ESL Learners' Use Of Learning Management System Features And Metacognitive Online Reading Strategies

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ABSTRACT

The objective of this study is to investigate the use of available features in a Learning Management System (LMS) and the metacognitive online reading strategies of adult learners of an English as a Second Language (ESL) course in Universiti Teknologi MARA (UiTM), Malaysia. A survey adapted from Online Survey of Reading Strategies (OSORS) developed by Anderson (2003) was used to gather information of 157 adult learners in semesters one and two. The survey is divided into three parts: Learners' background, learner use of available features of an LMS and learners' metacognitive online reading strategies. The survey revealed that these adult learners usually log into the LMS during their working hours at the office. The learners mostly used global reading strategies followed by problem-solving strategies and support reading strategies. Independent t-test reveals that there is no significant difference between semester one and semester two students in using global reading strategies, problem-solving strategies and support reading strategies. Based upon the results illustrated in this study, it can be concluded that the learners have learning goals and purpose since they used mainly global reading strategies, but they do not effectively utilize online learning tools and features that are available in the LMS.

Keywords: metacognitive online reading strategies, ESL reading online, adult learners, Learning Management System (LMS)

INTRODUCTION

Learning Management System (LMS) is an option for any online course that allows the administrators of an institution to manage and monitor learners, teachers and content of courses. With the Internet, online learning is a possibility for distant learners. Therefore, learning a language online has become more complex as learners share and build knowledge at any remote locations (Anderson & Shakarmi, 2013; Felix, 2002; Chapelle, 2001; Hajhasemi, Levy, 1997; Warschauer, 1996; Wyatt, 1984). Though the learners may be at a distance, they log into the LMS and use online tools like email, chat, quizzes, and forums to communicate. Kaplan-Leiserson (2000) defines LMS as a,

…software that automates the administration of training. The LMS registers users, tracks courses in a catalog, records data from learners; and provides reports to management. An LMS is typically designed to handle courses by multiple publishers and providers. It usually doesn't include its own authoring capabilities; instead, it focuses on managing courses created by a variety of other sources.

Another definition that describes the role of LMS as a learning platform is provided by Paulsen (2003, p.30). He explains LMS as,

…a broad term that is used for a wide range of systems that organize and provide access to online learning services for students, teachers, and administrators. These services usually include access control, provision of learning content, communication tools, and administration of user groups.

The roles and functions of LMS that allow ease of use in terms of the management of learners, instructors, and learning content as well assessment provide the technological solutions for educational institutions that offer online learning (Borboa et al., 2017; Rhode et al., 2017) However, the development and design of LMS that serves as a learning platform to support learning still need to be refined depending on the needs of the institution and the learners themselves. Most institutions or organizations often overlook pedagogical considerations. Walker et al. (2016) suggest that the features of an LMS that bring the most positive impact to the students should be maximized. This consideration is crucial in implementing any online course via LMS.

For instructors, the LMS presents pedagogical implications, while, for most online learners, LMS offers a means of social networking and sharing of information. In online language learning, the learners can learn autonomously and interact constantly with peers and facilitators using features available in the LMS. Thus, LMS supports the negotiation of meaning and construct personal interpretations of information through online interactions (Felix, 2002; Hsiu-Mei, 2002). Many research studies investigated reading in English as a Second Language (ESL) in an online environment (Shang, 2018; Ahmadian & Pasand, 2017; Darwish, 2017; Jusoh & Abdullah, 2015; Anderson, 2003; Coiro, 2003; Chapelle, 2001; Singhal, 2001).

Reading is essentially a cognitive activity between text and the reader, however, for an online language learner, the reading process has become a 'social' activity in an online learning environment. Learners may utilize online features like a forum to discuss text reading with other learners or autonomously other websites surfing to gain more information on what has been read. Though an LMS may provide the tools and features to the learning process, lack of understanding of the background and cognitive strategies of these autonomous learners in an LMS environment may impede learning, particularly in English as a Second Language (ESL) reading.

