Enhancing Summary Writing of ESL Learners via a Theory-Based Online Tool: System Development and Evaluation

Chiou Sheng Chew¹, Wen-Chi Vivian Wu², Norisma Idris¹, Er Fu Loh³, and Yan Piaw Chua⁴

Abstract
The purpose of this study was to design and develop a theory-based summary writing online tool, named Summary Writing-Pal (SW-PAL), to assist English as a second language students in improving their summary writing. It also evaluates the effectiveness of SW-PAL in enhancing the students’ summary writing performance and examines their perceptions about it. This mixed-method empirical study involved 53 English as a second language students majoring in computer science at a local university. Two intact groups were randomly chosen as the control and experimental groups with 26 and 27 students, respectively. The control group was taught using the conventional method, while the experimental group was taught using SW-PAL. Both groups were given a pre- and post-summary writing test. A Split-Plot Analysis of Covariance test was used to examine the effectiveness of the SW-PAL tool. A focus group interview was conducted to gather qualitative data on perceptions about the SW-PAL tool. Quantitative findings revealed that students’ summary writing performance improved significantly due to the SW-PAL with a large effect size of .42.

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Qualitativewise, the users perceived SW-PAL to be useful as a motivating, challenging, and self-learning tool. Recommendations for practice for language instructors who wish to incorporate such a tool into their language instruction and suggestions for future research are discussed.

**Keywords**
summary writing, summarizing strategies, ESL, worked examples, prior knowledge, learning theories

**Introduction**

Summary writing is a critical element of reading and writing that builds the background knowledge of students and improves their overall writing outcomes (Asaro-Saddler, Muir-Knox, & Meredith, 2018; Graham & Perin, 2007). It is also an advanced reading skill, which provides students with valuable practice in searching for meaning and communicating that meaning (Kim, 2001). Especially for college-level students, who are often required to complete various types of summarization assignments, being able to write a good summary is essential to achieving academic success (Kirkland & Saunders, 1991). As such, teaching summary writing is valuable and a major goal of the language-learning process.

Research on summary writing with English as a foreign language (EFL) and English as a second language (ESL) students in the Association of Southeast Asian Nations (ASEAN) countries tends to focus on summary writing instruction and identification of summary writing strategies (Abdi, Idris, Aliguliyev, & Aliguliyev, 2016; Idris, Baba, & Abdullah, 2011; McDonough, Crawford, & De Vleeschauwer, 2014; Wichadee, 2014). In most ASEAN countries, where the English language is taught either as EFL or ESL, many students appear to have poor summary writing skills (Cho, 2012; Choy & Lee, 2012). In fact, the students’ summary writing often reflects simple repetition of sections from the original article with absence of comprehension. A few studies have reported a correlation between summary writing and reading comprehension (Cho, 2012; Mokeddem & Houcine, 2016). When learners summarize effectively, they demonstrate their comprehension of the source text through writing. Moreover, they have to decode what they read, making connections between what they read and their prior knowledge on the subject matter (Ausubel, 1963; Wichadee, 2014).

McDonough et al. (2014) showed that most of the EFL students who had received explicit instruction on paraphrasing techniques preferred to copy fewer word strings from source texts when summarizing, compared with those without the instruction. Wichadee’s (2014) study, which compared EFL students who received instruction in transactional strategies with those taught by the traditional method, showed that transactional strategies enhanced their summarizing...
skills. Abdi et al. (2016) and Idris et al. (2011) developed algorithm-based summarization assessment systems to identify the ESL students’ summarizing strategies to improve comprehension and summary writing.

**Prior Knowledge**

Prior knowledge is “the whole of a person’s knowledge,” a body of structured information that exists before learning takes place (Perin, Keselman, & Monopoli, 2003, p. 21). Based on Rosenblatt’s (1988) Transactional Theory, a transaction occurs between reading and writing that enables a student to comprehend the text more effectively through prior knowledge. The mere availability of relevant prior knowledge is insufficient for a reader to understand a text.

Ambrose, Bridges, DiPietro, Lovett, and Norman (2010) maintained that to comprehend a text effectively, prior knowledge needs to be activated to connect existing knowledge with new information in the text. They further claim that the activated prior knowledge aids subsequent learning, while inactivated prior knowledge hinders learning. Furthermore, Van Rosmalen, Kester, and Boshuizen’s (2013) study revealed that summary writing can be strengthened through the activation of prior knowledge. Hence, there is a need to activate the students’ prior knowledge to enable them to relate the source text to their existing knowledge while writing the summary. However, prior knowledge activation is absent or underrepresented in most of the studies related to summary writing (Abdi et al., 2016; Choy & Lee, 2012; Friend, 2001; Gao, 2013; Idris et al., 2011; Wichadee, 2014). Friend (2001), Choy and Lee (2012), and Wichadee (2014) investigated the effects of strategy instruction on summary writing, whereas Gao (2013) examined the effects of summary writing on students’ reading comprehension. Moreover, Abdi et al. (2016) and Idris et al. (2011) focused more on the investigation of summarizing strategies using algorithm-based systems. Thus, this study addresses the importance of activating the students’ prior knowledge before their summary writing proper.

**Summarizing Strategies**

Apart from prior knowledge, summarizing strategies also play an important role in enhancing summary writing performance (Abdi et al., 2016; Chang & Lin, 2017; Hosseinpur, 2015; Idris et al., 2011). There is a growing body of literature discussing the strategies that readers use to summarize texts (Brown & Day, 1983; Chiu, 2015; Cho, 2012; Friend, 2001; Idris et al., 2011; Ke & Hoey, 2014; Kintsch & Van Dijk, 1978). Many of these studies drew insights from Kintsch & Van Dijk’s (1978) Text Comprehension Processing Model on how to derive the macrostructures of the original texts for the development of an acceptable summary. Macrostructures represent the gist of the texts. Deletion, generalization, and construction are the macrorules introduced by
Kintsch & Van Dijk’s (1978) in producing macrostructures for summarization, and the macrorules were further improvised by Brown and Day (1983) to ease the explanation for instruction. These rules are applied by other researchers (Abdi et al., 2016; Idris et al., 2011) to identify strategies that readers use to locate their main summary points. Effective summarizing strategies identified by Idris et al. (2011) and Abdi et al. (2016) are topic sentence selection, deletion, sentence combination, paraphrasing, generalization, and invention. Topic sentence selection is used to determine which sentence in a paragraph represents the main idea of the paragraph. Deletion is used to remove unimportant words or phrases from a sentence. Sentence combination is used to combine one or more sentences from the source text to construct a summary sentence. Paraphrasing is used to rewrite the sentences using one’s own words while maintaining the original meaning of the sentences. Generalization is the use of a single word or phrase or even a sentence to replace or substitute a list of items or a group of ideas or concepts that have been selected (Idris et al., 2011). Invention is used to state the implicit main idea by constructing a sentence that relates the topic to the key words and phrases in a general manner.

