by segmental elements. This view is supposed to uphold the communicative perspective in language teaching. In terms of the focus of attention, in bottom-up approach, possible first language inferences may be prescribed for learners to overcome through practice, whereas the top-down approach tends to draw learners' attention to a more functional aspect of actual language use. The first method is likely to help learners to deal with just-in-case situations and they may encounter some difficulties when facing real and natural speech. Conversely, the second method may equip learners with more efficient skills to handle just-in-time situations or unpredictable circumstances. For this reason, the underlying principle of the top-down approach in teaching pronunciation is chosen for listening practice in the present study. The next section will demonstrate how prosody is important to L2 listening in general before delving into the the significance of specific components of prosody.

2.2.2 The importance of prosody in L2 listening

According to Frühholz and Belin (2019), prosody is a key feature of human spoken language, yet the definition of prosody has remained inconsistent among many

scholars. For Wennerstrom (2001), prosody consists of several speech characteristics called suprasegmentals which are distinguished from segmental phonology. These features include intonation, rhythm, and distribution, and length of pauses, all of which are crucial to communicative competence for second language learners. Unlike Wennerstrom (2001), Wells (2006) defines prosodic characteristics of speech as a combination of pitch, loudness, and speed which creates the rhythm of speech. However, for Carroll (2008), prosodic factors refer to stress, intonation, and rate; all of which influence the overall meaning of an utterance. They are sometimes called suprasegmentals. Supra means to be above something; these aspects of speech lie over speech segments, providing a kind of musical accompaniment to speech. In a different manner, Prieto and Esteve-Gibert (2018) characterize prosody in spoken language as patterns of timing, melody, and intensity that are utilized in various languages to communicate different language functions. This process is supposed to play a crucial role in organizing information in speech and unraveling a vital set of semantic-pragmatic meaning. In general, each definition is given to serve the focus of each researcher. In this study, prosody or suprasegmentals simply refers to different elements such as stress, rhythm, and intonation, which share the description of Gilbert (2008).

Prosody is universally used to convey emotions while, at the same time, it has language-specific functions. This is because each language may have its own prosodic structures (Wennerstrom, 2001). Moreover, infants have been sensitized to the prosody of their native language before learning to talk (Speer & Blodgett, 2006). They

apply it automatically and unconsciously to their own speech and language comprehension. Regarding L2 listeners, they tend to hear any new language with their own native language prosodic framework (Speer & Blodgett, 2006). This means that learning English requires listeners to be aware of the differences and practice with its prosodic patterns to achieve comprehension.

Besides, in the case of English, Gilbert (2008) argued that prosody often distorts the individual sounds of spoken input and makes it difficult for listeners to recognize in actual speech. Therefore, listeners should be taught how the sounds actually change due to the prosodic influence. It is emphasized by Gilbert (2008) that listening comprehension would be optimized with sufficient mastery of the prosodic system.

What is more, according to Frazier et. al's (2006) speculations, prosody might supply the basic skeleton that allows listeners to hold an auditory linguistic sequence in memory while the brain processes it. They also suggest that an approach to prosody may help to reconcile the existence of grammatical constraints. For segmental features, Reed and Levis (2015) state that suprasegmental features should be given priority since they are likely to impact fluency more than segmental features. Likewise, Hönig (2017) claims that correct prosodic perception or production is likely to have positive consequences on the segmental level. In other words, with a rudimentary prosodic competence through training, listeners can handle many phonological interferences. Altogether, prosody is central to understanding spoken language. Each

component of prosody has a part to play in the process of making meaning. They may have separate functions, yet sometimes there are overlapping between them.

2.2.2.1 Stress

According to Wennerstrom (2001), stress is a phonological characteristic of lexical items and is largely fixed and predictable with some basic levels of stress consisting of primary stress, secondary stress, no stress, and compound stress. For Chun (2002), stress is the linguistic means of marking syllables or perceptually salient in relation to others. Likewise, Mary (2019) makes a more general definition by referring stress to the relative emphasis that may be given to certain syllables in a word, to certain words in a phrase or sentence. In the current study, the focus is on sentence stress rather than word stress. It does not mean that word stress is underestimated as word stress is the basic component for understanding. As Brown (1997) explains, all words have stress patterns that are quite stable when pronounced in isolation. However, when they are combined in utterances not all words are stressed. This is most reflected in the speech stream due to the variabilities of real-time spoken language. In the case of listening comprehension in this study, learners' attention will be directed to the most prominent syllable in the utterance at sentence stress level. This vital because manipulating sentence stress placement can change the meaning of an utterance (Low, 2015). It is a priority because of the ephemeral nature of listening. It is logical because of the support of evidence from brain functions stating that humans should pay attention

to the global picture first prior to details in order to achieve better comprehension (McGilchrist, 2019).

2.2.2.2 Rhythm

It has been pointed out that rhythm is one of the biggest challenges encountered by L2 learners with various components such as syllable prominence, stress, syllable count, vowel length and vowel quality, and so on (Vázquez, 2016). Specifically, in English, rhythm is mainly influenced by syllable length as a result of the combination of distinctive features including stress, accent, vowel quality, syllable structure, and pauses (Low, 2015). Put it simply, rhythm is the perceived regularity of prominent units in speech. According to Chun (2002), rhythm can be viewed as word level, sentence level, and discourse level. At the word level, rhythm is related to word stress and stress of a certain phrase. At the sentence level, it comprises timing, accent, and reduced syllables. Regarding timing, in some languages, stressed syllables often occur at approximately equal intervals. These languages are called stress-timed languages. In contrast, languages having syllables roughly equal in length are syllable-timed languages. At the discourse level, rhythm indicates pragmatic stress and rhythm in conversation. In this case, English is a stress language. Tone is another prosodic characteristic, which shows the differences in the pitch of the voice. Some languages use tone lexically such as Vietnamese, Chinese, and Thai. In general, the discrepancy between English and Vietnamese is that English makes use of tone intonationally while Vietnamese use tone lexically (Wells, 2006). With respect to teaching rhythm, Chun

(2002) suggests that it should begin with the development of listening skills with the focus on the placement of stresses and the overall rhythm of the second or foreign language. Besides, teaching materials should be adopted beyond the word level to the phrase, sentences, and discourse levels together with repeated listening and intense analysis for maximizing the outcomes. Concerning its role, it is argued by Flores (1997) that priority should be given to rhythm in teaching English pronunciation because it is one of the features that foreign learners of English find difficult to acquire.

What is more, because the form and structure of the individual's native language system are developed at an earlier stage through the medium of rhythmic patterns, what a foreign language learner mainly lacks is a basic perceptual and organizational framework in that new language or the rhythm of that language (Condon & Ogston, 1966). Condon and Ogston (1966) argued that the body of the speaker dances in time with his/her speech and the body of the listener dances in rhythm with that of the speaker, which is called self-synchrony and interactional synchrony, respectively. In the case of English, the rhythmic beat is the stressed syllable, which will coincide with the muscular beats of the whole body (Brown, 1997; Dalton & Seidlhofer, 2001). Besides, as every language has its own characteristic rhythm, language learners tend to speak the new language with their native rhythms (Gassin, 1990). In other words, their body motions while speaking a foreign language are often in synchrony with their L1. From a listener's perspective, Gassin (1990) pointed out that without mastering the rhythmic patterns, L2 learners may be excluded from the

interactional synchrony with L2 speakers, which results in psychological consequences as well as miscomprehension. Given the importance of rhythmic patterns in language learning, it is vital to be aware of the fact that there is a unity between speech and body motions. Gassin (1990) defines body motions as gestures, postures, eye contact, and facial expression, which all rhythmically integrate with speech behavior. Therefore, the body can be used as a pedagogical tool in establishing new rhythms in language learning and teaching. If learners can coordinate their speech and body rhythms to those of L2 speakers, their chance of communicating and understanding is bigger. Yet, Gassin (1990) also adds that body rhythm is supposed to be one of the least conscious elements. For this reason, it is necessary to make the connection between speech rhythms and communicative competence explicit to both language teachers and learners.

2.2.2.3 Intonation

Wells (2006) defines intonation as the melody of speech. It refers to how the speakers' voice rises and falls to convey both linguistic and pragmatic meanings. It is also based on the framework created by the interplay of accented, stressed and unstressed syllables or the rhythm of speech. Wells (2006) asserts that intonation patterns are likely to be more easily misunderstood than segmental patterns among speakers of different languages. For example, the same physical patterns of rises and falls may have different meanings depending on a particular context and language. In Wells's descriptions (2006), concerning intonation, three aspects should be considered: tonality, tonicity, and tone. Generally speaking, tonality indicates how the

spoken input is divided into chunks or intonation phrases. Regarding tonicity, it is related to how some words are highlighted as important for conveying an intended meaning. After the words are chosen to be emphasized, there comes the selection of its location with a signal of rising, fall, or rise-fall. This is called tone by Wells (2006). Altogether, these characteristics make English become one of the languages which utilize more elaborate use of intonation to express meaning compared to other languages. Besides, Wells (2006) recommends that more attention should be drawn to intonation by EFL learners and teachers because of the diverse functions of intonation. For instance, with the tone, intonation is used to express the attitude and emotions such as surprise, anger, boredom, and the like. With tonicity, intonation helps to show the focus of an utterance such as new or old, important information while facilitating to organize the auditory speech into units for more efficient communication. In terms of spoken discourse, intonation helps to mark the sequences of clauses and sentences. Most importantly, grammatical structures can be identified by intonation structures. According to Wells's (2006) interpretations, grammar tends to be reflected by tonality. To illustrate, intonation breaks usually signal the syntactic boundaries such as sentences, clauses, phrases, or even anywhere that makes the utterance clearer.

In the same manner, Chun (2002) suggests that intonation is multi-functional and provides additional cues to express full meanings. Her overview also emphasizes different aspects of intonation such as signaling grammatical structures, revealing information structure, communicating attitudinal meaning and controlling

interactive structure at discourse-level. One distinctive point that Chun (2002) made in her view is the need to look at the functions of intonation from the perspective of the hearers, not the speakers. Indeed, there are no clear-cut categories for the functions as there is always much overlapping. The importance is how to help listeners aware of these functions to facilitate their aural comprehension.

Furthermore, in another review by Levis (2006), some key factors about intonation are found to be relevant to English teachings such as pitch levels, intonation patterns, and the like. Among them, Levis (2006) emphasizes the listener's perceptions of intonation. He explained that listeners tend to hear intonation according to internal categories because they each have a different way of organizing intonation patterns and intonation meanings as a result of the influence of their own native language or their experience with any other languages. As a consequence, their perception often affects their meaning-making mechanisms. What is more, Levis (2006) also identified the linguistic and pedagogical problems of some current textbook treatments of intonation, which causes a misleading understanding of intonation functions. For instance, the form, as well as the function of intonation, is illustrated inaccurately and inadequately. To take an example, WH-questions are commonly associated with falling intonation, but it actually can carry a different meaning with rising intonation patterns. All the assumptions and overgeneralizations in these textbooks implicitly create a certain hindrance in listeners' comprehension. Another problem is that too much emphasis is placed on affective functions, which leads to a

lack of communicative focus. One of Levis's recommendations (2006) is that intonation should be practiced in variations as a communicative tool by using authentic materials in particular contexts. With the right provision of some aspects of intonation, listeners can optimize their listening comprehension for better communication. This idea is also reflected in a paper by Chapman (2007) who claimed that teaching discourse intonation may help students to better understand spoken English. Likewise, this argument also receives support from Rife2 (2010) who advocates that intonation is vital for listening comprehension. Therefore, it is necessary to direct learners' attention to the intonation of the stream of speech with a pedagogical framework to assist their listening comprehension.

2.2.2.4 Chunks or intonation phrases

As discussed above, with respect to grammatical functions of intonation, the intonation structure reflects the grammatical structure. Therefore, spoken input is often divided into intonation phrases or chunks by speakers (Well, 2006). Therefore, as a listener, paying attention to chunks while listening would be beneficial for understanding. Empirical evidence has shown that chunks can promote listening comprehension (Mohseni, 2014; Tang, 2013; Xi, 2015; Xu, 2016). Chunk covers a variety of meanings depending on each discipline from a different perspective (Gobet et al., 2016).

The most acceptable definition in language learning and teaching is that a chunk refers to a collection of elements having strong associations with one

another but much weaker associations with other elements in other counterparts concurrently in use (Cowan, 2010; Gobet et al., 2001). Simply, chunking is the recoding of small units of information into larger, familiar units (Thalman et al., 2019). Regarding aural comprehension, chunking ability or the awareness of chunks is likely to free up capacity in working memory. This is the conclusion of the study by Thalman et al. (2019) which discovered that chunking could reduce the load on working memory. Moreover, a study by Tang (2013) also suggests the effectiveness of the acquisition of chunks to improve L2 learners' listening competency. In the study, with a combination of the lexical approach combined with the communicative approach, participants have raised awareness of chunks, practiced analyzing chunks, and producing chunks while listening. Data analysis from pre-and post-tests shows that chunks are helpful to increase L2 listeners' efficiency of processing language while listening. The results indicate that mastering chunks enable listeners to improve their predictive abilities and build up their self-confidence. The findings later are confirmed by other researchers such as Mohseni (2014) and Xi (2015) who also assert that lexical chunks play a significant role in listening comprehension. The reason for this is that chunks help listeners ease the processing load while listening, which enhances noticing. In other words, chunking is supposed to be useful for enlarging the capacity of memory.

Similarly, Xu (2016) also investigated the relationship between chunking and short-term memory. Unlike previous experiments, Xu (2016) let students in the experimental group learn about the theory of working memory, connections

between WM and chunking in addition to awareness-raising, and practice chunks. The findings of the study reveal that the capacity to chunk information helps listeners to memorize the new input better. In sum, these studies have demonstrated that practice with chunks or intonation phrases would be beneficial for learners during their listening comprehension.

2.2.3 Neuroscientific perspectives underlying prosodic-driven approach

Given the importance of prosody in language learning, especially aural comprehension, it is necessary to direct learners' attention to the prosodic system at the earliest stage of learning a new language. According to Xie (2018), L2 learners often rely on the neural network of the L1 to learn and process L2. Moreover, this is also reinforced in the traditional teaching method in which learners have been trained primarily on linguistic features at a sound level and word level as the same way of learning L1. Therefore, the significance of prosodic aspects is almost overlooked. In other words, learners have had their left hemisphere activated while the right counterpart is untouched. As explained by Kemmerer (2015), this is because the left brain favors linguistic representations, whereas the right works well with intonation patterns. Besides, Hull and Vaid (2005) also state that late bilinguals have a tendency to show left-hemisphere dominance for language, which may cause hindrances in the act of comprehension. What is more, according to McGilchrist (2019), the left hemisphere contributes to dealing with language or symbol manipulation. In contrast, the right hemisphere tends to understand meanings in contexts. During comprehension,

it is the right region that is responsible for making connections across related information (McGilchrist, 2019). Another key claim made by McGilchrist (2019) is that any new information or skill must be processed by the right hemisphere first before shifting to become the focus of the left hemisphere, especially verbal input. For these reasons, by prioritizing suprasegmental features in listening practice, the present study favors implicitly the fact that it is necessary to activate the right brain rather than focus only on the left brain traditionally. Furthermore, by using an unconventional way of teaching listening with low pass filtered audio, the current study implicitly exerts some influence on learners' auditory perception with the hope that this new information would be processed via the right brain.

2.2.4 Related studies about prosody and L2 listening

According to Gilbert (1984), pronunciation and listening comprehension are linked together. Similarly, Wong (1993) proposed that learning about pronunciation develops learners' abilities to comprehend spoken English. Studies in literature have also shown a positive correlation between pronunciation and listening comprehension (Ak, 2012; Han, 1996; Kissling, 2018; Tezi, 2007; Xiaoyu, 2009). Some highlight the effectiveness of suprasegmental features on listening comprehension, while others employ both segmental and suprasegmental elements. The earliest study was conducted by Han (1996) who attempted to investigate the effects of pronunciation-based learning practice on Korean EFL learners. With the focus on suprasegmentals, integration of pronunciation into an oral component, and the implementation of communicative

language teaching to pronunciation, the participants were provided with activities raising their awareness and understanding of the English sound system. After that, they took a pronunciation-based listening test which was designed to test six aspects of pronunciation: segmental sounds, focus meaning, contractions, word stress, focus identification, and thought groups. For the speaking test, subjects recorded a conversational dialogue. All records were analyzed later in terms of 5 aspects: contraction, intonation, focus, stress, and segmental sounds. The findings suggest that there are significant correlations among listening proficiency, pronunciation-based listening, and pronunciation-based speaking test. Most importantly, suprasegmental features were discovered to be indispensable for understanding fluent and conversational speech and more closely related to listening and pronunciation than segmental aspects. Indeed, this study has come up with some significance regarding the relationship between pronunciation-listening, but it was approached from a micro-level perspective with a bottom-up sense. Besides, the participants in the study were all females whose major was English.

In the same vein, Xiaoyu (2009) carried out a study based on the assumption that those Chinese learners with a good command of suprasegmental features of pronunciation tend to have better listening comprehension. After the analysis of the subjects' recordings based on three categories: stress, rhythm, and intonation, Xiaoyu (2009) pointed out that not only the combination of the three suprasegmental features but also each feature separately had a bearing on the participants' comprehension of

spoken English. This conclusion has a meaningful contribution to the current theme but still requires more empirical evidence since there was no intervention in the research.

Unlike the above researchers, Tezi (2007) made an effort to implement a technological tool for teaching pronunciation by determining if Computer-Assisted Pronunciation Teaching (CAPT) is effective in terms of improving students' listening comprehension. The results indicated that whatever instructions are given, students would perform better, yet the most significant performance belongs to the experimental group with explicit pronunciation instructions on both segmental and suprasegmental components. In line with this study, Ak (2012) also investigated the effects of pronunciation training on listening comprehension skills, yet instead of separating segmental and suprasegmental constituents, his training focused on raising awareness of both at the same time. The findings of the study lend support to previous studies which suggested that there is an improvement in learners' listening comprehension after the pronunciation training.

Similarly, a recent study by Kissling (2018) attempted to investigate the effect of pronunciation instruction on bottom-up processing to support L2 listening. 116 novice learners of EFL Spanish learners taking part in the study were divided into 4 experimental groups with instructions focusing on segmental or suprasegmental features followed by production-focused or perception-focused practice and one control group receiving no such pronunciation instructions. The production-focused practice involved following the instructor's modeling, repeating, and receiving feedback,

whereas, in perception-focused practice, the participants listened, filled the blanks highlighting the target features, and got feedback on their accuracy. Interestingly, the findings reveal that pronunciation instructions on suprasegmental features together with perception-focused practice can facilitate learners in segmenting the speech stream in their dictation task. In other words, directing learners' attention to suprasegmental elements can promote their listening skills. Yet, suprasegmental instructions in the study covered three aspects that are thought to impede word identification and speech segmentation: linking, diphthongs, and synalepha. These problems are supposed to be related to only EFL Spanish learners. Besides, the approach in the study was instructor-driven and low-tech, which seems to minimize two important factors: the application of technology and the autonomy of learners.

Taken all together, some studies focus on the combination of both segmental and suprasegmental elements while others only favor the latter. Although some researchers attempted to investigate the effectiveness of prosodic features, there is still a need for empirical evidence of its positive impact on listening comprehension. Besides, most of them are unlikely to mention the underlying theory of learning to account for the emphasis on suprasegmental over segmental components. Furthermore, these studies tend to employ explicit instructions. Therefore, what makes the present study significant is that it highlighted the implicit prosodic instructions, and the intervention was based on a perception theory of language learning which is verbotonalism.

2.3 Working Memory and L2 listening

2.3.1 Working Memory

2.3.1.1 Definitions and models of Working Memory

Working Memory is defined as the mental processes accountable for the simultaneous and temporary storage and processing of information in the performance of cognitive tasks. According to Baddeley's model (2000), there are four main elements: the two short-term storage components including the Phonological Loop and the Visuo-Spatial Sketchpad, a Central Executive, and the Episodic buffer which is the place where various types of information are temporarily stored and integrated. The Phonological Loop deals with phonological and verbal input, whereas the Visuo-Spatial Sketchpad manages visual and spatial information. The Central Executive is the most important subsystem, controlling, regulating, and mediating the other counterparts. Among the four components of WM, the phonological short-term memory, or Phonological Memory (PWM) and the Central Executive (EWM) are likely to play a vital role in language learning and use (Juffs & Harrington, 2011).

Working memory (WM) has caught a lot of attention from a large number of scholars in second language learning with its considerable contributions to as well as its impact on language learning (Jackson, 2016; Juffs & Harrington, 2011; Wen, 2012). The most common models in the literature and L2 research would include Baddeley's multicomponent model (2000), Cowan's embedded-processes model (2005), and Engle and colleagues' resource-dependent inhibition model (2004).

According to Jackson (2016), some distinct features among the three models are related to the non-unitary nature of WM, the role of the Central Executive, and the determination of capacity limits. In terms of the Central Executive, all these researchers emphasize its primary function of controlling attention compared to others. Yet, regarding the nature of WM, only Baddeley's multiple-component view gives a crystal-clear picture of each subsystem with different roles. Moreover, concerning the limited capacity proposed by Miller (1955), of the three, Baddeley's model seems to be the most congruent with the notion of capacity limits in both storage and processing. Given these characteristics of Baddeley's model, it can be considered as the most appropriate model that can support the current framework for teaching listening skills in this study. The model is illustrated in the following figure:

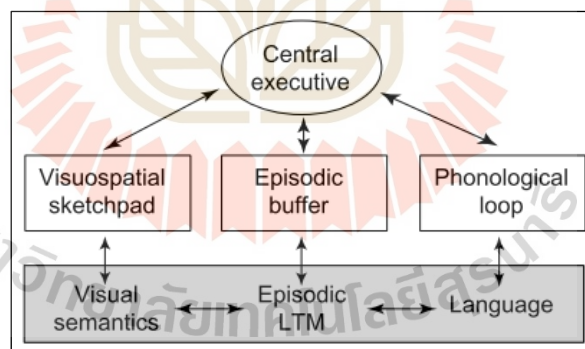


Figure 2.3 The multi-component Working Memory model (Baddeley, 2000)

2.3.1.2 Features of Working Memory

Despite the controversies and debates over the construct of WM among researchers, there is a consensus about its nature and its components (Wen, 2015). According to Wen (2015), in second language research, WM can be

characterized by some following basic features. First, the capacity of WM is limited. For instance, it can hold temporarily seven units of information (Miller, 1955) or in another way, four chunks of information (Cowan, 2000). Second, WM is a kind of memory system that subsumes multiple mechanisms and executive functions, consisting of domain-specific storage components and domain-general executive functions such as information updating, task switching, and inhibitory control. Third, long-term memory forms an integral part of the WM systems as working memory relies on representations recalled from long-term memory. Finally, WM capacity is not fixed. According to Klingberg (2009), WM can be improved through training. In other words, the systems are not static and that the limit of WM capacity can be stretched. Similarly, Simmering and Perone (2013) describe WM capacity as a dynamic process that emerges from a unified cognitive system flexibly adapting to the context and the demands of each task. This is also the findings of Brady et al. (2016) and van den Berg and Ma (2018) who claim that the capacity of WM is dependent on what is being remembered or the tasks assigned.

2.3.1.3 Measures for Working Memory capacity

Several measures have been invented to assess WM capacity and processes. In general, there are two kinds of tests, one for PWM and the other for EWM. The former, known as the word and digit span test, tapping only the storage function can be presented either visually or aurally such as the Forward Digit Span Task and the Word Span Task. In the Forward Digit Span Task, at the end of each list, participants

attempt to recall sets of unrelated numbers in order. Another alternative is the Non-Word Recognition or Repetition Span Task designed by Gathercole (2006). In this task, non-words or nonsense words are presented and recalled. All these simple working memory tests can be used for measuring PWM capacity.

The other kind of assessment that involves measuring both storage and processing is complex span tests such as the Reading/Listening Span test, the Operation Span test, and the Backward Digit Span Task. The Reading Span Task proposed by Daneman and Carpenter (1980) requires participants to read aloud sentences while trying to remember the last word of each sentence for later recall. Similarly, the Listening Span Task follows the same format but requires participants to listen instead of reading (Daneman & Carpenter, 1980). Another measure of EWM is the Operation Span Task suggested by Turner and Engle (1989). Instead of being confronted with sentences, participants solve mathematical operations while trying to remember the final words that are paired with each equation. In this way, the effect of prior language knowledge can be minimized. Later on, Kormos and Sáfár (2008) introduced another kind of measure, known as the Backward Digit Span Task. This task is quite like the Digit Span Task except for the fact that participants recall the numbers in reverse order. In general, these complex working memory tests intend to impose dual-task demands on participants; hence, require more than passive storage tested in simple working memory tasks (Miyake, 2001).

For the present study, the Forward Digit Span task was chosen for assessing the PWM and the Backward Digit Span task for EWM with the hope to measure working memory capacity independently from L2 listening ability and L2 knowledge (Brunfaut & Revesz; 2015).

2.3.2 Previous studies related to WM and listening

According to Engle (2010), one of the reasons why people differ in the performance of a variety of real-world tasks is their WM capacity. In the case of language learning, WM including both PWM and EWM are assumed to predict foreign language comprehension (Andersson, 2010; Engle, Cantor, & Carullo, 1992). This is also the findings of Daneman and Merikle's meta-analysis (1996) which synthesized the data from 6,179 participants in 77 studies investigating the relationship between WM capacity and language comprehension ability. They confirmed that WM plays an important role in language comprehension. Additionally, another meta-analysis by Linck et al. (2014) from 79 samples with 3707 participants also indicates that WM is positively associated with both L2 processing and proficiency outcomes. In the same manner, Jubera (2015) added more evidence to support that both EWM and PWM are involved in the process of second language learning. Her meta-analysis has shown that learners with bigger WM capacity have better performances in language learning. What is more, about particular aspects of second language learning, results from various studies have shown that WM is crucial for the development of L2 speech production (Finardi and Silveira, 2011; Weissheimer, 2011), oral fluency (Rezai & Okhovat,

2016), writing performance (Satori, 2012) and reading comprehension (Adams & Shahnazari-Dorcheh, 2014; Heriyawati et al., 2018). However, there are relatively few empirical studies examining the relationship between WM capacity and L2 listening.

In the field of L2 listening, regarding measures of WM, some studies required participants to take the complex memory task, whereas the others administered both simple and complex memory tasks. In the first trend, EWM involving both storing and processing information is measured. For instance, Gu and Wang (2007) let the EFL Chinese subjects take two listening span tests in L1 and L2 along with a listening test. Their data analysis reveals that learners with larger working memory capacity are more likely to have better abilities in listening comprehension. Moreover, the findings also indicate that the L2 working memory span is more effective in differentiating learners' EFL listening comprehension. Similarly, a recent study conducted by Namaziandost et al. (2018) has reached the same conclusion suggesting that working memory is a good predictor for EFL listening comprehension. In the study, the Iranian EFL participants also took a listening comprehension test and two listening span tests (in L1 and L2) but with an additional placement test to determine their homogeneity level. Although the two mentioned studies have come up with significant findings, they are both correlational studies. Similarly, another correlational study by Fay and Buchweitz (2014) reaches the same conclusion that larger WM capacity generally facilitates the process of listening. However, what makes their study different from the previous ones

is that the EWM was measured by a distinct test created in Brazil unlike those from the mainstream of the WM test.

In another strand, several researchers have employed both simple and complex memory span test tapping PWM and EWM, respectively. For instance, in an investigation into the relationship between WM and L2 listening comprehension among 150 Japanese EFL students, Satori (2012) used L1 and L2 digit span tasks and listening span tasks as WM test; TOIEC test as listening comprehension task and a proficiency test. She found out that the correlation is more significant in the low-level group than the high-level group. The findings contrast with what Zafarghandi and Bahrpeyma (2017) discovered in their experiment with 145 Iranian EFL students. Their analysis demonstrates that WM has more influence on listening comprehension performances at an advanced level. For the lower proficiency level, the correlation between WM and listening comprehension is weaker. The conflict between the two studies may lie in the different measures of listening comprehension. Although both studies were correlational and made use of the same type of WM tasks, the listening test was taken from two distinct sources. The listening part in the IELTS test was employed in Zafarghandi and Bahrpeyma 's study (2017) while Satori (2012) chose the listening part in the TOIEC test. It seems that the task type of the two tests may be the contributing factor in this case.

Likewise, a study by Andringa et al. (2012) which aims to explain individual differences in both native and non-native listening comprehension uncovered a near

absence of correlations between WM and listening comprehension for non-native listeners. The study utilized a battery of tests covering various linguistic and nonlinguistic cognitive skills related to listening comprehension skills such as discourse, vocabulary, semantic processing, grammar processing, segmentation, word monitoring, self-paced listening task, and an intelligence test. In terms of the WM test, with a closer inspection, they used one non-word recognition task together with 4 digit-span tasks consisting of forward visual, backward visual, forward auditory, and backward auditory.

From a multivariate perspective analysis, Andringa et al. (2012) argued that contrary to what has been suggested in previous studies, WM capacity is found to be an independent general cognitive function and does not explain why some listeners are better than others. Later on, in an attempt to explore the influence of WM on listening difficulty, Brunfaut and Révész (2015) conducted a correlational study with 93 participants from different backgrounds around the world, studying in the United Kingdom. In their experiment, the PTE Academic test was selected as the proficiency test and the listening comprehension test. For measuring WM capacity, visual modality was chosen for the Forward and Backward Digit Span task based on the empirical findings reported by Olsthoorn, Andringa, and Hulstijn (2014) that visual digit span test has the advantage of avoiding language-specific input. After analyzing the data, Brunfaut and Révész (2015) confirmed that individual differences in WM predict L2 processing abilities. Yet, they also made a remarkable discovery that no correlation was

found between listening performance and WM measure when focusing on a particular task type. In other words, they interpreted that the differences in the nature of the listening text and response characteristics, along with the type of listening evaluated by the task may have a part to play in accounting for such no correlation. In relation to the inconsistency among the results of the above-mentioned research, Brunfaut and Révész (2015) argued that this would be caused by the differences among the listening tasks.

Unlike earlier studies, Kormos and Sáfár (2008) attempted to explore the different roles of PWM and EWM in instructed second language acquisition with an intervention. All the participants were involved in a one-year-long intensive English language training program with the communicative teaching method combined with focus-on-form instruction. Their instruments were the FCE test, the Non-Word Span test, and the Backward Digit Span test. As regards PWM, the findings of the study show that there was no meaningful correlation between non-word repetition scores and English proficiency test results in the case of beginners but a highly significant relationship for pre-intermediate students. Yet, in terms of EWM, the backward digit span test correlated highly with overall English language competence as well as with listening scores. In sum, these results indicated that PWM and EWM capacity play a different role in instructed second language acquisition.

In respect to the modality of the Digit Span tasks, the results of the study conducted by Olsthoorn et al. (2014) uncovered that while natives performed better

than the non-natives on the auditory tasks, performances on the visual tasks did not significantly differ between natives and non-natives. These findings suggested that the visual digit-span tasks should be employed in the case of between-language differences in digit-name length. However, evidence from neuroimaging (fMRI, ERP) data has been shown that auditory and visual modalities are often activated at the same time by sight or sound stimuli. In other words, auditory processing appears to be engaged in reading (Haist et al., 2001; Petkov & Belin, 2013; Zhou et al., 2019) and auditory attention may engage the visual cortex automatically (Brang et al., 2015; Cate et al., 2009; McDonald et al., 2013). For this reason, the issue of choosing which modality for conducting a memory span test in second language teaching and learning is still in need of empirical verification.