STATEMENT OF THE PROBLEM

A number of researchers have investigated the distance online learning program at UiTM. Recent researches on these adult distance learners of UiTM online learning programs indicated their preferences to the traditional face-to-face classes (Osman et al. 2018; Nor Hapiza Mohd Ariffin et

al, 2014; Rugayah Hashim, Hashim Ahmad & Che Zainab Abdullah, 2009; Nor Aziah Alias & Haziah Jamaludin, 2005). A survey revealed that these learners were anxious and unfamiliar with the customized features in the university LMS. Thus, using the LMS proved to be an intimidating task despite the high level of computer literacy among the students (Nor Hapiza Mohd Ariffin et al 2014; Mohd Nor Hajar Hasrol Jono et al 2009; Rugayah Hashim, Hashim Ahmad & Che Zainab Abdullah, 2009). This contradictory finding suggested more investigation should be done on the learners as well as the LMS itself. Moreover, the dependency on instructors reveals the learners were not equipped with learning strategies that required them to be autonomous. Merriam (2004) advocates that for adult learners to be successful in their learning they need to be self-directed and have the capability to monitor their own learning. However, Nor Aziah Alias and Haziah Jamaludin (2005) found from a study of three local universities, including UiTM offered distance online learning to adults, these learners lack the metacognitive skills that were essential for self-monitoring and regulating their learning. Lee and Mimi (2017) also stressed the role of metacognitive strategies as part of self-regulating learning which is important for distance online learners to plan and manage their learning tasks. As O'Malley and Chamot (1990) mention that this self-monitoring and evaluating skills or metacognitive strategies ensure the learners stay on the right path of learning.

The LMS of UiTM contains features that are state-of-the-art. However, the learners fail to take advantage of these features to help them learn (Norshima Humaidi et al. 2013; Rugayah Hashim, Hashim Ahmad & Che Zainab Abdullah, 2009). Thus, this research seeks to determine the use of of UiTM LMS in the context of the learners' online metacognitive strategies.

OBJECTIVE OF THE STUDY

The objective of the present study is to investigate the use of available features in an LMS and the metacognitive online reading strategies of adult learners of an ESL course of Universiti Teknologi MARA (UiTM), Malaysia.

As such, the research questions are as follows,

1. What is the overall metacognitive online reading strategy employed by the adult learners?
2. Is there a significant correlation among the online reading strategies employed by the adult learners?
3. Is there a significant difference between the two groups (semester 1 and 2) of adult learners in using metacognitive online reading strategies?
4. Is there a significant difference between age and strategy employed by the adult learners?
5. Is there a significant association between the frequency of log into i-Class and the strategy employed by the adult learners?

REVIEW OF RELATED LITERATURE

Language Learning in Online Learning Strategies

Success in learning a language depends on the use of learning strategies employed by learners in any setting (i.e. face-to-face classroom, at home or online). Language learning requires active self-direction on the part of the learners; they cannot be spoon-fed if they desire and expect to reach an acceptable level of competence. The ability to read efficiently in the targeted language is a required skill. The reading process, however, involves complex cognitive processes. Research in English as a second language (ESL) learning indicates that reading skill is crucial because primarily through reading the learner can improve linguistic abilities and learn the structure of the language (Nuttall, 1996). Nevertheless, to achieve comprehension in reading, it is not merely deciphering words and symbols. Successful learners need to apply appropriate reading strategies.

In second language (L2) reading, the strategy or ability to monitor and adapt his reading skills during a reading task is the determining factor to successful reading. Reading strategy researchers such as Anderson (2002) as well as Mokhtary and Sheorey (2002) also emphasize the use of metacognitive skills in L2 reading. In further research on ESL metacognitive skills, they indicate that inculcating awareness and giving training of metacognitive strategies to learners are integral aspects in ESL reading classrooms (Cohen, 2003; Cook, 2001; Carrell, 1998).

