Technology and Pedagogy Types in Foreign and Second Language Learning Focusing on Listening Comprehension: A Review of Literature
การทบทวนงานวิจัยเกี่ยวกับประเภทของเทคโนโลยีและศาสตร์การสอนที่ใช้ในการเรียนการสอนภาษาต่างประเทศและการเรียนการสอนภาษาที่สอง เพื่อเพิ่มพูนความสามารถในการฟังเพื่อความเข้าใจ

Mayuret Yaibuates[1]*, Praweenya Suwannatthachote, Ph.D.[2] ,
Major Ra-shane Meesri, Ph.D.[3]

[1]*Ph. D. Candidate in Educational Technology and Communications*
Graduate School, Chulalongkorn University
254 Phayathai Road, Pathumwan, Bangkok 10330

[2]*Assistant Professor in Educational Technology and Communications*
Faculty of Education, Chulalongkorn University
254 Phayathai Road, Pathumwan, Bangkok 10330

[3]*Lecturer in Curriculum and Instruction*
Faculty of Education, Chulalongkorn University
254 Phayathai Road, Pathumwan, Bangkok 10330

Abstract

This review categorizes technology and pedagogy types used in foreign and second language learning for enhancing listening comprehension. The objective of this study is to review existing literature to examine what technology and pedagogy types were used in teaching, listening comprehension and how learners and instructors interacted with technology, in foreign and second language learning. Main findings from documentary research include nine unique technology types, six pedagogy types used, learner-technology interaction and suggestions for learner-instructor interaction when using technology to enhance listening comprehension in foreign and second language learning.

* Corresponding Author.
Email address: winmayuret@gmail.com

Keywords

Technology Types, Pedagogy Types, Foreign Language Learning, Second Language Learning, Interaction, Listening Comprehension

บทคัดย่อ

บทความนี้นำเสนอประเภทของเทคโนโลยีและศาสตร์การสอนที่ใช้ในการเรียนการสอนภาษาต่างประเทศและการเรียนการสอนภาษาที่สองเพื่อเพิ่มพูนความสามารถในการฟังเพื่อความเข้าใจ มีวัตถุประสงค์เพื่อทบทวนงานวิจัยที่เกี่ยวข้อง โดยศึกษาประเภทของเทคโนโลยีและศาสตร์การสอนที่ใช้ในการเรียนการสอน การฟังและศึกษาปฏิสัมพันธ์ระหว่างผู้เรียน ผู้สอน และเทคโนโลยีที่ใช้ในการเรียนการสอน ผลการวิจัยเอกสารพบว่า เทคโนโลยีใช้ในการเรียนการสอนภาษาต่างประเทศและการเรียนการสอนภาษาที่สองเพื่อเพิ่มพูนความสามารถในการฟังเพื่อความเข้าใจ จำนวน 9 ประเภท ศาสตร์การสอน จำนวน 6 ชนิด ปฏิสัมพันธ์ระหว่างผู้เรียนและเทคโนโลยี ตลอดจนข้อเสนอแนะสำหรับการมีปฏิสัมพันธ์ระหว่างผู้เรียนและผู้สอนในการใช้เทคโนโลยีเพื่อเพิ่มพูนความสามารถในการฟังเพื่อความเข้าใจในการเรียนการสอนภาษาต่างประเทศและการเรียนการสอนภาษาที่สอง

คำสำคัญ

ประเภทของเทคโนโลยี ประเภทของศาสตร์การสอน การเรียนการสอนภาษาต่างประเทศ การเรียนการสอนภาษาที่สอง การฟังเพื่อความเข้าใจ

Introduction

Listening is foundation of language learning, especially listening comprehension since it is the heart of foreign language (FL) and second language (L2) learning. Moreover, the development of listening in foreign and second language affects other skills. Learners cannot learn to communicate efficiently without effectiveness of listening (Nunan, 1997; Rost, 2002; Vandergrift, 2007; Wang & Liu, 2013) Listening comprehension is a process involved with interactive and meaningful activities for understanding overall listening text (Hasan, 2000) It is related to complex cognitive activities - an active process in which an individual chooses aural input, creates meaning from listening text and links heard sound to their background knowledge (O'malley, Chamot, & Kupper, 1988; Rost, 1991) Therefore, helping learners to develop understanding of spoken message is an objective of listening (Ur, 1984) The effectiveness of teaching pedagogy and technology would be useful for developing listening comprehension. However, only a few studies emphasized on enhancing listening comprehension. Most of them have focused on developing speaking, reading, and writing. As a consequence, listening was overlooked or received less value than it should be (Field, 2008; Nunan, 1997; Rost, 2002; Vandergrift, 2007)