Taken together, investigations of the impact of WM on L2 listening have not only been scarce but also yielded contradictory conclusions. Therefore, the goal of the current study was to add more empirical evidence to the related literature by investigating the impact of WM capacity on listening comprehension performance in the case of Vietnamese EFL learners. What clearly distinguishes the current study from earlier ones is that the participants were exposed to intensive listening practice with the OPA. As for the measures of WM capacity, both visual and auditory digit span tasks were exploited in L2. All these characteristics contribute to the significance of the current study.

2.3.3 Fluency and automaticity

2.3.3.1 Fluency

According to Segalowitz (2010), L2 fluency can be categorized as cognitive fluency, utterance fluency, and perceived fluency. Cognitive fluency is the efficiency of operation of the underlying processes responsible for producing utterances whereas utterance fluency refers to the characteristics of utterances that reflect the speaker's cognitive fluency. For perceived fluency, it is the inferences listeners make about speakers' cognitive fluency on their perceptions of their utterance fluency. Based on this categorization, in the case of listening skills, cognitive fluency has a vital part to play for comprehension. In a more general sense, Derwing et al. (2004) describe fluency as an automatic procedural skill on the part of the speaker and a perceptual phenomenon in the listener. Likewise, Chang and Millett (2016) simply claim that listening fluency can be characterized as listeners' reasonable understanding of aural input delivered at a normal speech effortlessly and accurately. In their explanations, due to the real-time nature of listening, listeners usually have no time to stop to think about what is being said. Therefore, the listening process should be automatic to guarantee the best comprehension. To put it in another way, in terms of the WM model of Baddeley (2000), because of the limited capacity of WM, the more fluent the processing is, the more capacity there is available for higher mental processing like comprehension. In this case, cognitive fluency is likely to be one indication of this processing capacity. What is more, according to De Jong and Perfetti (2011), although

many language learners try to achieve performance fluency, it is highly dependent on the knowledge and skills of the speaker, which are the basis of cognitive fluency. This means that cognitive fluency does have a strong connection with oral fluency. In the current study, fluency is defined from a listener's perspective, referring to the efficiency of processing information while constructing meanings from aural input. Therefore, the more automatic the process, the better the comprehension.

2.3.3.2 Automaticity

The concept of automatic processing or automaticity stems from the argument of Dumais et al. (1982) that the quality of performance depends on the amount of attention and effort made by an individual. This is demonstrated by two distinct processes: automatic processing and controlled processing. The former requires minimal effort, is fast, and is not limited to EWM; whereas the latter needs considerable attention, is relatively slower, and is limited by EWM. Later on, in an overview of the development of a dual theory of processing, Schneider, and Chein (2003) demonstrated a set of core behavioral phenomena differentiating controlled processing and automatic processing. Among them, there are some which are likely to be in connection with language learning. For example, automatic processing can be developed with massive repetition experience and extended consistent training. With automatic processing, little effort is required, and the ability to face high workload situations is enhanced. With respect to second language acquisition, according to Segalowitz (2003), the term “automaticity” is often used to refer to different senses of meaning with various

characteristics. These features can be summarized as fast processing, ballistic processing (unstoppable), load-independent processing, effortless processing, unconscious processing, shift to instance processing and brain activity measures. Segalowitz (2003) also points out the need to help learners develop their automaticity for a number of possible reasons. First, automatic processing consumes fewer attentional resources, saving for other activities that needs attention. Second, with automatic processing, interference can be minimized, assisting in processing information more quickly and precisely. Third, automaticity is able to promote fluency in terms of certain aspects of L2 performance such as pronunciation, grammatical processing and word recognition. Based on these arguments of Segalowitz (2003), enhancing automaticity is supposed to facilitate listeners to achieve comprehension.

The fleeting nature of the speech signal makes listening more challenging for non-native listeners who lack automaticity in processing L2. According to Lynch (2010), L2 listeners at different levels may put different efforts into processing information while following the speed rate. Due to a lack of L2 knowledge, listening comprehension may put a heavy demand on the processing system of the listeners. As also stated in Nagle and Sanders (1996), automatic processing is critical to comprehension, and too much controlled-processing may lead to a breakdown in understanding. They explained that putting too much attention on details may cause a system overload and trigger anxiety about a failure to make sense of the signals. In other words, when the system is fully occupied with prior input because of over-

processing, this may result in a loss of information from new input. Besides, human working memory has limited capacity. Working memory allows listeners to store incoming information temporarily, waiting for the activation of prior information (Cowan, 2000). In this way, the integration of old and new information contributes to the meaning-making mechanisms in the listening process. Therefore, if listening lacks automaticity and involves conscious attention, working memory will be overloaded and cause difficulties in generating meanings. In contrast, when listeners process information automatically, they can allocate the limited capacity of their working memory to process new information and to notice the global context of the signal for a better understanding (Joaquin, 2018).

In sum, it seems that automaticity is a sub-process in fluency, yet the two constructs may describe the same process to some extent. In the study, the term fluency was used to refer to automatic processing or automaticity. The technique used in the study to strengthen automaticity is shadowing, which will be described in detail in the next section.

2.3.4 Shadowing and listening

2.3.4.1 Definitions of shadowing

From a technical perspective, Lambert (1992) defines shadowing as a paced, auditory tracking task that involves the immediate vocalization of auditorily presented stimuli. For a simpler definition, Hamada (2016) describes shadowing as repeating what one hears simultaneously as accurately as possible. He also

distinguishes shadowing from repetition. They are both about reproducing what a person hears but differ in the time lag. The time lag in shadowing between what one hears and reproduces what one hears chunk by chunk is less than that in repetition (Hamada, 2016). Originally, this technique was exploited in cognitive psychology as a means of studying selective attention; in training simultaneous interpreters in L1 and recently, as a pedagogic tool in foreign language teaching and learning (Bovee & Stewart, 2008; Hamada, 2016). However, as being used in many contexts, the term shadowing seems to cover different aspects, which leads to many variations as demonstrated in Table 2.1.

Table 2.1 Varieties of shadowing (Hamada, 2016a)

Name	Procedure
Complete shadowing	Learners shadow everything speakers say
Selective shadowing	Learners select only certain words and phrases to shadow
Parallel reading	Learners shadow while reading the text
Content shadowing	Learners concentrate on both shadowing and the meaning
Mumbling	Learners silently shadowing the incoming sounds without text
Interactive shadowing	Selective shadowing, and adds questions and comments to make it more natural and show more involvement on the part of the learners
Conversational shadowing	Learners repeat conversation partner's words
Phrase shadowing	Learners shadow phrase by phrase with a slight delay
Phonemic shadowing	Learners shadow each sound as soon as they hear

In the present study, shadowing simply refers to what Hamada (2016) describes, i.e., it requires learners to repeat what they hear simultaneously as accurately as possible. As for the learners in the current study, shadowing is beneficial in terms of four aspects that are claimed by Hamada (2016). First, practicing shadowing may familiarize learners with intonation patterns of the target system; consequently, they unconsciously internalize the sound system of the target language. Second, learners often confront attention failures when encountering unfamiliar sequences. With shadowing training, they can build resilience to overcome these failures in attention. Third, regarding fast speech, learners often have trouble following the flow of speech while listening. Practice shadowing can enable listeners to get used to the speed rate for better comprehension. Finally, learners often know a word in isolation but find it difficult to catch it from the auditory signal due to a lack of automatic processing. When they develop automaticity through shadowing, listeners can focus on making meaning of the aural input. Nakayama and Armstrong (2015) also state that performing shadowing tasks may facilitate learners' online processing and, thus, help improve the phonological loop, which functions as processing and storing incoming information during listening (Baddeley, 2000). As Hamada (2016, 2018) explains, shadowing is the act of rehearsing information explicitly but implicitly in sub-vocal rehearsal. Therefore, it can help to strengthen phonological working memory capacity.

2.3.4.2 Previous studies

Empirical evidence has shown that shadowing can promote listening comprehension (Hamada, 2014, 2016a, 2016b; Hiroko, 2004; Hwang, 2016; Tomokazu & Toshiaki, 2012), improve pronunciation (Hsieh et al., 2013; Martinsen et al. 2017; Yavari et al., 2019), and raise motivation (Hamada, 2015; Shiota, 2012; Sumiyoshi & Svetanant, 2017). In respect to listening comprehension, for example, Tomokazu and Toshiaki (2012) investigated whether visual-auditory or auditory shadowing led to a greater improvement in listening comprehension. It turns out that visual-auditory shadowing is more effective, yet it does not directly improve listening comprehension but facilitates higher cognitive processing for listening comprehension. Likewise, based on the working memory theory, Hiroki's study (2004) aims to investigate the relationship between shadowing and listening comprehension ability. The findings reveal that EFL learners with better phonological memory have better listening ability. This is because while shadowing, students must practice holding auditory information temporarily in the phonological working memory. From this interpretation, the study concludes that shadowing can promote listening comprehension ability.

Other studies not only investigate the impact of shadowing on pronunciation, especially oral fluency and intonation but also combine the use of mobile technology such as a pronunciation program named My English Tutor (Hsieh et al., 2013), video-based shadowing combining tracking (Martinsen et al., 2017), and a designed mobile application for shadowing (Foote & McDonough, 2017). Altogether,

these studies have suggested that shadowing has a positive effect on learners' overall performances on pronunciation, particularly fluency.

From a psychological perspective, it has been discovered that students perceive shadowing as effective for listening skills and its usefulness. This is also the result of the study by Sumiyoshi and Svetanant (2017) based on both quantitative and qualitative data analysis from a written survey with 35 questionnaire items and 3 open-ended questions. The results of this study are in line with what Hamada (2015) uncovered in his experiment with 80 Japanese sophomores. Hamada (2015) discovers that in addition to improving learners' listening comprehension skills, shadowing also contributes to raising their motivation for listening. In another case, shadowing can even be helpful to reduce the anxiety of students (Shiota, 2012).

For the sake of more effective ways of using shadowing in teaching and learning, different aspects related to shadowing have been also examined such as learners' level, types of materials, and order of learning. In relation to learners' proficiency level, shadowing can benefit both the low and intermediate levels of listeners (Hamada, 2016b; Yavari, 2019). Especially, it is the low-level students who see the most empirically observable benefits from performing shadowing tasks (Bovee & Stewart, 2008; Hamada, 2016a). Regarding materials, Hamada (2011; 2016b) argues that difficult materials can still assist learners' listening improvement in addition to the favorable choice of easy materials. Hamada (2012) also emphasizes that learners can improve their listening comprehension skills more quickly when using a combination

of different difficulties of materials. For the order of learning, according to Hamada (2014; 2016b), shadowing can be implemented before learning the content referred to as pre-shadowing and after learning the content referred to as post-shadowing. In his explanations, with pre-shadowing, learners focus more on the phonological information, which can reinforce their speech perception skills. However, this may be challenging for learners because they may encounter unknown vocabulary. As a result, the cognitive load of pre-shadowing is higher. On the contrary, in post-shadowing practice, seeing the contents may bring learners relaxation and comfort. In general, each kind of shadowing has its own merits depending on the purpose of using it.

In brief, the current study used pre-shadowing for three reasons. First, the researcher aimed to direct learners' attention to the rhythmic and intonation patterns. Second, learners were not distracted by the contents and concentrated on what they were hearing and vocalizing, so they were exclusively training their listening skills. And finally, without seeing the content, learners had to face uncertainty more. However, with consistent practice, it is expected that they could get familiar with it. Given the challenges pre-shadowing might cause for the learners, the audio was slowed down to a reasonable speed and they could play the audio many times at their will in order to reduce the cognitive load that they might experience.

2.4 The verbotonal approach

2.4.1 The history of the verbotonal approach

The Verbotonal method was initially invented by Petar Guberina (1913-2005) at the end of the 50s and it is the first method to have considered the tone of speech sounds as an essential element in the rehabilitation of the audible remains of hard-hearing people (Calvez, 2009). Verbo refers to speech and tonal is based on frequencies to which the ear is sensitive. The original idea of this method is to maximize the conditions of perception by presenting to the subjects the model that makes them better aware of the elements that remain foreign to them and gradually to widen their auditory field (Rancon, 2018). At the same time, Guberina was struck by the fact that adults with normal hearing fail to perceive the sounds of a foreign language correctly. Then, he drew a parallel between a hearing-impaired person with the first language learning and a learner of a foreign language. Both structure the sound background with their own system, but the former's system is determined by pathological factors and the latter by the "phonological sieve" of the mother tongue (Intravaia, 2013). The term "phonological sieve", proposed by Troubetzkoy (1939), explains that bad perception will cause bad production in second language learning because these sounds do not exist in the mother tongue and the learners cannot recognize them (Garzon, 2017). In other words, learners might not identify and misinterpret the foreign language as its sound is filtered by its own phonological screen acquired in their childhood, which results in "phonological deafness" to the foreign language. For this reason, according

to the verbotonal approach, real deafness, as well as phonological deafness, can be treated in the same way.

The focal point of this method is that perception must precede production. Therefore, the main goal is to reeducate the learners' ears to improve their perception. Yet, in order to promote the perception of phonological elements, it is essential to use activities based on the rhythm and intonation of language (Boureux, 2012). Thus, this can be considered as the prosodic-driven methodology. Since its inception, the verbotonal method has been applied by many researchers in the perspective of phonetic correction and pronunciation in teaching and learning of other foreign languages (He, 2014; Ludovic, 2010; Zhang, 2005). Later on, as pronunciation is believed to condition the entire learning process of a foreign language, more studies have been carried out using verbotonalism to improve other skills such as speaking (Yang, 2016) and reading (Alazard et al., 2010; Alazard, 2013). However, research regarding listening comprehension based on verbotonal procedure is still scarce. In order to fill this void in the literature review relating to this theme, the current study aimed to employ some principles in verbotonalism to enhance learners' listening comprehension.

2.4.2 The verbotonal principles

The first and foremost principle of verbotonal approach is that good perception will lead to good production. Therefore, the focus is to change the perception of learners. It can be said that verbotonalism is a theory of changing perception. As discussed above, when learners communicate in a foreign language, they spontaneously

continue to interpret the foreign phonic models by following the habits developed in their mother tongue. They fail to perceive the phonological differences which form phonological deafness (Intravaia, 2013). Under this circumstance, the learning of a foreign system is challenging as the old system is deeply rooted as learners' experience. Regarding auditory perception, what we hear is based on our past experiences (Mueller, 1958). That is to say, learners of a foreign language often associate what they hear with the experiences with which they are familiar. In this case, what they are used to is the sound of their native language since they were born. To learn a new language, learners need to develop a new habit pattern by getting a new "ear". In order to do that, an intervention is necessary to create new experience for learners to modify their auditory perception.

The second principle is its priority to prosodic features. The verbotonal approach highlights the importance of the suprasegments and proposes that prosody should precede the sounds in the sequence of teaching and learning (Garcia, 2018). It has been verified that the establishment of rhythmic-melodic contours eliminates many segmental errors (Intravaia, 2013). In other words, the improvement in prosodic elements seems to compensate for the loss of linguistic knowledge. Therefore, the use of activities based on rhythm and intonation can help learners have a better perception of the tonal variations of the prosody of the target language. Moreover, the fact that the ability to understand these prosodic cues can help learners promote their listening comprehension has been supported by several scholars (Flores, 1997; Gilbert, 2008;

Wennerstrom, 2001; Yenkimakeki, 2017). In line with these arguments, Goldfarb (2012) also stresses that suprasegment is the foundation of both listening and spoken language. According to Alazard (2013), even when learners read orally or silently, the role of prosody in comprehension cannot be overlooked. For instance, once learners see a word, the mental repetition of its pronunciation will come up, allowing for the meaning-making process. In Alazard's explanation (2013), in terms of reading, if learners have not acquired the prosodic system orally, they may face many problems in understanding written documents. In relation to writing, it is argued that if learners approach writing at the earlier stage, the mental images of the orthograph of words may hinder them from obtaining the right pronunciation (Zarekar & Rahmatian, 2017). For these reasons, oral skills should be prioritized to minimize the hindrances in the process of learning a new language. Yet, there can be no oral production earlier than aural comprehension and listening appears to be the basic mechanism through which the rules of language are internalized (Byrnes, 1984).

However, a focus on prosodic elements alone is not enough but has to be in coordination with body movements and gestures. This is the third principle in verbotonalism. At a young age, the child feels the speech rhythms through the vestibular perception or body perception so that the brain can perceive speech rhythms (Asp, 2006). After the speech rhythms are internalized in memory, the child can recall different patterns only by listening. Good rhythm perception enables learners to anticipate what speakers will say and hear rapidly with ease and pleasure. Moreover,

the body is the transmitter and receiver of communication (Calvez, 2009). It is also argued that speech and body motions are rhythmically coordinated (Condon & Ogston, 1966). From their experiment, Condon and Ogston (1996) conclude that in communication, not only self-synchrony occurs but also interactional synchrony does. Furthermore, previous findings relating to gestures suggest that producing gestures help internalize L2 prosodic structure through embodied processes (Gullberg, 2008; McCafferty, 2004; Negueruela et al., 2004). This kind of production may contribute to communication and memory for novel information in the same individual, whether it is spontaneous or nonspontaneous (Morett, 2018). Similarly, Chan (2018) emphasizes that the employment of gestures is helpful for language learners who need to develop sensitivity to auditory input. By producing gestures while repeating, learners can gain awareness of prosodic patterns in spoken English and internalize them into body memory. Therefore, it is vital for learners of a foreign language, as a speaker, to integrate their whole body into the speech rhythm of the new language form and as a listener, to synchronize with the interlocutors for effective communication.

All the above principles lead to the fourth principle, which emphasizes the absence of intellectualization. This principle can be considered as a reflection of others. According to this concept, the process of correctly acquiring a phonological system must be carried out most naturally. That is, an excess of indications as to how a sound should be articulated can be counterproductive to the learners. Consequently, the learning process should operate at the unconscious level at which learners are given

implicit instruction. According to Ellis et al. (2009), implicit instruction seeks to provide learners with experience of specific patterns while they are not attempting to learn them. In this way, learners can internalize the underlying patterns without their attention being explicitly focused on them. Ellis et al. (2009) also point out that direct intervention can be considered as implicit in case it attempts to create a learning environment enriched with the target feature and keep learners uninformed about that. As a result, learners may make certain improvements without being aware of the reasons. In speech comprehension, implicit knowledge is also argued to be an effective way of learning (Rebuschat, 2015).

Taking all the principles together, a number of techniques were employed in verbotonal procedures to create an optimal condition for reeducating the learners' "ear" to improve its perception and potentially its production. Two main techniques were listening to low pass filtered sentences and repetition.

The first technique is letting learners listen to low pass filtered audio. Technically speaking, low-pass filtering is the process of removing high frequency which is vital for speech comprehension while leaving the speech melody intact (Snel & Cullen, 2013). Simply put, the segmental features including lexical and syntactic cues are filtered out, but the prosodic characteristics are preserved consisting of pitch parameters, stress patterns, rhythm, and tempo. There are two reasons for employing this technique. The first reason is that it has been proved as an effective method for speech delexicalization since the low frequencies transmit the rhythm and intonation

patterns of language. According to Sonntag and Portele (1997), this technique is considered as an ideal stimulus manipulation for prosodic perception because it conveys the primary prosodic features and the detection of these phenomena requires less listening effort from the subjects. Moreover, this is a useful tool to mask the semantic content (Snel & Cullen, 2013). The fact that rendering the lexical content of an utterance unintelligible and keeping the prosodic contours directs the learners' aural attention to the patterns as a whole (Flores, 1997). In this way, learners can increase their sensitivity in perceiving the same patterns in normal language behavior. Indeed, in the literature review, another technique was also used to help learners forget the meaning of the messages and concentrate on the melody of the language such as using nonsense syllables (Flores, 1997; Rançon, 2018). When using this approach, the teacher must sing the model sentences by replacing the verbal messages with these logatomes. For instance, TI for unstressed syllables, TA for stressed syllables, and TAA to indicate the tonic syllable (Flores, 1997). This means that the teacher will demonstrate all the models verbally to learners whenever they need to listen. Needless to say, this technique requires much effort from the teacher, limits learners' autonomy, and reduces the authenticity of the input. With the advances of technology, this technique seems to be inadequate in the current educational setting in which the role of the teachers should be transparent and the learners' self-directed learning ability should be promoted. As a result, with the filtering technique, these problems can be solved and can guarantee that when the learners listen to whether filtered or unfiltered recordings, they will still listen

to the same authentic prosodic patterns. The second reason for employing low-pass filtering is that this way can give the right signal to bypass the normal processing mechanism of listeners which is often manipulated by the left hemisphere. This kind of aural input is different from what listeners are often exposed to; therefore, it will be handled by the right hemisphere first before being processed to the left hemisphere (McGilchrist, 2019). This is in line with findings from several neuroimaging studies investigating the lateralization of prosodic processing (e.g. Fonseca et al., 2009; Hesling et al., 2005; Ischebeck et al., 2008; Meyer et al., 2004; 2002). They discovered that stronger right-hemispheric activations within frontotemporal areas for low-pass-filtered speech than for natural speech. For these reasons, the low-pass filtering technique was used in this study.

The second technique is repetition. During the intervention, learners must have the experience of a lot of repetitions of listening to both the filtered and normal recordings, then imitating them because these repetitions can enable learners can develop a sense of rhythmic patterns and then increase their awareness of prosodic structures (Jung et al., 2017). As explained by Nishikawa's (2014), repetition can be used as a practical method to enable learners to make changes in their production due to their perception of internal transformation. Indeed, repetition is important in this case as it can help learners have more speed of access and more attention to the prosodic information by creating a cognitive effect, as stated by Bygate (2018, p.8) “learners of all levels of proficiency are likely to benefit from repetitions by changing their focus

and the resulting output...On any given repetition cycle, some learners may take the opportunity to complexify their language, some may hone their accuracy, and others may use their familiarity from the previous iteration to operate more fluently". This view is consistent with Lambert et al. (2016), suggesting that repetition is one of the ways of the human mind to assimilate information gradually to achieve fluency. Besides, according to Silva and Santos (2006), repetition is likely to facilitate a type of spontaneous pre-patterning, which sharpens the automaticity in interaction. What is more, Ghazi-Saidi and Ansaldo (2017) added neurofunctional evidence related to the effects of repetition. They reveal that repetition is a neuroplasticity agent in L2 learning. Therefore, a certain amount of repetition can be used as a technique in L2 intervention to minimize the cognitive load. As regards the frequency of repetition, it remains inconsistent (see review in Webb, 2007). The minimum number of repetitions for vocabulary learning is argued to be 8 (Horst et al., 1998), 10 (Saragi et al., 1978; Webb, 2007), and 20 (Waring & Takaki, 2003). In the current study, although repetition was used to internalize the prosodic structures not vocabulary, the number of repetitions was adopted and adapted based on these findings. For the first trial, students listened to filtered audio 15 times because they needed time to process the new information and get familiar with an unusual sound. After that, they listened to unfiltered audio 10 times. Then, 10 repetitions for the filtered sentences. At this point, the frequency was cut down to minimize the boredom of the students. In sum, the repetition 15-10-10 was chosen

to make sure both the effectiveness of the approach as well as to maintain the students' attention.

2.4.3 Studies related to the verbotonal approach

Originally, the verbotonal approach was designed for the rehabilitation of hearing-impaired persons by Petar Guberina (1913-2005). It then became a fruitful tool in the teaching of languages (Intravaia, 2013). The procedures used for rehabilitation of the deaf have been successfully applied in French as a Foreign Language (FLE) and later is transposed to the teaching and learning of other foreign languages regarding phonetic corrections (Billières, 2018; Intravaia, 2013). With respect to FLE, a recent thesis by Garzon (2017) has proposed many activities for phonetic correction for Spanish learners based on an exhaustive analysis of various problems in phonetics teaching. He explained that since the current methods of teaching French seem ineffective, it was necessary for a renewal of language teaching and learning where the verbotonal approach would find its place. In an attempt to investigate the positive influence of oral skills' training on reading abilities for learners of FFL, Alazard et al. (2010) hypothesize that teaching prosody, especially for beginners, will not only enhance students' speech fluency and pronunciation skills but also improve their strategies to decode written speech. Indeed, these verbotonal procedures in the study have confirmed their hypothesis. The results reveal that with the assistance of prosody, readers can access higher-level competencies by creating encoding automatism in both native and foreign languages. Therefore, their reading fluency has made significant

progress. Later on, Alazard (2013) wrote her Ph.D. thesis on the role of prosody in fluency regarding oral reading. In her findings, she concluded that learners who took phonetic correction courses via the verbotonal approach could improve their productions in spoken English and develop their reading fluency. She accounted for this for the fact that promoting prosodic competence is the reflection of profound cognitive changes essential to the encoding and decoding of a foreign language.

In sum, in the field of FFL, the verbotonal approach is fruitful in teaching and learning. Indeed, this is not only a comprehensive and effective phonetic correction method with French but also with other languages such as Catalan language (Seguí, 2014), Arabic (Farah & Dichy, 2017), Croatian (Milanović & Dobrić, 2017), and Spanish (Garcia, 2018). In the case of Mandarin, Zhang (2005) built a system to provide interactive feedback utilizing the verbotonal method as a theoretical framework to enhance pronunciation in learning Mandarin. The results of the study revealed a potential expansion in using this method to teach a foreign language in the technological era. Gradually, the verbotonal approach seems to receive much attention in English teaching and learning. Truly, in EFL contexts, many researchers have shown interest in discovering its effectiveness both in phonetic corrections and other linguistic aspects like pronunciation and speaking skills. For corrective phonetics, Ludovic (2010) introduced many activities based on verbotonal principles to help learners correct their errors. Most importantly, the paper highlights the positive attitude of learners when experiencing these activities. Likewise, He (2014) attempted to integrate CALL and the

verbotonal approach to enhance Chinese EFL learners' pronunciation. Her study lends support to previous studies and added a new perspective which suggests that learners' fluency also becomes better after intervention with the approach. Following the trend, Yang (2016) carried out her study to examine the effectiveness of the verbotonal approach on the speaking skill of EFL learners. Her findings reveal that the oral fluency of learners improved after the treatment of the verbotonal approach. Additionally, according to Yang (2016), learners' phonological working memory is also strengthened.

Taken all together, within a verbotonal perspective, phonetics correction is the main theme but later, the implementation is extended to pronunciation, speaking skill, and reading skill. All seem to share the same mechanism that implicit prosody training has built up the oral fluency in learners, but none has examined its impact on cognitive fluency which reflects listening skill. In the realm of listening, only lately has the degree of influence of verbotonalism during listening and reading activities with Iranian learners of EFL been investigated by Zarekar and Rahmatian (2017). The results of the study are based on descriptive and analytical methodology. By analyzing the data collected from the questionnaire, the researchers tried to identify the listening and reading activities that learners would find it effective during their learning and those that appear to them to be less effective and unnecessary. Although the study highlights the impact of the verbotonal approach on listening activities, it still lacks empirical evidence. As a result, the present study was conducted to investigate the effect of some

verbotonal principles on listening comprehension skills as a contribution to this theme in the literature.

2.5 Summary

The chapter reviewed and gave the outline of some key concepts as well as previous related studies on the listening process, listening pedagogies, prosody, working memory, shadowing, and verbotonalism. From a revisit of the earlier definitions of listening, together with the principles of Lian and Sussex's meaning-making mechanism (2018) and the multi-level account of selective attention, the researcher puts forward an alternative model of the listening process. Specifically, listening refers to a process of constructing meaning from aural input through a perceptual filter under the influence of both known and unknown variables related to the idiosyncratic features of an individual learner. In order to enhance learners' listening comprehension, it is necessary to help them adjust their native language listening habits and adopt a new one in the target language, which is English. The approach in this study is established on the foundation of some related findings in the human brain concerning prosodic processing and neuroplasticity of Working Memory. Learners will be engaged in some activities using techniques such as listening to filtered audio, repetition in synchrony with body movements, and shadowing. All also reflect the theory of perception which is the verbotonalism.

CHAPTER 3

METHODOLOGY

This chapter begins with a description of the subjects involved in the study. Then, the research design is presented including the construction of the OPA and identification of the variables. After that, a description of all the instruments used to collect both quantitative and qualitative data is given in detail. The chapter continues by providing an outline of research procedures, the steps in the data collection phase, and the methods in analyzing data. Then, some ethical issues are identified before the pilot study, and the summary of the chapter is presented.

3.1 Participants and setting

The participants in the study were 65 Vietnamese students aged from 20 to 23 at Ho Chi Minh Economic Technical College Language Center from a variety of disciplines. They were first-year and second-year students who registered for the English course and formed two intact classes as a result of the arrangement from the training department. The two classes were randomly assigned as one control group and one experimental group.

Ho Chi Minh Economic Technical College (HOTEC) was established in 1999 and has been providing training in 16 vocational courses and 7 college courses. HOTEC

constantly improves and raises its educational quality to compare with other schools in regional and global contexts. In terms of English, all the students whose major is not English have to achieve a B1 level for college students and an A2 level for vocational students to graduate. Regarding English teachers, the department of foreign languages is made up of 15 teachers consisting of 2 males and 13 females.

3.2 Research design

This study used a mixed-methods approach. According to Ary, Jacobs, and Sorensen (2010), there are many reasons for conducting mixed methods research such as seeking corroboration of findings, elaborating findings, developing interpretations, investigating contradictions, or expanding the depth of a study. The mixed-methods approach was chosen because the researcher wanted to seek triangulation evidence to better understand the effectiveness of the new approach applied to the teaching of listening skills. Specifically, quantitative test scores were used to measure the effectiveness of the teaching approach while data from students' journals, the researcher's observation, and interviews were used as a qualitative method to explore students' opinions towards as well as experiences with the OPA.