In the present context, with the advent of computers and the Internet, online language learning enters a new realm, a new learning environment. Learning a language online has become more complex as learners share and gain knowledge at any remote locations (Felix, 2002; Chapelle, 2001; Levy, 1997; Warschauer, 1996; Wyatt, 1984). Though the learners may be at a distance, they log in to the LMS and use online tools like email, chat, quizzes and forums to communicate. For these online learners, LMS is also a means of social networking and sharing of information. Numerous researchers investigate in particular ESL reading in an online environment (Darwish, 2017; Jarvis, 2012; Reinders & White 2011; Anderson, 2003; Chapelle, 2001). From the socio-constructivist point of view, a person's learning is shaped through his interactions with the people and environment that surrounds him (Vygotsky, 1997).

Jarvis (2012) conducted a study to examine the practices and perceptions of non-native English speaker adult learners (Thai and Arab) who were working on computer-based materials in their own countries. He employed both qualitative and quantitative techniques to gather data. In his report, he established the idea that the ability to access unlimited information or reading resources in English on the Internet has proven problematic to these L2 learners. Darwish (2017) elaborated that learners face difficulty in transferring reading skills and strategies on printed media into an online learning environment. Furthermore, Reinders and White (2011) commented that having access to unlimited access to information online without instructors' guidance could restrict autonomy for language learners.

Overview of the Reading Process and Metacognitive Strategies

The reading process is viewed as a complex mental process of deciphering letters on text. This process, however, is largely dependent on the readers' prior knowledge. This knowledge is constructed by their perception of the world (Nuttall, 1996; Carrell, Devine & Eskey, 1988). Thus, comprehension of text is achieved, once the information that he perceives on the text connects with his prior or background knowledge (Nuttall, 1996; Bernhardt, 1991). This process is an intrapersonal problem-solving task where the reader processes the text and interprets the data received in his mental structures (Bernhardt, 1991). Reading effectively requires the reader to interpret or to decode the message or the purpose of the text being presented (Nuttall, 1996). What the writer intends to convey should be interpreted by the reader so that comprehension is achieved. Hence, the ability to read effectively requires effort from the reader in making mental connections between text and his existing knowledge.

A reader achieves comprehension based on the stimulus he gains from the reading material and also the interaction with his background knowledge. This schematic process allows the reader to make his interpretation of the text (Nuttall, 1996). Anderson and Pearson (1984) describe this mental process as the interaction with the reader's schemata, which is regarded as old knowledge interacting with new knowledge in a text (Anderson & Pearson, 1984; Carrell, Devine & Eskey, 1988). When the reader manages to find the link or a place for this new information, comprehension is achieved. Schema theory is the basis for the three reading models: top-down model, bottom-up model and interactive model (Nuttall, 1996). The "Top-down" reading model describes that the reader uses his experiences or knowledge of the world and brings it to the text. On the other hand, when the reader builds up his interpretation of the text by recognizing the letters, words and sentences, he is applying the "bottom-up" reading model. However, these two processes are not exclusive from one another. Most of the time, the reader consciously or subconsciously switches from one process to another and back again. Swaffar, Arens and Byrnes (1991) further describe that fluent readers utilize the three reading models interactively and effectively. Therefore, it is the schemata of pre-existing culture, experience and knowledge that differentiate between L1 and L2 readers (Grabe, 1991).

On the other hand, activating the right schema is not the only factor in successful reading. Readers have to apply appropriate reading strategies to help them achieve comprehension. Reading strategies are unconscious or at certain conditions deliberate actions done by the reader to achieve a desired reading task (Carrell, 1998). Even more importantly, having metacognitive skills is critical in the reading process (Grabe, 1991; Swaffar, Arens & Byrnes 1991). Grabe (1991) identifies metacognitive knowledge and monitoring skills as one of reading components of fluent L2 readers. He highlights the fact that fluent readers use their metacognitive skills more effectively compared to less fluent readers.