Studies conducted by Choy and Lee (2012), Hosseinpur (2015), Ke and Hoey (2014), and McDonough et al. (2014) showed that instruction on the use of summarizing strategies, such as deletion, selection, abstraction, paraphrasing, topic sentence selection, sentence combination, syntactic transformation, generalization, invention, and copy–paste, had encouraging effects on ESL summary writing and resulted in significant improvement in their summary writing performance. However, providing direct instruction to students by teachers via conventional methods was further restricted by large class sizes, which served as barriers to providing adequate and constructive feedback from teachers to students. Thus, there is an urgent need for instructors to select an effective medium/online tool to teach summarizing skills to big classes. However, summarizing strategies have yet to be incorporated in summary writing instruction in school at all the levels. Even though some basic strategies have been applied indirectly in teaching, some students still fail to write good summaries (Idris et al., 2011; McDonough et al., 2014; Wichadee, 2014). Poor knowledge of summarizing strategies appears to be the main reason for the poor performance in summary writing (Hosseinpur, 2015).

Computer-Assisted Language Learning

Research on computer-assisted language learning (CALL) has increasingly explored the affordances of technology to improve the ability of learners to summarize source texts more effectively (Abdi et al., 2016; Chiu, 2015; Franzke, Kintsch, Caccamise, Johnson, & Dooley, 2005; He, Hui, & Quan,
Furthermore, CALL encourages and facilitates the adoption of a pedagogical environment that provides feedback and multiple opportunities for language learning to take place (Cardoso, 2011; Jeong, 2017). Moreover, the use of CALL could promote student and teacher confidence in developing technological skills and pedagogical expertise (Jeong, 2017; Wang, Shang, & Briody, 2013). Studies comparing CALL methodology with conventional classroom teaching methods have indicated that using CALL resulted in better learning performance (Chiu, 2015; Franzke et al., 2005; Jeong, 2017; Wade-Stein & Kintsch, 2004; Wang et al., 2013).

Over the last decade, a few CALL tools for summary writing have been developed to improve the summary writing ability of students, such as Summary Street (Wade-Stein & Kintsch, 2004), summary assessment system (He et al., 2009), online summary assessment and feedback system (Sung et al., 2016), summary sentence decomposition tool (Idris et al., 2011), and relevance detection summarizing strategies identification tool (Abdi et al., 2016). These tools focused on the quality of a summary, the content coverage, and strategies of writing a summary. However, these tools neglect the prewriting comprehension stage prior to the actual summarizing phase. Merely concentrating on the written summary does not resolve the problem of attaining the proper level of text understanding before writing summaries. On the contrary, a student with the help of activated prior knowledge can comprehend the text effectively and write better summaries, as compared with one without prior knowledge (Ambrose et al., 2010). Moreover, these summary writing tools did not provide students with instruction on summarizing strategies, which could enhance their summarizing performance. Furthermore, incorporation of learning theories is greatly lacking among the existing summary writing tools (Abdi et al., 2016; He et al., 2009; Idris et al., 2011; Sung et al., 2016; Wade-Stein & Kintsch, 2004). According to Alzaghoul (2012) and Wu, Chiou, Kao, Alex Hu, and Huang (2012), incorporating learning theories into educational tools enhances the learning experience. Hence, there is a pressing need to embed learning theories in a summary writing tool.

In view of the foregoing gaps in the literature on summary writing, such as the lack of, and inadequate use of, prior knowledge activation, and lack of instruction in summarizing strategies and theories in an online summary writing tool, this study was undertaken to address these gaps. The purpose of this study, therefore, was threefold. First, it designed and developed a theory-based online instructional tool for summary writing, which is called Summary Writing-Pal (SW-PAL), that activated the students’ prior knowledge in the prewriting comprehension stage and provided instruction in summary writing strategies prior to the summary writing proper. Second, it investigated the efficacy of the SW-PAL to improve the students’ summary writing. Third, it examined the students’ perception toward SW-PAL.
To address the purposes of this study, the research questions and hypothesis are as follows:

**Research Question 1:** Was there a significant difference in summary writing performance between students who learned summary writing using the SW-PAL tool and those using the conventional method?

**Hypothesis:** Students using SW-PAL will improve more in summary writing performance, at a significant level, compared with those using the conventional method.

**Research Question 2:** What were the students’ perceptions toward the use of SW-PAL?

**Learning Theories That Underpin the SW-PAL**

The two fundamental learning theories that underpin the development of SW-PAL are cognitivism and constructivism. The specific theories for cognitivism are Transactional, Meaningful Learning, and Cognitive Load. Meanwhile, the specific theory for constructivism applied in this study is The Zone of Proximal Development (ZPD). The elements identified from these learning theories are prior knowledge, advance organizer, instructional approach, and scaffolding. Based on these elements, the proposed features used for the development of the SW-PAL were concept mapping, worked examples, and feedback. The details of the framework of the SW-PAL are shown in Figure 1, which includes specific theories, elements, and proposed features for each fundamental learning theory, which are further discussed in the following subsections.

**Cognitivism**

According to Ertmer and Newby (2013), cognitivism emphasizes knowledge and internal mental acquisition as well as receiving, organizing, storing, and retrieving of information in one’s mind. Furthermore, this concept is derived from two ideas, which are (a) the system of memory is one that organizes information actively as well as (b) the significant function of prior knowledge in learning. Specific learning theories based on cognitivism that underpin this study are Rosenblatt’s Transactional Theory, Ausubel’s Theory of Meaningful Learning, and Sweller’s Theory of Cognitive Load.

First, the Transactional Theory associates prior knowledge with reading, where a student can comprehend the text more effectively as the transaction occurs between the students and the text (Rosenblatt, 1988). In addition, Anson (1989) asserted that by transacting with past experiences and the text,
new meaning is formed. However, in order to organize information meaningfully, individuals must relate new knowledge obtained to relevant concepts from their prior knowledge (Ausubel, 1963).

Second, the Meaningful Learning Theory was postulated by Ausubel in 1963. Ausubel found that meaningful learning takes place when new information is related to prior knowledge. Ausubel also suggested that better understanding is obtained by using an advance organizer as a mechanism to link new information or concepts with the existing ideas. The use of advance organizers can activate information processing on the part of the learner, and this helps to prepare the student for active learning (Rohman, 2017). Regardless of the numerous advance organizers available, concept mapping appears to be the best for summary writing (Desoiza, 2011; Yang, 2015) due to its graphical features that embed multiconcepts for grasping essential gist in summary writing (Tseng, Chang, Lou, Tan, & Chiu, 2012), and it also make it easier for students to see how big ideas in a passage are related or connected to (Adesope, Cavagnetto, Hunsu, Anguiano, & Lloyd, 2017). In addition, Farshi and Tavakoli (2014) stated that concept mapping helps students to organize their ideas in a network of relationships and link new knowledge with prior knowledge. For this reason, concept mapping is used in the SW-PAL.