Due to the absence of randomization in sampling, the study was quasi-experimental. The control group was taught listening with a traditional method in the classroom while the experimental group learned to develop listening skills with the OPA in a teacherless, autonomous listening platform. The focus of the research design

was to see whether the intervention, the OPA, could improve the students' listening skills, together with their working memory; and if yes, in what way. In the beginning, both groups took the same tests including listening comprehension test, language proficiency test, vocabulary test, and WM span tests. In the end, both retook all the tests for later comparison in data analysis. Both groups spent the same amount of time practicing their listening but with different approaches. The independent variable was the teaching approach applied during the study while the test scores regarding listening comprehension and WM capacity were the dependent variables in this study. The research design of the study can be illustrated as below:

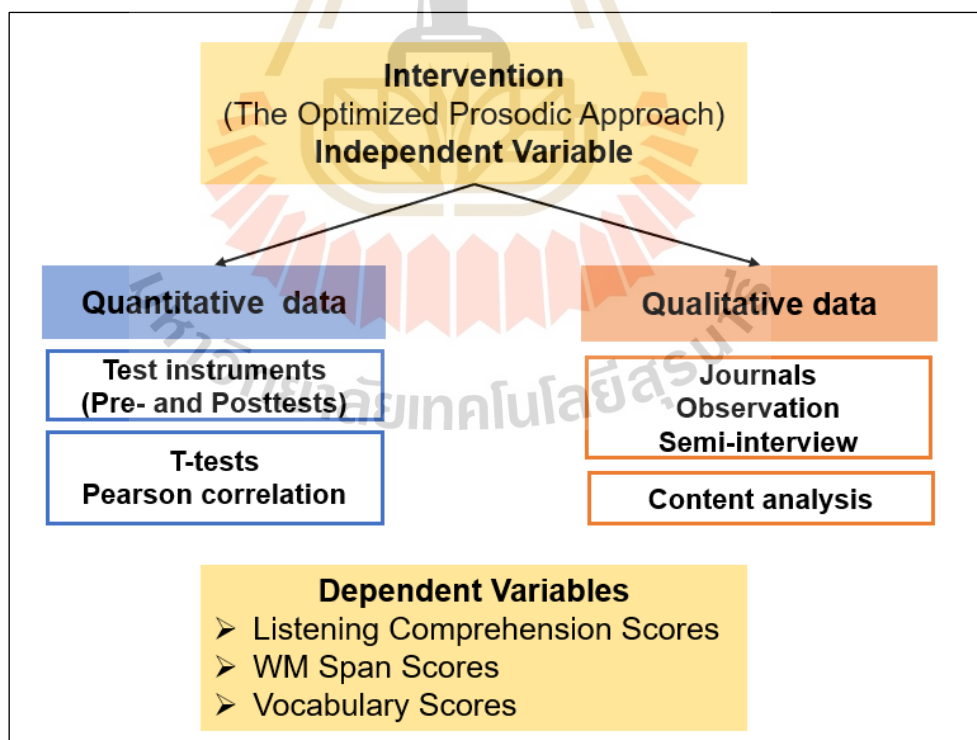


Figure 3.1 Research design of the study

3.2.1 The construction of the Optimized Prosodic Approach (OPA)

The main purpose of the study was to improve the listening performances of Vietnamese EFL learners by applying the OPA embedded in a Computer Assisted Language Learning (CALL) environment. For the development of the constructs of the OPA, the researcher began with a theory of language learning and selective attention and then combined them with some related findings in brain lateralization. After that, the researcher utilized these underlying principles to develop the appropriate techniques to build into the CALL system for students to practice listening. The descriptions of the OPA are given in detail as follows. As mentioned in chapter two, in light of Lian and Sussex's principles (2018) of language learning, and theory of selective attention, listening is described as a process of constructing meanings from auditory input through a perceptual filter under the influences of both unknown and known variables internally and externally in relation to individual learners. Even though certain kinds of contributing factors to the listening process can be identified, the dynamic and unstable attribute is highlighted due to its uncertainty and unpredictability. This leads to a realization of the significance of individual perception in meaning-making mechanisms. Within the sea of knowledge to be navigated during the journey of acquiring a new language, having the capability of selecting the right information to construct a reasonable interpretation is essential to serve the purposes of communication. Having said that, in order to enhance learners' listening comprehension, it is necessary to exert some sort of influence on their auditory

perception by developing their awareness of some critical elements useful for this process at a personal level. Specifically, the current approach focuses on two elements, which are prosody and automaticity in language processing at a perceptual level. The rationale for this selection is based on the latest findings of brain lateralization related to language learning.

Regarding prosody, its functional constituents including stress, rhythm, and intonation are emphasized due to the variabilities of spoken language. Given the contributions of prosody to the meaning-making process by compensating for the segmental interference, learners need to adjust their L1 listening habits and adapt to new listening habits for a target language, which is English in this case. This means that listeners need to be involved in activities to internalize new rhythmic systems as well as the new intonation patterns. In this way, the listeners will be able to regulate the interactional synchrony and interpret the incoming speech to achieve better comprehension. Consequently, low pass filtered audio is utilized as a way of input modification in order to steer learners' attention toward prosodic patterns. This technique must be implemented concurrently with body movements in a repetitive manner to optimize the outcomes.

With respect to the automaticity, because of the real-time nature of listening and the limited capacity of working memory, the more automatic the processing is, the more effective the comprehension process is. In other words, with automatic processing, interferences can be minimized while processing information by reducing

the cognitive load the listeners have to encounter. The major techniques to do this are shadowing and chunking, both of which can contribute to facilitating the listeners' online processing.

Altogether, given the meaning-making mechanisms in L2 listening, the theory of selective attention, and the lateralization of the brain, the underlying principle of the OPA is to optimize learners' listening conditions through awareness-raising activities based on two components: prosody and automaticity. The five basic techniques used in the approach were listening to low pass filtered audio, body movements, repetition, shadowing, and chunking. All these components combined to lay the foundation of the OPA. Their relationships can be shown in Figure 3.2.

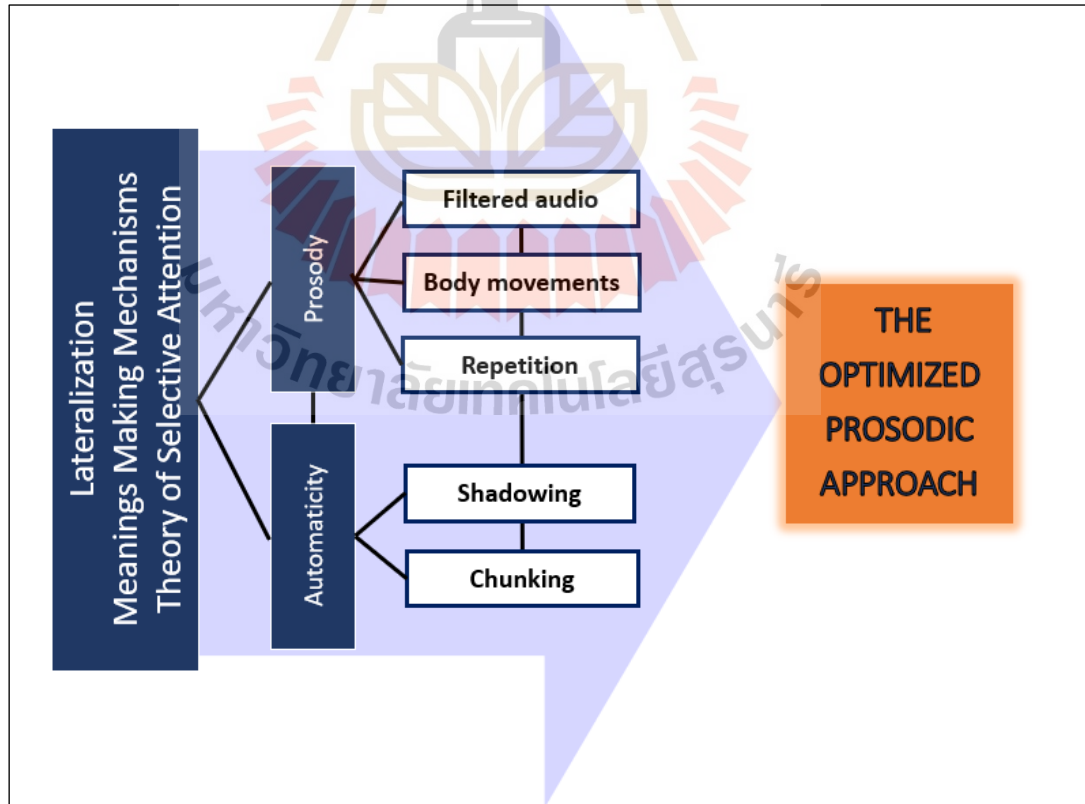


Figure 3.2 The components of the Optimized Prosodic Approach

3.2.2 The application of the Optimized Prosodic Approach in the study

In the study, the students in the experimental group participated in the training sessions under the instruction of the trainer. Although without the training sessions, students could get access to the listening course and practiced by themselves, it was necessary to give them a demonstration for two reasons. First, from the pilot study, this method was quite unfamiliar to the students. Therefore, providing them with clear steps might guarantee the right application. Second, because the timetable for the experiment was quite tight, being engaging in the training might save time for the students so that they could concentrate on completing the lessons in time. The training sessions consisted of three hours divided into two sessions with the following steps:

First, students listened to filtered sentences. This is one of the ways to internalize the rhythmic and intonation patterns of the signals. Listening to low pass filtered audio helps to bypass the listeners' operational histories because it is unfamiliar to them. At the same time, it lightens the processing load because it makes the prosodic features more salient and removes the necessity of processing words and grammar. As a result, the listener could pay attention to the rhythmic and intonation patterns rather than the lexical meanings at the outset.

Second, students listened to unfiltered sentences of the same sentences and noticed chunks or intonation phrases. By doing this, the students familiarized themselves with the variabilities of individual words in the continuous speech stream.

Being aware of chunks while listening helps listeners ease the processing load and makes up for the limited capacity of WM.

Third, repetition and humming combined with body movements while listening. These techniques not only build up the automatic processing but also increase the speed of internalizing the prosodic patterns. Repetition is considered as an effective way of assimilating rhythmic frameworks gradually to achieve fluency while body movements in synchrony with speech facilitates the establishment of new rhythmic patterns.

Fourth, students practiced shadowing the conversation as another way of fostering their automatic processing. Shadowing is supposed to help improve their phonological loop, which processes and stores incoming speech during listening.

In brief, these steps reflect the principles of the OPA, which were also mainly applied in the listening website designed for the students. A web-based platform named Listening Vitamins Course was created by the researcher and was used for the students to access and practice by themselves after the training. All the activities in the course were developed as prosody-drive listening. There were 30 Vitamins equal to 30 conversations in the listening course. 30 Vitamins were similar in terms of procedures but different in terms of contents. In each Vitamin, there was a list of activities that overlapped with those in the training session such as listening to filtered sentences, listening to unfiltered in chunks, repetitions, humming combined with body movements, and shadowing. Since the CALL system functions as a learning support

system to promote an autonomous listening environment, it was originally built with a simple interface for students to follow and complete the tasks. The most distinctive characteristic of the system was the mechanism for giving feedback, which reflects the theoretical structure of the OPA.

As discussed in previous sections, according to the OPA, meaning is constructed internally by each individual according to his/her personal representational and logical systems, which are the product of the individual's past. Therefore, under any circumstance, the act of learning is to challenge the past, and the act of comprehension is to require the individual to confront, contrast and contest their understanding and beliefs against all the signals they are perceiving (Lian, 2004). As a result, instead of receiving explicit feedback right after noting down what they hear, students will be shown the transcripts and then compare them with their writing. The students will figure out how much they understand for each sentence or each conversation as a self-assessment. This activity can allow the students to be involved in their own internal dialogues as a way of constructing their own interpretations. These dialogues are supposed to represent the collisions between their pre-existing understanding and the new information provided. Besides, this process is supported by other additional sources from which the students may seek assistance when in need such as their friends, the Internet, and the instructor.

3.2.3 Learning materials

The materials for teaching students in the study were taken from some practice books for Preliminary English Test (PET), which is one of the Cambridge English exams which is targeted at level B1. There were 4 reasons for this choice. First, based on the CEFR scale, this level was an intermediate level at which learners could understand factual information and became aware of opinions, attitudes, and moods in both spoken and written English. This was appropriate for the graduation requirements for the students in the learning program in the study. Second, the level of difficulty of the materials was also suitable for the students based on their general latest English test results. Third, in terms of authenticity, the listening part in PET consisted of monologues and dialogues based on authentic situations such as parts of talks, radio announcements, recorded messages, conversations at home, or between friends and exchanges in shops. These were situational dialogues which contained prosodic features needed for the study. These authentic-like conversations also contributed to making listening conditions as natural as possible. Fourth, the length of these dialogues was also appropriate for the allotted time for practice during the experiment. Altogether, these characteristics made the PET a reasonable choice to serve the purposes of the present study.

3.3 Research instruments

3.3.1 Measure of English language proficiency

The DIALANG test is a project funded by the European Commission under the Socrates LINGUA program and is the result of collaboration among over 20 partner universities throughout Europe. It is an online diagnostic language testing system for foreign language abilities, consisting of tests in five aspects of language knowledge: Reading, Listening, Writing, Grammar, and Vocabulary. The test is in 14 languages. The results based on the six levels of the Common European Framework of Reference (CEFR) are reported on each of these tests separately. After completing the tests, users are given two kinds of extensive feedback along with the detailed test results. First, feedback on the difference between their self-assessment and their test performance are provided. From this information, learners try to figure out the reasons for these discrepancies. This activity may help to raise learners' awareness about the nature of language and language learning as well as to diagnose their strengths and their weaknesses. Second, advisory feedback which is on how learners can improve to move to the next level on the CEFR is also supplied.

A description of the DIALANG test and steps for taking the test will be presented as follows. First, learners have complete freedom to choose which skill they wish to be tested first and can quit a test at any point. To take the tests, an Internet connection is needed. When learners enter the DIALANG system at www.dialang.org

and click on the DIALANG icon on their desktop, they will see a Welcome screen as in Figure 3.3.

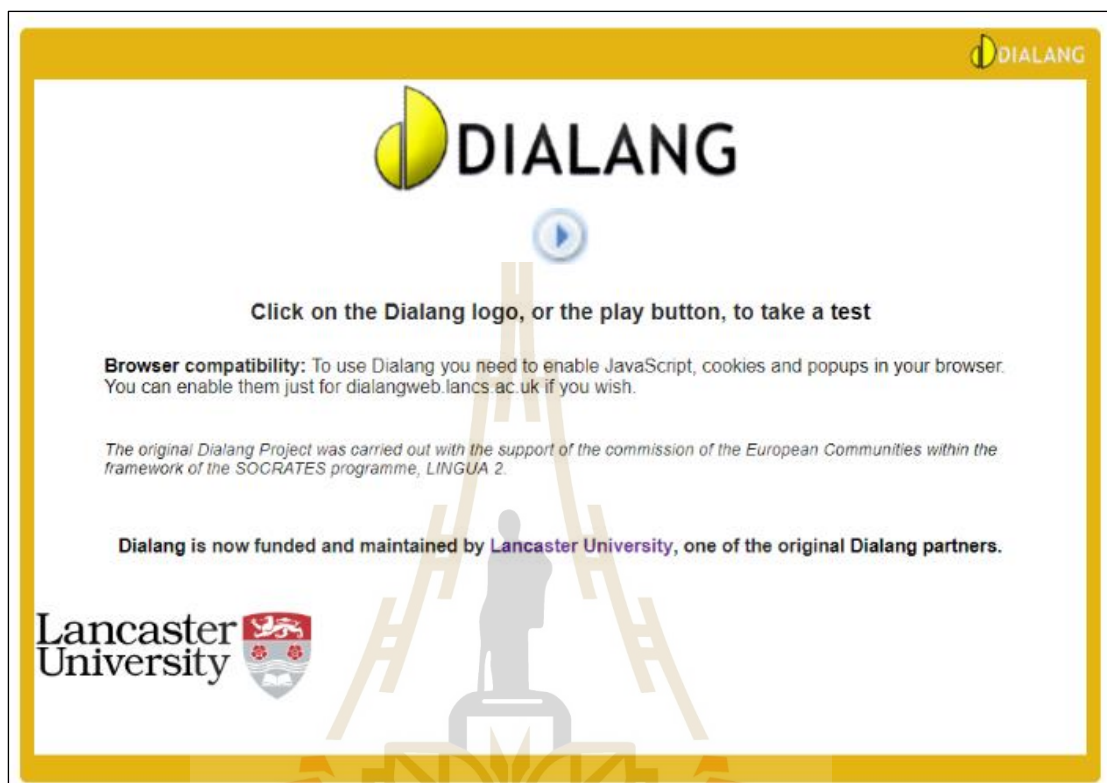


Figure 3.3 The interface of the DIALANG test

Then, learners click the play button and select their language of 14 languages. In this case, Vietnamese is selected. All information is presented in the language chosen except for the test items themselves. Learners will see a brief description of the DIALANG system. In this stage, they can skip these and go directly to the Test Selection Screen. First, learners are presented with a screen explaining the Vocabulary Size Placement Test (VSPT) and its function. The VSPT is a Yes-No vocabulary test to assist in the decision as to which one of three levels of difficulty to administer tests. The test contains 75 words including 50 real words, 25 nonwords in a randomized order.

The learner will click ‘Yes’ for a real word and ‘No’ for a pseudo-word. Each correct identification gets 1 point. Immediate feedback is given to learners on their performance from very low to indistinguishable from a native speaker. Next is the self-assessment statement “I can...” for reading, writing, and listening based on skills in the CEFR. Learners read these statements and click ‘Yes’ if they believe that they can do what is described in the statement and ‘No’ if they cannot. After learners have responded to the VSPT and the self-assessments, the two results are combined to decide which level of the test they will be given. There are three levels of difficulty of the test: easy, medium, and difficult. If no placement procedure has been selected by the user, then the medium test is administered among three levels in the system. At this stage, learners choose the type of test they want to take. Each test consists of 30 questions. There are four types of questions in the test: multiple-choice, drop-down menus, text-entry, and short-answer questions. Once learners have finished the test, they can see a variety of feedback as following:

- ✓ *Your level*: test result in terms of six levels of the CEFR
- ✓ *Check your answer*: a summary of right and wrong answers with feedback
- ✓ *Placement test*: score on the VSPT
- ✓ *Self-assessment feedback*: a comparison of their test score based on CEFR levels with their self-assessed CEFR level
- ✓ *About self-assessment*: reasons why there is a mismatch between their score and self-assessment

When learners get the test result, they will keep a record of their score for each skill and submit it in the end. For more details see Appendix C, page 243.

The researcher decided to choose DIALANG as a proficiency test to identify the subjects' English proficiency for three reasons. First, DIALANG can be used to diagnose learners' language proficiency because it evaluates learners' performance overall in relation to the levels of the CEFR. It is known that the CEFR is a set of standards for language development, and thus knowing their level is meaningful to the learners as well as the purpose of the current study. The second reason is the validity and reliability of DIALANG. This test enables learners to relate their performance to an accepted standard of ability. In Alderson's description of DIALANG (2005), he stated that a rigorous process of standard-setting has been undertaken, with appropriate judges, and using appropriate procedures of both data collection and data analysis. These standards are also the results of a series of subjective judgments. Furthermore, the level of difficulty of each item and its possibility to discriminate among learners have been revealed from the piloting. The last reason accounting for the researcher's choice is that this system is free of charge and not a high-stakes test. From the researcher's perspective, it is economical and serves the purpose of the present study at the same time. From the subjects' perspective, it is informative to know their English proficiency with necessary feedback for improvement for free. Besides, there is no time limit for taking the test. Therefore, the subjects may have no time pressure.

3.3.2 Measure of listening comprehension

The participants' listening comprehension was measured by the listening test as a component of the DIALANG test. The reasons for choosing this test were because of its free of charge, its validity, and reliability. Besides, it is based on the CEFR levels. There were 30 items in the listening test, including both dialogue-type and monologue-type discourse. The tasks consist of multiple-choice, short answer, and gap-fill (drop-down or text-entry). The test covered three aspects of listening: listening for detail, identifying main ideas, and inferencing. All the test items were played once only.

3.3.3 Measure of vocabulary knowledge

For measuring the vocabulary knowledge, in addition to the written form in the DIALANG test, The Picture Vocabulary Size Test (PVST) was chosen as an aural form. PVST is a test of receptive vocabulary size. It measures whether the test-taker can find a suitable meaning (a picture) for a given partly contextualized word form. The PVST was designed by Paul Nation of Victoria University of Wellington, New Zealand. The test was chosen because of the following reasons. First, the PVST can be used as an indication of whether vocabulary knowledge is likely to be a major factor accounting for poor or good performance on a task, especially used to see how many words they know aurally. Second, although the test is designed primarily for young pre-literate children, it can be used with older learners of English as a second or foreign language. Third, its test validity and reliability have been tested. Fourth, it is free and convenient for the current study. It should be borne in mind that the purpose of the PVST in the

study is to see if there is any connection between the students' vocabulary knowledge and their listening performances as well as their Working Memory scores.

The test draws word samples from twelve 500-word family lists made from a specially created corpus of writing for children and adult spoken language. It contains 96 test items; each presents four-choice multiple formats. It takes about 15 minutes to complete. The test is a computerized test that is administered on a one-to-one basis using a picture matching format and can be downloaded at <https://www.laurenceanthony.net/software/pvst/>. The sample screenshot of the test is shown in Figure 3.5.

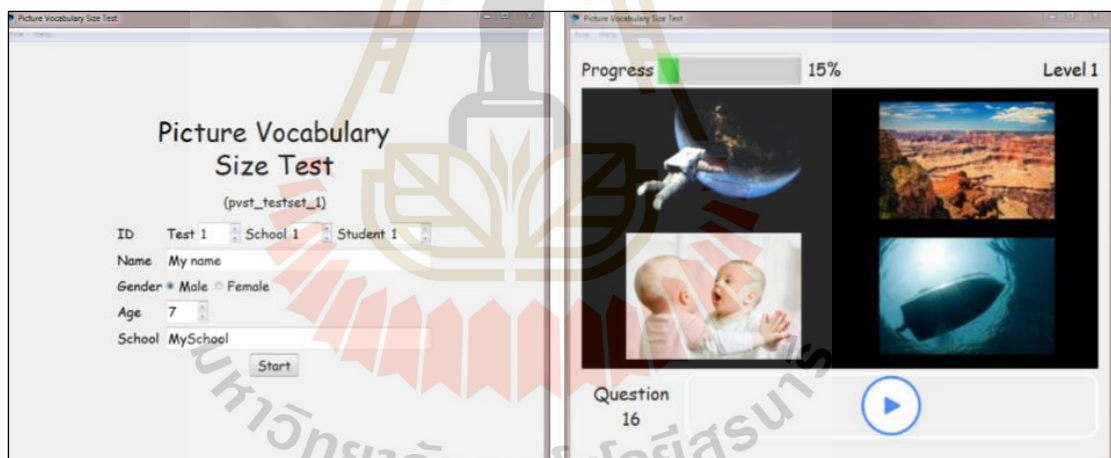


Figure 3.4 The interface of the Picture Vocabulary Size Test

3.3.4 Measure of Working Memory capacity

For measuring the PWM capacity, the Forward Digit Span task (Baddeley, 2003) was adopted. This is one of the most widely used tests of PWM capacity. In this task, a series of digits between 1 and 9, with each digit used no more than once per list

was presented on each trial. The list length started very short and increased every few trials, with the exact number of trials per list length differing from one procedure to another. There were 14 trials in total. After each trial, the participants recalled the digits in order.

For measuring the EWM capacity, the Backward Digit Span task (Kormos & Sáfár, 2008) was chosen. This task was used for examining the role of Working Memory in cognition and individual differences as it taps on simultaneous processing and storage of Working Memory. In this task, the procedures were like those in the Forward Digit Span task; however, the participants recalled the digits in reverse order.

The participants took both visual and auditory Forward and Backward Digit Span tasks. They recalled by clicking the digits on the screen. In the study, the digit span tests on the website <https://www.millisecond.com/download/library/digitspan/> were used because they are computerized tests of digit span which offer some advantages over traditional paper-and-pencil tests (Woods et al., 2011). This can significantly enhance the reliability and precision of digit span assessments of working memory. These tests ensure the consistency and clarity of digit list delivery and permit the use of randomized digit lists. For more details, see Appendix D, page 246.

3.3.5 Students' journals

After three practice sessions, the participants in the study were given time to write their own journals in their native language on the system. The frequency of writing was one time a week. The purpose of this activity was to record their thoughts

and feelings as their reflections on the intervention (Lodico, Spaulding, & Voegtle, 2010). According to McKernan (1996), the journal is a tool for research purposes and can be employed to encourage interpretations and evaluations on an issue. It is also a tool to get and store information from the participants with a minimizing effect of distortion of the memory. In the current study, the researcher created a set of instructions regarding the contents, the frequency, and the expected length of each entry. Also, some guided questions might be posed for the participants (Appendix E, page 247). All of these helped to make the data generated in the journal more structured, which made it easier for the researcher to analyze the contents at the end of the intervention. As the journal in the current study was related to learners' experiences of the intervention, learners were required to follow the journal format which reflects learners' experience with the new teaching method (Walker, 2006). Also, learners' difficulties, motivations, and feelings during their involvement with the intervention were expected to be recorded after each training session.

3.3.6 The researcher's observation

During the study, the researcher was in charge of giving instructions and demonstrations during the training sessions. She noticed students' behavior and expression during the training. Moreover, during the listening practice, the researcher was one of the two technical assistants. Being present during these sessions, the researcher made sure that she exerted no influence on the students' performances while encouraging students to use their gestures when they repeated and hummed along with

the audio. Besides, she took this chance to observe students' reactions while practicing with the audio. In sum, observational data in the current study was conducted every sections in order to record the non-verbal behavior of the students during the experiment. It followed a structure focusing on certain aspects illustrated in Appendix F, page 248.

3.3.7 Questionnaire

The study used a questionnaire to collect personal information from students in both the control and experimental groups. It was written in the students' native language. Besides, as the questionnaire is often used for an exploratory purpose, in the study, it was used to gather some general information related to the students' opinions about the teaching method with which they were taught. Therefore, there were two sections in the questionnaire. Part one was to collect the background of the students and part two was to gather the students' opinions on the teaching method with Likert scale format (Agree-No Ideas-Disagree), see Appendix G, page 249. In total, there were 65 students in the study, 35 and 30 for the experimental group and the control group, respectively. The version of the questionnaire for the control group only had part one.

3.3.8 Semi-structured interview

The purpose of an interview in doing research was that the researcher tried to enter someone's mind and get specific information (Merriam, 2009). In the current study, the researcher decided to choose to interview students because she wants to know about students' feelings and thoughts, which was not observable. According to Cohen

et al. (2013), interviews in a research study have three purposes: a means of collecting information having a direct influence on the research objectives; an explanatory device to help identify variables and relationships; and a supplement to other methods in a research undertaking. Taking this into considerations, the researcher used interviews to approach her research questions from a different angle as well as to corroborate with the other methods. This also reflects Mason's description (2002) of the interview function which can provide an additional dimension and be used as methodological triangulation in doing research. Specifically, a semi-structured interview was adopted in the study. Merriam (2009) defines the semi-structured interview as more open-minded, more flexible, and less structured. In the current study, the researcher attempted not only to obtain specific information from all the students but also to explore students' experience of the effect of the intervention. Therefore, the interview was in students' native language and was guided by a list of issues to be discovered and allowed the researcher to respond to special situation or new ideas at hand. For questions in the interview, see Appendix H, page 251. The interview, conducted in tandem with the questionnaire and journaling, was also to see how well they corroborated each other. A total number of 10 interviews were recorded with the permission of the participants and were transcribed. The criteria for choosing interviewees was coverage of a variety of students at different levels based on their performance on the listening activities. Besides, what they wrote in their journal might

reflect an interesting issue related to the research question. The selection was also a balance of genders, which resulted in a quantity of 10 students (5 females and 5 males).

3.4 The conceptual framework of the study

Based on the literature review in chapter 2, the present study aimed to improve the Vietnamese EFL learners' listening comprehension performances, using the OPA. The researcher developed this approach based on related findings in brain lateralization, combining with the fundamental role of automaticity and prosody in language learning, especially listening skills. The listening process is also redefined as a result of the underlying principles of the learning theory and theory of selective attention. The most identified predicting factors contributing to the listening processes are kept to a minimum as much as possible. The conceptual framework of the study can be illustrated in Figure 3.5.

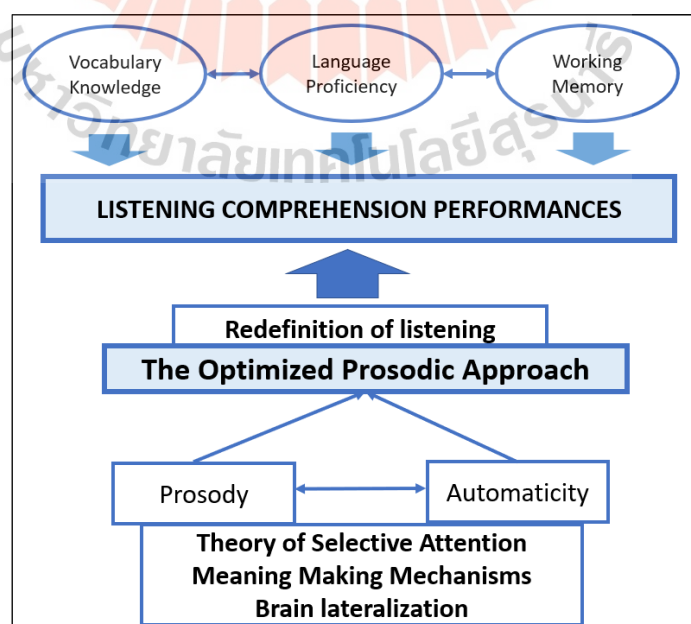


Figure 3.5 The conceptual framework of the study

3.5 Research procedures

Both the control and experimental groups participated in the listening course. There were 10 weeks in total for the course. Each week included 3 sessions. Each session lasted around 60 minutes. The procedure is shown in Figure 3.7

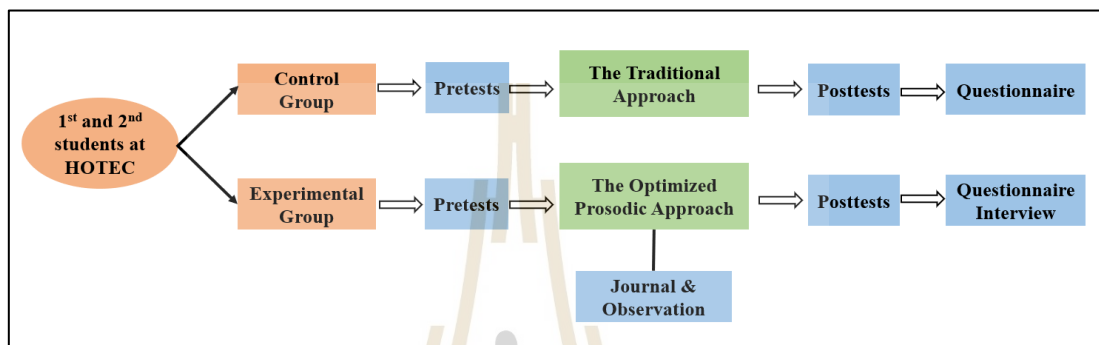


Figure 3.6 Research Procedure of the study

For the control group, at the beginning of the course, students took the language proficiency pretest, the listening pretest, the WM capacity pretest, and the vocabulary pretest. After that, students learned to listen with a traditional method, which can be described as follows.

At the beginning of the lesson, there were often some pre-activities such as exercises practicing pronouncing new vocabulary, discussing the related topic, guessing, and predicting what they would hear.

Then, the audio was played 2 or 3 times, students were required to answer some comprehension questions in the form of multiple-choice, matching, filling the blanks, and answering questions, to name a few.

After that, the feedback was given by providing the correct answers right away or playing the audio with certain pauses to point out the right answer in the audio.

Later, the listening lesson often ended with some activities such as discussing related topics with friends and giving their opinions about what they heard which might be presented in oral or written form. The common tips which students often received from their teachers were staying focused inside the classroom and listening more and more outside the classroom.

The learning materials were from the book *DEVELOPING* for the TOIEC Test. At the end of the course, students in the control group took the DIALANG test, the listening test, the vocabulary test, and the WM test as posttests. Besides, they also filled out a questionnaire. (See Table 3.1 for more details)

Table 3.1 Timetable of teaching for both groups

Week	Session	Control group	Experimental Group
1	1	Students took the DIALANG pretest (2 hours)	
	2	Students took the listening pretest (30 mins) WM capacity pretest (30 mins) Vocabulary pretest (30mins)	
	3	Traditional method	Training session Statements, yes/no and WH- questions Shadowing and a sample Vitamin Writing journals
2	4	Traditional method	Practice with Vitamins course
	5	Traditional method	Practice with Vitamins course
	6	Traditional method	Practice with Vitamins course Writing journals

Table 3.1 Timetable of teaching for both groups (Conts.)