In relation to language learning, research studies have begun to focus on metacognitive skills (Ahmadian & Pasand 2017; Darwish 2017; Rajab 2017; Jusoh & Abdullah 2015). Flavell (1979) describes metacognitive strategy as a mechanism that helps learners to monitor and regulate learning. This strategy is perceived as a higher-order cognitive skill due to its role in overseeing other cognitive skills (Flavell, 1979). O'Malley and Chamot (1990, p. 44) define metacognitive

strategies as, '...higher-order executive skills that may entail planning for, monitoring or evaluating the success of learning activity'. To be able to manage and monitor own learning is the determining factor in the success of learning. In L2 learning, metacognitive skills are even more crucial. As Anderson (2002) maintains that, 'Understanding and controlling cognitive processes may be one of the most essential skills that classroom teachers can help second language learners develop.' For ESL learners, to able to make the distinction between effective and ineffective learning strategy proved to be beneficial. Through metacognitive skills, L2 learners are able to develop improve their learning skills (Anderson, 2002; Grabe, 1991). In L2 learning, Krashen (1988, 1987) also argues that this ability to edit linguistic output in a communicative setting is vital. The success of an L2 learner is profoundly affected by his ability to monitor or edit his own learning process (Krashen, 1988, 1987). Having metacognitive skills, therefore, proved to be ubiquitous in L2 reading.

Previous studies on Learning Management System

In recent years, there has been an increasing amount of literature on the use of LMSs. An indication of the effectiveness of the design and use of the LMS is related to the usage of features in LMS. Nevertheless, not much is known about the extent of the features of LMS that are used in an educational setting (Borbia et al. 2017; Rhode et al., 2017; Walker et al, 2016; Palmer & Holt, 2009; Watson & Watson, 2007 Phillips, 2006). Phillips (2006) found that LMS providers such as WebCT claim that the features are learner-centered. A summary of five findings from various researchers is discussed in the context of education.

Firstly, a study conducted by Dang and Robertson (2010) investigated the impacts of LMS on learners' autonomy in EFL learning. Interview data were gained from 4 undergraduates of a Vietnamese university. Analysis of the interviews reveals that learners' online habits did not have any influence on online learning engagement on the LMS. This means those who frequently used the internet for social reasons were those who frequently logged into the LMS. The most important finding of this study is the fact that learners logged into the LMS because of social factors rather than academic factors. Thus, EFL educators should take advantage of students' social online habits for academic purposes and employ effective facilitation to keep them engaged in online conversations. However, educators should avoid dominating these online conversations to encourage learner autonomy and capitalize on the functions of an LMS.

In addition, a local study was conducted by Ahmad Fauzi Mohd Ayub et al. (2010) on Universiti Putra Malaysia (UPM) LMS. They investigated the factors that influence 215 science learners in using the Portal of Learning Calculus (POLCA) of UPM. The factors studied are technology competencies of learners, the role of instructors, accessibility and learners' attitude. The mean value shows that learners with a good level of computer competencies were those who used POLCA. This finding echoes Guglielmino and Guglielmino's (2004) argument that being technically savvy is important for online learners. However, besides being technically competent, they claim that self-directedness is even more crucial in a successful online learning environment. Another significant finding of this local study indicates that instructors play vital roles in making learners engaged in the portal. As a matter of fact, the study shows that there is a strong relationship between instructors' role and access to POLCA and learners' attitudes towards using the LMS.

The study suggests that further research should focus on learners' attitude since it is the most important factor in determining the effective use of LMS.

As such, Rugayah Hashim et al. (2010) investigated the level of cognitive engagement and course value among adult distance learners toward e-learning. This study was conducted on 19 UiTM online learning programs with the use of a questionnaire. The sample size for this study was 500 adult learners and the returned response was 33.8%. The results show that there was a low-level integration and motivations among the adult learners. The paper concludes that the university administration needs to ensure that the customized LMS is more user-friendly as this would enhance learners' success and reduce the rate of attrition.

In another study on UiTM LMS, Syerina Azlin Md Nasir et al. (2019) found that the quality of the instructors' feedback should be emphasized in order to foster student's critical thinking. The feedback received indicated that students in the study did not post any feedback to the questions posed by the instructor. It shows that regardless of the type of assessments being used, there are students who find that online discussion does not encourage them to be engaged in online learning. The study showed that the feedback is not part of the grading system and students do not feel obliged or interested to answer them.

Thus, studies on LMS yielded that the instructors play a significant role in making students be engaged and participate in online learning activities. The administrators of the LMS, on the other hand, need to provide the appropriate technological support for both the students and instructors for them to fully utilize the features or tools in the LMS.