Finally, the Theory of Cognitive Load, which was developed by Sweller (1988), states that the process of learning occurs best when the learner’s cognitive architecture are aligned with instructional conditions. The learner’s
cognitive architecture consists of sensory memory, working memory, and long-term memory. The theory assumes that learning occurs through very limited working memory and unlimited long-term memory. Working memory is limited in capacity and duration when dealing with new information. It is important to consider the cognitive load imposed by instructional design due to the limitation of working memory. Otherwise, instruction becomes inadequate because it imposes high cognitive load for learning (Sweller, Van Merrienboer, & Paas, 1998). In addition, studies concerning the Cognitive Load Theory suggest that the use of worked examples could lessen cognitive load imposed on the learner and improve the learning outcome (McLaren & Isotani, 2011).

Worked examples usually provide students with example problems and worked-out solution steps for final answers (Sweller et al., 1998). Using worked examples in well-structured domains such as computer programming, physics, and mathematics (Sweller, Ayres, & Kalyuga, 2011) is promising; however, it is also further proven effective in less structured domains such as language learning (Kyun, Kalyuga, & Sweller, 2013; Yu, 2014). In domains with low structure, such as literature, history, and social studies, many dimensions appear to be subjective because the results rely on the proficiency and capability to understand a passage, and this includes the summary writing task (Roscoe & McNamara, 2013). Regardless of well- or ill-defined problem areas, worked examples appear as a viable solution for learning summary writing. Hence, worked examples are used as the instructional approach in teaching summarizing strategies in the SW-PAL.

**Constructivism**

In constructivism, learning is considered an active process that builds knowledge. Furthermore, in constructivism, learners recursively develop knowledge that they already have, instead of merely receiving and storing knowledge transmitted by the teacher (Ben-Ari, 1998). The specific learning theory based on Constructivism (Wu et al., 2012) that is used to support the study is Vygotsky’s (1978) Theory of the ZPD. According to Vygotsky (1978), the ZPD is defined as the variance between what a student can do with or without help. Vygotsky (1978) claimed that a student who adheres to an instructor’s example can gradually develop the ability to complete tasks without assistance. When a student is given a task in the zone of development, providing scaffolding is a way to encourage positive accomplishment, that is, initial high levels of support are slowly withdrawn to encourage student independence. Hence, scaffolding is seen in terms of the feedback provided to students in learning summarizing strategies as a way to encourage positive accomplishment. Feedback refers to a fundamental means through which students can evaluate and improve their writing (Roscoe & McNamara, 2013). Furthermore, it also allows students to learn and practice summary writing independently without much intervention.
from the instructor. Hence, the feedback is used as a scaffolding tool on students’ summary writing.

**System Design of the SW-PAL**

In the previous section, three concepts selected for the development of SW-PAL were described, including concept mapping, worked examples, and feedback. SW-PAL was developed to help ESL tertiary students to improve their summary writing ability by activating students’ prior knowledge when comprehending the text, modeling summarizing strategies, and providing feedback to students in the summarizing process. The design of system as shown in Figure 2 comprised two main parts, which were (a) component design and (b) three-tier client–server system architecture.

**Component Design**

Three components were designed for SW-PAL, which were prior knowledge activation, summarizing strategies instruction, and scaffolding.

*Prior knowledge activation.* In the prior knowledge activation component, concept mapping was used as an advance organizer to activate the students’ prior

![Figure 2. Process for designing SW-PAL.](image-url)
knowledge in reading. The concept mapping, which relates new and existing knowledge to understand source texts, adopted the design guidelines outlined by Novak and Cañas (2008) based on two features: (a) concepts that are hierarchically arranged with most inclusive and general notions at the top and the most specific at the bottom depending on the knowledge domain and (b) cross-links that bridge concepts in varied domains found in the concept map. As the result of adapting the Novak and Cañas’s design guidelines, the students are required to identify the (a) main general topic, (b) main idea as key concepts, and (c) specific supporting details for each main idea when comprehending the text. An example of concept mapping is shown in Figure 3, where the main general topic is labeled first, then consequently each main idea as one key concept is represented by a node, with respective lines showing the linkage of specific supporting ideas that created a meaningful statement or proposition.

The concept mapping tool in Figure 4 was developed and modified from Richard’s (2017) open source mapping tool, an online and off-line capable application leveraging HTML5 technologies. Some functions built for the concept mapping tool were add, delete, export as image, and save. The concept mapping tool acts like a drawing tool that was purposely designed for students to sketch concept maps during the reading process in order to link new knowledge with prior knowledge.

**Summarizing strategies instruction.** In the summarizing strategy instruction component, worked examples are used as an instructional approach in teaching summarizing strategies. The instructional design of worked examples was adapted from Sweller et al.’s (2011) Cognitive Load Theory. To keep the cognitive load at a minimal level, worked examples presentation features, as well as redundancy
and split-attention effects, had been weighed in. The integration of varied sources of information (e.g., images and explanatory texts) into a schema leads to split-attention effect (Chandler & Sweller, 1991; Sweller et al., 2011). Upon temporal or spatial distribution of sources, the learners would need to constantly shift their attention, thus defeating the purpose of worked examples. This is because worked examples demand learners to go through information derived from multiple sources (images, audio clips, or texts) that become cognitively demanding which interferes with learning instead of facilitating it (Tarmizi & Sweller, 1988). Thus, in the design of the worked examples tool, no multiple information resources were used in presenting worked examples to students in the SW-PAL.

Figure 4. Concept mapping tool.
Second, multiple sources with similar information can lead to a redundancy effect that may hinder learning from taking place (Chandler & Sweller, 1991). For example, a written text (visual presentation) that is presented concurrently with reading aloud (auditory presentation) results in lower learning output when compared with presentation of the material either orally or visually (van Mierlo, Jarodzka, Kirschner, & Kirschner, 2012). The integrated presentation may burden the cognitive capacity of a learner leading to ineffective learning process. Hence, from a cognitive load perspective, it is better not to present redundant information in worked examples. The SW-PAL used a visual presentation of the instructional design of worked examples.