Technology has progressed and changed rapidly. Computer has used for presenting listening texts and listening comprehension questions since it is easy to replay. In addition, learners can listen to variety and authentic materials on the Internet (Hanson-Smith, 2001; Levy & Hubbard, 2005 ; Stockwell, 2012) The blooming of new technologies such as smartphones and other mobile internet-accessible devices become effortlessly available and are adapted for foreign and second language pedagogy (Golonka, Bowles, Frank, Richardson, & Freynik, 2012) corresponded to the interview of Gay Rawson, Co-Director of the Master of Education program in world language instruction (Interview with Koning, 2012a), who stated that *"The world has changed greatly, and most of that change is from technology. It's our job as educators to navigate these new styles of communication with our students. We need to come into their world."* Computer Assisted Language Learning [CALL] has used computer-based resources and technologies in language learning. It includes stand-alone computers and other devices access the Internet. CALL also emphasized on learning resources and teaching pedagogy The study of Wang & Liu (2013) pointed out the contribution of CALL to enhance listening comprehension by stating that CALL can increase learning motivation of students, empower them to control their task strategies and learning paced. As a result, students had positive attitude in learning environment. In addition, learning in online environment can provide feedback or extra explanation for learners individually. This suggests that learners can become active learners and pay more participation in learning process through CALL.

Learners, digital native students, in the present time are expected to use technology in their learning environment, since technology is considered part of their life (Koning, 2012b). However, the simply use of computers and technology do not guarantee the effectiveness of learning outcomes (Bruce, 2007 cited in Flanagan & Shoffner, 2013) Therefore, teachers should take advantages of using technology effectively in their instruction by increasing students learning and altering in teaching pedagogy properly (Flanagan & Shoffner, 2013; Walker & White, 2013). It is teachers' responsibility to provide information guideline and importantly support structured learning for students inside and outside of classroom (Helgesen & Brown, 2007).

The effectiveness of teaching pedagogy and technology would be useful for developing listening comprehension. However, only a few studies emphasized on enhancing listening comprehension. Most of them has focused on developing speaking, reading, and writing. As a consequence, listening was overlook or received less value than it should be (Field, 2008 ; Nunan, 1997 ; Rost, 2002 ; Vandergrift, 2007).

A number of current technology and pedagogy research articles for enhancing listening comprehension was selected based on the chosen publication titles purposively. The chosen publication titles are consisted of ReCALL, The Modern Language Journal, and CALL. The reasons of purposively selected publication titles were as follows. First, most of empirical research articles have been published

in three major language journals. Second, they always publish peer-reviewed articles and emphasize on technology in language learning. Moreover, they are in well-known databases (Cambridge, Wiley online library, and Routledge respectively) and have had impact factors (since 2010 for ReCALL, since1999 for The Modern Language Journal, and since 2006 for CALL). The current (2013) impact factors are 1.226, 1.181, 0.880 respectively.

The literature review from three publication titles was conducted by using listening and computer as keywords. A set of 3,039 articles was primary labelled. However, the filtered data of this study based on criteria (from 2012 - 2014, full text research articles and relevant to technology and pedagogy use in foreign language focusing on listening comprehension), it revealed 14 articles; five articles from ReCALL, three articles from the modern language journal, and six articles from CALL. The detail of first language and foreign language/second language of 14 articles are displayed in Table1.

Table 1

Languages Used from Reviewed Articles

	Language(s)	Numbers	Researcher/Researchers (Year)
First language (L1)	Mandarin Chinese	3	Leveridge & Yang (2013a, 2013b); Yang & Chang (2013)
	English	2	de la Fuente (2012); Winke, Gass, & Sydorenko (2013)
	Spanish	2	Cárdenas-Claros & Gruba (2012, 2013)
	Chinese	1	Hong, Chen, & Lan (2012)
	Dutch Bulgarian, Russian, or Albanian	1	Montero Perez, Peters, & Desmet (2013)
	French	1	Sockett (2013)
	Chinese, Malay, Thai, French, Cham and Khmer, Arabic	1	Matthews & O'Toole (2013)
	Japanese	1	Goble & Kano (2013)
	Norwegian	1	Dahl & Ludvigsen (2014)
Foreign language (FL) or Second language (L2)	Not stated	1	Van Zeeland (2014)
	English	11	Cárdenas-Claros & Gruba (2012,2013); Dahl & Ludvigsen (2014); Goble & Kano (2013) ; Hong, Chen et al. (2012) Leveridge & Yang (2013a, 2013b); Matthews & O'Toole (2013);