METHOD

This study employed a quantitative approach and was conducted in Universiti Teknologi MARA (UiTM) campus in Shah Alam. The survey was distributed by the researcher to the learners during face-to-face seminar sessions.

The context

Universiti Teknologi MARA (UiTM) as with any other higher institutions in this country offers various online programs to adults who seek to pursue their education in a flexible mode of learning. An LMS has been developed by UiTM as a platform for adult learners to learn and interact in an online learning environment at their own pace and convenience. This LMS, known as i-Class[1] (http://iclass.uitm.edu.my/), also allows instructors to update or upload relevant information and materials regarding courses offered. Besides that, most importantly, the system acts as a social network where the learners communicate with each other via the technological support features that are available in the system as well. Institute of Education Development (InEO), UiTM, has been established to ensure the smooth running of the online learning programs offered by the university.

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[1] i-Class was initiated in July 2008 by the Institute of Education Development, UiTM, for learners of online learning programmes. The institute used the LMS framework of Open University Malaysia as the basic code to design and develop i-Class. Based on this framework, online learning features have been added on to fulfill the needs of online learning programmes of UiTM.

i-Class can only be accessed by UiTM registered learners and staff. They are given usernames and passwords upon registration. These learners and instructors can only log on to their assigned courses and programs. To connect and interact with the learners, instructors use asynchronous features of i-Class are email, discussion board, forum and bulletin board. The forum in i-Class, or *i-Discuss*, allows the instructors to post questions or instructions in order to generate a discussion thread. Learners can upload assignments and store them in *myDrawer* for future references. Learners can obtain a description of courses, syllabus and other relevant information through browsing or downloading documents in *myCourse*. In addition, they have access to support learning materials that are uploaded by their instructors such as previous examination papers, PowerPoint slides of lecturers, course modules and other relevant documents. Other support learning materials that are made available are *i-Library* that links to digital collections of e-books and e-Journals and *References* for listing related books. For the instructors, they have the access to the control panel to develop online quizzes, upload learning materials and manage the progress of the learners online. Figures 1 and 2, given below, show the main page and features available in i-Class.
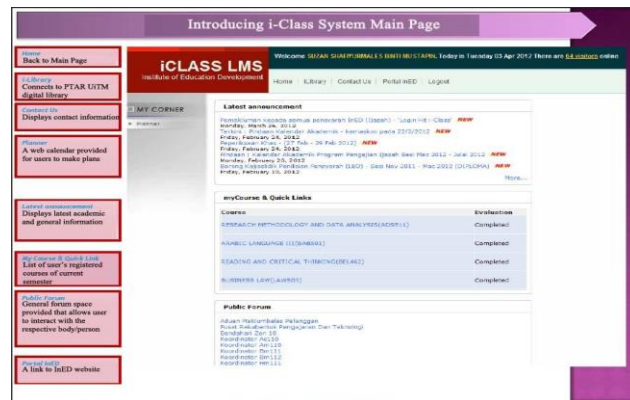

Figure 1: i-Class Main Page

Figure 2: Support Online Learning Features in i-Class

Participants

The Faculty of Public Administration in Shah Alam receives approximately 200-350 learners which is the largest number of adults enrolled in UiTM online learning program yearly These learners were selected since the learners from this faculty make up the largest group of learners compared to the other programs every year. A total of 157 learners of 229 learners, which is 68.6%, responded to the questionnaire. 92 learners out of 151 learners from semester 1 responded to the questionnaire. While 65 learners out of 78 learners from semester 2 responded to the questionnaire. The percentages of learners who answered the questionnaire are 60.9% and 83.3% respectively. The majority of the respondents are females. They make up 73.2% which is 115 out of 157 respondents. 74.5% of these respondents are in the age group of 20 – 30 years old.

The learners are a homogenous group since they go through similar courses offered by the faculty in semesters one and two. Among the compulsory courses are English as a Second Language Proficiency courses. For each course, there is a reading component that is geared towards reading for academic purposes.