Week	Session	Control group	Experimental Group
3	7	Traditional method	Practice with Vitamins course
	8	Traditional method	Practice with Vitamins course
	9	Traditional method	Practice with Vitamins course Writing journals
4	10	Traditional method	Practice with Vitamins course
	11	Traditional method	Practice with Vitamins course
	12	Traditional method	Practice with Vitamins course Writing journals
5	13	Traditional method	Practice with Vitamins course
	14	Traditional method	Practice with Vitamins course
	15	Traditional method	Practice with Vitamins course Writing journals
6	16	Traditional method	Practice with Vitamins course
	17	Traditional method	Practice with Vitamins course
	18	Traditional method	Practice with Vitamins course Writing journals
7	19	Traditional method	Practice with Vitamins course
	20	Traditional method	Practice with Vitamins course
	21	Traditional method	Practice with Vitamins course Writing journals
8	22	Traditional method	Practice with Vitamins course Writing journals
	23		(They could choose to work in the language laboratory or at home)
	24		
9	25	Traditional method	Practice with Vitamins course Writing journals
	26		(They could choose to work in the language laboratory or at home)
	27		
10	28	Questionnaire Vocabulary posttest	Questionnaire -Semi-interview Vocabulary posttest
	29	Students took the DIALANG posttest (2 hours)	
	30	Students took the listening posttest WM capacity posttest	

For the experimental group, after taking the pretests related to language proficiency, listening, WM capacity, and vocabulary, the students participated in the training session and were shown how to do a sample Vitamin. After that, they spent 10 weeks practicing with the Vitamins course including 30 Vitamins. They were also asked to write down their feelings and thoughts every 3 Vitamins as their journal. Their performance was also observed by the researcher as an observer. In the end, they took the posttests including the DIALANG test, the listening test, the vocabulary test, and the WM test. Besides, they filled out a questionnaire and 10 of them were chosen to participate in the interview section.

The training sessions aimed to show students how to perform and apply all the techniques in the OPA appropriately and effectively. The contents focused on some typical types of sentences such as statements, yes/no questions, and WH-questions. Moreover, students were shown how to shadow a conversation. More detailed descriptions can be seen in Table 3.2.

Table 3.2 Steps in a training session

Steps for sentences	Students' activities	Purposes	The instructor's activities
1. Sensitizing	<ul style="list-style-type: none"> • Listen to filtered sentences 15 times • Pay attention to the rhythmic patterns 	Direct their attention to the prosodic features rather than the segmental ones	Play the audio Encourage Ss to focus on the rhythm and intonation
2. Habituating	<ul style="list-style-type: none"> • Listen to unfiltered sentences 10 times • Hum along with the audio • Pay attention to chunks or intonation phrases 	Get a feel of the real sentence while listening Raise Ss awareness of chunks	Play the audio Encourage Ss to hum along Direct the attention of Ss to chunks
3. Internalizing	<ul style="list-style-type: none"> • Listen to filtered sentences 10 times • Repeating • Use body movement while repeating 	Repetition helps students develop and sharpen the automaticity in processing. Repeating with body movements helps students assimilate the rhythm faster.	Play the audio Encourage Ss to repeat and use body movements
4. Guessing	<ul style="list-style-type: none"> • Listen to unfiltered sentences • Guess the contents • Write down their guess • Comparing with friends 	Guessing is advantageous to later memory when corrective feedback is provided. Peer-correction helps students learn from each other and develop interactional skills.	Elicit their answers and give feedback
5. Performing	<ul style="list-style-type: none"> • Write the contents on the board • Showing their gestures while repeating the sentences 	Individual performance encourages students to become more confident.	Give feedback

Table 3.2 Steps in a training session (Conts.)

Steps for sentences	Students' activities	Purposes	The instructor's activities
Steps for conversation			
1. Feeling	Pay attention to the rhythm patterns and intonations	This raises students' awareness of chunks while listening	Play the audio
2. Grasping ideas	Listen to the conversation Point out the context, the role of speakers, the main ideas	This helps Ss to look at the general picture of the conversation	Play the audio Elicit Ss responses Give feedback
3. Shadowing	Listen and shadow as a group Listen and shadow individually	Get familiar with shadowing	As a facilitator Give feedback
4. Performing	Listen and shadow as a demonstration	Practice shadowing	Give feedback

The Vitamins for listening course included 30 Vitamins. Each Vitamin was about a conversation. The student had to follow three steps for taking a Vitamin (See Appendix I, page 252). In the first step FEEL IT, students listened to filtered sentences and then the unfiltered version taken from a conversation. After that, they wrote what they heard and compared their answer with the transcript. In the second step CHEW IT, students listened to the conversation while shadowing it. They recorded it and uploaded it to the website. In the last step SWALLOW IT, students listened to the conversation again and answered questions about its main idea and any details of what they heard (Table 3.5).

Table 3.5 Steps in a Vitamin

STEPS IN A VITAMIN	
Step 1 FEEL IT	<ol style="list-style-type: none"> 1. Listen to a filtered sentence 15 times 2. Listen to the unfiltered sentence 10 times and hum along 3. Listen to the filtered sentence 10 times, hum along and use body movements to “dance” to the music 4. Listen to the unfiltered sentence and write it down 5. Compare what has been written with the answer
Step 2 CHEW IT	<ol style="list-style-type: none"> 1. Listen to a conversation 2. Shadow the conversation 3. Record while shadowing 4. Upload the recording to the website
Step 3 SHALLOW IT	<ol style="list-style-type: none"> 1. Listen to the conversation 2. Answer 2 questions: <ul style="list-style-type: none"> - What is the main idea of the conversation? - Write down as many of the details as possible in the conversation 3. Compare what has been written with a transcript of the conversation

3.6 Data collection

Scores from the language proficiency test, the listening comprehension test, the vocabulary test, and the WM capacity test from both groups were collected before the students took the course. During the study, journals from students in the experimental group were submitted every week in addition to the information collected from the researcher’s observation. At the end of the study, scores from all the posttests measuring language proficiency, listening, vocabulary, and WM capacity were gathered from both groups. Besides, the data from the questionnaire and a semi-structured interview was also collected from the experimental group. 10 out of 35 students in the experimental

group with different levels of performances were chosen to take part in the interview.

The data collection aimed to answer the research questions as demonstrated in Table 3.6.

Table 3.6 Data collection for answering the research questions

	Research instruments	Tool for analysis
Research question 1	<ul style="list-style-type: none"> ▪ Listening Comprehension Test (Appendix J, p.255) 	<ul style="list-style-type: none"> ▪ T-tests ▪ Descriptive statistics
Research question 2	<ul style="list-style-type: none"> ▪ Working Memory Span Task (Appendix K, p.257) 	<ul style="list-style-type: none"> ▪ T-tests ▪ Descriptive statistics
Research question 3	<ul style="list-style-type: none"> ▪ Working Memory Span Task ▪ Listening Comprehension Test ▪ Vocabulary Test (Appendix L, p.259) 	<ul style="list-style-type: none"> ▪ Pearson Correlation
Research question 4	<ul style="list-style-type: none"> ▪ Journal (Appendix N, p.262), Observation, Questionnaire, Semi-Interview 	<ul style="list-style-type: none"> ▪ Content analysis

3.7 Data analysis

3.7.1 Quantitative analysis

The qualitative data was collected from the pretests and posttests of both control and experimental groups including the language proficiency test, the listening tests, vocabulary test, and the memory capacity tests. The main software used in data analysis was SPSS version 16. After the data was gathered, stored, and coded, basic descriptive statistics were performed to obtain a general overview of the data. Paired t-tests were run to see whether any statistically significant difference between the means existed before and after the study within a group while t-tests for independent samples

were performed to see whether the difference between the means of two groups was statistically significant or not for both pretests and posttests. Altogether, these t-tests were demonstrated to decide on the effects of the OPA on the improvement of students' listening and memory scores to answer the two research questions and test the hypothesis. Besides, the Pearson Correlation was run to see if there was a positive relationship between listening scores, vocabulary scores, and working memory scores.

3.7.2 Qualitative analysis

The qualitative data generated by students from the questionnaire, the interviews, and journals were analyzed and interpreted by content analysis to answer the research question 4. Data from questionnaires were coded and analyzed using SPSS 16 to give a summary of descriptive statistics. After the ten interviews were transcribed, the data from both journals and interviews were explored using content analysis. According to Cohen et al's definition (2013), content analysis is simply a process of summarizing and systematically reporting written data. The reason why the content analysis was used was because this was a research technique for the researcher to make valid inferences from the texts which can be any written materials from documents to interview transcriptions. Moreover, it concentrates on the meaning in context and can be verified with its transparent rules during the analysis. Plus, the written form enables a reanalysis to happen. All of this can contribute to the validity and reliability of the study. Another reason why the researcher chose this technique was that it was the best

method for coding open-ended questions to identify the patterns and themes in such communicative contents.

The procedures for content analysis procedure consisted of 5 steps (Creswell, 2009). First, the researcher organized the data by systematically rearranging them. Second, she read through the data to obtain a general sense of the information. Third, she started to code the data by labeling or organizing them into categories. Fourth, she used the coding process to generate a description of the themes for analysis. Finally, she tried to interpret the data related to the research question using information from the literature or theories. To ensure data reliability, the study made use of the intercoder agreement. The researcher and another expert in the same field coded the data separately. After that, they met each other and discussed to reach an agreement on the same codes used for the data. At the same time, interrater reliability was run to check the reliability.

3.8 Ethical issues

According to Ary et al. (2010), researchers have obligations both to their participants and to their profession in planning and conducting research. In educational settings, the first step that must be taken is to have the research plan reviewed by an Institutional Review Board (IRB) on the researcher's university campuses. Then, the researcher should communicate the aims of the investigations to appropriate representatives of institutions and keep them updated about any significant changes in

the research program. As regards the participants, they have the right to be informed about the likely risks involved in the research and of potential-consequences for participants and to give their informed consent before participating in research. The purposes of informed consent are to enable potential participants to make an informed choice to take part in the study and to document their decision to participate (Appendix M, page 260). It is necessary to make sure the participants understand the purpose of the study, the procedures, the risks, the benefits of the project, and the obligations of both participants and the researcher. Besides, any source of participants' information will not be disclosed without their permission to protect the confidentiality of the participants. Participants have the right to remain anonymous in the study. In terms of profession, the researcher is responsible to report exactly and honestly what the findings were, avoiding offering misleading information.

In brief, for the current study, after the review by IRB, the researcher communicated with the educational institution where she conducted the study to request official permission. After that, the researcher talked to the participants and gave them informed consent including the important information related to the study such as the purposes, the benefits, the procedures at the outset of the study. The students decided to voluntarily take part in the study and then sign the form. During the study, the students could withdraw at any time in case they change their minds, or something unexpected happens. Fortunately, during the study, no case of withdrawal was reported.

3.9 Pilot study

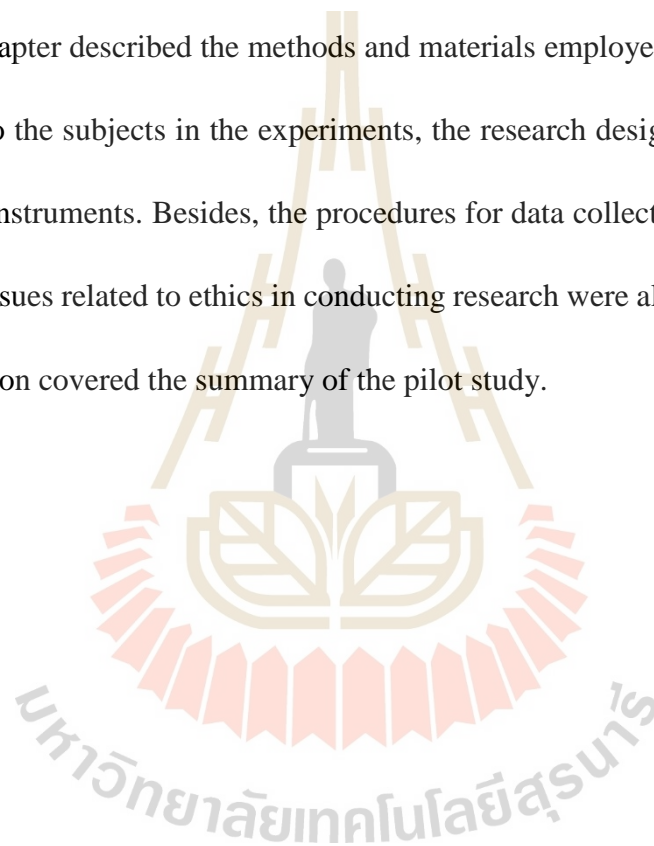
Before the experiment, a pilot study was conducted to try out the proposed procedures on a few participants. Results of the pilot indicated that the data-collection methods were appropriate despite some minor changes to be made. Overall, thanks to the pilot study, the real experiment was carried out in a well-organized manner with a minimum of unanticipated problems.

There were some changes to be made to ensure the experiment to be implemented smoothly after the pilot study. For the language proficiency test, after receiving the instructions, students took the test in class under surveillance of the teachers within 2 hours and half to make sure that students would not consult google while doing the test. At the end of the test, they took notes of their overall level and submitted it to the teacher in charge. For the listening comprehension test, prior to the test, students were given instructions and a demonstration of how to write their responses. Students wrote their answers online instead of on paper for the convenience of scoring. For the memory test, students did the test under surveillance to avoid cheating and make sure that they did not use too much time for the task. Regarding the role of the researcher during the experiment, she was the trainer and an observer. The researcher was the trainer for the training sessions. During the listening practice in the experimental group, she was one of the two assistants for technical problems. She had to make sure that the students did use body movements while repeating and humming because most students in the pilot study were reluctant and shy to use gestures. In terms of the speed of conversation, it

was slowed down because students could not shadow the conversations because the speed of delivery was too fast. Transcripts could not be shown because the purpose of shadowing was to practice memory and not to focus on the content.

3.10 Summary

This chapter described the methods and materials employed in the present study. In addition to the subjects in the experiments, the research design was presented with all research instruments. Besides, the procedures for data collection and analysis were also given. Issues related to ethics in conducting research were also described in detail. The last section covered the summary of the pilot study.



CHAPTER 4

RESULTS

This chapter aims to present the findings of the present study in response to the four main research questions. The first four sections of this chapter provide information about the quantitative analysis while the fifth section deals with qualitative analysis from the questionnaire, journal, interview, and observation. After that, a summary of responses to all research questions and the chapter is given.

4.1 Response to research question 1: What are the effects of the OPA on EFL learners' listening comprehension?

Results of the study show that the students in the EG outperformed the students in the CG in their listening performances, indicating that thanks to the OPA, learners' listening comprehension improved significantly although students in the CG and EG spent the same amount of time on listening practice. While the CG learned listening in a traditional classroom, the EG practiced listening with the OPA without a teacher in a self-managing listening environment. In other words, the OPA had a positive and profound impact on improving Vietnamese EFL learners' listening comprehension. The results are specifically demonstrated as follows:

The DIALANG test was implemented at the beginning of the experiment To test the homogeneity of the students' general language proficiency in both groups. Table 4.1 and Table 4.2 illustrate the results of their performances in five aspects: writing, structures, reading, vocabulary, and listening for the experimental group (EG) and the control group (CG) respectively. Overall, the majority of students in both groups achieved A1 level in all skills. In particular, there was a 100 % A1 level regarding listening within two groups. There was a tiny proportion in writing, structures, reading, vocabulary parts that are above the A1 level. However, when these cases were examined in detail, these scores were distributed among different students, which did not affect the general language proficiency of the students according to the criteria assessment of the DIALANG test. In sum, it can be said that the students' language proficiency was homogeneous

Table 4.1 Proficiency level of each skill in the experimental group

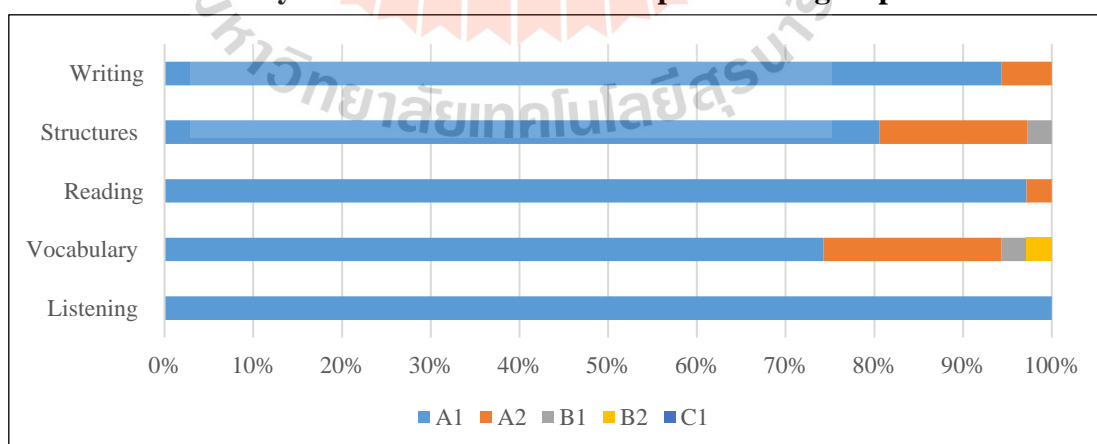
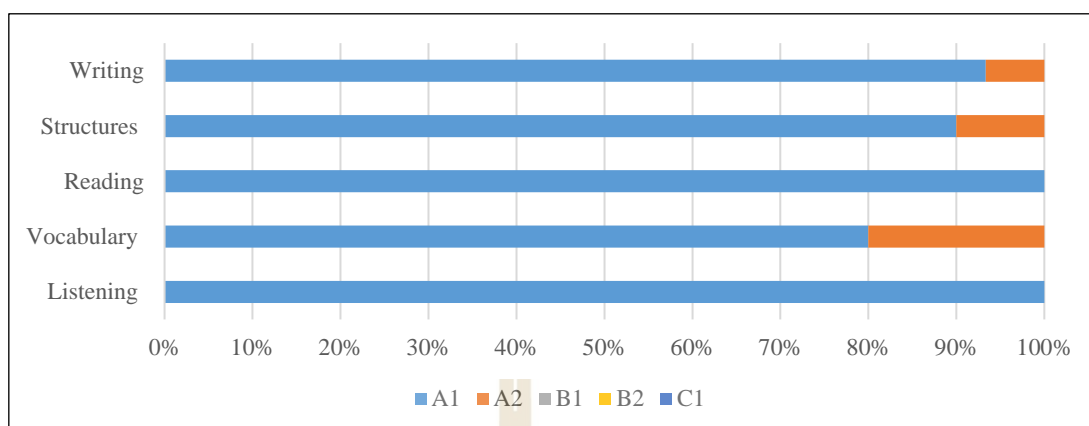


Table 4.2 Proficiency level of each skill in the control group

Besides, results of independent t-tests (Table 4.3) showed that there was no significant difference between the scores in the listening pretest between the two groups, $t(63) = 0.95$, $p = .347 > .05$. This indicates that students in both groups were at the same level of listening comprehension.

Table 4.3 Differences in the listening performances of the EG and the CG

		Independent Samples Test								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the	
									Lower	Upper
PreListening	Equal variances assumed	7.791	.117	.948	63	.347	.500	.527	-.554	1.554
PostListening	Equal variances assumed	6.214	.115	3.194	63	.002	2.043	.639	.765	3.321

4.1.1 Within-group scores

To test whether the students' listening comprehension in both groups made any significant improvement after the treatment, the researcher performed a paired t-test which compared students' scores on the pretest with their scores on the posttest. Table 4.4 shows the difference between the means of the pretest and the posttest in the

two groups while Table 4.5 displays the results of the t-test for two pairs. It can be seen that for the EG, the students' scores were significantly higher for the posttest ($M=11.3$, $SD=3.03$) than for the pretest ($M=8.4$, $SD=2.44$), $t(34)=9.56$, $p=.000<.05$. Similarly, for the students in the CG, there was also a significant difference in the scores between the posttest ($M=9.3$, $SD=1.89$) and the pretest ($M=7.9$, $SD=1.67$), $t(29)=5.89$, $p=.000<.05$. The results suggest that both the EG and the CG have recorded a significant increase in their listening scores although only the EG practiced listening with OPA.

Table 4.4 The mean difference between pretest and posttest of two groups

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PreListening for the Experimental Group	8.400	35	2.4399	.4124
	PostListening for the Experimental Group	11.34	35	3.029	.512
Pair 2	PreListening for the Control Group	7.90	30	1.668	.305
	PostListening for the Control Group	9.30	30	1.896	.346

Table 4.5 Paired t-test of development of their listening scores in each group

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	PostListening- PreListening for the Experimental Group	2.94286	1.81404	.30663	2.31971	3.56600	9.597	34	.000
Pair 2	PostListening - PreListening for the Control Group	1.40000	1.30252	.23781	.91363	1.88637	5.887	29	.000

4.1.2 Between-group scores

When the mean difference in the pretest and posttest results of the two groups were examined, it is clear that the EG (MD=2.9) made a much greater improvement than the CG (MD=1.4) of the order of 207% (Table 4.5). Independent sample t-tests were carried out to compare the listening performances in the posttests between the EG and the CG. As indicated in Table 4.3, students in the EG achieved significantly higher scores in the listening posttest than those in the CG, $t(63)=3.19$, $p=.002<.05$. This means that thanks to the OPA, the EG made a significant improvement in their listening comprehension. In other words, the EG outperformed the CG in their listening comprehension thanks to the OPA.

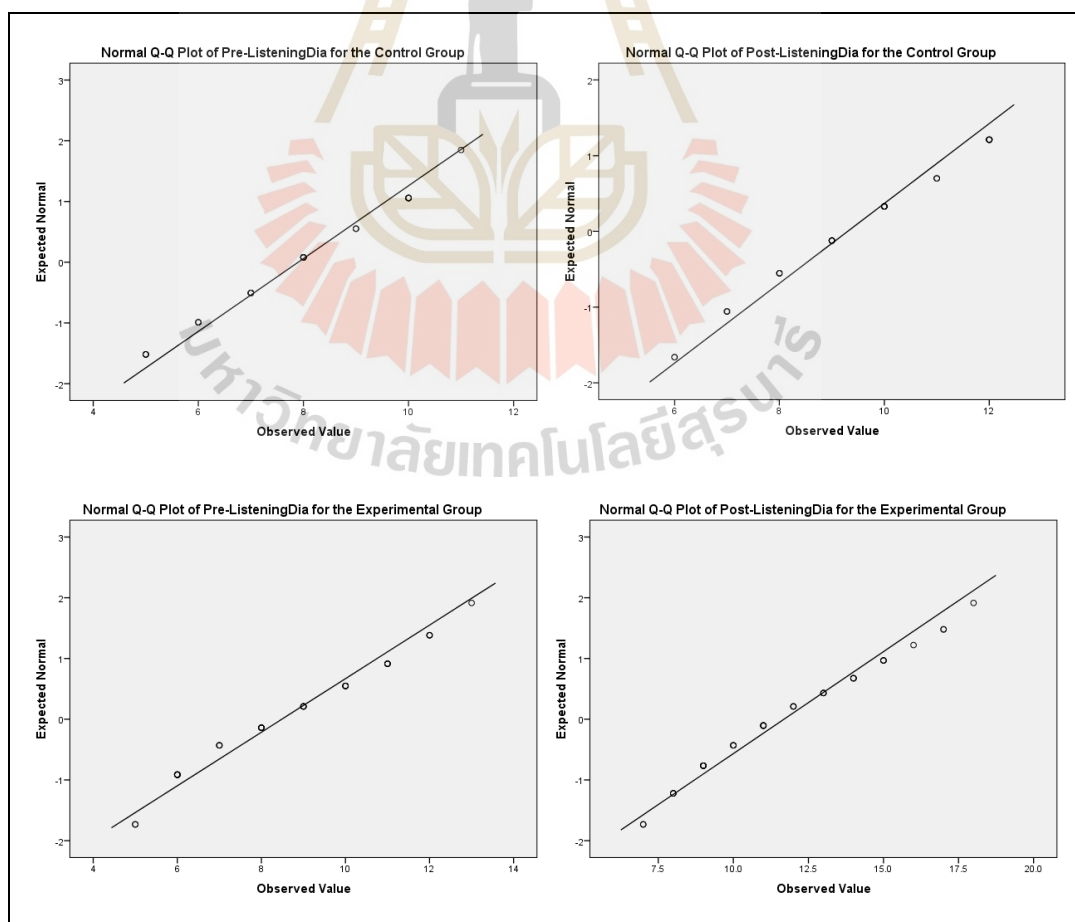
To ensure the reliability of data from independent t-tests, the homogeneity and normality of variance were checked. The Levene's F test for Equality of Variances is the most commonly used statistic to test the assumption of homogeneity of variance. As seen in Table 4.3, the probability (Sig.=.117 for pretests and Sig.=.115 for the posttests) for the F value is more than .05, suggesting that the variance in the two groups are equal or homogeneous. Regarding the normality, the Shapiro-Wilk test was used due to our small sample size. Table 4.6 provides information about the results of the Shapiro-Wilk tests in the two groups. Apparently, in the case of the EG as well as the CG, both tests gave a significant value (Sig.=.097, Sig.=.056 for the CG; Sig.=.057 and Sig.=.224 for the EG) that was greater than .05, indicating that the scores of the pretests and the posttests in two groups were normally distributed.

Table 4.6 Results of tests of normality

	Tests of Normality					
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pre-Listening for the Control Group	0.143	30	0.122	0.941	30	0.097
Post-Listening for the Control Group	0.123	30	.200*	0.928	30	0.056
Pre-Listening for the Experimental Group	.149	35	.047	.939	35	0.057
Post-Listening for the Experimental	.134	35	.115	.960	35	0.224

*. This is a lower bound of the true significance.

Graphically, these normal distributions also can be observed by the Q-Q plots in Table 4.7. As can be seen in Table 4.7, the scores cluster around the trend line, which provides further evidence that the distribution was normal.

Table 4.7 Normal Q-Q plots of pretest and posttest for the CG and the EG

Besides, when the effect size, Cohen's d , was calculated, it was found that $d = .807$ indicating a large effect size. This means that the two groups' means differed by 0.8 standard deviations or the difference was substantial.

All things considered; the results demonstrate that the difference between the two groups was significant enough to reject the null hypothesis which states that the OPA does not affect students' listening performance. Therefore, it can be concluded that the OPA can improve learners' listening performances.

4.2 Response to research question 2: What are the effects of the OPA on EFL learners' Working Memory capacity?

The results show that the students who had experience with OPA achieved significantly higher scores in all visual digit span tasks and the auditory simple task but the auditory complex task. These findings indicate that thanks to OPA, there seems to be a change in how these students stored and processed information in visual and aural mode. In other words, the OPA appears to have exerted positive effects on EFL learners' working memory capacity. Details of the results will be given as follows:

4.2.1 Visual digit span tasks

4.2.1.1 Within-group scores

Table 4.8 shows the descriptive statistics of the results for the pretest and posttest while Table 4.9 gives information about the results from the paired t-tests. The data indicate that in the CG, students' pretest scores ($M=8.60$, $SD=1.33$), and

posttest scores ($M=8.87$, $SD=1.25$) were not significantly different regarding the visual forward task, $t(29)=1.44$, $p=.161>.05$. Similarly, in the case of the visual backward task, there was no statistically significant difference between the pretest ($M=7.43$, $SD=1.61$) and the posttest ($M=7.50$, $SD=1.41$), $t(29)=.34$, $p=.738>.05$. These findings demonstrate that neither the Phonological Short-term Memory (PWM) nor Executive Working Memory (EWM) of students in the CG underwent any change when they were taught listening with the traditional method.

Table 4.8 Descriptive statistics of the results of the visual forward and backward pretests and posttests for each group

		Statistics							
		Pre-visualforward EG	Pre-visualforward CG	Post-visualforward EG	Post-visualforward CG	Pre-visualbackward EG	Pre-visualbackward CG	Post-visualbackward EG	Post-visualbackward CG
N	Valid	35	30	35	30	35	30	35	30
	Missing	30	35	30	35	30	35	30	35
Mean		8.80	8.60	10.114	8.87	7.54	7.43	8.371	7.50
Std. Error of Mean		.224	.243	.2681	.229	.206	.294	.1883	.257
Median		9.00	9.00	10.000	9.00	7.00	7.50	8.000	7.00
Mode		9	9 ^a	9.0	9	7	7 ^a	8.0	7
Std. Deviation		1.324	1.329	1.5862	1.252	1.221	1.612	1.1137	1.408

Table 4.9 Results of t-tests for visual forward and backward digit span scores

		Paired Samples Test							
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Postvisualforward - Previsualforward for EG	1.3143	1.2549	.2121	.8832	1.7454	6.196	34	.000
Pair 2	Postvisualforward - Previsualforward for CG	.267	1.015	.185	-.112	.646	1.439	29	.161
Pair 3	Postvisualbackward - Previsualbackward for EG	.8286	1.0142	.1714	.4802	1.1770	4.833	34	.000
Pair 4	Postvisualbackward - Previsualbackward for CG	.067	1.081	.197	-.337	.470	.338	29	.738

In contrast, for the EG, about the visual forward task, scores in the posttest ($M=10.11$, $SD=1.59$) were significantly higher than scores in the pretest

($M=8.80$, $SD=1.32$), $t(34)=6.20$, $p=.000<.05$. Likewise, their performance in the visual backward posttest ($M=8.37$, $SD=1.11$) improved significantly more than their performance in the visual backward pretest ($M=7.54$, $SD=1.22$), $t(34)=4.83$, $p=.000<.05$. This means that the students who practiced listening with the OPA showed a significant change in their working memory performance, including both PWM and EWM.

4.2.1.2 Between-group scores

Before the independent-sample t-test was calculated to investigate whether the difference between the two groups was statistically significant or not, the Shapiro-Wilk tests were run to make sure the distribution of the scores were normal. As can be seen in Table 4.10, the Sig. column of the Shapiro-Wilk tests displays that all the values were greater than .05, which suggests that these scores were normally distributed.

Table 4.10 Results of visual memory tests of normality

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pre-visualforward EG	.189	35	.013	.935	35	.059
Post-visualforward EG	.187	35	.066	.935	35	.150
Pre-visualbackward EG	.215	35	.000	.896	35	.063
Post-visualbackward EG	.173	35	.009	.912	35	.155
Pre-visualforward CG	.185	30	.010	.924	30	.054
Post-visualforward CG	.209	30	.002	.928	30	.163
Pre-visualbackward CG	.137	30	.154	.923	30	.063
Post-visualbackward CG	.172	30	.024	.933	30	.056

a. Lilliefors Significance Correction

Likewise, the results of independent t-tests in Table 4.11 show that there was a non-significance in the scores of visual forward pretests between the EG (M=8.80, SD=1.32) and the CG (M=8.60, SD=1.33), $t(63)=.61$, $p=.547>.05$ and in the scores of visual backward pretests between the EG (M=7.54, SD=1.22) and the CG (M=7.43, SD=1.61), $t(63)=.31$, $p=.757>.05$. Results of Levene's test indicate equal variances ($F=.14$, $p>.05$ and $F=3.29$, $p>.05$ for the visual forward task and visual backward task respectively).

Table 4.11 Independent t-tests of visual forward and backward pretests and posttests

Independent Samples Test									
	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Pre-visualforward	.139	.711	.606	63	.547	.200	.330	-.459	.859
Post-visualforward	3.306	.074	3.477	63	.001	1.2476	.3588	.5306	1.9646
Pre-visualbackward	3.292	.074	.311	63	.757	.110	.352	-.594	.813
Post-visualbackward	3.006	.088	2.785	63	.007	.8714	.3130	.2460	1.4968

Concerning the posttest, students having the experience with the OPA had higher scores on the visual forward task (M=10.11, SD=1.59) than those studying listening traditionally (M=8.87, SD=1.25), $t(63)=3.48$, $p=.001<.05$. In the same vein, a significant difference in the scores of the visual backward task was also observed between the EG (M=8.37, SD=1.11) and the CG (M=7.50, SD=1.40), $t(63)=2.79$, $p=.007<.05$. The probability for the F value of Levene's test for the visual forward task ($F=3.31$, $p=.07$) and visual backward task ($F=3.01$, $p=.09$) was more than .05, suggesting an equal variance in the scores of the two groups.