Third, multiple instances allow comparisons wherein learners are able to identify and comprehend the variances between elements, thus distinguishing relevant information from that irrelevant. Besides, similarities should also be comprehended in deciding the relevant aspects. As such, learners acquire the skills of abstracting from irrelevant features which happens to be a criterion to induce schema (Atkinson, Derry, Renkl, & Wortham, 2000). Therefore, multiple worked examples were used in the SW-PAL as illustrated in Figure 5. The instructor used the worked examples tool to prepare the worked examples summary for each single text. Moreover, students were able to view the different worked examples, which were summarized by the instructor and thus understand how these strategies were used by the instructor to produce the example summaries.

Scaffolding. In the scaffolding component, a strategies identification feedback tool was developed to enable students to check the strategies they employed in writing summaries (see Figure 6). It was developed by adopting Abdi et al., (2016) algorithm which is known as “Identification Summarizing Strategies Linguistic Knowledge.” The summarization strategies identified in the feedback tool were deletion, sentence combination, copy-verbatim, topic sentence selection, and paraphrasing. The feedback scaffolding tool used Abdi et al., (2016) summarizing algorithm to check the students’ strategy use and did not provide feedback on whether or not the students were using the correct strategies. It worked by identifying which types of strategies were used by the students. This informed the students on whether they were using the same or a variety of strategies in writing their summaries. This feedback prompted them to incorporate a variety of strategies necessary for effective summary writing rather than a restricted set. The students used this feedback, in tandem with the instructions they received during their training sessions on the effective use of different strategies, to produce a good summary. Furthermore, the feedback tool allowed students to learn and practice summary writing independently, without adding to the excessive workload of teachers. On the part of the teachers and instructors, the feedback was used for diagnostic teaching and reviewing of the students’ summarizing strategy use.
The SW-PAL system architecture was comprised of three tiers, which were presentation, application, and data layers. The presentation layer displayed the user interface to the users, who were the instructor and students. The instructor inserted the learning material, such as worked examples, into the system via the presentation layer, while the students accessed the study material from the presentation layers. Meanwhile, the second layer, which was the application layer, introduced web applications, such as a web browser, an application server to host the key program tool such as concept mapping, worked examples, and feedback. The third layer, which was the data layer, stored the instructor’s learning materials and the students’ summaries.

Figure 5. Worked examples tool.

SW-PAL 3-Tier Client–Server System Architecture

The SW-PAL system architecture was comprised of three tiers, which were presentation, application, and data layers. The presentation layer displayed the user interface to the users, who were the instructor and students. The instructor inserted the learning material, such as worked examples, into the system via the presentation layer, while the students accessed the study material from the presentation layers. Meanwhile, the second layer, which was the application layer, introduced web applications, such as a web browser, an application server to host the key program tool such as concept mapping, worked examples, and feedback. The third layer, which was the data layer, stored the instructor’s learning materials and the students’ summaries.
Method
Subjects
This experimental study involved a total of 53 computer science major undergraduate students who came from two intact classes. The subjects had met the university requirement of passing a standardized test such as the Malaysian University English Test (MUET). They had learned ESL for 14 years. Moreover, the subjects were taking an English course entitled “English for Critical Academic Reading” to improve their academic reading. The average age of the subjects was 21 years. Sociodemographic data are expected to
influence the summary writing performance. Thus, before examining the effect of
the SW-PAL on the students’ performance in summary writing, their sociodemographic variables such as gender, age, and years of studying English were collected.

Next, two intact groups were randomly chosen as the control and experimental groups with 26 and 27 students, respectively. The control group was taught using the conventional teaching method, while the experimental group was taught using SW-PAL. The subjects in the experimental group used their own laptops in their classroom to use the SW-PAL. However, the subjects in the control group did not have to use their laptops, as they were taught in the conventional method in the classroom.

**Procedures**

Every student in the experimental group received a pretest, a SW-PAL training session, six SW-PAL practice sessions, a posttest, and a semistructured focus-group interview session. However, for the control group, the students received a pretest, a conventional instruction session, and six conventional practice sessions, and a posttest. Figure 7 shows the entire instructional and data collection process.

The pretest was administered to students in the experimental and control groups during a 60-minute session in the first week of the study. Before the pretest, the instructor explained to the students what summarizing a text meant. The pretest required the students to read a text and thereafter provide a summary of the text. The number of words for the summary had been set at one third of the total number of words from the source text. The students in the experimental group went through a 90-minute SW-PAL induction training session after the pretest to familiarize them with the SW-PAL tool before starting their practice sections. The students were taught the summarizing process, including concept mapping, worked examples, and feedback. The instructor acted as a facilitator to train the students to use the SW-PAL tool. However, in the conventional instruction session for the control group, the students were taught summarizing by the instructor using the conventional instruction method. The conventional instruction method was adopted from McWhorter (2015). The instructor taught the students on how to summarize on the following step:

1. Highlight or write brief notes on the material.
2. Write one sentence that states the writer’s overall concern or most important idea. This sentence will be the topic sentence of your summary.
3. Using own words to paraphrase.
4. Review the major supporting information.
5. Check the amount of detail include, if any, depends on the purpose for writing the summary.
6. Present ideas in the summary in the same order in which they appeared in the original material.

There were six sessions in the practice phase, which were held twice a week, from Weeks 2 to 4, in the students’ regular class time. All students practiced only one article per session, and each session took approximately 90 minutes. During the practice session for the experimental group, students interacted with the SW-PAL by engaging in activities such as drawing concept maps, understanding the instructor’s worked examples to acquire summarizing strategies and to summarize the text, and finally using the feedback from the SW-PAL to check the summarizing strategies, which were used to improve their summary writing. The instructor only assisted the students on matters concerning the technicalities of using the SW-PAL tool. However, during the practice sessions for the control group, the students were taught summarizing by the instructor using conventional methods with a single text in each session. The instructor provided assistance to the students on the summarizing process.

The posttest session was held in the fifth week. All procedures for posttest for experimental and control groups were the same as those used in the pretest. The same pretest and posttest were used to analyze the students’ performance and
improvement in summary writing. To select an appropriate statistical method for pretest and posttest, the skewness and kurtosis tests were conducted on pre- and postdata to examine the normality of the data. During all these tests, none of the subjects were permitted to use external source, such as Internet access, dictionary, or questioning. After the posttest, five students from experimental group were randomly chosen for the focus-group interviews. The interviews were used to explore the subjects’ perceptions about their learning experience.