Research Instrument

This research adopts Mokhtari and Sheorey (2002) survey based on the importance of metacognitive skills in L2 reading. They categorize metacognitive strategies into the following:
1. Global reading strategies - readers carefully plan their reading by using techniques such as having a purpose in mind and previewing the text.
2. Problem-Solving strategies - readers work directly with text to solve problems while reading such as adjusting the speed of reading, guessing the meaning of unknown words and rereading text.
3. Support strategies - readers use basic support mechanisms to aid reading like using a dictionary, highlighting and taking notes.

Mokhtari and Sheorey (2002) also developed an instrument called Survey of Reading Strategies (SORS), which is aimed to elicit metacognitive skills information from L2 students. The information gained from the survey is used to make the learners aware of their reading strategies and also for the teachers to prepare better reading lessons (Mokhtari & Reichard, 2002). Anderson (2002) on the other hand, classifies metacognitive reading strategies of L2 learners into five primary components:
1. preparing and planning for effective reading
2. deciding when to use particular reading strategies
3. knowing how to monitor reading strategy use
4. learning how to orchestrate various reading strategies
5. evaluating reading strategy use

With regards to online reading for the L2 learners, Anderson (2003) developed the Online Survey of Reading Strategies (OSORS). This survey adapted Mokhtari and Sheorey's (2002) categorization of metacognitive strategies for ESL learners. This survey contains 38 items (18 items on Global Strategies, 11 on Problem-Solving Strategies, and 9 items on Support Strategies).

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This survey, essentially, measures or describes the ESL learners' metacognitive reading online strategies.

However, for the purpose of the research, 3 Global Reading Strategies statements have been omitted so that the questionnaire is focused on online reading in an LMS environment. The Likert scale of the questionnaire has been changed from 1-5 to 1-4. Thus, the students will have to be decisive in their responses instead of choosing 3- which means 'I am not sure'.

Data Collection and Analysis

The data were collected from learners who were in the first and second semesters. The process of gathering data using the survey began in the middle of the semester. By the middle of the semester, the learners were familiar with the LMS system, i-Class.

For Part A, the reliability is 0.88 while Part B, the reliability is 0.94 Cronbach Alpha. The results indicate that the survey has high reliability in gauging the use of technological support features of i-Class and online reading strategies of the learners since the value for Cronbach Alpha is more than 0.6.

Part A of the questionnaire gathered the demographic of the adult learners who were involved in the study. The data obtained were semester, gender and age, occupation. Part A of the questionnaire was analyzed using descriptive statistics to give an overview of the characteristics of the selected population. This part also seeks information on learners' venue and frequency for log into i-Class, familiarity with the features of i-Class as well as the most frequently used technological support features in i-Class. Both descriptive and statistical tests (frequency and percentage) were used to analyze the data.

Part B of the questionnaire consists of a list of metacognitive online reading strategies. The respondents are required to rate on a Likert Scale (1–4) of the metacognitive strategy used during reading online. Data were analyzed using descriptive statistics, applying both graphical and numerical techniques in SPSS and Microsoft Excel programs. This research used statistical techniques such as test for normality, mean and standard deviation, coefficient of variation test (CV), correlation, independent t-test, analysis of variance (ANOVA) and Chi-Square test of independence.

To interpret the mean score of the strategy used, the study referred to Anderson (2003) and Mokhtari and Reichard (2002) scoring guide which indicates that, high use of strategy if the mean of 3.5 or higher, moderate use if the mean of 2.5 to 3.5 and low use if the mean of 2.4 or lower. The third research question used a coefficient of variation test to identify the overall strategy type used by the learners. Finally, the fourth research question, which is to determine the significant difference between the two groups of learners, an independent t-test was used.

FINDINGS

The findings are presented according to the research questions. The analysis of the questionnaire reveals the following results.

Part A of the questionnaire gathers learners' background data but most significantly it seeks to find the location and frequency of students logged into i-Class. Firstly, the analysis reveals that the majority of learners log into i-Class at the office during working hours. Semester 1 learners mostly logged into i-Class while they were at the work or office (47.8%), and followed by at home, (40.2%). Similarly, the respondents from semester 2 expressed that they logged into i-Class at the office (44.6%), followed by at home (32.3%). Secondly, both semester 1 and 2 learners, frequently logged into i-Class 1 to 3 times a week, 42.4% and 40.0% respectively.