Table 1
Languages Used from Reviewed Articles (Continued)

Language(s)	Numbers	Researcher/Researchers (Year)
		Sockett (2013); Van Zeeland (2014); Yang & Chang (2013)
French	1	Montero Perez, Peters et al. (2013)
Spanish	1	de la Fuente (2012)
Arabic, Chinese, Russian, and Spanish	1	Winke, et al. (2013)

Consequently, this study aims to review the literature to examine what technology and pedagogy types were used in teaching listening comprehension and how learners and instructor interacted with technology. This study attempts to answer the following questions:

1. What technology types were used in foreign and second language learning to enhance listening comprehension?
2. What pedagogy types were used in foreign and second language learning to enhance listening comprehension?
3. How did foreign and second language learners and instructors interact with technologies to enhance listening comprehension?
4. How should foreign and second language learners interact with instructors when using technology to enhance listening comprehension?

Results

This section answers a review of the three research questions from the previous section.

1. What technology types were used in foreign and second language learning to enhance listening comprehension?

In the 14 studies reviewed, nine technology types were used in FL/L2 learning to enhance listening comprehension namely caption, help options, web-based computer application, audio and video on demand, online quizzes, mobile technology, the animated agent, video, and audio. Although five (35.71%) of the 14 studies used caption, three (21.43%) used caption with video (Montero Perez, Peters, & Desmet, 2013 ; Winke, Gass, & Sydorenko, 2013; Yang & Chang, 2013) The remaining two (14.29%) used caption with audio (Leveridge & Yang, 2013a, 2013b) Two (14.29%) studies used help options: one (7.14%) used help options (Cárdenas-Claros & Gruba, 2013), the other (7.14%) used help options with video (Cárdenas-Claros & Gruba, 2012) Of the remaining seven (50%), each one (7.14%) used web-based computer application and audio (Matthews & O'Toole, 2013), audio and video on demand (Sockett, 2013), online quizzes (Gobel & Kano, 2013), mobile technology (de la Fuente, 2012), the animated agent (Hong, Chen, & Lan, 2012), video (Dahl & Ludvigsen, 2014) and audio (Van Zeeland, 2014). In the following section, technology

types in which foreign and second language learners used to enhance listening comprehension and their brief features are displayed in Table 2.

Table 2

Reviewed Technology Types and Features to Enhance FL/L2 Listening Comprehension

Technology Types	Features to Enhance Listening Comprehension
Caption A piece of visual text appearing on screen as part of audio or video inputs	• Facilitating learners understanding by creating a strong connection between the text and what they hear (Leveridge & Yang, 2013a, 2013b; Montero Perez et al., 2013; Winke et al., 2013; Yang & Chang, 2013) • Enabling learners to separate to continual stream of speech (Leveridge & Yang, 2013b) • Enabling learners to recognize words in the caption (Leveridge & Yang, 2013a) • Enabling learners to check the accuracy (Leveridge & Yang, 2013a)
Help options - audio/video control buttons - translation - transcript - cultural note - glossary	• Enabling pacing the delivery of input tally with learners styles and working memory capacity (Cárdenas-Claros & Gruba, 2012, 2013) • Providing opportunity for learners to listen individually (Cárdenas-Claros & Gruba, 2013) • Supporting learners to modify their comprehension, verify their prediction and examine their understanding of vocabulary (Cárdenas-Claros & Gruba, 2012, 2013) • Providing learners with an opportunity to recover from a comprehension breakdown (Cárdenas-Claros & Gruba, 2012) • Present unfamiliar vocabulary for learning (Cárdenas-Claros & Gruba, 2012) • Providing access to enriched input (Cárdenas-Claros & Gruba, 2013) • Reducing time consuming for searching unfamiliar words as a result does not interrupt the listening process (Cárdenas-Claros & Gruba, 2013) • Drawing leaners' attention to critical vocabulary (Cárdenas-Claros & Gruba, 2013)
Web-based computer application An online space for presenting learning	• Providing opportunity for learners to listen individually • Providing access to rich and authentic input • Facilitating course content organization • Providing static images to activate prior knowledge relevant to listening passage

Table 2

Reviewed Technology Types and Features to Enhance FL/L2 Listening Comprehension (Continued)