These data revealed that the students in the EG made a more significant achievement in their memory test assessing the PWM as well as the EWM compared to those in the CG. Altogether, this reflects a detectable impact of the OPA on improving the students' memory capacity.

4.2.2 Auditory digit span tasks

4.2.2.1 Within-group scores

Table 4.12 displays the information about the mean and SD of the pretests and posttests in two groups concerning the auditory forward and backward tasks while Table 4.13 summarizes the difference between the pretests and posttests, the values of that difference, the t-value, and its degree of freedom, and the p-value. As seen in Table 4.12, for the CG group, the mean of the posttests' scores in both auditory forward task (M=5.97, SD=1.16) and auditory backward task (M=5.97, SD=1.13 respectively).

Table 4.12 Means of the auditory forward and backward pretests and posttests

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-auditoryforward EG	6.00	35	1.085	.183
	Post-auditoryforward EG	6.829	35	1.2001	.2029
Pair 2	Pre-auditoryforward CG	5.60	30	1.102	.201
	Post-auditoryforward CG	5.97	30	1.159	.212
Pair 3	Pre-auditorybackward EG	6.49	35	1.245	.211
	Post-auditorybackward EG	6.543	35	1.0100	.1707
Pair 4	Pre-auditorybackward CG	5.97	30	1.129	.206
	Post-auditorybackward CG	6.067	30	1.0483	.1914

However, it is apparent from Table 4.13 that students' performance in the CG fell short of statistical significance for the auditory forward task ($t(29)=1.73$, $p=.094>.05$) and the auditory backward task ($t(29)=.59$, $p=.557>.05$). These results indicate that there was no notable improvement in the students' working memory in the CG.

Table 4.13 Results of paired t-tests for forward and backward digit span scores

		Paired Samples Test							
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
Lower	Upper								
Pair 1	Postauditoryforward- Preauditoryforward for EG	.8286	1.2945	.2188	.3839	1.2732	3.787	34	.001
Pair 2	Postauditoryforward - Preauditoryforward for CG	.367	1.159	.212	-.066	.800	1.733	29	.094
Pair 3	Postauditorybackward - Preauditorybackward for EG	.0571	1.1617	.1964	-.3419	.4562	.291	34	.773
Pair 4	Postauditorybackward - Preauditorybackward for CG	.1000	.9229	.1685	-.2446	.4446	.593	29	.557

As regards the students in the EG, the scores in the auditory backward task also missed the significance level ($M=6.49$, $SD=1.25$ for the pretest and $M= 6.54$, $SD=1.01$ for the posttest in Table 12), $t(34) =.29$, $p=.773>.05$. However, there was a significant increase in the scores of the auditory forward task for the EG at the end of the experiment ($M=6.82$, $SD=1.20$) compared to those at the beginning of the experiment ($M=6.00$, $SD=1.09$), $t(34)=3.79$, $p=.001< .05$. This means that when the students in the EG took the digit span tests in the auditory mode, the results of the scores got higher in both forward and backward tasks, but only significantly in the former one.

In other words, in this case, it seems that only their PWM improved thanks to the OPA, not the EWM.

4.2.2.2 Between-group scores

The results of the test of normality shown in Table 4.14 illustrates that all the Sig. value of the Shapiro-Wilk tests was greater than .05. Therefore, it can be concluded that the scores of the auditory forward span tasks in the two groups had a normal distribution.

Table 4.14 Normality of the scores of auditory forward tasks

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pre-auditoryforward EG	.250	35	.103	.828	35	.060
Post-auditoryforward EG	.186	35	.023	.912	35	.109
Pre-auditoryforward CG	.207	30	.002	.909	30	.114
Post-auditoryforward CG	.165	30	.037	.922	30	.130

a. Lilliefors Significance Correction

Given this assumption, independent t-tests were conducted to compare auditory forward digit span scores between two groups. In the pretest, as seen in Table 4.15 that there was no significant difference between the performance of the EG (M=6.00, SD=1.09) and that of the CG (M=5.60, SD=1.10), $t(63)=1.47$, $p=.146 >.05$. On the contrary, in the posttest, 35 participants who received listening practice with OPA (M=6.83, SD=1.20) compared to the 30 participants who practiced listening with the traditional method (M=5.97, SD=1.16) demonstrated a statistically significant difference in their performance, $t(63)=2.93$, $p=.005 <.05$. At the same time,

the variance in both groups is equal because the probability (Sig.=.617 for the pretest and Sig.=.823 for the posttest) for the F value is more than .05. The findings suggest that the students' performance on the memory test assessing the PWM increased significantly under the influence of the OPA.

Table 4.15 Independent t-tests of the auditory forward task

	Independent Samples Test								
	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Interval of the Difference	
								Lower	Upper
Pre-auditoryforward	.253	.617	1.471	63	.146	.400	.272	-.143	.943
Post-auditoryforward	.051	.823	2.932	63	.005	.8619	.2940	.2745	1.4493

4.3 Response to research question 3: What is the relationship between listening comprehension, Working Memory capacity and vocabulary knowledge?

Results of correlational analyses show that listening ability and receptive vocabulary knowledge were significantly moderately correlated. The degree of correlation for the experimental group (or more skilled listeners) is slightly higher than that of the control group (or less skilled listeners). For the connection between listening ability and working memory, a significant relationship was observed in the case of the experimental group but not the control group. Specifically, only visual digit span tasks were found to be linked with the listening scores. These findings suggest that there was a moderate correlation between listening ability and receptive vocabulary knowledge.

Moreover, listening is found to be only related to visual working memory in the case of the more skilled listeners. The description of the results will be given as follows:

At the end of the listening course, results of the DIALANG listening posttest demonstrate that the students in the EG have achieved significantly higher scores than those in the CG. The working memory scores in the two groups also displayed a significant difference regarding the posttests. This means that the two groups had different developmental patterns in terms of their listening comprehension and working memory after the experiment. For these reasons, the relationship between listening, vocabulary, and working memory was analyzed separately for each group. Based on their listening scores, students in the EG are considered as more skilled listeners and those in the CG as less skilled listeners.

4.3.1 For the control group

Correlational analyses were performed to examine the relationship between listening, vocabulary, and working memory. Table 4.16 shows the statistical correlation between the variables. It can be seen that the data reveal the existence of a positive significant relationship between listening scores and vocabulary scores, $r(30)=.35$, $p<.05$, indicating that listening ability and vocabulary were positively and significantly correlated. However, the scores of the listening tests were not related to those of all digit span tasks ($r=.29$, $r=.26$, $r=.15$, $r=.11$), suggesting that no connection was found between listening ability and memory capacity in the case of the CG.

Table 4.16 The correlation between the scores of listening, vocabulary, and working memory for the CG

	Auditory Vocabulary Size Test	Visual Forward Span Task Scores	Visual Backward Span Task Scores	Auditory Forward Span Task Scores	Auditory Backward Span Task Scores
Listening DIALANG	.350*	.297	.260	.155	.111

*. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed).

4.3.2 For the experimental group

Correlations were computed among the scores of the listening, vocabulary, visual digit span tasks, and auditory digit span tasks as illustrated in **Table 4.17**. Results of the Pearson correlation show that there was a significant positive association between the listening scores and vocabulary scores ($r(35)=.39$, $p<.05$). These findings demonstrate that listening ability and vocabulary were found to be positively and moderately correlated.

Regarding the connection between working memory and listening, a significant relationship was identified between the scores of the listening test and visual forward digit span tasks ($r(35)=.40$, $p<.01$), and between the scores of the listening test and visual backward digit span tasks ($r(35)=.35$, $p<.05$). The findings suggest that there was an association between listening ability and visual phonological working memory as well as general working memory capacity.

Table 4.17 The correlation between the scores of listening, vocabulary, and WM for the EG

	Vocabulary Scores	Visual Forward Span Task Scores	Visual Backward Span Task Scores	Auditory Forward Span Task Scores	Auditory Backward Span Task Scores
Listening DIALANG	.385*	.400**	.352*	.217	.236

*. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed).

4.4 Response to research question 4: What are the opinions of EFL learners on the OPA?

Overall, the students in the study had positive opinions about the OPA. They reported that OPA enabled them to have more chances to improve their listening, their pronunciation, their vocabulary; and how to store and process auditory information effectively. Moreover, the participants were aware of being more autonomous in managing their own learning activities, more motivated, and more confident to deal with listening tasks. In sum, Vietnamese EFL learners were in favor of the OPA and believed that OPA can help them to improve their listening skills. Details of data analysis from questionnaire, journal, interview and observation will be described as follows:

4.4.1 Results from the questionnaire

In the current study, a questionnaire was distributed as an exploratory purpose, which aimed to get a general idea about the students' opinions about the teaching method they experienced. In total, there were 65 students in the experiment,

35 and 30 for the experimental group and the control group, respectively. The distribution of male and female in each group is illustrated in Diagram 4.1.

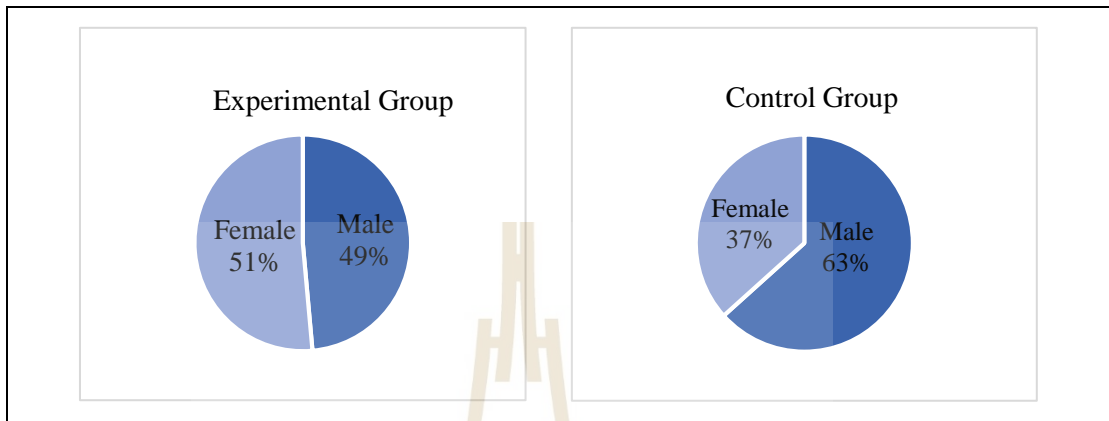
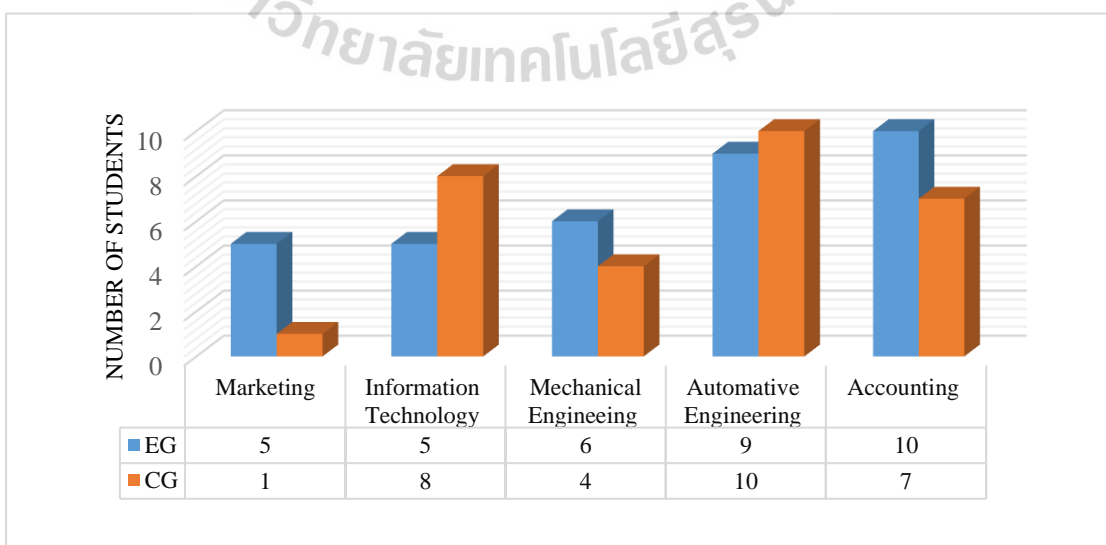


Diagram 4.1 The distribution of male and female students in each group

These students came from different provinces in Vietnam, mainly in the Southern areas. Regarding academic fields, as displayed in Table 4.18, these second-year students majored in automotive engineering, accounting, information technology, mechanical engineering, and marketing.

Table 4.18 A summary of students' majors in each group



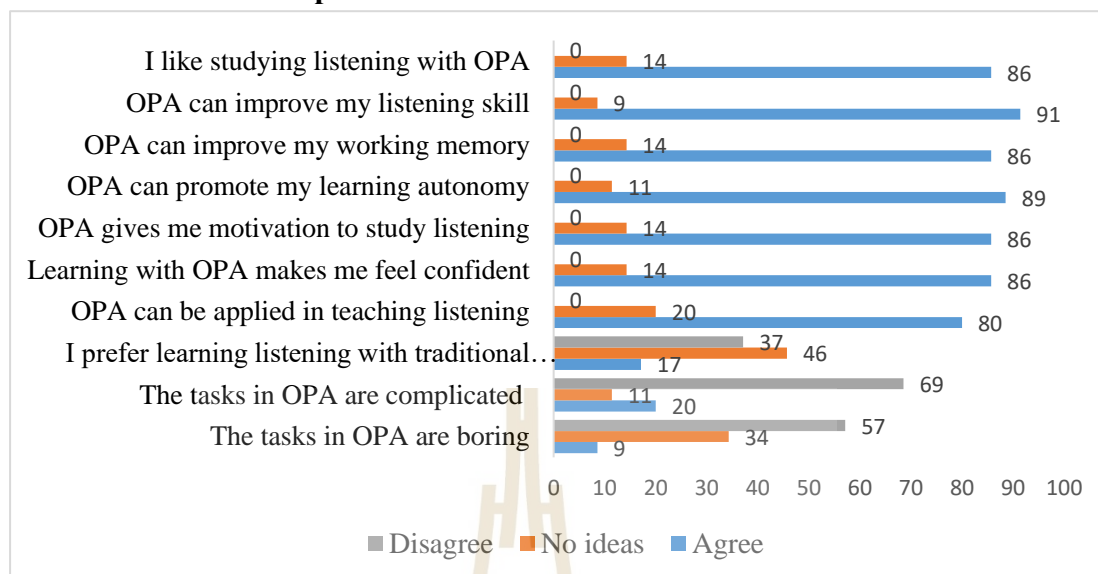
The data in Table 4.19 shows that the average age of these students was 20.38 years ($SD=0.9$). Overall, these students reported that they had been studying English for more than 10 years ($SD=2.2$). Moreover, none of them had ever taken any standardized English tests as well as enrolled in any additional course at a language center. Yet, when they were asked what activities they often did to improve English outside the classroom, the most common responses were listening to English songs and watching movies; the other answers were using English applications, surfing the internet, doing homework, and doing nothing. In terms of other foreign languages, only two students in the CG used to study Japanese as beginners.

Table 4.19 Descriptive statistics about the age and years of learning English

Descriptive Statistics								
	N	Range	Minimum	Maximum	Sum	Mean	Std. Deviation	Variance
Age	65	6	19	25	1325	20.38	.913	.834
Duration	65	13	6	19	622	9.57	2.222	4.937

The second part of the survey including ten Likert-scale items aimed at discovering the students' thoughts about the OPA. Therefore, only 35 students in the experimental group filled in this section. As can be seen in Table 4.20, the overall opinions about the application of OPA were very positive. Closer inspection of the table indicates that 86% of the participants showed their favors for the OPA. Concerning the effectiveness of the OPA on their listening and memory development, a major proportion of the students agreed that the OPA could help improve their listening skills

(91%) and their memory (86%). Besides, 89% of the students indicated that the OPA could foster their learning autonomy. The percentage of the participants who commented that practice listening with the OPA could make them feel more motivated to study listening and feel more confident when listening was equal with 86%. In response to the item related to the possibility of applying the OPA in teaching listening, most of the participants (80%) expressed their agreement while one-fifth of them had no opinion. Interestingly, there was a diversity in the ratios of the answers concerning the item which comparing the OPA with the traditional listening teaching. 46% of these responses demonstrated a neutral position. 37% of the students preferred the OPA to the traditional method whereas 17% of them showed a contrasting view. As regards the nature of the given tasks in the OPA, one-fifth of the participants felt that the activities were complicated while the majority (69%) showed their disagreement in this aspect. Moreover, when commenting on the attraction of the tasks, only a tiny number of students (9%) said the activities were boring. 57% of them disagreed while 34% of them remained neutral. To sum up, the preliminary findings of the questionnaire revealed positive opinions about the implementation of as well the effectiveness of the OPA.

Table 4.20 Students' opinions about the OPA

4.4.2 Results from journals

The students in the experimental group were asked to keep a journal to record their experiences with the OPA. Except for one journal after the sample Vitamin, they were asked to write down their experiences and feelings after every 3 Vitamin exercises or once a week. The outline of the journal was mainly about the reflection of their progress, their experiences with the activities, and their feelings about what they had done. When the experiment had almost come to an end, they were also required to express their opinions about the effectiveness of the OPA relating to listening and memory, learning autonomy, the application of the OPA, and the difficulties they encountered during the course.

Overall, the analysis of participants' written reflections showed that they were aware of their own improvement in carrying out the tasks after every lesson although the rate of progress was slow. Additionally, it was reported that their

confidence increased little by little. The most common benefits of the OPA also emerged from these journals (see Table 4.21 for some sample excerpts from students' journals). First, the students commented that they were given ample opportunities for listening. They could listen repeatedly. Second, they could listen at their own pace without any distraction from their peers or any interruption from their teachers as in a traditional listening class. They said they could focus more on the aural input. Third, another advantage was the ease of use of the website. They said they could practice listening anytime and anywhere at their convenience without any pressure. The tasks on the website were described to be user-friendly. Besides, these students wrote that they felt comfortable while listening because they were not afraid to lose face or make mistakes when they checked their own answers after each listening task. Fourth, most of the participants reported that their pronunciation could improve thanks to the extensive exposure to native accents such as connected speech, rhythm, and stress, and by listening to their recordings from the shadowing task. Fifth, there were many comments about their chance of learning new vocabulary through listening activities. Finally, the students were unanimous in the view that the implementation of the OPA was feasible and appropriate for them to practice listening.

However, there were some negative comments related to the listening materials as well as tasks. A few students said that the speed of audio was fast and difficult for them to follow. Some reported that the shadowing tasks were quite difficult for them to do without looking at the transcripts of the audio.

Table 4.21 Sample excerpt from students' journal regarding their opinions about the OPA

	Identified student by email	Vietnamese	English
1	ngochuyentran2704@gmail.com	Cảm thấy khoá học này lạ nhưng lại dễ tiếp thu, dễ hoà nhập với sinh viên, không khí lớp thoải mái trong việc học tiếng anh	I think this course was new and strange, but it was effective for learning listening and suitable for learners, the atmosphere was comfortable and stress-free.
2	phuongnhi112020@gmail.com	Em được luyện nghe nhiều hơn và biết thêm được nhiều từ mới lúc em dịch đoạn văn	I had more listening practice and could learn new word when I checked the transcript right away
3	vuthimyle0704@gmail.com	Theo em phương pháp đang luyện tập có cải thiện được trí nhớ vì nếu nghe nhiều lần trong bài sẽ nhớ lâu và dai hơn	I think this method partly helped me to strengthen my memory because I listened many times and tried to remember the information.
4	camtu27122000@gmail.com	Phương pháp giúp tự học tốt hơn và biết thêm được nhiều từ mới hơn	I think I could learn by myself with this method and also learned more new vocabulary.
5	vutruongtd99@gmail.com	Có thể học mọi lúc mọi nơi mà không cần phải đến lớp	I could listen everywhere I wanted without having to go to class
6	lamngochai387@gmail.com	Nó cải thiện nghe , cho chúng ta nghe biết được ngữ điệu thế nào và cả nhiều lần nữa	It helped me listen better because it gave me more chance to focus on the melody of the speech and to listen many times
7	hiep11012000@gmail.com	Em chưa quen với cách này nhưng khá rõ ràng và dễ hình dung từ hơn là nghe trên máy	I was not familiar with this method, but this approach could help me to visualize what I heard easily

Table 4.21 Sample excerpt from students' journal regarding their opinions about the OPA (Conts.)

	Identified student by email	Vietnamese	English
8	dobichphuong14022000@gmail.com	Em thấy phương pháp này nó sẽ giúp người nghe tiếp cận được với sự phát âm của họ	I feel that this method can help learners to have more exposure to the correct and natural pronunciation
9	phamnhutruc27112000@gmail.com	Phương pháp này giúp cải thiện kỹ năng nghe hơn vì được nghe nhiều hơn nghe 1 mình chứ không phải nghe chung với các bạn trong lớp thì mình có thể tập trung hơn để nghe	This method helped me improve my listening because of a lot of repetitive listening and self-pace listening; I did not have to listen with my friends, and I could focus more
10	phamchinghia5102000@gmail.com	Em nghĩ là bài nghe quá nhanh để em có thể hiểu. Phần shadowing thì hơi khó để nói theo	I think the audio was too fast and I could not understand. When I did the shadowing, it was so difficult to repeat.

4.4.3 Results from interview

The choice of the semi-structured interview as one of the data collection tools was to get to know more about the learners' thoughts and feelings for a better understanding of the effect of the OPA. The interview, conducted in tandem with the questionnaire and journaling, was also to see how well they corroborated each other. A total number of 10 interviews were recorded with the permission of the participants and were transcribed. After the data was coded and interpreted using content analysis based on procedures proposed by Creswell (2009), students' perspectives could be

categorized into four broad themes: skill development, learning autonomy, the implementation of the OPA in the teaching of listening, and the challenges they faced during the course as seen in Diagram 4.2.

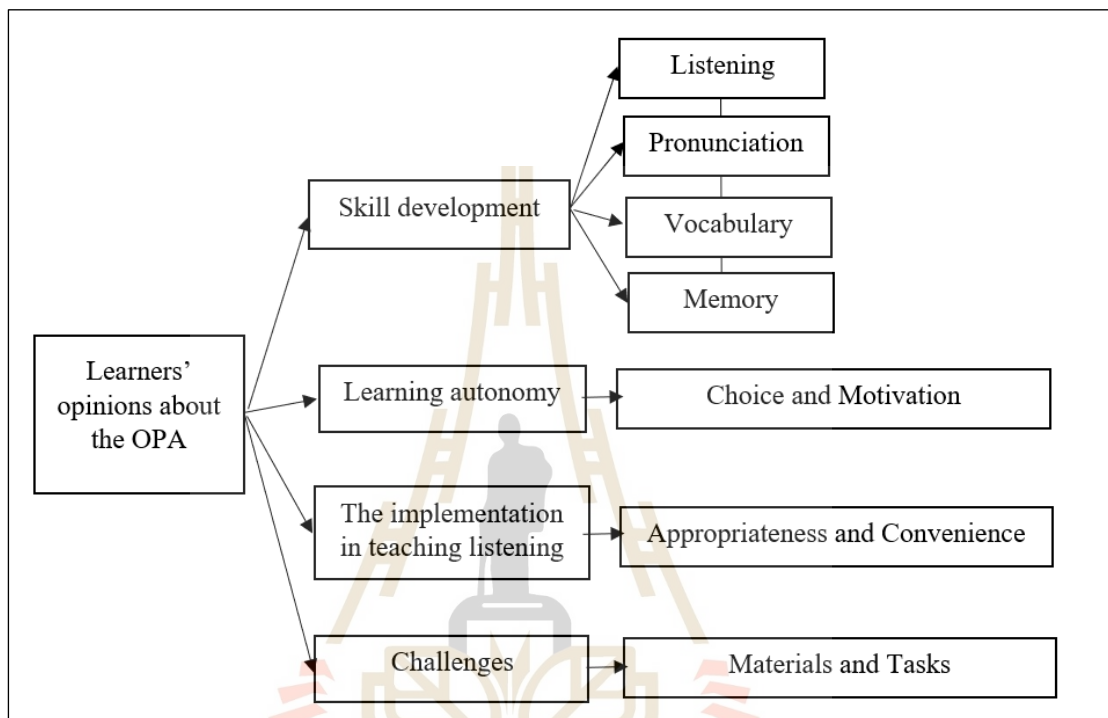


Diagram 4.2 Summary of learners' opinions about the OPA

Most of the students reported that they could improve their listening ability, their pronunciation, their vocabulary and their working memory. To illustrate, some extracts from the transcripts of the interview as follows:

I think this method was very good. Normally, the time for listening activities in class is not much. I have to listen at the same time as my friend and the teacher plays the recording. I think my listening comprehension improved thanks to this course - Student 001F

My listening has improved because I could listen to the audio many times. Especially I could listen to the sentences separately first and then the conversation. I see that there was a connection between these activities, and this helped me to remember better - Student 002F

I think I received a lot of exposure to natural input. This helped me to familiarize myself with the connected speech, rhythm, and stress of English. When I listened to my recording, I could recognize my mistakes. I think I could improve my pronunciation - Student 003F

Practice listening this way helped me to focus more. By listening many times and paying attention to the pronunciation I could improve my listening and pronunciation- Student 008M

I could learn a lot of vocabulary. After I listened, I checked the transcript right away. If I did not know I would look it up. I had to listen and then wrote what I heard, therefore, I could remember longer- Student 006M

Regarding memory capacity, the students agreed that being involved in these listening activities might be helpful for their memory. As Student 004M demonstrated:

I guess it had a certain effect on my memory because I listened many times so I could remember the vocabulary better. I also listened to the conversation, tried to remember to take notes. Besides, while I was recording, I tried to remember what I heard to repeat as correctly as possible

Talking about learning autonomy, it was said that the OPA could give them an autonomous learning space. They could practice listening without the presence of the teacher or attending class.

I could listen at my own pace by choosing to listen to many times as I wished. I stopped to check the meaning of the new vocabulary whenever I liked- Student 008M

I feel that I was more autonomous because I did not depend on the teacher too much. I had my own space to concentrate on my listening. Especially, I could practice at home or anywhere at my convenience- Student 009F

When asked to compare the OPA with the traditional way of learning listening, in all cases, it was reported that the OPA was more favorable. The students thought that if listening could be taught with this approach, it would be more helpful and effective. For instance, as Student 010M put it:

This method is better than the traditional method. I could have more chances to listen, especially listen at my own pace. I think the listening activities were less boring. If this method can be applied in teaching listening, it will be very good.

However, being autonomous does not mean being given total freedom without any guidance. As Student 003F stated:

I think I could have an opportunity to develop my learning autonomy because I could do the tasks without the teacher. I just followed the

procedures on the website. All were set and what I needed to do was to click the mouse and the audio was played many times, and then I tried to write the answers. I could decide the speed of my activity.

The respondents reported no problems with the interface of the listening website, however, one of them mentioned that the listening materials were difficult. As Student 005M said:

I had no difficulties in learning with the website, but I think it would be better if the audio was slower a bit. The audio was so fast and sometimes it was unclear for me to listen.

In sum, the results of the interview reveal that students subjected to the OPA had positive opinions about its effectiveness as well as its efficiency in improving their listening ability.

4.4.4 Results from observation

Overall, from what the researcher observed during the experiment, it can be said that most of the students enjoyed the listening course. Regarding the steps in the listening, at the outset, the students had some problems following the steps. For FEEL IT and CHEW IT, the steps were quite smooth after the students were given instructions on how to do it. But for CHEW IT, they found it challenging to carry out. Some had to repeat the shadowing tasks many times. They were quite confused as many questions were raised for the assistant (played by the researcher) during the first two weeks. Gradually, when they became familiar with the procedure of the steps, they could

handle the tasks more effectively as no questions were raised anymore. They started to concentrate on their listening.

In terms of using gestures for feeling the melody in the step FEEL IT, at the beginning of the course, most of the students forgot to coordinate with their body movements. The majority only sat down still as they often did as usual. Later on, some used their body movement clearly, but some did it gently due to shyness. Therefore, the instructor had to remind them to do it correctly to achieve the best outcome. From the observation, students had different ways of synchrony such as moving their head, their fingers, their neck, their shoulders, their feet, etc. In general, some gestures were quite subtle and not easy to notice.

For the students' reactions and feelings, it can be seen that most of the students were immersed in their listening. Some special cases showed tiredness because they could not make sense of the signals by laying their heads on the table while listening. When they encountered any troubles, they often talked to their peers, and sometimes they asked for help from the assistant. It was noticed that many students used Google translate for checking the meanings of new words as they opened the Google website. Some of them wrote down the answers into the notebook for remembering.

Regarding the atmosphere, it seems that most of the students were interested in the first second step the most (SWALLOW IT) as the room was quite noisy. They were eager to listen to their recording before submitting it. For them, it can be said that

this was a brand new experience. For the low-pass filtered audio, as they were introduced to it during the training sessions already, they were familiar with that. For the last step, some students played the recordings many times while some just listened to them a few times. This was reflected by the number of playing the audio in the database.

By looking at the products of the students in the database such as their answers typed into the text before clicking the submit button and the frequency of repetition of their listening as well as listening to the students' recordings of their shadowing tasks, the researcher could identify whether the students did the listening activities seriously or not. She also could measure the level of their attention during the practice to some extent. There was some clear listening progress in most cases but for some students, it was not easy to detect the changes because of their fragmented answers.

In conclusion, the observation revealed that the students performed their listening activities in the right way despite some challenges in the first phase and they seemed to like the listening activities more and more when they knew how to do it.

4.5 Summary

This chapter described the outcomes of the current study. The findings showed that the student subjected to the OPA significantly improved their listening scores and memory scores. Further, the listening ability was found to yield a moderate relationship

with vocabulary knowledge and working memory in the case of learners who experienced the OPA. Besides, these students also had positive opinions about the OPA.



CHAPTER 5

DISCUSSION

This chapter discusses the results reported in Chapter 4. The discussion is organized on the basis of the research questions in the study. The first two sections are about the effects of the OPA on learners' listening ability and working memory. The next section deals with the relationship between listening ability, vocabulary knowledge, and working memory. After that, learners' opinions on the OPA are explored. The final section presents some reflections on the OPA.

5.1 The effects of OPA on EFL learners' listening comprehension

The outcome of the study demonstrated that students in both groups made significant progress in their listening performance by the end of the experiment. However, students who received listening practice with OPA achieved significantly higher scores than those involved in the traditional teaching listening method ($t(63)=3.19, p=.002<.05$). Specifically, the EG improved twice as much as the CG despite the similar amount of time on tasks. These findings indicate that the OPA had a positive and profound impact on learners' listening ability. One may speculate that the OPA succeeded in providing learners with a multi-channel perceptual experience that helped modify their auditory perception for more effective aural comprehension.