**Material**

**Source text.** The Flesch Reading Ease (FRE) readability index was used to select the source texts. Seven expository texts with FRE readability index between 30 and 50 were directed toward the undergraduate students’ ability level (Fielding, 2006). The length of each text was between 600 and 650 words. The same texts prepared for both groups including general topics on education, environment, health, sciences, and economics to encourage a multidisciplinary readership among the ESL students in real-life situations. One of the expository texts was used for the pretest and posttest, while the other six were used in the practice session. The rationale for using the same text for both pre- and post- measurement was to assure objectively comparable results, thus avoiding the problem of equating different surface linguistic forms of the pre- and posttexts. The 4-week interval between administrations was considered long enough to control for any short-term memory effects. This is because the students were not provided with the correct summary after the pretest, so they had no way of knowing whether their summary was correct; moreover, they were unlikely to remember how they had summarized the text the first time. Thus, the interval was deemed long enough to control for any significant learning except for that due to the training (Lin, 2010). Moreover, any memory effect would also be present in the control group. It is also to be noted that both groups also experienced the same testing effect. Therefore, this testing effect would not influence the posttest scores when comparing the two groups. In other words, the testing effect is neutralized.

**Worked examples summaries.** An instructor who is experienced in using the summarizing skills in her teaching prepared the worked examples for each text by using six summarizing strategies (Topic Sentences Selection, Deletion, Sentences Combination, Paraphrasing, Generalization, and Invention), as identified by Idris et al. (2011) and Abdi et al. (2016). The SW-PAL was used by the instructor in preparing the worked examples.

**Instruments**

The data in the study were collected using two summary writing tests (pre and post) and a semistructured focus-group interview. The same text was used in the
pretest and posttest for both the experimental and control groups. The selected text had a FRE readability index of 49.1, which was exactly within the range between 30 and 50, meaning it was suitable for reading at the undergraduate level (Fielding, 2006).

To explore and further understand the perceptions of the SW-PAL tool users, five subjects were invited from the experimental group based on their willingness for a semistructured focus-group interview. Their perceptions with regard to use of this tool, including its effectiveness, beneficial features, and improvement of the tool were analyzed (see Appendix B). The five subjects were representatives of the larger group in terms of gender (two males and three females) and their modest (MUET Band 3) to satisfactory (MUET Band 4) English proficiency levels. MUET is a standardized examination that measures the level of English competency (Malaysian Examination Council, 2015) among undergraduate students in Malaysia. The characteristics of the five subjects for the focus-group interview are displayed in Table 1.

### Quantitative Data Analysis

To determine the subjects’ overall summary writing performance, in answer to Research Question 1, the subjects completed pretest and posttest. The summaries were evaluated by two lecturers with more than 10 years of teaching experience in the English language. They rated the summaries using the rubrics adopted from Desoiza’s (2011) empirical study (see Appendix A), which consisted of five criteria—main ideas, accuracy, words and style, organization, and length. Main idea was used to measure how well the students captured the main idea from the original text. Accuracy was used to measure how well the students reflected the meaning of the text without distortion of information. Words and style were used to measure how well the students wrote the summary in their own words and sentence structure. Organization was used to measure how well the students omitted unnecessary details from the original text and organized the

### Table 1. Characteristics of the Five Subjects for the Focus-Group Interview.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Gender</th>
<th>Language proficiency (MUET band)</th>
<th>Pretest score</th>
<th>Posttest score</th>
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<tbody>
<tr>
<td>1</td>
<td>Female</td>
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<td>5</td>
<td>Male</td>
<td>4</td>
<td>11</td>
<td>13</td>
</tr>
</tbody>
</table>

*Note. MUET = Malaysian University English Test.*
information, and finally, the length was used to measure how well the students shortened the text.

The rubric scoring consisted of four grading levels that ranged from exemplary (4 points), proficient (3 points), adequate (2 points), and needs to improve (1 point). When the score for each criterion was summed up, a cumulative summarization performance score (ranging between 5 and 20 points) was obtained.

**Qualitative Data Analysis**

To provide qualitative data to complement the quantitative results on the effectiveness of the SW-PAL tool to enhance students’ summary writing performance, a semistructured focus-group interview (see Appendix B) was conducted on five subjects to gather data on their perceptions toward this tool. The researcher recorded the interview, transcribed it into texts, coded the contents, and extracted for recurring themes from the interview. To ensure the reliability of the study, peer debriefing and member checks were employed. In other words, the data were coded for a second time by a different person (Yilmaz & Karaoğlan Yılmaz, 2018; Yilmaz & Keser, 2017) who is an English language lecturer. The codes collected from the researcher and the lecturer were examined for intercoder reliability. The kappa value of 0.82, which was larger than 0.70, showed that coding of the researcher was reliable (Chua, 2013). For member checks, the transcribed text was checked by the original interviewees to avoid researchers’ own bias.

**Results**

**Effect of SW-PAL on Students’ Summary Writing Performance**

The researchers used pretest and posttest analysis to answer Research Question 1, about whether there would be a significant difference in summary writing performance between students who learned summary writing using the SW-PAL tool and those using the conventional method. They hypothesized that students using SW-PAL would improve more in summary writing performance, at a significant level, compared with those using the conventional method.

Preliminary data analysis examined the normality of the data to select an appropriate statistical method. The skewness and kurtosis values of the pretest scores for the control group were 1.023 and 1.504, respectively, while the values of the posttest scores were 0.416 and 0.390, respectively. The skewness and kurtosis values of the pretest scores for the experimental group were 0.019 and −1.006, respectively, while the values of the posttest scores in the experimental group were −0.838 and 0.060, respectively. All the above values were within the range of −1.96 and +1.96, indicating that the data were normally distributed for all variables (Chua, 2009); hence, the data were appropriate for
analysis using parametric tests. Moreover, the inter-rater reliability of the pretest (.91) and posttest (.90) was established using Pearson’s product-moment correlation.

Although the students of the control and experimental groups were randomly assigned, sampling error occurred due to unequal numbers of gender, age, and years of studying ESL of the two groups (see Table 2), and therefore, the three sociodemographic variables needed to be controlled before examining the effect of the SW-PAL on performance in summary writing. Hence, to analyze the difference between control and experimental groups, a Split-Plot Analysis of Covariance test (SPACOVA) was used to examine the effect of the SW-PAL on ESL students’ performance in summary writing after controlled the sociodemographic variables (gender, age, and years of studying ESL) as covariates in this study.

The results of analysis of effect of covariance on sociodemographic variables as covariates in Table 3 indicate that the only significant sociodemographic variable that had effect on performance of students was Gender, $F(1, 48) = .09, p < .05$.