Technology Types	Features to Enhance Listening Comprehension
presenting learning materials namely monologues, static images and text files	• Providing static images to activate prior knowledge relevant to listening passage • Recording log of listening rounds and number of alterations of text reconstruction • Providing immediately feedback • Allow learners to track their progress (Matthews & O'Toole, 2013)
Audio and video on demand	• Promoting individual differences • Provide access to rich and authentic input (Sockett, 2013)
Online quizzes Online listening questions written for FL/L2 learners with audio passage	• Providing opportunity for learners to practice listen comprehension individually • Providing randomized questions based on learners reading score • Recording frequency of access • Providing immediately feedback • Allowing learners to track their progress (Gobel & Kano, 2013)
Mobile technology such as PDAs, smart phone, MP3 players, tables	• Facilitating learners access to learning resources • Providing opportunity for learners to listen individually (de la Fuente, 2012)
The animated agent An virtual characters that can perform verbal and non-verbal communication	• Telling stories/Speak in target language • Motivating learners to learn due to attractive appearance e.g. presence of cartoon-like • Enabling learners to repeat listening many times (Hong et al., 2012)
Video	• Facilitating learners understanding by supporting visual cues (Cárdenas-Claros & Gruba, 2012; Dahl & Ludvigsen, 2014; Montero Perez et al., 2013) • Providing access to rich and authentic input (Winke et al., 2013; Yang & Chang, 2013)
Audio	• Providing an access to rich and authentic input (Leveridge & Yang, 2013a, 2013b; Matthews & O'Toole, 2013; Van Zeeland, 2014)

2. What pedagogy types were used in foreign and second language learning to enhance listening comprehension?

In the 14 studies reviewed, six pedagogy types were used in FL/ L2 learning to enhance listening comprehension namely bottom-up, top-down, informal online learning, reading while listening, problem-solving, and task-based instruction and focus-on-form. Although nine (64.29 %) of the 14 studies used bottom-up, six (42.86 %) used bottom-up approach solely (Cárdenas-Claros & Gruba, 2012, 2013; Matthews & O'Toole, 2013; Montero Perez et al., 2013; Winke et al., 2013; Yang & Chang, 2013). Two (14.29%) used bottom-up approach and top-down approach (Leveridge & Yang, 2013a, 2013b). The remaining one (7.14%) used bottom-up approach and task-based instruction and focus-on-form (de la Fuente, 2012). Two (14.29%) studies used top-down approach (Dahl & Ludvigsen, 2014; Van Zeeland, 2014). Of the remaining three (21.43 %) studies, each one (7.14%) used informal online learning (Sockett, 2013) reading while listening (Gobel & Kano, 2013), and problem-solving learning (Hong et al., 2012). In the following section, pedagogy types in which foreign and second language learners used to enhance listening comprehension are displayed in Table 3.

Table 3

Reviewed Pedagogy Types in FL/L2 Listening Instruction

Pedagogy Type	Description	Main listening activities
Bottom-up approach	Recognition and combination of smaller language units (words) to larger meaning chunks (sentences).	• Using in-built computer resources (e.g. translation, transcript, hyperlinks to glossaries, definitions, dictionaries) appropriately (Cárdenas-Claros & Gruba, 2012, 2013) • Segmenting listening passage by using video/audio control buttons (Cárdenas-Claros & Gruba, 2012, 2013; de la Fuente, 2012) • Providing vocabulary instruction (Montero Perez et al., 2013) • Focusing on word recognition ability (Matthews & O'Toole, 2013) • Reading the caption before listening to the audio, then match the caption to the aural input (Leveridge & Yang, 2013a, 2013b) • Facilitating listening instruction by using caption e.g. full caption, keyword-only caption, and annotated keyword caption (Montero Perez et al., 2013; Winke et al., 2013; Yang & Chang, 2013)

Table 3

Reviewed Pedagogy Types in FL/L2 Listening Instruction (Continued)