Although it is not easy to identify which factor had the most decisive impact on this improvement, some reasons can be given as follows:

5.1.1 Perceptual training may lead to better production

Given the positive impact of the OPA on the learners' listening ability, it is vital to take the underlying learning and teaching principles of the OPA into consideration for a clear interpretation of this effectiveness. As discussed in section 2.4.2 (see p.95), the principles of the verbotonal approach were taken as the foundation to design the listening activities for the listening Vitamins course. The results of the study reflect and confirm the fundamental concept that a positive change in perception may lead to a positive change in production. This is also in line with the arguments of previous researchers (e.g., Bradlow et al., 1999; Derwing & Munro, 2005; Nord, 1980), suggesting that L2 appropriate perceptual training can lead to an automatic improvement in production. The perceptual training that the students in this study received helped them not only to overcome the interferences caused by the phonological differences between L1 and L2 but also to develop new habit patterns for listening that did not make use of their native language's ear (Intravaia, 2013). Although listening is not a productive skill, what happens in the mind of the listeners can be observed only by their responses or their results in a kind of listening test. Therefore, in this case, the impact of perceptual training seems to be fruitful for a positive change in the product of listening.

5.1.2 Prosodic training can improve listening comprehension

It is clear that as a result of the intervention, the students appear to have directed their attention to the prosodic features of the spoken speech to facilitate their listening comprehension. This critically important finding is also one of the main principles of the theory of verbotonalism, which states that prosody should be prioritized for effective language learning. A similar point is also made by Joo (1973) and Morley (1991) who argue that prosodic features are indispensable for understanding fluent and conversational speech. Moreover, according to Wennerstrom (2001), being attuned to the prosody of a target language in the early stages of acquisition could influence eventual progress toward their communicative competence. Additional support for this explanation comes from evidence from earlier findings of Han (1996) and Huang (2009) which show that prosody-oriented listening tasks can help learners develop their auditory perception and improve their listening performance.

5.1.3 The impact of filtered stimuli in synchrony with body movements

The students' significant improvement in their listening performance also demonstrates a key point that repeated exposure to filtered and unfiltered stimuli in synchrony with body movements can help learners internalize the prosodic patterns. As Chang and Millett (2014) point out that consistent practice is essential to improving listening fluency or automatic processing. After substantial, repeated exposure to

speech stimuli, the EG appears to have trained their ears to process spoken English more readily and naturally than the CG.

One of the crucial elements contributing to this positive change can be due to listening to the filtered recordings. Listening to filtered audio might have helped direct learners' attention to the prosodic patterns instead of the lexical contents. Besides, these unfamiliar auditory signals appear to have succeeded in bypassing the learner's normal processing mechanism which is often manipulated by the left hemisphere, and in triggering the right region of their brain (Hesling et al., 2005; Meyer et al., 2004). In this respect, it reflects the argument of McGilchrist (2019) about how the human brain works in the realm of language learning. He posits that any new verbal input must first be processed by the right hemisphere before shifting to become the focus of the left hemisphere. In other words, any kind of input that causes uncertainty, apprehension, or difficulty in predicting is likely to engage right-region attention more than the left. Through practice, the input has become familiar and then shifts to be the concern of the left hemisphere.

Another factor that results in a positive change in perception might lie in the repetition in synchrony with body movements. During communication, as speech and body movements are rhythmically coordinated (Condon & Ogston, 1966), the establishment of self-synchrony is helpful for effective comprehension. This kind of coordination may have strengthened listeners' awareness of the sound-meaning connection, which was then transformed into automatic processing. In this case,

producing gestures helped learners internalize L2 prosodic structures through embodied processes (Gullberg, 2008; McCafferty, 2004). This echoes Chan's suggestion (2018) that the employment of gestures is helpful for language learners who need to develop sensitivity to auditory input. In other words, an understanding of the human body as an instrument of speech and the employment of embodied pronunciation techniques can help language learners develop both perceptive and productive skills.

5.1.4 The OPA reflects the natural process of language learning

Another possible reason for the development of the students' listening skills is that the OPA appears to reflect a natural process of learning a language in which its prosody should be prioritized (Speer & Blodgett, 2006). As Speer and Blodgett (2006) stated, infants acquire language mainly from auditory input or spoken language that is structured by prosodic form. Based on this, mental representations and processes that compose linguistic processing are built. Besides, this learning process is quite implicit and intuitive, especially listening skills. Implicit learning is an autonomous, non-conscious process that takes place whenever information is processed receptively (Hulstijn, 2006). For Winitz (1981), language learning is largely an implicit process in that learners actively formulate rules of languages whether they learn their mother tongue or any other foreign languages. However, the distinction between L1 and L2 learning is that L2 learners carry their prior knowledge of a language (their L1), an advanced level of cognitive maturity, a set of established social and cultural beliefs, and in some cases, a firm conviction as to how foreign languages are acquired. Therefore,

being involved in a condition in which learners can develop their listening skills spontaneously by paying attention to the prosody first and can express their understanding of the input without being imposed by any preconceptions is likely to be helpful for their listening skills. Furthermore, Hulstijn (2006) explains that due to the limited attentional capacity of the human brain, the more processing of information at the lower level is automatized, the more attention language users can give to the higher levels of linguistic or any kind of necessary information to make meanings.

5.1.5 The automaticity was strengthened thanks to the shadowing tasks

The students' listening improvement can be attributed to the fact that their automatic processing or automaticity was strengthened thanks to the shadowing practice. As stated by Hamada (2017), shadowing can develop automaticity or listening fluency because shadowing required students to process what was heard and immediately verbalized it again without much chance for translating online. In this way, students could put less attention to details of the input or minimize the possibility of triggering anxiety by the overloaded system. Besides, shadowing appears to stimulate and shape their inner speech (Guerrero, 2005) and strengthen phonological working memory (Hamada, 2018). The reason is that shadowing is the act of rehearsing information explicitly and this is normally done implicitly in sub-vocal rehearsal in the WM. Through practice, this process will be reinforced and in turn, help the phonological working memory to manage and store information more effectively and efficiently. As novice L2 learners, due to their limited memory capacity, these students

often rely on controlled processing during the listening process, which may interfere with their comprehension (Vandergrift, 2011). Once the automatic processing was enhanced, they could allocate their limited memory capacity and direct more attention to the process of constructing meaning to achieve effective comprehension.

5.1.6 Listening problems were minimized thanks to the OPA

The improvement in learners' listening performance can be explained by the fact that the OPA might have assisted these students to cope with or minimize their listening problems. As presented in Section 1.2 (see p.9), the most common listening difficulties reported by these students were because of limited vocabulary, fast speech, and pronunciation. These listening barriers seem to be shared by the majority of language learners as they are often discovered by several researchers (e.g., Graham, 2006; Vu & Shah, 2016; Yang & Chen, 2007). If these revelations truly reflect the learners' obstacles in their listening comprehension, the OPA is likely to minimize them. Indeed, the learning protocol that the students in the EG experienced is a self-access web-based platform. This listening environment provided them with optimal exposure to the spoken input with text support for enhancing input and comprehension. Especially, students were given opportunities to notice new language and personalize their own experience as a part of their listening process. They were also encouraged to figure out the meanings by themselves and promote the use of clarification and comprehension checks (see section 3.2.2 p.110 for more details). These procedures have exactly the key elements to be an effective approach to the teaching of listening

as described by Morley (2001) and Rost (2016). They stressed that self-access listening materials should focus on the active process of listening, the authentic input, the internal communicative interaction of listeners by reformulating the signal, the verification of comprehension with self-check answers, etc. In this way, these students seem to have noticed the features of the spoken language and make progress in their listening thanks to the OPA. In addition to brushing up on their lexical items incidentally and implicitly, they gradually became familiar with the continuous stream of speech.

However, in another scenario, according to Hasan (2000), learners' perceptions of their listening problems may or may not correspond to what happened as different factors which the listener may not be aware of may interact and influence learners' perceptions. The findings of his study indicate that the identification of listening comprehension problems is pertinent to tasks and activities, the message, the speaker, and the listener. Under this circumstance, the impact of the OPA on these students' listening ability seems to remain effective. Highlighting the importance of the perceptual in the listening process would mean equipping these students with a well-prepared mindset for facing any kind of listening obstacles. Bearing in mind that the complex interaction between both internal and external factors to interfere or facilitate the listeners to make meanings and the uncertainty of how these factors affect the comprehension of listeners, a focus on learners' auditory perception is likely to be helpful for them. As Cutler (2012) states, in this world, where complex signals arrive at speed, vary in form and overlap or occur simultaneously, ambiguity is all around us.

Therefore, learners should receive more perceptual training using existing knowledge to retune decision-making for future encounters with such ambiguity.

In sum, the abovementioned factors may have contributed to the improvement of students' listening comprehension but how to identify which one had the most decisive role remains unclear. However, it is certainly the combination of the techniques in the OPA that resulted in their better achievement in the listening scores. The bottom line is that these techniques were related in some way and complemented one another. Together, they created a complete OPA that had a positive impact on learners' listening ability.

5.2 The effects of OPA on EFL learners' working memory capacity

The second question in this research was designed to determine the effectiveness of the OPA on the working memory capacity of the learners who received listening practice with the OPA. The current study found that the students in the EG achieved higher scores in the visual forward and backward digit span tasks than those in the CG, indicating that there seems to be a positive change in how they store and process the information after the intervention. Concerning the acoustically presented stimuli, however, the EG did not show any significant increase in their backward digit span task scores but only in the forward span task scores, demonstrating that only the phonological short-term memory appears to be influenced by the OPA in the case of auditory presentation mode. These findings confirm those of previous work suggesting

that working memory is not a fixed capacity and can be enhanced or optimized to function more effectively (Brady et al., 2016; Caeyenberghs et al., 2016; Klingberg, 2010; Loosli et al., 2012; Reza et al., 2016). Some of these researchers suggest that WM training may result in WM gains, reflecting the plasticity of the neural system underpinning WM (Caeyenberghs et al., 2016; Klindberg, 2010), whereas the others claim that repeated practice on WM tasks may facilitate the storage of information or improve the efficiency of processing (Loosli et al., 2012; Santacruz & Ortega, 2018). In a general sense, the participants in the abovementioned studies were either exposed to repeated tasks with varied stimuli purposely designed to improve multiple components of the WM system or specific strategies to perform better in tasks requiring retention of information such as chunking and learning to organize the input. Although these training activities exploit different techniques, they seem to share the same principle of giving explicit instructions. For the current study, it is difficult to identify exactly which factor had led to the improvement of these students in their memory scores. After all, the OPA is a combination of techniques that are supposed to provide the students with optimal conditions for their listening practice. The listening activities were designed to strengthen their memory not explicitly but implicitly. Irrespective of the form of instruction, directly or indirectly, provided that the assignment places demands on working memory, it may help improve the memory system (Cockcroft, 2015). Therefore, some possible explanations can be taken into consideration for the students' improvement in their memory scores.

5.2.1 The impact of extensive training in tasks requiring cognitive control

It seems possible that the higher scores obtained in the memory tasks may be related to the nature of given tasks involving WM. Basically, in the OPA, students listened to sentences or phrases and short dialogues repeatedly, and then wrote down what they could hear. They also did the auditory shadowing with the dialogues and kept their recordings of these shadowing (for more details, see 3.2.3 p.106). The students in the EG had to carry out the tasks using their working memory with a high frequency. They had to learn how to deal with or organize a stream of speech and construct meaning, which required their attention as well as the ability to store and process information at the same time. At a low proficiency level, these students are likely to lack experience in this kind of practice. According to Gathercole and Alloway (2007), distraction, excessive input, and engaging in a demanding task are situations that often cause the loss of information from WM due to its limited capacity. Therefore, extensive practice under such pressure may facilitate the memory store and manipulate input more effectively. This is also consistent with the findings of earlier research (Basak & O'Connell, 2016; Gathercole et al., 2019; Loosli et al., 2012; Redick et al., 2015), indicating that when participants are trained to deal with tasks requiring more cognitive control, it may help them to develop the efficiency of their working memory system. It is suggested that this new routine can be applied to other similarly structured tasks, which is called a near-transfer effect. As stated by Klingberg (2010), the transfer of the training effects is consistent with the notion of training-induced plasticity in a common

neural network for WM. Moreover, extensive practice or repetition has been shown to be a neuroplasticity agent in L2 learning (Ghazi-Saidi & Ansaldo, 2017).

5.2.2 The impact of implicit training in memory strategies through shadowing and chunking

It is probable that the shadowing tasks in the OPA also play a major role in contributing to the students' success in their memory span tasks because shadowing has been considered as a way to promote the efficiency of the WM system. As explained by Hiroko (2004), through shadowing practice, the students had to practice holding information temporarily in the phonological memory as an act of rehearsing information. Besides, their attention must be directed to sequences of language while shadowing. Therefore, it is likely that the mechanism of shadowing is also a factor influencing the working memory. What is more, listening to sentences or chunks repeatedly is also an additional factor because chunking can help free up or reduce the load on WM (Thalman et al., 2019). In von Bastian and Oberauer's view (2014), chunking is one of the strategies which can mediate the transfer effect in WM training. In line with this, the results of Ibarra Santacruz and Martínez Ortega's study (2018) demonstrate that strategy training for WM can help minimize learners' memory limitations, thus increasing their retention and retrieval capacity, which would lead to better performance.

Altogether, the two likely theoretical assumptions might have caused an increase in the students' scores of memory tasks. In other words, it is possible that

practice listening with OPA led to a change in memory capacity or increased efficiency in the strategies carried out by working memory over time since the students in EG were exposed to some experiences and factors that could improve the storing and processing function of their working memory. In another case, the students' memory system had learned how to manage the auditory signals thanks to a factor, which so far is unknown, as a result of the combination of the discussed techniques of the OPA.

5.2.3 Different modalities of stimuli have a different impact on WM

Concerning the modality of stimuli in memory tasks, when the span tasks were presented aurally, the gains in these students' scores of the backward span or complex task could not be observed but only those of the forward span or simple task. In the case of visual mode, the significant performance could be seen clearly in all tasks. This indicates that the auditory retention may be inferior to visual retention in the digit span tasks, which is in agreement with the results obtained by Bigelow and Poremba (2014), Lindner et al., (2009), and Olsthoorn et al. (2014). Specifically, the outcome of Olsthoorn et al.'s study (2014) reveals that the performances on the visual tasks did not significantly differ between natives and non-natives, suggesting that the influence of language-specific input can be minimized in the visual modality. Yet, the current findings also contrast with a previous observation by Jensen (1971), arguing that auditory presentation enables recall that is superior to visual memory. He explains that as in visual memory tasks, verbal rehearsal often occurs to convert information from visual to auditory storage, which is less necessary if the memory tasks are presented

acoustically. A possible explanation for this disparity is due to the features of the tasks used in the memory test which may favor either auditory or visual modality (Mascio, 2017). In other words, whether the presentation-mode is critical for triggering the respective modality in memory or not depends on the choice of task types. Additionally, in terms of backward digit span tasks, according to Sven et al.(2015), the critical factor affecting internal processing is not the mode of presentation but the preferred cognitive strategy. Another probability is that because the task was performed in L2, learners might find it more challenging to access and retrieve the information presented acoustically rather than visually due to their limited L2 phonological knowledge (Olsthoorn et al., 2014). In short, in the case of L2 learners, presenting auditory stimuli may cause more interference for the memory system to store and process information than visual stimuli.

5.3 The relationship between listening comprehension, vocabulary knowledge, and working memory

The third question in this study sought to determine the relationship between listening comprehension, vocabulary knowledge, and working memory capacity. The results of the correlational analysis showed that there was a significant association between listening ability and vocabulary knowledge regardless of their level of listening while a non-significant correlation was found between listening and working memory

for less-skilled listeners (the CG) except for the more skilled listeners (the EG). Reasons for the existence as well as the lack of connection are discussed in turn as follows:

5.3.1 A moderate positive correlation was found between listening comprehension and vocabulary

Listening ability and vocabulary knowledge were found to be significantly correlated at a moderate level in both groups. In particular, in the case of the less skilled listeners, the correlation values were $r=.35$ and $r=.34$ while for the more skilled listeners, the values of r were $.39$ and $.43$, suggesting a moderate relationship. This finding is in line with some prior studies (e.g, Li & Zhang, 2019; Matthews, 2018; Milton et al., 2010; Vandergrift & Baker, 2018) reporting a correlation between listening comprehension and vocabulary size. A possible explanation is that it is the aural receptive vocabulary size or phonological vocabulary size that was measured, which somehow reflected their ability to recognize spoken language. During listening, comprehension may be affected if an oral vocabulary item is not retrieved and identified fast enough. However, the correlation observed in the abovementioned studies was higher than that observed in the current study and even strong enough to suggest that vocabulary size is an important predictor of L2 listening. This slight difference may be explained by the fact that although vocabulary plays a vital role in listening, there seems to be some variation among L2 listeners as to the degree to which they can manage unknown vocabulary items as they listen and construct meanings (Vandergrift & Baker, 2018). Besides, this kind of relationship also depends on learners' vocabulary size

(Miralpeix & Muñoz, 2018), which accounts for the fact that the value of r in the experimental group is slightly higher than that in the control group (.04 and .09). Another reason is that the vocabulary test itself may be only a partial indication of their ability to understand spoken input since it might not have fully captured listeners' ability to recognize vocabulary in connected speech (Zhang & Graham, 2020). In brief, the current study has added more evidence to support the argument that the interplay of aural vocabulary size test and listening ability is significantly correlated.

5.3.2 A moderate positive correlation was detected between listening comprehension and WM only in the case of more skilled listeners (the EG)

Regarding the extent to which listening ability is linked to memory capacity, a non-significant relationship was found between listening and working memory for less-skilled listeners (the CG) except for the more skilled listeners (the EG).

For less-skilled listeners, listening scores did not form any significant correlation with all the memory measures, indicating that listening ability was not significantly related to phonological working memory as well as the general working memory irrespective of the modality of memory tasks. This finding is in agreement with what other researchers discovered stating that no significant connection was observed between learners' listening performance and their working memory (Andringa et al., 2012; Brunfaut & Révész, 2015). A possible explanation for this is the nature of task type together with the type of listening may have a part to play as argued by Brunfaut and Révész (2015). Another reason may lie in the learners' experience with

the target language. The participants with limited linguistic knowledge may have used their native language when doing memory tasks (Andringa et al., 2012). Besides, memory is a general skill that develops with experience and may not be a predictor of listening success in the early stages of learning.

In the case of more skilled listeners, data analysis revealed that when the digit span tasks were presented visually, the scores of both forward and backward digit span scores were correlated with the listening scores. In contrast, for the auditory forward and backward digit span tasks, there was no significant relationship between listening scores and memory scores. These results provide support for a significant connection between listening ability and the phonological working memory as well as general working memory when memory measures were presented visually but this was not the case in the auditory mode. This may be explained by the fact that the auditory digit span may not be suitable for non-native learners when performing memory tasks. As argued by Olsthoorn et al. (2014), since the tasks were conducted in L2, participants may resort to translation when carrying out the auditory tasks. For this reason, the auditory superiority effect is unlikely to occur but turns out to favor the visual mode. After all, the students in the control group in the present study are generally low proficiency learners whose habit is to translate to their native language whenever confronting L2 speech (Eastman, 1991).

For visual span tasks, what emerged from our findings was that both EWM and PWM are involved in the process of L2 learning, especially at the beginning level,

which echoes the result of a meta-analysis conducted by Jubera (2015). In particular, the storage component of working memory (or PWM) was found to be moderately associated with listening ability. This is also in accord with Vandergrift and Baker's (2018) findings showing that there is a significant correlation between L2 listening comprehension and PWM. Furthermore, a connection was observed between listening and the executive control component of WM (EWM). This finding matches those of earlier studies (e.g. Fay & Buchweitz, 2014; Gu & Wang, 2007; Kormos & Sáfár, 2008; Satori, 2012) indicating that working memory capacity significantly yielded a moderate correlation with L2 listening.

Taken all together, the results indicate that working memory has a significant relationship with listening ability in the case of novice learners. A possible interpretation for the discrepancy between the two groups of the students in the study may be because the experimental group had been trained with listening tasks involving memory and managing attention intensively. According to Basak and O'Connell (2016), WM entails the ability to keep information in the focus of the attention and to manipulate it despite distraction. For this reason, the association between memory capacity and listening might be easier to be identified in the case of the EG. Furthermore, the current study demonstrates that both phonological short-term memory and executive working memory were both related to listening comprehension, which is contrary to previously mentioned studies that only detected a relationship with the former or the latter. This inconsistency may be due to the diversity of the nature of WM

measures, the language proficiency of the participants involved, and the type of listening assessment test among the research. For instance, for measuring memory, some researchers chose to implement L1 nonword list recall (Kormos & Sáfár, 2008; Vandergrift & Baker, 2018) while others used the L2 listening span task (Gu & Wang, 2007; Satori, 2012). Although L2 working memory is more related to L2 listening comprehension than L1 working memory (Gu & Wang, 2007; Karimi & Naghdivand, 2017), the presentation mode of memory measures may cause a certain kind of interference (Olsthoorn et al. 2014). What is more, proficiency in the language in which the task is administered (L1 or L2) can affect the performance on WM tasks (Mitchell et al., 2015). WM measured with different languages may lead to a variation in the outcomes.

In conclusion, learners with more vocabulary knowledge appear to be good at their listening skills. Similarly, having the ability to store and process information appropriately while listening may enable learners to achieve effective listening comprehension.

5.4 EFL learners' opinions on the OPA

The fourth research question in the current study was to explore the students' opinions about the use of OPA. Generally, data analysis from the questionnaire, journals, interviews, and observation revealed that the participants had positive views about the OPA. All qualitative data were used to support students' perspectives which

were categorized into four broad themes: skill development, learning autonomy, the implementation of the OPA in the teaching of listening, and the challenges they faced during the course.

5.4.1 Skill development

As the participants reported, they believed that their listening improved thanks to the OPA. They stressed that the repetitive practice contributed to the improvement. This may be explained by the fact that the time spent on listening in traditional class did not give them enough exposure to the aural input. The high frequency of repetition in this method seems to increase their sensitivity to the English accent as well as the natural speech. This may lead to the enhancement of their automaticity in listening or listening fluency. As Lynch and Mendelsohn (2010) state, repetition is considered as a well-beaten path approach to fluency development. Moreover, in some ways, all these students appeared to coincide with the idea that this approach enabled them to have their personal space for listening at their own pace. They contrasted this learning mode with normal classes by stating that there were less distraction and less dependence on the teachers or their peers. Being given more choice in controlling the listening tasks such as replaying the conversations, checking new words, figuring out the mistakes by themselves, and expressing their understanding personally appear to meet the students' needs in their listening practice. According to Field (2009), since the nature of listening is personal, internalized, and time-constrained, practicing listening in a whole-class context is ineffective. The more

engagement the students have in the tasks, the more chance learning can happen. Recall protocol tasks gave the students a chance to reconstruct the message in their own ways. They had a chance to actively structure their understanding as well as evaluate their work by comparing their answer with the provided transcripts.

One interesting finding was that the students perceived that there was a certain improvement in their pronunciation even though they did not take any related tests. It is likely that extensive exposure to natural input including listening to filtered and unfiltered speech gave them a sense of the prosodic features of the target language. In other words, their awareness of their language ability was raised implicitly through the listening activities. The students also highlighted the benefits of being exposed to features of spoken language. They admitted that gradually they became familiar with the fast speech and felt more comfortable with the listening tasks.

The fact that the students said they could learn a lot of new vocabulary was an unexpected outcome in the study. This was also reflected by their performances in the vocabulary tests. A possible explanation was that they had picked up new vocabulary incidentally. Laufer (2010) refers to this phenomenon as incidental learning, which takes place while improving other language skills. This kind of learning is slow and untargeted and depends on the level of engagement with the vocabulary. The involvement of the students in these tasks offered them opportunities to confront new lexical items, to compare with what they have already known, and to establish a new connection. The students in the experiment did indeed engage a lot through listening

tasks. For instance, they listened and then checked the transcripts for self-assessment. They might check the meaning of the new words to make sure they could understand the text. They had to take notes of what they heard. Moreover, according to Nation and Meara (2010), listening is a source of meaning-focused input. For effective vocabulary learning, a condition of low unknown vocabulary load, the quantity of input, and deliberate attention to vocabulary are necessary. In the case of the participants in the study, the OPA seems to offer them the right condition to enable this incidental learning. They were provided with optimal exposure to natural input through both aural and visual modes. The listening materials were also chosen based on their level.

Another issue that was raised among the students referred to the effectiveness of the OPA on their working memory capacity. Most of the students gave the impression that their answers were positive, but they could not see much of how it had an impact on their memory when asked to explain. Their common account was because they had to listen and devote their full attention to the input to repeat or write down what they could hear. The reason might be that the activities were designed implicitly to train them to learn how to store and process information by themselves. Each listener may have their own way to deal with the incoming input and construct their own interpretation. By being given the condition to confront the obstacles, the students could figure out the right strategies to fit their situation according to their personal experience.

5.4.2 Learning autonomy

The participants on the whole demonstrated that the OPA helped them to promote their learning autonomy. They expressed that the absence of the teacher enabled them to take charge of their learning. What they had to do was to follow the procedures on the website and only turned to the teachers when encountering any problem. They also agreed that they were given more choices and freedom to some extent. This might be because they could choose the task they wanted, choose to spend how much time on a specific task during the course. It seems that these students came to actively participate in the learning process by carrying out some activities such as looking up new words, reflecting on their own progress, making effort to provide the best answers for every task, etc. Furthermore, it was reported that the OPA allowed them to practice comfortably at their own pace and whenever they feel at ease. Some students even said they felt motivated to study listening. The reason for this is not clear but it may have something to do with their anxiety related to listening. Thanks to the OPA, they had a stress-free context for practicing their listening, consequently helping them overcome the fear to be more willing to study listening. Altogether, the OPA appears to offer the students an environment in which their learning autonomy can be exercised. The students thought they became autonomous because they were likely to have the possibility to act on the affordances available within this learning environment (Murray, 2014). They might have been given more freedom in a self-regulatory way but still under the control of a management system designed by the instructor. In this

case, the autonomy they mentioned means knowing how to make the most of the provided resources to facilitate their own learning. In this case, the notion of autonomy is quite narrow and simply understood as having more freedom with their own learning under a subtle control in the disguise of the self-organized language system.

5.4.3 The implementation of the OPA in listening pedagogy

Concerning the implementation of the OPA on a larger scale, the majority of students showed their agreement. It seems that they did appreciate this kind of learning mode because of its appropriateness and convenience. For example, they mentioned the suitability of the courses in terms of the materials, the tasks, the procedures as well as the time spent on listening. It can be suggested that they were aware of being given more exposure to aural input compared to the traditional class. Besides, they stressed that they were given more freedom but somehow, they did not feel lost and had to manage everything by themselves. This might be explained by the fact that despite the constant presence of a teacher, the learning system was still administered by that teacher as a facilitator, not as a controller. Furthermore, these students highlighted the convenience of the course because they could choose to listen beyond the four walls of the classroom and at their own pace. Given the nature of the listening process, this appears that a prominent feature of the OPA is to offer learners a private environment to freely practice listening without any pressure and fully engaged in the listening process.

5.4.4 Challenges

Despite the abovementioned benefits of the course, some drawbacks were identified by some students. The first issue was the difficulty level of the listening materials. It was said that the audio was fast and unclear. Another problem related to the shadowing task. Some students complained that they could not repeat exactly what was playing and often panicked. A possible interpretation might be because of their unfamiliarity with natural spoken language. In a normal classroom, they are often exposed to slow and non-native speech. Moreover, English is not their native language; therefore, the students feel that the speech sound faster as it is harder for them to process (Bosker & Reinisch, 2017). Another reason might be due to their low language proficiency, which results in low level of understanding. They often pay attention to the details of the input and resort to translation while listening.

Taken together, students who had experience with the OPA expressed positive opinions about this approach in terms of its effectiveness as well as its application in the teaching of listening.

5.5 Reflections on the OPA

Based on the findings of the study, it can be assumed that the OPA is a potential approach of value to the teaching of listening for EFL learners. This approach not only embraces the nature of language learning which supports the idea that learning should be implicit and intuitive but also makes the most use of technological affordances to

facilitate learning in a digitalized era by integrating the use of the CALL system. The success of the implementation of the OPA in the study has gained support to confirm those underlying principles of the OPA as follows:

A positive change in perception can lead to a positive change in production. This principle may not only apply to one specific skill but any language skills. In the case of listening, it is the auditory perception that needs changing or at least adjusting so that learners can form new listening habits to match with the target language system. The reason is that L2 learners tend to rely on the neural network of the native language to learn and process L2 (Xie, 2018). In other words, in most cases, their left hemisphere is activated not the right hemisphere in processing information. Instead, at the perceptual level, the right brain region should be triggered to process new verbal input before shifting to the focus of the left (McGilchrist, 2019). In this respect, the use of filtered audio to bypass the mechanism of processing information of learners is an effective way to maximize the function of the right brain.

Listening is a cognitive activity that is individual and personalized. A listener constructs meaning through a perceptual filter under the influence of both unknown and known factors internally and externally concerning their personal experiences. In other words, the listening process is under influence of the “operational histories” of a listener (Lian & Sussex, 2018). For this reason, given listening activities should allow learners to bring their own unique experiences and knowledge to construct meanings. When

learners' meaning-making mechanisms are respected, their personal needs are met to some extent.

Prosodic features are key components to understanding spoken language. Allowing learners to have more exposure to the prosody of the target language can facilitate their aural comprehension. Although there may be other ways for developing learners' perception of prosodic patterns, listening to filtered recordings, repetition in synchrony with gestures and shadowing has been shown to be an effective and efficient way to strengthen their cognitive fluency or automaticity by internalizing the prosodic patterns.

Memory is an indispensable component of the listening process irrespective of the language (Witkin, 1990). This system includes the ability to use selective attention wisely and efficiently. The memory capacity is limited and experience-related, but it can be adapted by training. In this study, integrated tasks in the OPA such as listening to filtered audio, repeating while using body movements, and shadowing can be helpful for learners to train their automatic processing. Besides, the activities in the OPA such as listening to chunks and practicing note-taking can also contribute to improving the storage and processing function of working memory while listening. Although the OPA was not designed for WM training explicitly, the embedded techniques in the OPA implicitly brought a positive effect on WM capacity. Specifically, the OPA yielded benefits in selective attention in the listening process and minimized learners' memory limitations, thus increasing their listening performance.

Suggested protocols for building a website-based listening environment

The first phase is to help students internalize the prosodic patterns of the target language. It starts with listening to low pass filtered recordings of sentences or phrases so that students can be sensitized to these structures. They will try to feel the melody of the audio first. Then they listen to unfiltered recordings of the sentences to get the real sense of natural speech. At this point, they are encouraged to repeat with gestures and focus on the melody. The more these patterns are associated with physical actions, the stronger its recollection is in the memory (Asher, 1969). After that, they will listen again to the filtered sentences while using gestures to strengthen the process of internalizing. After the listening activities, they will try to write down what they can hear. In the end, transcripts are shown for them to compare with their answers after they click the Submit button.

The second phase is to habituate students to a whole conversation containing the sentences in the first phase. In this case, habituation can help students to strengthen their automatic processing and develop new habits of listening. With the same focus on prosody, students will be familiarized with prosodic patterns in various contexts. They are asked to listen to the conversation while shadowing it. They have to record their shadowing and submit their final products whenever they feel satisfied with their recordings.