After removal of the sociodemographic effects on the dependent variable (student performance) by the SPACOVA test, the effect of treatment in the experimental study was determined by comparing between-subject groups (control and experimental) and within-subject measurements (pretest and posttest) together in the SPACOVA to obtain the interaction effect (or treatment effect). A significant result in the Multivariate Pillai’s Trace test shows significant

<table>
<thead>
<tr>
<th>Table 2. Sociodemographic of Control and Experimental Groups.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sociodemographic variable</td>
</tr>
<tr>
<td>----------------------------</td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Age (years old)</td>
</tr>
<tr>
<td>20</td>
</tr>
<tr>
<td>21</td>
</tr>
<tr>
<td>22</td>
</tr>
<tr>
<td>23</td>
</tr>
<tr>
<td>Years of studying English as a second language</td>
</tr>
<tr>
<td>13</td>
</tr>
<tr>
<td>14</td>
</tr>
<tr>
<td>15</td>
</tr>
<tr>
<td>16</td>
</tr>
</tbody>
</table>

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The effect of the SW-PAL on ESL students’ performance in summary writing is indicated in Table 4. The results in Table 4 showed that the pretest and posttest mean scores for the experimental group were 10.33 and 13.06, respectively, indicating an increase in the mean score. The pretest and posttest mean scores for the control group were 9.52 and 10.84, respectively, also indicating an increase in the mean score. However, the difference of mean scores between the pretest and posttest scores for the experimental group (2.73) was more than 2 times larger than the difference of mean scores between the pretest and posttest improvement scores for the control group (1.32), and the difference was significant, $F(1, 48) = 34.10, p < .001$, with a large effect size ($\eta^2 = .42$). The profile plot of the experimental group in Figure 8 clearly indicates that the treatment (SW-PAL) in the experimental group had a positive effect on the students’ performance in summary writing when compared with the control group.

Table 3. Analysis of Effect of Covariance on Sociodemographic Variables as Covariate.

<table>
<thead>
<tr>
<th>Effect</th>
<th>Multivariate test value</th>
<th>$F(df1 = 1, df2 = 48)$</th>
<th>$p$</th>
<th>Partial $\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance x Gender</td>
<td>.09</td>
<td>4.97</td>
<td>.030*</td>
<td>.09</td>
</tr>
<tr>
<td>Performance x Age</td>
<td>.01</td>
<td>0.44</td>
<td>.512</td>
<td>.01</td>
</tr>
<tr>
<td>Performance x Years of Studying English as a Second Language</td>
<td>.02</td>
<td>0.78</td>
<td>.382</td>
<td>.02</td>
</tr>
</tbody>
</table>

Note. *Significant at .05.

Table 4. Results of SPACOVA for Effectiveness of the SW-PAL on English as a Second Language Students’ Performance in Summary Writing.

<table>
<thead>
<tr>
<th>Between-subject (group)</th>
<th>Within-subject</th>
<th>$M$</th>
<th>Standard error</th>
<th>Mean difference</th>
<th>$df1, df2$</th>
<th>$F$</th>
<th>$p$</th>
<th>Effect size (partial eta squared $\eta^2$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Pretest</td>
<td></td>
<td>9.52</td>
<td>.36</td>
<td>1.32</td>
<td>1, 48</td>
<td>34.10</td>
<td>.000**</td>
<td>.42 (large effect)</td>
</tr>
<tr>
<td>Control Posttest</td>
<td></td>
<td>10.84</td>
<td>.31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental Pretest</td>
<td></td>
<td>10.33</td>
<td>.35</td>
<td>2.73</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental Posttest</td>
<td></td>
<td>13.06</td>
<td>.31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Effect size ($\eta^2$): small = .01, moderate = .06, and large = .14 (Cohen, 1988); covariates appearing in the model are evaluated at the following values: gender = 1.75, age = 20.19 years, and years of studying English as a second language = 14.21.

**Significant at $p < .001$.**

The results in Table 4 showed that the pretest and posttest mean scores for the experimental group were 10.33 and 13.06, respectively, indicating an increase in the mean score. The pretest and posttest mean scores for the control group were 9.52 and 10.84, respectively, also indicating an increase in the mean score. However, the difference of mean scores between the pretest and posttest scores for the experimental group (2.73) was more than 2 times larger than the difference of mean scores between the pretest and posttest improvement scores for the control group (1.32), and the difference was significant, $F(1, 48) = 34.10, p < .001$, with a large effect size ($\eta^2 = .42$). The profile plot of the experimental group in Figure 8 clearly indicates that the treatment (SW-PAL) in the experimental group had a positive effect on the students’ performance in summary writing when compared with the control group.
The results indicated that there was a significant difference in the students’ summary writing improvement between experimental and control groups, with the experimental group improving more. Therefore, the hypothesis was accepted. The experimental group achieved better summary writing improvement and performance than the control group with a large effect size ($\eta_p^2 = .42$). The results also showed that the treatment (SW-PAL) in the experimental group significantly enhanced the students’ performance in summary writing compared with the conventional approach.

**Students’ Perceptions Toward the Use of SW-PAL**

The second category of analysis was conducted to answer Research Question 2, which concerned the students’ perceptions about the SW-PAL tool. The students’ overall perceptions of their learning experiences using the SW-PAL were collected via semistructured focus-group interviews, which consisted of three open-ended questions (see Appendix B). For the first question, asking the
students to describe their SW-PAL learning experiences in terms of differences and uniqueness, the interview data revealed three categories, namely, (a) motivation, (b) challenge, and (c) self-learning. Examples of the students’ responses which correspond to the categories are as follows:

Motivation. SW-PAL was regarded as an online tool, which motivated the students to use it to improve their summary writing. A student responded that using SW-PAL made him interested in using it to improve his summary writing skills.

S1: I was very interested in knowing how the SW-PAL works and how it can help me to summarize texts online. It can help me to improve my summarizing skills.

Two students stated that they were enthusiastic in using the online tool because of its novelty and hands-on approach to learn summary writing.

S2: It’s good to try something new like the SW-PAL which is different from the lecture method. It’s interesting to explore new ways of learning.
S3: I’m more of a hands-on person. I learn better by doing it rather than from lectures. I will know what works and what doesn’t.

Another student reported that his past experiences in learning about summary writing focused only on paraphrasing, and he was keen to use the SW-PAL tool because he was able to learn various types of summarizing skills.

S4: I used to summarize by paraphrasing sentences in the text. Now I know that from the worked examples, there are many types of summarizing strategies beside paraphrasing. So, the next time I will use these other types in my summary writing tasks.
S5: Since this is the first time I am doing summary writing on the computer which is different from the normal class method, I find there are a lot of new things to learn about summary writing.

Challenge. The students found that drawing concept maps was a challenging task, which would provide them an overall picture of the text and the organization of the text in terms of major and minor points. Most of the students reported that the difficult part of using the SW-PAL was doing the concept map as a presummarizing activity because it was either a new thing to them or they lacked experience using it. With more attempts at concept mapping, some found this task to be less demanding and understood how the text were organized.

S1: This concept mapping is something new to me. I have to read the texts a couple of times before I can map out the main points and sub ideas. Eventually this helps me to see how the texts are organized.
S2: I lack experience in drawing concept maps. The lecturer's examples gave me a better picture of concept mapping. It was difficult at first but I still had to work on it by referring to the examples given.