Pedagogy Type	Description	Main listening activities
Top-down approach	The use of context clues, background knowledge, and listening strategies to drive interpretation of input.	• Using gestures to enhance comprehension (Dahl & Ludvigsen, 2014) • Trying to construct meaning from the aural input (Leveridge & Yang, 2013a, 2013b) • Making guesses of vocabulary by noticing linguistic cues and applying listeners world knowledge (Lexical inference) (Van Zeeland, 2014)
Informal online learning	Informal target language practices such as chatting, social networking online, watching television series or program, and listening to music via on demand website	• Listening to songs, compare listener's interpretation of song with lyrics website • Watching movie in target language • Singing along or practicing speaking by repeating after characters (Sockett, 2013)
Reading While Listening	Development of aural and written verification stage	• Matching aural text by reading aloud with a transcript (Gobel & Kano, 2013)
Problem-solving learning	Presenting problems, learners try to find solutions Designed tasks that attract	• Asking learners to talk with each other in target language for solving the missions/problems • Receiving textual and aural cues to help learners (Hong et al., 2012)
Task-based instruction and focus-on-form	learners attention to difficult grammar form while listening to simple content	• Processing aural input for meaning before noticing it for form (de la Fuente, 2012)

3. How did foreign and second language learners interact with technology to enhance listening comprehension?

In the case of the reviewed 14 studies, FL/L2 learner-technology interaction consisted of (1) controlling of delivery of the listening input, (2) making use of listening support individually, (3) taking advantages by noticing visual element–e.g. bodies, gesture etc. in video, and (4) presenting listening input via technology for motivating students. The learner-technology interaction was illustrated as follows:

First, learners can control the delivery of listening input though replay, pause, rewind, and forward buttons. Learners used pause button for requesting more time to understand listening passage that they found too fast to be processed in the real time (Cárdenas-Claros & Gruba, 2012, 2013). Additionally, mobile technology allowed learners to manipulate - decide number of listening rounds, when to pause or stop listening input at their learning pace (de la Fuente, 2012).

Second, learners can use help options to support their listening comprehension according to their individual preferences. Help options in this study were translation, transcript, caption, culture notes, and glossary. Learners used L1 translation options for comprehending the target language, proving their own thought and checking the meaning of unfamiliar vocabulary (Cárdenas-Claros & Gruba, 2012, 2013). Learners looked at transcript in order to make sense of key breakdown segments, to learn vocabulary, and pronunciation by reading along transcripts and match with the written form (Cárdenas-Claros & Gruba, 2012). However, every learner relied on additional support variedly. In term of caption, Leveridge and Yang (2013a) revealed that most low level learners and intermediate level learners reported their positive responses toward caption which were higher than high level learners. Caption helps low and intermediate level learners to understand listening passage. On the other hand, high level learners noted caption obstruct their attempt to focus on aural input. Also, some intermediate level learners noted verbatim caption were not necessary for them. Low and intermediate levels learners tend to read caption before listening to audio and match caption to the audio comparable to bottom-up processing. Nevertheless, intermediate and high proficiency learners were likely to construct meaning from the audio - top-down process. In term of culture notes, lower proficiency listeners did not use culture notes since they were not be able to understand the explanation in the target language. In contrast, intermediate and high intermediate learners used culture notes to expand their understanding beyond the listening passage (Cárdenas-Claros & Gruba, 2013). Interestingly, however, it was found that all proficiency learners found glossary unhelpful because it presented definitions in the target language. Therefore, L1 definition should be provided (Cárdenas-Claros & Gruba, 2012).

Third, video is an alternative format to present listening input by adding speakers' bodies and visible context. Video could expand physical content while speakers were speaking, especially in satirical or ironic speech. Basically, it was hard for listeners to realize by listening to audio alone. Video can show facial expression and gesture of speakers for better understanding (Lynch, 2009). As a result, all foreign language learners acknowledged visual cues in communication through gestures in video (Dahl & Ludvigsen, 2014).

Forth, learners were motivated by listening input presented through technology. Learners were interested in listening to songs or watching movies on the Internet. They enjoyed comparing the meaning of the song by themselves with other people via Song Facts website and checking with lyrics website. Some learners, who usually sang along or repeated after characters' dialogue several times, have improved their listening comprehension because they could match the pronunciation sound with the word correctly. In addition, the repetitive nature of listening passage available on the Internet, helped them improve intonation, vocabulary recognition and listening comprehension (Sockett, 2013). Besides, the finding from Hong et al. (2012) also showed that most of language learners enjoyed learning with the animated agent. Moreover, half of the students in the experimental group felt more comfortable talking to the animated agents than teachers. They were not only motivated by the animated agent but also increased their confidence. Additionally, the majority of students liked the animated agents to tell L2 stories, utter vocabulary, and converse with them.

4. How should foreign and second language learners interact with instructors when using technology to enhance listening comprehension?