The third phase is to allow students to apply their knowledge and prior experience to construct meaning while listening. They are allowed to control the frequency of

listening by choosing to listen as many times as they like. Then, they write down their understanding of the conversation. In the end, transcripts are shown for them. In this way, students will figure out how much they comprehend. Self-evaluating can allow them to be involved in their internal dialogues that are supposed to represent the collision between their pre-existing understanding and the new information. As a result, by confronting, contrasting, and contesting their understanding against the signals they are perceiving, listeners make the act of comprehension or learning happen (Lian, 2004).

5.6 Summary

This chapter discussed the results of all related tests in accordance with the research questions. It started with the effects of the OPA on listening ability and working memory. Then, the relationship between listening ability, working memory, and vocabulary was interpreted. After that, the learners' opinions about the OPA were reported. The chapter then ended with some reflections on the OPA.

CHAPTER 6

IMPLICATIONS, RECOMMENDATIONS, AND CONCLUSION

The chapter concludes the whole thesis. The first section summarizes the findings of the study and its contribution. The second section describes some implications of the study. The third section discusses the limitations and suggests some promising directions for further research.

6.1 Summary of the study

The main goal of the current study was to determine the effects of the OPA on EFL learners' listening ability as well as working memory capacity. Another aim was to examine the relationship between listening ability, vocabulary knowledge, and working memory. Furthermore, learners' opinions about the OPA were also explored. The participants were 65 Vietnamese first-year students at Ho Chi Minh Technical Economic College in Ho Chi Minh city.

The results of this investigation show that the OPA had a positive effect on EFL learners' listening ability. After ten weeks of practice with the OPA in an entirely teacherless autonomous mode, the experimental group outperformed the teacher-led control group in their listening performance. Thanks to the OPA, learners appear to

have adjusted their habitual first language listening habits and have developed new listening habits in English. The results highlight the value of prioritizing prosody by using the techniques employed in the study such as listening to low-pass filtered recordings repeatedly in conjunction with gestures and shadowing. These techniques seem to have worked out for learners to sensitize and internalize the prosodic patterns and in turn, modify their auditory perception so that they are now able to better organize input for more effective listening comprehension.

The outcomes of the study also shed new light on the possibility of improving working memory by providing training in demanding tasks that implicitly strengthen working memory. In this study, although it is not easy to identify a specific contributing factor, it seems clear that the students were exposed to some related experiences that could help them either improve the storage and processing function of their working memory or increase their memory capacity. This confirms the idea that the human working memory system is dynamic and adaptive, reflecting the plasticity in the neural system that underpins working memory.

Moreover, the current data highlight the importance of the relationship between listening ability, vocabulary knowledge, and working memory in the case of low proficiency EFL learners. The fact that a moderate correlation between listening and vocabulary knowledge was identified suggests that knowing more vocabulary is always helpful for aural comprehension, especially in its spoken form. Also, the fact that a significantly moderate association between listening ability and the general working

memory was observed indicates that working memory is actively involved in listening comprehension. Working memory may influence not only the length of time that information is stored in short term memory but also the speed of processing for searching existing information in long term memory during the process of making-meaning in listening. However, this kind of relationship may vary depending on the nature of WM measures, the type of listening assessment test, and the participants' language proficiency.

From the learners' perspective, the OPA was reported to give students a nice experience. They showed a positive attitude toward learning with this approach. The students believed that the OPA was helpful for the improvement of their listening ability, working memory, pronunciation, and vocabulary. Most importantly, they felt more motivated to develop and more confident with their listening ability.

6.2 Pedagogic implications

The findings of this research have significant implications for teachers, educators, policymakers, and researchers in the field of language learning in general and listening in particular.

6.2.1 For teachers

It is clear from the current study that learners significantly improved their listening ability as a result of practicing listening with the OPA and that they also showed their preference for this approach. These findings suggest the potential

application of OPA in the teaching of listening and it should be recommended for teachers in EFL/ESL contexts. By implementing this approach, what teachers should do is to learn how to build a self-managed language system where learners can have free access to listening activities. This system operates based on an online learning management system which will allow the teachers to track students' progress easily. At the same time, it will also partly release teachers from their workload from teaching listening skills. Instead of spending time preparing listening activities and playing audio in the classroom, teachers can save a lot of time thanks to this system. They only need to learn how to operate this system and give instructions or assistance if necessary. With its effectiveness and efficiency, the OPA has been shown to be an appropriate approach for teachers at a time when their roles are becoming increasingly supportive rather than directive.

Besides, where teaching conditions do not allow for the implementation of the OPA, the guiding framework introduced in this study can be applied by teachers to help their students develop their listening ability. This framework includes specific listening techniques such as listening to low pass filtered recordings, repetition in coordination with body movements, and shadowing. Teachers can draw students' attention to the significance of the prosody of the target language by using the techniques studied in this project in their classroom. First, they have to learn to low-pass filter audio and then learn how to apply these in their classroom by looking at the steps in the training session. While this may not be as effective as using the OPA

itself, it may still help students establish a self-synchrony between the body and the speech during listening comprehension, resulting in more effective listening comprehension.

Furthermore, the positive effect of the OPA on working memory capacity as well as a moderate positive relationship between listening ability and working memory also confirms the promising implementation of the OPA in promoting the efficiency of working memory in addition to enhancing listening ability. Teachers may want to build a computerized listening platform or develop their own activities using this framework for their students to practice listening together with organizing and managing auditory input for more effective comprehension. Instead of designing separate activities for training students' working memory, making use of the OPA can achieve the two targets at the same time, thus reducing the teachers' workload while still maintaining productivity. Meanwhile, the evidence from this study also supports the importance of working memory and vocabulary knowledge in listening comprehension. Therefore, teachers should raise learners' awareness of the valuable contributions of working memory and vocabulary knowledge for the attainment of effective aural comprehension.

6.2.2 For learners

Given the learners' positive opinions of the OPA after the intervention, it can be suggested that the OPA can provide students with an individualized listening environment by meeting their personal needs to some extent. First, students can bring

their experiences and knowledge into the listening process to construct their own interpretations of the auditory input. This will make the learning activity more meaningful and more personalized. Second, students have more freedom in choosing their listening tasks in terms of being more independent in their listening, being more in control of the listening process, and being able to access the listening resources at their will. Third, students feel more confident and more motivated to study listening, which has been considered the most difficult skill for them. Overall, in such a higher education context, the OPA can offer a means for students' listening practice at a certain customized level. The learning protocol can help lighten the cognitive load of listening as well as improve their ability in organizing and managing auditory signals effectively.

In light of the results of the study, EFL learners need to acknowledge the significant impact of auditory perception in their native language on the achievement of a target language competence. Having said that, students should pay more attention to the prosodic patterns during their language learning. They can practice listening to filtered recordings, make use of gestures while repeating utterances, and do shadowing to adjust their L1 auditory perception to fit with the L2 perception. Moreover, given the positive connection between working memory, vocabulary knowledge, and listening ability, students should spend more time boosting their lexical knowledge and strengthening their working memory in L2 if they want to achieve their L2 aural listening comprehension effectively.

6.2.3 For educators and policymakers

The theoretical perspective and the application of the OPA to the L2 listening approach mark its original contribution to the field of language teaching. One of the main messages from the study is that there is a need to reconceptualize what language learning looks like in general and what the listening process looks like in particular. The proposed listening process in the study can be used as a guiding framework for further listening research. This model highlights the unpredictability of identifying specific decisive factors during the process of listening comprehension because this process is quite context-dependent, experience-related, and unique to each individual. As a result, learners' needs should be respected and can only be met with a flexible, dynamic, and adaptable learning system. These perspectives should be introduced to the educators and student teachers who can apply this approach in their teaching to see what will happen and whether the results are replicable or not.

Teacher education is the most significant factor that can contribute to this transformation in the listening pedagogy. Potential courses for teacher education would consist of not only these theoretical perspectives but also knowledge of how to implement CALL into building a self-management system in which the OPA is embedded. Specifically, an online management system is always in need of a big database. Therefore, these student teachers can gather authentic listening materials and make a collection of filtered recordings. They can build a bank of listening resources to serve their teaching practice by familiarizing themselves with the OPA.

The current findings also make a significant contribution to L2 listening pedagogy in terms of the role of teachers as well as learners. The effectiveness of the OPA has shown that the classroom-based, teacher-led approach has lost its status in the CALL setting in such a digitalized society. Instead, learning should take place in a teacher-less autonomous environment where learners are in more control of their learning and can exercise their autonomy at a maximized level without getting lost. This approach may challenge the role of teachers in the classroom or even result in a reduction in teaching positions, which in turn leads to more competitive and selective employment of teachers.

6.2.4 For researchers

The results of the study may apply to researchers in the realm of listening in terms of their approach to the listening process. Researchers should bear in mind that the meaning-making mechanism of each learner is different and after all, listening is an act of making meaning. For this reason, caution should be taken to choose an assessment tool for listening as well as listening resources. By acknowledging the complex nature of listening, researchers can discover more valuable insights into this cognitive process.

The study has demonstrated that working memory is significantly related to listening ability. However, this connection may depend on the language experience as well as the proficiency of learners, the nature of the memory tasks, and the listening assessment. Keeping these factors in mind, researchers need to set clear goals and purposes when carrying out their studies.

The outcomes of our research suggest that adopting an interdisciplinary perspective in learning and teaching research may bear fruitful results. As researchers, making the most of related latest evidence from different disciplines would help them to understand learners more from different angles. Consequently, they may come up with appropriate approaches and techniques for learners' language development.

6.3 Strengths and limitations of the study

The study used a mixed-methods approach to investigate the effectiveness of the OPA on listening ability and working memory of EFL learners. Before the study, a pilot was conducted to make sure the research design, as well as instruments, worked out for the sample size. Quantitative data were collected through tests with validity and reliability while qualitative data were gathered from different sources such as questionnaires, journals, interviews, and observation. These instruments corroborate and validate the findings in this study. Besides, the study also utilized a disciplinary perspective by implementing empirical evidence in brain research related to language learning to construct a theoretical framework for the study. Therefore, this adds more validation to the outcomes of the present research.

Despite the positive results of this study, some limitations should be noted. The first weakness of this study is that the participants were Vietnamese EFL learners with a low proficiency level. Therefore, the findings of the study should be interpreted with caution when applying to intermediate or advanced learners in a different context.

Second, because the theoretical framework in this study was constructed based on the foundation of how the human brain processes prosody, the fact that Vietnamese is a tonal language may affect the generalization of these results to other participants who are from different language backgrounds. The Vietnamese participants might have been more sensitive to prosodic patterns than those whose language is not tonal. Finally, the most important limitation lies in the fact that it was not possible to identify exactly which factor had the most decisive impact on the improvement of learners' listening ability. As the OPA used a combination of techniques to provide learners with the optimal listening conditions, it is not easy to conclude which variable plays the most influential role.

6.4 Recommendations for further research

The OPA was found to be beneficial for EFL learners in the current study. However, as already mentioned, the study only included pre-intermediate EFL learners in the Vietnamese context, further experimental investigation is needed to validate the results covering other EFL learners including the intermediate or advanced level at different ages in different contexts to fully recognize the potential value of the OPA in improving EFL listening ability.

The outcome of our research has provided empirical evidence for the effectiveness of the OPA on improving listening ability and working memory. Yet, it was the blend of several techniques in the OPA, and which variable had the most influence was still

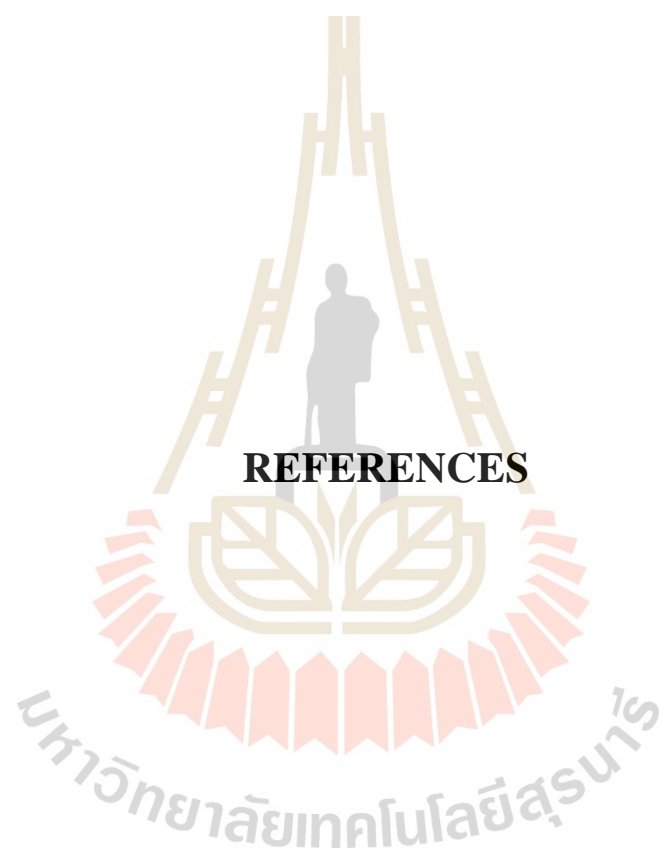
unknown. Therefore, considerably more work will need to be done to determine which factor is the most decisive one in contributing to this listening progress as well as the efficiency of working memory.

In the current study, despite the same amount of time on tasks, the experimental group subjected to the OPA in a teacher-less autonomous environment outperformed the control group taught with a traditional listening method in a classroom-based teacher-led environment in their listening performances. Given the fact that there have been many unexplored variables in this experimental design, further studies need to be carried out in order to determine the effectiveness of the OPA with a focus on different variables such as the role of the teacher, the listening materials (filtered and unfiltered) and the tool of listening assessment.

The work also contributes to our understanding of the importance of combining research in the human brain into language learning. How the human brain processes auditory information and how the two hemispheres deal with auditory input can be practical to research in listening. Besides, the native language of learners also has a vital part to play in their auditory perception. As participants in this study were Vietnamese which is a tonal language, further research can be conducted with other participants whose language is also tonal to confirm the effect of this approach. Further studies regarding participants with other native language backgrounds would be worthwhile to establish more definitive evidence.

The present study offers a better understanding of the nature of listening as well as the working memory system based on theoretical assumptions and classroom experiments. It is noted that listening and memory both are characterized as cognitive processes. Therefore, the precise mechanism of listening and memory under influence of the OPA remains to be elucidated with the assistance of brain research. Further work in brain imaging should be undertaken to explore how the OPA could influence learners' auditory perception to make such an achievement.

In conclusion, this thesis has provided a deeper insight into the L2 listening process from a different perspective. By interpreting L2 listening from a perceptual stance, this project proposed the Optimized Prosodic Approach to help EFL learners develop their listening ability. The effectiveness of the OPA in improving learners' listening ability has highlighted the importance of theoretical assumptions in a listening approach. At the same time, the study has raised important questions about the nature of language learning and the role of the teacher in a CALL environment. Meanwhile, this year has witnessed an ongoing worldwide pandemic of coronavirus disease 2019, which has had a huge impact on every facet of our daily lives, especially language learning. Through this outbreak, it can be seen that building an online learning language self-managing system for learners is inevitable. The success of the study suggests that the OPA is a potential and promising approach in the teaching of listening and should receive more attention from educators and teachers. This also brings to the end of the thesis.



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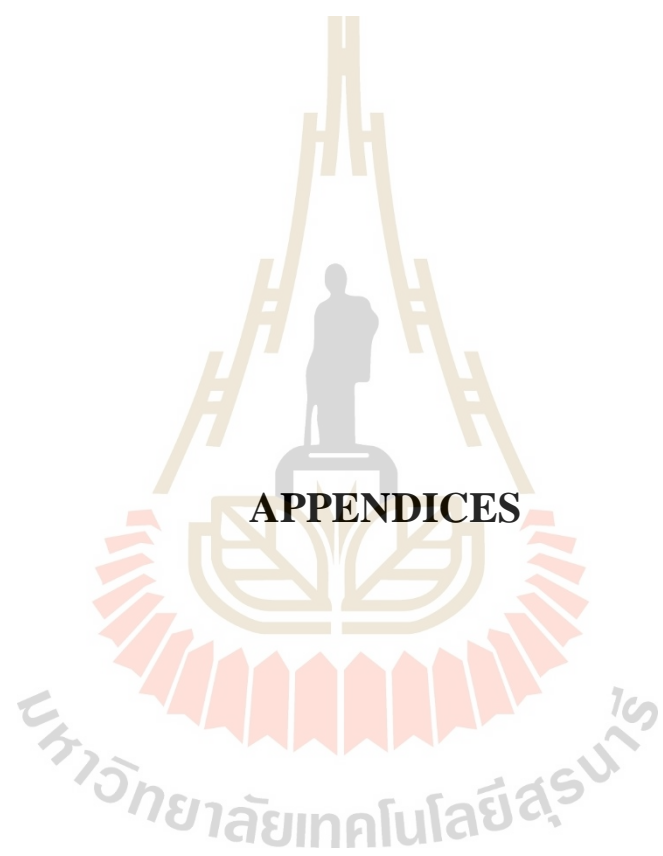
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APPENDICES

APPENDIX A

Online survey on listening method for teachers

Bảng Khảo Sát Về Phương Pháp Giảng Dạy Tiếng Anh Môn Kỹ Năng Nghe Hiểu

Chân Thành Cảm Ơn Quý Thầy/Cô đã dành thời gian trả lời phiếu khảo sát này. Mình tên Luu Thi Mai Vy ,hiện tại mình đang học tại trường Đại học Công Nghệ Suranaree tại Thái Lan và đề tài nghiên cứu sinh của mình là nghiên cứu phương pháp dạy nghe cho sinh viên. Bảng khảo sát này nằm trong một phần nghiên cứu của mình. Hi vọng quý thầy cô giúp mình cho biết ý kiến về cách giảng dạy môn nghe như thế nào. Cảm ơn quý thầy cô rất nhiều.

*** Required**

1. Năm sinh (Year of birth) *

Your answer _____

2. Số năm giảng dạy (Year of teaching) *

Your answer _____

3. Đối tượng giảng dạy (Subjects of teaching) *

Your answer _____

4. Địa điểm giảng dạy (Institutions or location) *

Your answer

5. Thầy/ Cô dạy môn kỹ năng nghe như thế nào? (How do you often teaching listening skills?) *

Your answer

6. Thầy/ Cô có gặp vấn đề gì trong quá trình dạy môn kỹ năng nghe không? Nếu có, xin vui lòng liệt kê chi tiết.(Do you have any difficulties in teaching listening? If yes, please clarify) *

Your answer

7. Theo ý kiếnThầy/ Cô , làm thế nào người học cải thiện được môn nghe hiểu? (What suggestions do you offer to students in order to improve listening skills?) *

Your answer

Submit

มหาวิทยาลัยเทคโนโลยีสุรนารี

APPENDIX B

Paper survey on listening problems for students

Students will be given a listening test. As soon as they finish the test, the questionnaire is distributed immediately. The reason for this is to capture students' genuine feelings about listening difficulties. There are two parts in the listening test: listen and write the chunks down; listen to conversations and answer questions. It is vital to keep in mind that the purpose of this listening test is not for testing any ability but for activating students' feelings and reminding them of what is obstructing their listening comprehension. As the questionnaire is used for an exploratory purpose to discover what difficulties the students perceived during their English listening comprehension process, it consists of only one open-ended question. Students answered only 1 question in their native language

**“Do you have any problems during listening? If yes,
what are the problems?”**

APPENDIX C

Screenshots of samples from DIALANG tests

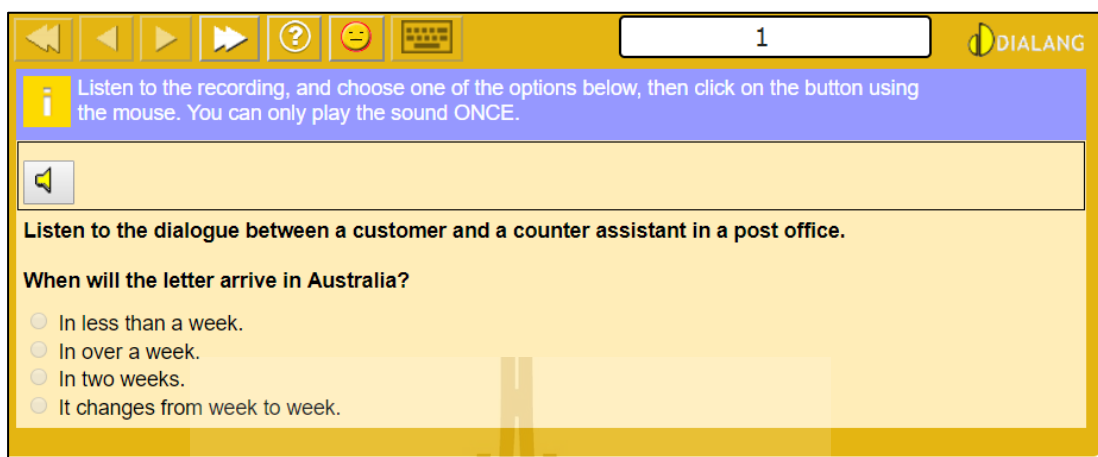
1. Screenshot of the Vocabulary Size Placement Test

Placement Test

= Yes = No

<input checked="" type="radio"/> <input type="radio"/> to campaign	<input checked="" type="radio"/> <input type="radio"/> to decite	<input checked="" type="radio"/> <input type="radio"/> to review
<input checked="" type="radio"/> <input type="radio"/> to futt	<input checked="" type="radio"/> <input type="radio"/> to megalize	<input checked="" type="radio"/> <input type="radio"/> to celebrate
<input checked="" type="radio"/> <input type="radio"/> to bourble	<input checked="" type="radio"/> <input type="radio"/> to markle	<input checked="" type="radio"/> <input type="radio"/> to demolish
<input checked="" type="radio"/> <input type="radio"/> to fear	<input checked="" type="radio"/> <input type="radio"/> to abolish	<input checked="" type="radio"/> <input type="radio"/> to administer
<input checked="" type="radio"/> <input type="radio"/> to preyout	<input checked="" type="radio"/> <input type="radio"/> to root	<input checked="" type="radio"/> <input type="radio"/> to erode
<input checked="" type="radio"/> <input type="radio"/> to study	<input checked="" type="radio"/> <input type="radio"/> to distinguish	<input checked="" type="radio"/> <input type="radio"/> to fabulation
<input checked="" type="radio"/> <input type="radio"/> to savedown	<input checked="" type="radio"/> <input type="radio"/> to outlate	<input checked="" type="radio"/> <input type="radio"/> to join
<input checked="" type="radio"/> <input type="radio"/> to compile	<input checked="" type="radio"/> <input type="radio"/> to sink	<input checked="" type="radio"/> <input type="radio"/> to settle
<input checked="" type="radio"/> <input type="radio"/> to motivate	<input checked="" type="radio"/> <input type="radio"/> to encompass	<input checked="" type="radio"/> <input type="radio"/> to driggle
<input checked="" type="radio"/> <input type="radio"/> to witness	<input checked="" type="radio"/> <input type="radio"/> to chariover	<input checked="" type="radio"/> <input type="radio"/> to mention
<input checked="" type="radio"/> <input type="radio"/> to emerge	<input checked="" type="radio"/> <input type="radio"/> to strang	<input checked="" type="radio"/> <input type="radio"/> to struggle
<input checked="" type="radio"/> <input type="radio"/> to prinkle	<input checked="" type="radio"/> <input type="radio"/> to permit	<input checked="" type="radio"/> <input type="radio"/> to yell
<input checked="" type="radio"/> <input type="radio"/> to oldenate	<input checked="" type="radio"/> <input type="radio"/> to promise	<input checked="" type="radio"/> <input type="radio"/> to complicate
<input checked="" type="radio"/> <input type="radio"/> to skey	<input checked="" type="radio"/> <input type="radio"/> to violate	<input checked="" type="radio"/> <input type="radio"/> to squeeze
<input checked="" type="radio"/> <input type="radio"/> to unleash	<input checked="" type="radio"/> <input type="radio"/> to digame	<input checked="" type="radio"/> <input type="radio"/> to congratulate
<input checked="" type="radio"/> <input type="radio"/> to honch	<input checked="" type="radio"/> <input type="radio"/> to numbelate	<input checked="" type="radio"/> <input type="radio"/> to keepsick
<input checked="" type="radio"/> <input type="radio"/> to name	<input checked="" type="radio"/> <input type="radio"/> to colour	<input checked="" type="radio"/> <input type="radio"/> to hesitate
<input checked="" type="radio"/> <input type="radio"/> to organize	<input checked="" type="radio"/> <input type="radio"/> to wordle	<input checked="" type="radio"/> <input type="radio"/> to complement
<input checked="" type="radio"/> <input type="radio"/> to mayto	<input checked="" type="radio"/> <input type="radio"/> to box	<input checked="" type="radio"/> <input type="radio"/> to repair
<input checked="" type="radio"/> <input type="radio"/> to type	<input checked="" type="radio"/> <input type="radio"/> to authorise	<input checked="" type="radio"/> <input type="radio"/> to reform

2. Screenshot of a sample from the Listening test



1

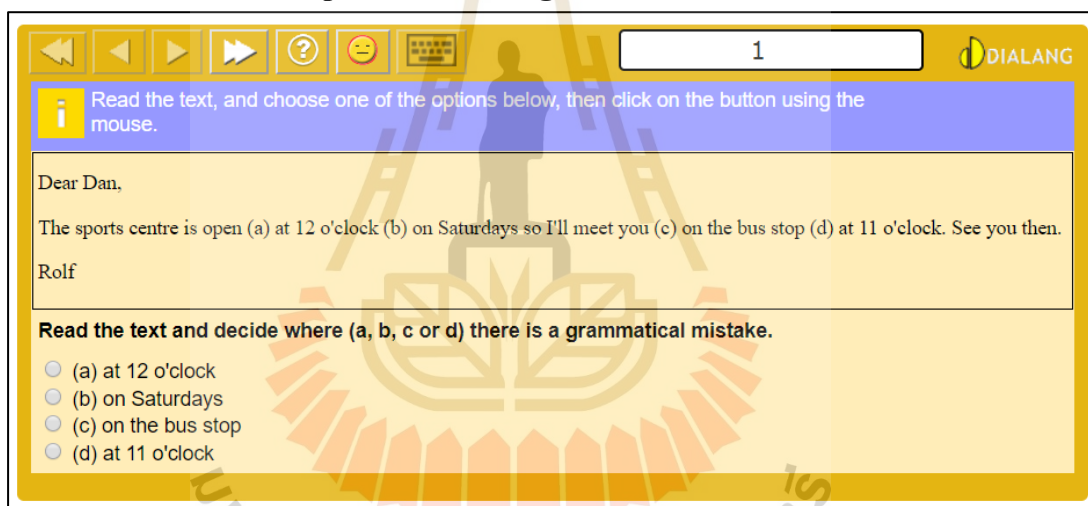
i Listen to the recording, and choose one of the options below, then click on the button using the mouse. You can only play the sound ONCE.

Listen to the dialogue between a customer and a counter assistant in a post office.

When will the letter arrive in Australia?

- In less than a week.
- In over a week.
- In two weeks.
- It changes from week to week.

3. Screenshot of a sample from Writing test



1

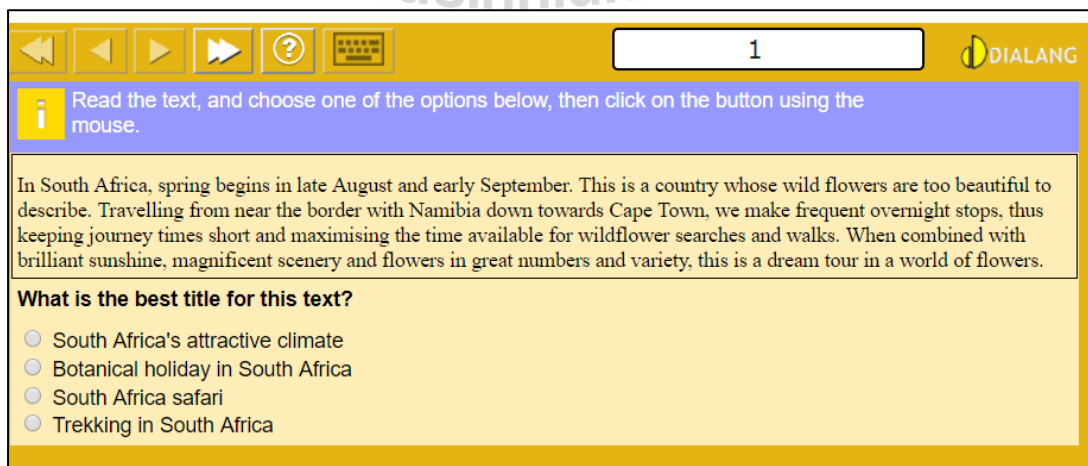
i Read the text, and choose one of the options below, then click on the button using the mouse.

Dear Dan,
The sports centre is open (a) at 12 o'clock (b) on Saturdays so I'll meet you (c) on the bus stop (d) at 11 o'clock. See you then.
Rolf

Read the text and decide where (a, b, c or d) there is a grammatical mistake.

- (a) at 12 o'clock
- (b) on Saturdays
- (c) on the bus stop
- (d) at 11 o'clock

4. Screenshot of a sample from the Reading test



1

i Read the text, and choose one of the options below, then click on the button using the mouse.

In South Africa, spring begins in late August and early September. This is a country whose wild flowers are too beautiful to describe. Travelling from near the border with Namibia down towards Cape Town, we make frequent overnight stops, thus keeping journey times short and maximising the time available for wildflower searches and walks. When combined with brilliant sunshine, magnificent scenery and flowers in great numbers and variety, this is a dream tour in a world of flowers.

What is the best title for this text?

- South Africa's attractive climate
- Botanical holiday in South Africa
- South Africa safari
- Trekking in South Africa

5. Screenshot of a sample from the Structure test

The screenshot shows a yellow navigation bar at the top with icons for back, forward, and help, and a score of 1. Below the bar, a blue instruction box says: "Choose one of the options below, and click on the button using the mouse." The main question area is yellow and contains the text: "Choose the best answer for the gap (...) in the following sentence: She has ... beautiful smile." Below this, three radio button options are listed: "-", "the", and "a".

6. Screenshot of a sample of Vocabulary test

The screenshot shows a yellow navigation bar at the top with icons for back, forward, and help, and a score of 1. Below the bar, a blue instruction box says: "Complete the task by filling the gap(s). Click on the box to make a list of options appear. Choose your answer by clicking on it." The main question area is yellow and contains the text: "Choose the best word for the gap in the following sentence: It may be possible to [dropdown] damages against a local authority for not taking care of the roads well enough." A dropdown menu is open, showing the following options: "claim", "ask", "sue", and "bet". A mouse cursor is pointing at "claim".

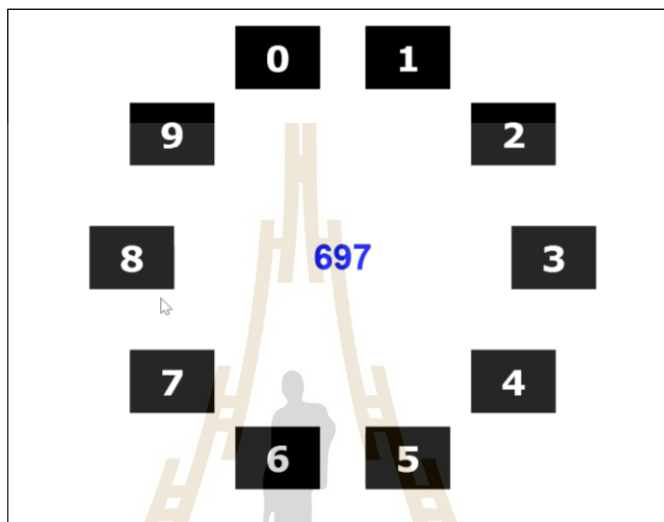
7. Screenshot of feedback

The screenshot shows a yellow navigation bar at the top with icons for back, forward, and help, and the DIALANG logo. The main content area is white and titled "Feedback Menu". Below the title, the text says: "Please choose the type of feedback you would like to see. You can return to this menu at any time." Below this text, a vertical stack of buttons is displayed: "Results", "Your level", "Check your answers", "Placement Test", "Self-assessment feedback", "Advice", and "About self-assessment". A mouse cursor is pointing at the "Your level" button.