S3: It was tough for me initially to do concept mapping. Through trial and error and persistence I manage to determine whether there is a topic sentence and the supporting details. And also how the details are related and organized accordingly.

S4: I’ve done concept mapping in my studies, but it takes time and effort to create concept maps for reading texts. Made a few mistakes here and there and finally manage to map out the major and minor ideas by doing it several times. It comes with practice and there is no fixed way in doing it.

S5: Concept mapping is something I learned before in school during my history lessons and essay writing. This time I have to do it based on reading texts for summary which is new to me. Challenging and interesting.

Self-learning. The interviewees considered SW-PAL a useful summary writing online tool for self-learning. The students stated that by using the worked examples and feedback features, they could use the system to learn summary writing on their own. Some students highlighted the accessibility of SW-PAL because they were able to use it at any time and any place.

S1: I like this online tool. The worked examples are useful and helpful. I can use them to help me summarize texts at my own time and elsewhere.

S2: By using the worked examples and feedback, I can use the system to learn summary writing on my own.

S3: I can see what summarizing strategies are used in the worked examples and then test whether I can use the same types of strategies by myself for other texts.

S4: When I fully understand the functions of the online system, I will use this tool as a guide and reference to summarize other texts.

S5: The tool allows me to use it at my own pace and when I am free. But in class I can ask my lecturer or friends when I don’t understand certain things in the system.

With regard to the second interview question, about beneficial features of SW-PAL, the students highlighted the worked examples and feedback.

S1: The worked examples show me the types of strategies used. I try to understand how and why they are used. They help me to remember the strategies.

S2: I prefer the worked examples and feedback because they enhance my knowledge of summarizing strategies.

S3: Worked examples are useful for me. I can understand how to summarize based on them. The feedback can let me check my summarizing strategies.

S4: The feedback helps me check my work. The lecturer can also check students' summaries from the feedback.
S5: I think the beneficial features are the worked examples and feedback because I know what the summarizing strategies are and can check my summary.

For the third interview question, about what areas or aspects of the SW-PAL tool could be improved, the students indicated that the feedback system, system interface, learning materials, and extra features all had room for improvement.

S1: I need an intelligent feedback system that can provide me instant feedback on whether I’m using the correct summarizing strategies.

S2: When I explore the concept mapping, worked examples, and feedback components, I need to click the tool functions separately. It would be good if the functions can be combined into a single system interface to make it more convenient for us to use the tool.

S3: We need more reading texts and worked examples to practice drawing the concept maps and use the different types of summarizing strategies.

S4: There should be a highlighting function to make it easy for me to draft my summary. I mean highlighting the main and minor points in the texts.

S5: I wish the tool can have more interactive and animation features to make it more attractive and interesting for the students.

Overall, the qualitative results indicated that SW-PAL was viewed positively as a useful interactive online tool for summary writing. The SW-PAL tool holds potential as an instructional and learning summary writing device with improvements and adds-on to its functions and features.

Discussions

The findings of this study indicate that students in the experimental group made significantly better improvements in summary writing, compared with the control group. This significant difference provides good evidence that the SW-PAL was able to support the students’ poststudy activities just as well as conventional supplemental learning. Moreover, the qualitative data on the students’ perception of the usefulness of SW-PAL as a motivating, challenging, and self-learning tool lend further support to the effectiveness of SW-PAL for the teaching and learning of summary writing.

The findings of this study concur with the those of the studies by Wade-Stein and Kintsch (2004), Franzke et al. (2005), Wang et al. (2013), Chiu (2015), and Jeong (2017) in that using this CALL tool (SW-PAL) brought about significant improvement in language learning compared with conventional approaches. Specifically, the findings were also consistent with the findings of Wade-Stein and Kintsch (2004), and Franzke et al. (2005) that CALL tools facilitated the performance of students in summary writing. The effectiveness of SW-PAL may be attributed to its features of concept mapping, worked examples, and feedback.
The application of concept mapping had a direct influence on the students’ summary writing ability. This aligns with other studies that have also shown that using concept mapping activates prior knowledge and enables combining existing knowledge with new information for constructing new language knowledge and learning experiences (Chang, Sung, & Chen, 2002; Liu, Chen, & Chang, 2010; Rosmalen et al., 2013; Sung et al., 2016; Yang, 2015).

The outcome of concept mapping in this study conformed to past research that showed that concept mapping prior to summarizing not only improves reading comprehension skills but also benefits other linguistic skills related to comprehension, such as text summarization skills (Chang et al., 2002). This is due to the similarity between the processes of reading comprehension and summarization. According to Brown and Day (1983), there is an overlap between reading comprehension and summarization in that concept mapping involves the identification of major ideas (key words and phrases), connection and organization of these concepts using relation links, and finally presentation of the major framework of the text. Because of their common processes, concept mapping strategy may effectively transfer to text summarization skills that are closely related to comprehension (Chang et al., 2002).

Next, the feedback shows that there was no single strategy that was the best for helping all students to summarize a text. The feedback assistance was most effective when it showed the use of a combination of strategies or a variety of strategies in the process of summarizing a text. Consequently, when a student’s set of strategies matched or were similar to those given in the feedback, he or she became less specific with the feedback’s assistance. When the student started to struggle, he or she relied more on the feedback until he or she started to make progress again. In short, the scaffolding provided by the SW-PAL in the form of feedback assistance was most effective when the support matched the needs of the students (i.e., in terms of the choice of summarizing strategies) in summarizing a text.

The findings of the study also support the theory of constructivism which underpins the online tool (SW-PAL) for summary writing. The SW-PAL provided a student-centered learning environment which promoted active learning. Throughout the process of summary writing using the SW-PAL tool, the students remained active learners: They noted the elements or features in the SW-PAL, related their prior knowledge with the textual information through concept mapping, modeled the use of appropriate summarizing strategies from the worked examples, and modified their use of the summarizing strategies based on the feedback given. The students were constantly building new experiences and knowledge as they actively engaged with the online summarizing tool.

The most notable finding of this study was the role worked examples played in stimulating the students’ summary writing ability in SW-PAL. The experimental group using SW-PAL performed better as the result of using the worked examples tool, as worked examples were not used in the control group. The worked examples were not simply someone else’s completed
summary, but rather the tool led the students through summarizing strategies, modeling the process and giving them a strong formula to use in summary writing. The outcomes of the application of worked examples are in agreement with the findings reported by Kyun et al. (2013), which signified that the worked example instructional approach is effective in ill-defined domain such as summary writing and essay writing. The domain in our study is summary writing, whereas in Kyun’s study, it was essay writing.