According to the articles review, there are some suggestions for foreign and second language learner-instructor interaction in order to improve listening teaching and learning instruction with technology namely, (1) analyzing learners proficiency before adding listening support, (2) preparing activities for checking information about help options, (3) preparing vocabulary instruction, (4) giving contextual information before playing video input, and *(5) demonstrating the use of learning courseware, learning procedures and monitoring learners progress. The learner-instructor interaction was illustrated as follows:*

First, all learners relied on caption differently. Lower level learners were depended on caption more than higher levels learners (Leveridge & Yang, 2013b). Thus, instructors should analyze learners before making decision whether or not to add listening support.

Second, some learners did not recognize the place of certain help options or did not know the function of some options. They could make worthy use of help options when they had a chance to be familiar with software (Cárdenas-Claros & Gruba, 2013). Therefore, instructors could design activities for checking learners knowledge about help options' function e.g. randomly ask students orally at the beginning

of the class, preparing worksheet (matching function with description) for them or requiring them to complete an explanation manual before accessing material etc.

Third, due to the significance of learners' vocabulary size which is related to their comprehension, learners should have sufficient words in order to gain enough comprehension of listening passage. Furthermore, many nonnative language learners found difficulties noticing unknown vocabulary in speech after hearing or remembering the word and its context. (Van Zeeland, 2014). As a consequence, instructors should prepare teaching vocabulary (Montero Perez et al., 2013).

Forth, in spite of the benefit from images and actions in video input, learners could be misleading. As a result, learners suggested that they should get some ideas about listening passage before playing video clips (Cárdenas-Claros & Gruba, 2012, 2013). Teachers could support by giving contextual information e.g. introducing main characters, their relationship, and the place of the story/ conversation.

Fifth, Gobel & Kano (2013) found that learners rarely enjoyed by practicing listening outside the class via online courseware. They might not realize the purpose of the activity or be confused with learning procedures. Hence, Teachers should demonstrate the use of learning courseware and learning procedures. In addition, while students were practice listening by logging on the system, teachers needed to check student progress and facilitate their learning.

Conclusion

This review categorizes technology and pedagogy types used in foreign and second language learning for enhancing listening comprehension. The findings revealed that caption was the most frequently used technology. The supported reason could be the ease to connect/comprehend the flow of speech with text appearing on screen. Even though listening and reading were associated with messages decoding, reading takes place over space where learners can read back and forth over pages. In contrast, listening takes place over time. Consequently, there are no gaps between words to show when learners were exposed to speech sounds. That's why leaners often faced difficulties in recognizing word boundaries or words they know when shown up in the written form (Field, 2008; Goh, 2000; Wilson, 2009). Therefore, caption could fulfill this challenge of spoken characteristics (Leveridge & Yang, 2013a, 2013b; Montero Perez et al., 2013; Winke et al., 2013; Yang & Chang, 2013).

In terms of pedagogy, the majority articles used bottom-up approach which emphasizes the decoding of the smallest units to lead meaning (Cárdenas-Claros & Gruba, 2012, 2013; de la Fuente, 2012; Matthews & O'Toole, 2013; Montero Perez et al., 2013; Winke et al., 2013; Yang & Chang, 2013). However, listening is not a single skill. It is composed of many sub-skills. Therefore, learners do not need

to use only bottom-up or top-down approaches. This two approaches are important for listeners who tend to use both approaches concurrently (Field, 2008; Nation & Newton, 2009).

Importantly, interactions occur when we apply technology to enhance listening comprehension: learner-technology and learner-instructor. First of all, the learner-technology interaction has empowered individual learner to be in charge of their own learning due to the help of providing audio/video control buttons, listening support, visual aspect, and attracting learners' attention (Cárdenas-Claros & Gruba, 2012, 2013; Dahl & Ludvigsen, 2014; de la Fuente, 2012; Hong et al., 2012; Leveridge & Yang, 2013b; Sockett, 2013). Secondly, the learner-instructor interaction should be well-prepared by realizing learners proficiency, providing pre-listening activities, and monitoring and facilitating leaners during leaning process continuity (Cárdenas-Claros & Gruba, 2012, 2013; Gobel & Kano, 2013; Leveridge & Yang, 2013a; Montero Perez et al., 2013; Van Zeeland, 2014).

Therefore, instructors should carefully consider the use of technology and pedagogy types which are appropriate for learners' competence, particularly for strengthening listening comprehension.

Acknowledgements

The authors are thankful to the Thesis Scholarship for Students by the Graduate School, Chulalongkorn University for financial support.

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