APPENDIX D

Screenshots of Working Memory capacity test

1. Screenshot of choosing numbers after seeing or listening to a series of digits



2. Screenshot of a sample result

Forward Assessment

- the maximum number of digits recalled correctly was: 10
- the maximum number of digits recalled correctly before making two consecutive errors was: 10

Backward Assessment

- the maximum number of digits recalled correctly was: 11
- the maximum number of digits recalled correctly before making two consecutive errors was: 11

APPENDIX E

Screenshot of a sample journal

JOURNALS
Search Courses

Home Dashboard Events My Courses This course Hide blocks

Courses > Miscellaneous > Diary > Writing journals for Vitamins > Journal 1 > Complete a feedback

Journal 1

What do you think about your results today? What do you like best today? Any difficulty or problem today? !

Phần shadowing hơi khó

- Required

There are required fields in this form marked !

Submit your answers
Cancel

« PREVIOUS ACTIVITY
Announcements
NEXT ACTIVITY
Journal 2 »

Navigation

Administration

- ▼ Feedback administration
 - Edit settings
 - Locally assigned roles
 - Permissions

Search



มหาวิทยาลัยเทคโนโลยีสุรนารี

APPENDIX F
Observation sheet

What are students' behaviors during the experiment?

	Aspects	Description	Notes
1	Using the Vitamin		
2	Activities in FEEL IT		
3	Activities in CHEW IT		
4	Activities in SWALLOW IT		
5	Expression		
6	Atmosphere		

APPENDIX G

Questionnaire for students at the end of the study

English version

Thanks for your participation and cooperation during the course. Please fill in this questionnaire to express your opinions on the approach with which you were taught listening. All your information will remain confidential. Thank you!

I. Personal information

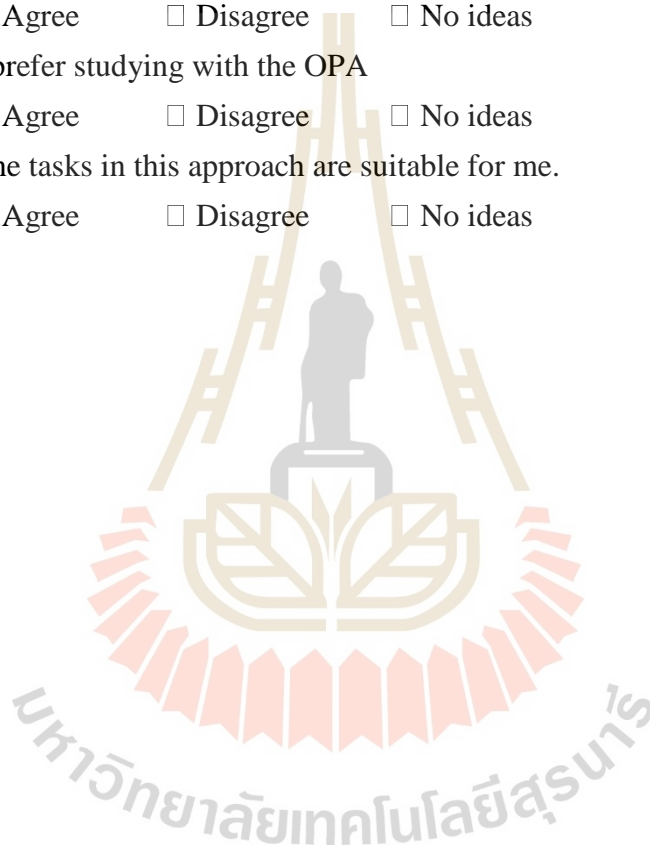
1. Name:
2. Gender:
3. Age:
4. Hometown:
5. Major:
6. How long have you studied English?
7. Do you learn any other languages? If yes, what is it?
8. Do you learn English in any language center?
9. Have you taken any language proficiency test? If yes, what is your level?
.....
10. What activities do you often do to improve your English outside the
classroom?

II. Opinions about the teaching approach

Please read these statements and mark the box as your answer.

11. I like learning listening with this approach
 Agree Disagree No ideas
12. This approach can help me improve my listening
 Agree Disagree No ideas
13. This approach can help me improve my memory

- Agree Disagree No ideas
14. This approach encourages my learning autonomy
- Agree Disagree No ideas
15. This approach gives me the motivation to study listening
- Agree Disagree No ideas
16. Learning with OPA makes me more confident
- Agree Disagree No ideas
18. This approach can be applied in my university
- Agree Disagree No ideas
19. I prefer studying with the OPA
- Agree Disagree No ideas
20. The tasks in this approach are suitable for me.
- Agree Disagree No ideas



Vietnamese version

Bảng khảo sát

Chân thành cảm ơn bạn đã tham gia khóa học đầy đủ và nghiêm túc. Xin mời bạn điền vào bảng khảo sát sau đây. Mọi thông tin của bạn sẽ được giữ kín.

I. Thông tin cá nhân

1. Tên:
2. Giới tính:
3. Tuổi:
4. Quê quán:
5. Ngành:
6. Bạn học tiếng anh bao lâu rồi?
7. Bạn có học ngoại ngữ nào khác ngoài tiếng Anh không?
8. Bạn có học thêm ở trung tâm không
9. Bạn có bao giờ thi kì thi tiếng Anh nào chưa?
10. Ngoài lớp học bạn có học thêm tiếng Anh không?

II. Ý kiến của bạn về OPA. Bạn hãy đánh dấu X vào ô mà bạn đồng ý

11. Tôi thích học với OPA
 Đồng ý Không đồng ý Không ý kiến
12. OPA giúp tôi cải thiện nghe
 Đồng ý Không đồng ý Không ý kiến
13. OPA giúp tôi cải thiện trí nhớ
 Đồng ý Không đồng ý Không ý kiến
14. OPA giúp tôi nâng cao khả năng tự học
 Đồng ý Không đồng ý Không ý kiến
15. OPA giúp tôi có động lực học nghe
 Đồng ý Không đồng ý Không ý kiến
16. OPA giúp tôi tự tin hơn khi nghe
 Đồng ý Không đồng ý Không ý kiến

18. OPA có thể được áp dụng dạy nghe

- Đồng ý Không đồng ý Không ý kiến

19. Tôi thích học phương pháp truyền thống hơn

- Đồng ý Không đồng ý Không ý kiến

20. Các hoạt động trong OPA phù hợp với tôi.

- Đồng ý Không đồng ý Không ý kiến



APPENDIX H

Questions for interview

A. English Version

Interview questions will be based on students' journals and answers to the questionnaire. Below are just guiding questions:

1. What do you think of the teaching approach in the listening course that you participated in?
2. In your opinion, what is the effect of the approach on your listening skills?
3. In your opinion, what factor affects your listening performance in general during the listening course?
4. What do you think about this approach compared to the traditional way that you often study listening in your class?
5. What do you think if this approach will be applied in the listening course at your college?
6. In your opinion, what is the effect of the approach on your Working Memory Capacity?
7. In your opinion, does OPA help you to promote your learning autonomy?
8. Did you have any problems when you were taking the Vitamins course? If yes, what problems did you have?

B. Vietnamese version

Câu hỏi phỏng vấn

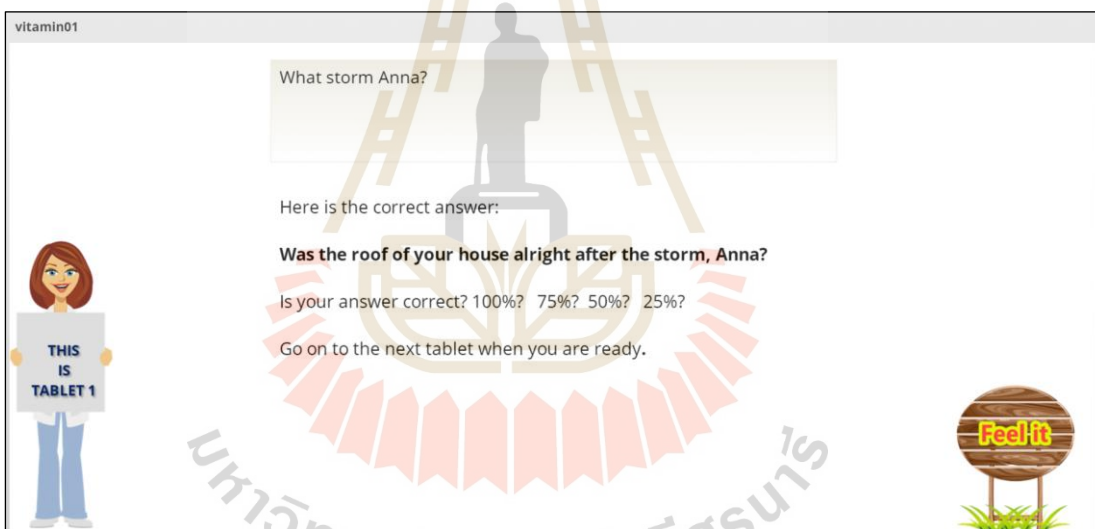
1. Bạn có suy nghĩ gì về khóa học với OPA?
2. Bạn có gặp vấn đề gì trong quá trình học với OPA không? Là gì?
3. Theo bạn, OPA có giúp bạn cải thiện nghe không? Tại sao?
4. Theo bạn, OPA có cải thiện trí nhớ không, tại sao?
5. Theo bạn, yếu tố nào giúp bạn cải thiện nghe trong khoa học?
6. So với cách học nghe truyền thống, bạn thấy OPA như thế nào?
7. Theo bạn OPA có nên được áp dụng rộng rãi để dạy nghe không?
8. Bạn có đề xuất gì để cải thiện khóa học không?
9. Theo bạn, OPA có nâng cao khả năng tự học của bạn không?

APPENDIX I

Screenshot of a sample from Vitamins Listening Course



Hello **Nguyen** !
Welcome to **Vitamin 1**! There are 3 steps to take the Vitamin. Click the Next button to read my instructions.



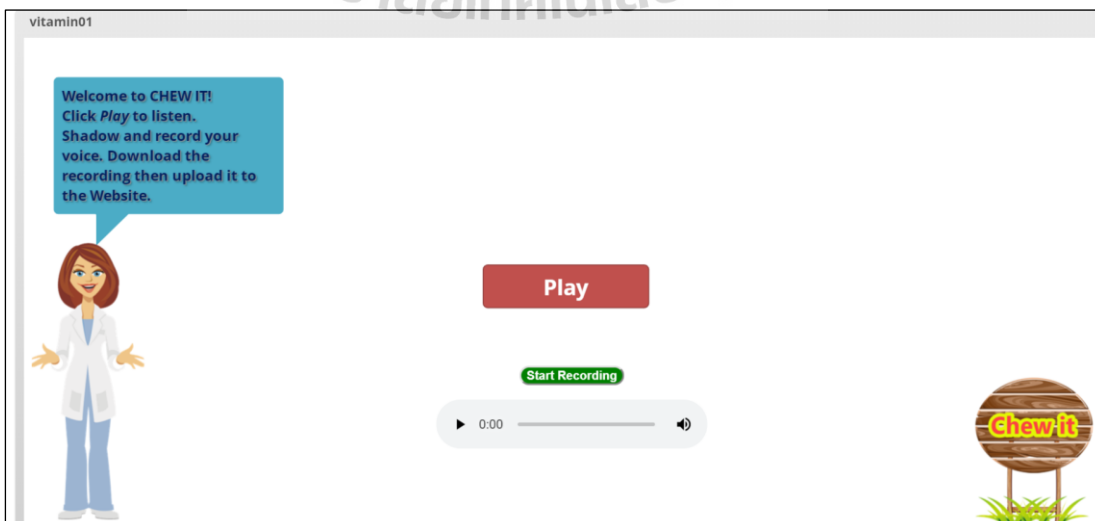
vitamin01

What storm Anna?

Here is the correct answer:
Was the roof of your house alright after the storm, Anna?
Is your answer correct? 100%? 75%? 50%? 25%?
Go on to the next tablet when you are ready.

THIS IS TABLET 1

Feel it



vitamin01

Welcome to CHEW IT!
Click *Play* to listen.
Shadow and record your voice. Download the recording then upload it to the Website.

Play

Start Recording


0:00


Chew it

vitamin01

What is the conversation about?
Write your answer here.

Write down all the specific details of the conversation
that you can remember. Click Submit when finished.


 **Play**



vitamin01

two friends were talking about the damage after the storm

He asked what was wrong with her house
Her car parked under the tree
It was lucky that her car had no damage

 **Play**


Great. Here is the transcript. Use it to decide if your answers are correct.

Man: Was the roof of your house alright after the storm, Anna? I saw a workman there with a ladder today

Woman: I'd had the roof repaired recently so that wasn't a problem. The workman was putting some new glass in an upstairs window. I think a branch from a tree broke it when it fell off the wind. I was quite lucky- it didn't damage my car which was parked right under the tree


Congratulations! You just took the first vitamin. Keep going and take all the others.

Click *Next* button to end the lesson :)



vitamin01

Good job **Nguyen** !
You just finished Vitamin 1.
See you next time!



APPENDIX J

Students' scores of the listening tests

STUDENTS' SCORES OF THE LISTENING TESTS									
	PRE	POST	PRE	POST		PRE	POST	PRE	POST
Experimental	11	14	16	18	Control	8	9	14	12
Experimental	8	10	17	17	Control	10	10	13	14
Experimental	5	8	10	13	Control	5	8	10	13
Experimental	7	14	12	14	Control	10	10	9	8
Experimental	6	11	9	10	Control	6	10	7	10
Experimental	12	15	10	10	Control	8	9	10	11
Experimental	7	9	9	11	Control	8	12	9	10
Experimental	8	9	12	14	Control	7	8	10	12
Experimental	10	17	14	16	Control	10	12	11	12
Experimental	9	10	13	18	Control	10	12	17	20
Experimental	11	12	17	15	Control	10	11	12	12
Experimental	5	9	12	17	Control	5	6	18	19
Experimental	8	11	12	14	Control	7	7	12	13
Experimental	10	13	15	18	Control	7	7	9	13
Experimental	5	8	17	21	Control	8	8	11	14
Experimental	9	10	16	15	Control	9	9	16	16
Experimental	5	7	15	15	Control	11	11	16	17
Experimental	8	12	13	14	Control	6	7	15	16
Experimental	13	16	19	22	Control	9	9	17	18
Experimental	6	9	12	15	Control	8	9	8	10
Experimental	11	12	14	18	Control	8	12	12	13
Experimental	13	18	11	11	Control	7	10	8	13
Experimental	9	11	13	14	Control	6	8	15	19
Experimental	11	10	9	10	Control	8	10	19	20
Experimental	6	7	13	15	Control	7	8	14	15
Experimental	7	11	10	10	Control	8	10	13	14
Experimental	6	7	7	9	Control	7	7	10	12
Experimental	7	9	9	9	Control	9	12	7	8
Experimental	11	14	21	24	Control	5	6	9	9
Experimental	6	10	19	20	Control	10	12	12	12
Experimental	12	17	21	23					
Experimental	10	15	11	12					
Experimental	7	13	14	15					
Experimental	9	11	15	20					
Experimental	6	8	11	16					

APPENDIX K

Students' scores of the memory digit span tests

STUDENTS' SCORES OF THE MEMORY DIGIT SPAN TESTS								
Treatment	PRE Visual forward	POST Visual forward	PRE Visual backward	POST Visual backward	PRE Auditory forward	POST Auditory forward	PRE Auditory backward	POST Auditory backward
Experimental	9	11	8	8	7	7	5	7
Experimental	7	8	7	7	7	7	9	6
Experimental	10	9	8	8	8	8	7	7
Experimental	10	12	6	7	6	6	9	9
Experimental	9	11	7	8	9	7	8	6
Experimental	9	10	6	8	5	6	6	7
Experimental	8	9	9	9	7	5	5	6
Experimental	10	9	9	9	5	7	8	8
Experimental	9	11	7	10	6	8	6	7
Experimental	8	9	8	8	5	5	7	8
Experimental	9	13	7	9	5	7	7	7
Experimental	10	10	6	6	5	6	6	6
Experimental	9	9	6	8	5	5	7	6
Experimental	9	10	7	10	5	6	6	7
Experimental	10	12	8	8	6	6	5	5
Experimental	8	10	9	9	6	9	8	7
Experimental	8	11	10	10	7	9	6	8
Experimental	7	11	7	9	5	6	6	7
Experimental	9	12	9	10	7	8	7	5
Experimental	10	12	7	9	6	7	5	6
Experimental	7	9	8	9	5	5	5	5
Experimental	9	12	10	10	6	9	6	7
Experimental	11	13	8	8	5	8	9	8
Experimental	8	8	7	7	5	6	6	6
Experimental	9	9	6	6	5	6	5	6
Experimental	11	12	9	10	5	8	7	6
Experimental	9	9	7	9	5	7	8	7
Experimental	8	8	8	9	6	5	5	6
Experimental	7	9	9	8	7	6	6	5
Experimental	10	10	6	8	6	7	6	7
Experimental	8	9	7	8	8	9	7	8
Experimental	11	12	9	9	6	7	7	6

STUDENTS' SCORES OF THE MEMORY DIGIT SPAN TESTS								
Treatment	PRE Visual forward	POST Visual forward	PRE Visual backward	POST Visual backward	PRE Auditory forward	POST Auditory forward	PRE Auditory backward	POST Auditory backward
Experimental	6	7	7	7	5	7	5	6
Experimental	10	10	6	7	7	7	7	6
Experimental	6	8	6	8	7	7	5	5
Control	9	9	9	9	7	7	6	5
Control	6	7	6	7	6	5	4	5
Control	10	9	10	10	7	8	7	6
Control	10	11	9	8	7	7	6	6
Control	7	7	8	7	4	4	5	5
Control	8	10	10	9	7	7	6	6
Control	10	9	10	10	5	6	7	6
Control	9	10	8	9	6	6	6	5
Control	8	9	6	8	8	6	7	7
Control	9	8	7	9	7	6	5	6
Control	10	9	9	7	4	5	6	5
Control	9	10	5	6	5	5	7	7
Control	7	7	5	6	5	4	5	4
Control	10	10	9	9	6	8	8	8
Control	11	10	8	8	5	5	5	5
Control	8	10	9	9	4	6	5	6
Control	7	8	8	8	6	6	9	8
Control	8	9	6	5	6	7	5	7
Control	10	10	7	5	6	4	5	6
Control	9	8	7	7	4	5	6	7
Control	9	9	8	7	6	7	6	7
Control	6	9	5	7	5	5	6	5
Control	10	11	7	7	4	5	5	6
Control	9	9	8	7	5	8	5	7
Control	9	9	9	9	7	6	8	8
Control	7	6	5	6	5	6	6	6
Control	8	8	6	6	5	5	7	7
Control	7	7	5	6	5	6	5	5
Control	8	8	7	6	5	7	6	5
Control	10	10	7	8	6	7	5	6

APPENDIX L

Students' scores of the vocabulary tests

STUDENTS' SCORES OF THE VOCABULARY TESTS									
	PRE AURAL TEST	POST AURAL TEST	PRE VISUAL TEST	POST VISUAL TEST		PRE AURAL TEST	POST AURAL TEST	PRE VISUAL TEST	POST VISUAL TEST
Experimental	41	51	7	18	Control	41	47	7	8
Experimental	39	45	5	7	Control	15	22	8	9
Experimental	35	38	6	9	Control	36	38	7	10
Experimental	21	44	5	10	Control	39	43	5	10
Experimental	18	24	5	8	Control	33	23	4	12
Experimental	34	47	7	12	Control	39	37	4	6
Experimental	37	38	4	5	Control	28	30	5	8
Experimental	29	45	4	6	Control	40	55	5	11
Experimental	31	42	5	12	Control	41	34	7	12
Experimental	16	40	5	8	Control	31	44	5	7
Experimental	20	57	8	12	Control	30	56	6	5
Experimental	38	50	6	10	Control	42	46	4	6
Experimental	35	45	4	10	Control	29	35	3	5
Experimental	25	29	5	8	Control	39	43	6	7
Experimental	39	44	5	13	Control	30	37	4	4
Experimental	39	34	10	15	Control	55	50	10	15
Experimental	35	47	8	13	Control	44	44	5	6
Experimental	38	48	5	14	Control	30	47	4	7
Experimental	48	66	9	13	Control	29	34	6	9
Experimental	35	38	6	10	Control	25	35	7	13
Experimental	34	35	4	6	Control	34	35	5	13
Experimental	28	25	6	9	Control	30	31	4	11
Experimental	34	38	7	13	Control	34	33	10	14
Experimental	21	39	9	15	Control	42	37	6	6
Experimental	24	25	5	7	Control	27	28	6	7
Experimental	31	38	10	13	Control	44	46	6	8
Experimental	41	36	4	10	Control	30	43	7	11
Experimental	24	26	5	7	Control	28	20	6	8
Experimental	38	47	6	8	Control	40	51	10	14
Experimental	44	63	8	13	Control	27	51	6	9
Experimental	29	39	12	18					

STUDENTS' SCORES OF THE VOCABULARY TESTS									
	PRE AURAL TEST	POST AURAL TEST	PRE VISUAL TEST	POST VISUAL TEST		PRE AURAL TEST	POST AURAL TEST	PRE VISUAL TEST	POST VISUAL TEST
Experimental	22	25	10	19					
Experimental	29	48	5	6					
Experimental	45	47	11	17					
Experimental	31	34	5	7					



APPENDIX M

Informed consent for participating in the experiment

Please read the information below carefully. In case, you have any questions, feel free to ask before you sign.

You are going to take part in a research study of English listening teaching and learning. You will be one of the participants.

1. Description of the study procedures

If you agree to join the study, you will be asked to do the following things:

- Take some tests before and after the course.
- Complete all the lessons in the Listening course

2. Risks/Discomforts of being in this Study

The study has the following negligible risks. First, the way of teaching and learning you have in the listening course during the experiment may be different from that of classes you are accustomed to. Second, you must familiarize yourself with using computers with strict steps that you are required to follow.

3. Benefits of being in the Study

The benefits of participation are as follows:

- You will learn how to make use of technology tools to facilitate learning on your own
- You will have access to some useful learning resources to improve your English
- Your English-listening ability may be improved.
- Your English-speaking ability may be improved.
- Your sense of autonomous learning may be increased.
- At the end of the course, you will receive some gifts in recognition of your participation

4. Confidentiality

Some of your personal information might be collected for the study (your name, age, gender, scores of all the tests, etc.). The information will be used anonymously, and for academic purposes only.

5. Right to refuse or withdraw

The decision to participate in this study is entirely up to you. You may refuse to take part in the study. You may withdraw at any time.

Consent:

Your signature below indicates that you have decided to volunteer as a research participant for this study, and that you have read and understood the information provided above.

Subject's signature: _____

Date : _____



มหาวิทยาลัยเทคโนโลยีสุรนารี

APPENDIX N

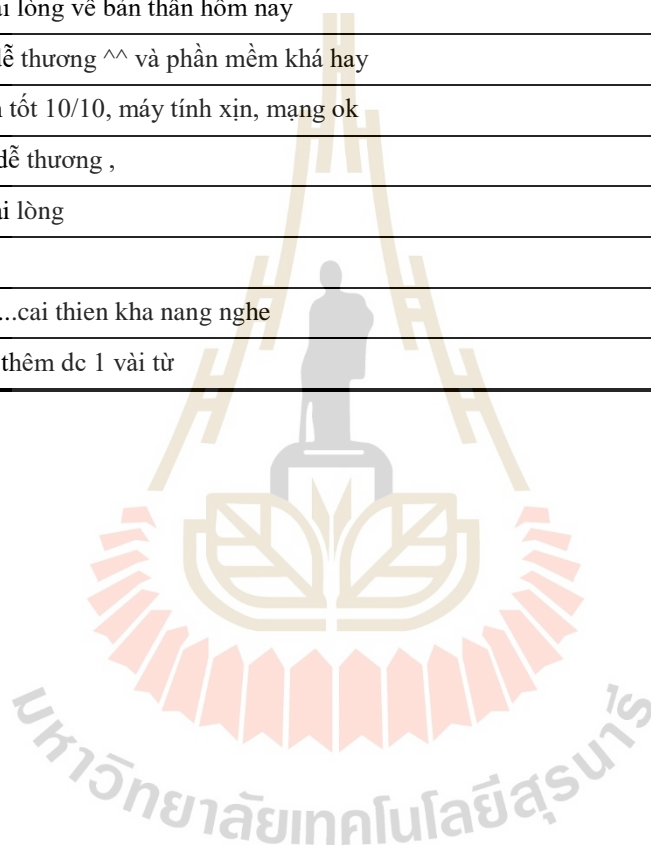
Sample journal from students

Vitamin 1 Wednesday, 1 July 2020, 5:26 PM Submitted answers:35	
1. Bạn cảm thấy kết quả làm bài của bạn hôm nay như thế nào? Đúng bao nhiêu phần trăm? Có cải thiện hơn không?	
	đúng 25%
	that vong,bai lam chua tot
	bai lam chua tot qua that vong.dung 2% co cai thien hon
	khá hơn một chút, ~10% .có cải thiện
	co, dung dc 10% cai thien dc 1%
	kết quả quá tệ đúng không % mới lần đầu
	Đúng 70%. Có cải thiện hơn
	được cải thiện hơn hôm trước.10%
	rất tốt,em bắt đầu nghe được và viết ra được vài từ tiếng anh
	hôm nay kết quả rất tệ. tôi không thể nghe và không đủ từ vựng để ghi lại. kết quả của tôi là 0%
	theo như tình hình đứt cáp AAG hiện nay thì em nghe không rõ vì mạng hơi lag,không biết nào hết lag để em nghe được,mong cô thông cảm,im sorry
	Em nghe không rõ nên kết quả hơi tệ. Em không nhớ luôn. Em cảm thấy chưa tốt lắm
	10% chưa cải thiện
	cải thiện được 10%
	kết quả làm bài chưa tốt
	hôm nay là bữa đầu tiên nghe chưa quen nên em không nghe được gì hy vọng là hôm sau sẽ nghe tốt hơn
	Không tốt10%
	không nghe được
	không được phần trăm nào hết . nhưng có cải thiện hơn trước ạ
	Không cải thiện hơn được bao nhiêu

cảm thấy kết quả bài làm hôm nay rất tệ đúng 0% chưa có cải thiện
kết quả rất khả quan đúng khoản 8% cũng có khả quan nhưng không nhiều lắm ,vì kĩ năng nghe của em còn rất yếu.
kết quả được tốt hơn mấy lần nghe trước, đúng 2% , có cải thiện hơn những lần gần đây
cảm thấy bài làm của mình rất kém Đúng 0%
kết quả làm bài của mình rất kém, không ổn tí nào, đúng tầm 5% trên tổng số bài làm, mình rất yếu về từ vựng nên nghe không được.cảm thấy có thể cải thiện
Em cảm thấy không được tốt lắm. Bài làm của em đúng được 0%. Không cải thiện được nhiều lắm
không tốt, sai nhiều
Em cảm thấy bài làm tệ, phần trăm thì là 0%
đúng dưới 5%, không cải thiện
qua te. can co giup do them
te....5%
khá, 20%, có
2.Bạn có gặp khó khăn gì trong quá trình làm Vitamin không? Nếu có, đó là gì?
không
am thanh chua tot
co.nghe am thanh nho
khả năng nghe kém
khong
không
Không thu âm được giọng của mình
khả năng nghe
không có
từ vựng tôi quá tệ, nên không thể hiểu câu nói và không đủ khả năng ghi lại.
giọng của chú đọc phần nghe nó khàn khàn..em nghe không,chắc có thể do lag
Giọng nói hơi rè
không nghe được
có, chưa nghe được
e nghe không rõ và không hiểu từng vựng nên không biết trả lời
Có. Không nghe được
không nghe được

em không gặp vấn đề j cả
Không nghe kịp
khó khăn: vẫn chưa nghe được bài nghe
trong quá trình làm bài thì vẫn chưa tập trung lắm vì kĩ năng nghe còn kém nên dễ chán
có , tai phone nghe nhỏ lúc nghe được lúc không nghe được
khó khăn: không nghe được nhiều
mình yếu từ vựng, không nghe được đúng, đoạn văn khá dài không có nút dừng nghe liên tục vì vậy khó nhớ được hết.
Em gặp khó khăn trong việc nghe, em nghe không rõ chữ lắm, người đọc hơi nhanh và khó nghe,
có nhiều từ nghe được nhưng em lại không biết viết
Về cái ngữ âm, em cảm giác khó nghe, nghe topic 350 khó nghe đọc chậm một chút, vì vốn từ vựng không nhiều mà còn nghe đọc nhanh sao nghe được
Em khó khăn trong việc nghe giọng người đọc rất khó nghe, nhanh , âm thanh nhỏ không được rõ lắm
đọc nhanh
co. tai phone nhỏ
co....tu vựng
nghe ko được
3. Bạn thấy hài lòng nhất về điều gì trong quá trình luyện tập hôm nay? Tại sao?
không có
cai thien duoc ki nang nghe
hai long.vi giup em cai thien tieng anh nghe
thầy cô nhiệt tình
nghe duoc nhieu tu hon
là nghe không được gì
Không biết
cô nhiệt tình.được nghe nhiều lần
nghe được nhiều từ hơn
phòng máy lạnh rất tốt
thầy cô hướng dẫn rất tận tình và chi tiết,không biết gì thì thầy cô chỉ hết, nhưng em rất tiết mạng AAG lag quá em nghe không được :)
Em không có gì không hài lòng
nghe được nhiều
được luyện tập phần nghe nhiều lần
hôm nay em không hài lòng

Nghe được nhiều
nghe được vài từ
em có thể nghe được đoạn hội thoại tốt hơn trước
Cải thiện việc nghe hơn trước. Có thể nghe một vài từ. Hải lòng nhất về đoạn hội thoại.
cảm thấy chưa hải lòng
rất hải lòng với bài luyện tập hôm nay vì nó sẽ là bước đà để em có thể cải thiện kic năng nghe của mình
hải lòng về phương pháp giảng dạy của giáo viên , vì hướng dẫn nhiệt tình hỗ trợ hết mình
không hải lòng về bản thân hôm nay
cô giáo dễ thương ^^ và phần mềm khá hay
máy lạnh tốt 10/10, máy tính xịn, mạng ok
Cô giáo dễ thương ,
không hải lòng
vui ve
hai long ...cai thien kha nang nghe
có, nghe thêm dc 1 vài từ



CURRICULUM VITAE

Luu Thi Mai Vy was born on 9 February 1988, Ho Chi Minh City, Vietnam. She graduated from Ho Chi Minh City University of Pedagogy in 2010 with a Bachelor of Arts degree in Teaching English as a Foreign Language. Upon that, she worked as an English teacher in Ho Chi Minh City, Vietnam. From 2017 to 2011, she pursued her Ph.D. in English language studies in the School of Foreign Languages, Institute of Social Technology, Suranaree University of Technology, Thailand. Her research interests mainly include Theory of Second/Foreign Language Learning and Teaching and Listening Comprehension.