The affordance of SW-PAL was obvious in terms of the students’ perception about SW-PAL. The students’ view that SW-PAL was a motivating and challenging online summarizing tool for self-study is indicative of the known benefits of asynchronous interactive environment for improving student–content interaction in terms of providing students time to think and allowing them to progress at their own pace and to use it outside the class (Yilmaz & Karaoglan Yilmaz, 2018; Yilmaz & Keser, 2017).

**Limitations and Suggestions for Future Studies**

The present study has several limitations. First, the sample size of 53 subjects is too small to generalize the effectiveness of the SW-PAL to other populations. Second, the subjects were ESL learners majoring in computer science at a university. Their English proficiency level was considered average for freshmen of Malaysian universities. The findings of this study regarding the effects of the SW-PAL can be generalized only to ESL populations with similar characteristics and cannot necessarily be generalized to other ESL populations, such as young ESL learners or college students with lower or higher English proficiency. Finally, the research results might not be valid and reliable enough because the duration of the experiment was for only 5 weeks; this could well be too short a period and needs a longer test. In this study, the students used SW-PAL for 3 weeks, following induction training. The novelty effect (aka Hawthorne Effect) may have played some role in elevating the experimental group results.

Moreover, the findings of this study need to be interpreted with caution in terms of the prolonged engagement of the experimental group. Several avenues exist for future research and improvement of the SW-PAL tool. We may examine the extent to which ESL students with different levels of language proficiency benefit from SW-PAL in their summary writing. Next, the effect of each component (concept mapping, worked example, and scaffolding) can be measured individually to determine the most effective in summary writing performance. For future development, the present SW-PAL can be enhanced by providing intelligent feedback to benefit more students who are struggling with writing. The feedback in the present SW-PAL tool neither identifies errors made by users nor corrects them accordingly. Hence, if intelligent feedback can be generated for students to correct mistake made in summary writing, learning the skills of summary writing can be more effective.
Future studies should include nonexpository texts and investigate the effects of tools similar to SW-PAL on the students’ summary of expository and non-expository texts to provide more insights into its efficacy on texts with different rhetorical organizations. Furthermore, the future studies could explore the five aspects of the summary writing rubrics to measure which aspects of the students’ summaries have been improved.

**Conclusion**

Summary writing has been recognized by numerous scholars as a vital skill, which not only builds the background knowledge of learners but also improves their overall writing outcomes, but there are very few theory-based online learning tools for summary writing. In view of this, abundantly rooted in several learning and education theories, SW-PAL was developed by the researchers to assist ESL non-English majors in improving their summary writing skills. The results of this study revealed that the theory-based online summary writing tool (SW-PAL) facilitated and enhanced the summary writing performance of ESL learners. Moreover, students had a favorable attitude toward the use of SW-PAL, albeit initial apprehensions about the novelty in the use of concept mapping prior to summary writing. Based on the findings and discussion of this study, the researchers offer the following recommendations for practice for language instructors who wish to incorporate such a tool into their language instruction:

1. Summary writing should be thought of as a process, with steps, strategies, and choices to make about the process. The use of technology, such as SW-PAL in this study, to assist summary writing should lead students through this process.
2. L2 summary writing can produce a high cognitive load because students need to understand the source text, reach conclusions about the content, and then shorten and reword the text. The use of technology to assist summary writing should facilitate each of these steps.
3. Concept mapping should be seen as an advanced technique, most appropriate to more students with higher ability, and possibly for summarizing longer texts.
4. Scaffolding in CALL applications can be provided in the form of feedback assistance in performing a task. It is most effective when the support is matched to the students’ needs in undertaking a task. This puts them in a position to achieve success in a task that they would previously not have been able to do without assistance.
5. Computer-assisted summary writing should be incorporated in the curriculum in tertiary institutions to encourage and promote independent learning and blended learning.
### Appendix A

**Table A1.** Grading Rubric for Summaries.

<table>
<thead>
<tr>
<th>Levels/criteria</th>
<th>Needs to improve 1</th>
<th>Adequate 2</th>
<th>Proficient 3</th>
<th>Exemplary 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Main ideas: Captures only the main ideas of original text</td>
<td>Does not restate main ideas or vaguely covers main ideas</td>
<td>Some main ideas are restated and incomplete grasp of main ideas</td>
<td>Most main ideas are restated and fairly good grasp of main ideas</td>
<td>Completely restates only main ideas and obviously has clear grasp of main ideas</td>
</tr>
<tr>
<td>ii. Accurate: Reflects meaning without distorting or slanting information.</td>
<td>Obviously distorted or inaccuracies of the original information</td>
<td>Some distortion or inaccuracies of the original information</td>
<td>Only slight slanting or minor inaccuracy of the original information</td>
<td>Objectively and accurately presented information</td>
</tr>
<tr>
<td>iii. Words and style: Written in own words and sentence structure</td>
<td>Obviously same words/phrases and sentence structure as original. Four or more grammar and punctuation errors or very awkward</td>
<td>Many of the same words/phrases and similarities in sentence structure as original. No more than three errors in grammar and punctuation or somewhat awkward</td>
<td>Mostly in own words/phrases and sentence structure. No more than two minor errors in grammar and punctuation (no comma splices, run-ons, or fragments) or slightly awkward</td>
<td>All in own words/phrases (except brief subject or factual words) and sentence structure. No grammatical or punctuation errors and natural style</td>
</tr>
<tr>
<td>iv. Concisely organized: Omits unnecessary details from original text and is well organized</td>
<td>Includes too many unnecessary details or very wordy or information seems randomly placed and disjointed</td>
<td>Includes some unnecessary details or some wordiness or information is only somewhat organized and hard to follow or choppy</td>
<td>May include only a couple of unnecessary details and slightly wordy but information is arranged in an orderly and logical manner</td>
<td>Concisely worded has no unnecessary details and information is well organized and easy to read with transitions</td>
</tr>
<tr>
<td>v. Length: Between 1/4 and 1/3 the length of the original text</td>
<td>Not a summary and about same length as original or much less than 1/4 (15% or less) of original</td>
<td>Summary is longer than 1/2 of original or less than 1/4 (16%–20%) of original</td>
<td>Summary is between 1/3 and 1/2 the length of original or less than 1/4 (21%–24%) of original</td>
<td>Summary is appropriate length—between 1/4 and 1/3 of original</td>
</tr>
</tbody>
</table>
Appendix B

Semi-structured Focus-Group Interview

(1) Please describe your own learning experiences in terms of the differences/uniqueness by using the SW-PAL.
(2) Which features of the SW-PAL tool are beneficial to you in enhancing your summary writing skills?
(3) What areas or aspects of the SW-PAL tool could be improved?

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