The first research question is to determine the overall metacognitive strategy use by the adult learners. Thus, the study uses a coefficient of variation (CV) test. Table 1 illustrates the results of comparing the degree of variation means of metacognitive online reading strategy employed by the adult learners.

Table 1: Overall Metacognitive Online Reading Strategy

Strategy Types	N	Mean	Std. Deviation	CV
GLOBAL	157	52.85	8.34	15.7%
PROBLEM-SOLVING	157	29.82	5.20	17.4%
SUPPORT	157	20.82	3.56	17.2%

The smaller the value of CV, the smaller the chances of having variation of means and thus shows more stability in the data. The results show that Global Strategy has the lowest CV value (15.7%) compared to Problem-Solving Strategy (17.4%) and Support Strategy (17.2%). As far as the three strategy types are concerned, Global Strategy has more consistency in the variation of means which indicates that when reading online the learners consistently employ Global Strategy compared to the other two strategies.

The second research question is the correlation among the online reading strategies employed by the adult learners. It was found that there is a significant strong positive correlation between the 3 strategies (Global, Problem-Solving and Support). Table 2 shows the correlation among the online reading strategies employed by the adult learners

Table 2: Correlations among Global, Problem-Solving and Support strategies

		Global	Problem-Solving	Support
Correlations				
Global	Pearson Correlation	1	.878**	.865**
	Sig. (2-tailed)		.000	.000
	N	157	157	157
Problem-Solving	Pearson Correlation	.878**	1	.800**
	Sig. (2-tailed)	.000		.000
	N	157	157	157
Support	Pearson Correlation	.865**	.800**	1
	Sig. (2-tailed)	.000	.000	
	N	157	157	157
**. Correlation is significant at the 0.01 level (2-tailed).				

There is a strong positive correlation (r = 0.878) between Global and Problem-Solving strategies where p-value (0.000) is less than 0.01 level of significance. This is the highest r value which is at 0.878 compared to the other correlations. There is also a strong positive correlation (r = 0.865) between Global and Support strategies where p-value (0.000) is less than 0.01 level of significance. The correlation between Problem-Solving and Support strategies is strong and positive (r = 0.800), where p-value (0.000) is less than 0.01 level of significance. Therefore, there is a significant correlation (p-value = 0.000< 0.01) between 3 strategies.

The third research question determines whether there is a significant difference between the two groups (semester 1 and 2) of adult learners in using metacognitive online reading strategies. The T-test is administered because there may be a potential difference in strategy used in reading online when taking into account the period of time that the learners are exposed to the LMS. The hypotheses are as follows,

H_0 There is no significant difference between the two groups (semester 1 and 2) of adult learners in using metacognitive online reading strategies

H_1 There is a significant difference between the two groups (semester 1 and 2) of adult learners in using metacognitive online reading strategies

Table 3: Differences in using metacognitive online reading strategies of
semester 1 and 2 of adult learners

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig	t	df	Sig (2-tailed)
SUPPORT	Equal variances assumed	1.972	.162	.469	155	.640
	Equal variances not assumed			.483	149.942	.630
PROBLEM-SOLVING	Equal variances assumed	8.097	.005	.541	155	.589
	Equal variances not assumed			.565	153.685	.573
GLOBAL	Equal variances assumed	3.920	0.49	.001	155	.999
	Equal variances not assumed			001	152.773	.999

It is found that there is no significant difference in using the three types of metacognitive online reading strategies between semesters 1 and 2. The test reveals that the three p-values (Support Strategy 0.640, Problem-Solving Strategy 0.589, Global Strategy 0.999) are greater than 0.05 level of significance. Therefore, the null hypothesis (H_0) is not rejected. This result shows that even though semester 2 learners should have more experience in using i-Class compared to semester 1 learners, the period of time learners is exposed to the online learning environment (i.e. i-Class) did not influence the use of metacognitive strategies. This reveals the fact that although these learners come from different semesters, they employ basically similar strategies to tackle their reading online tasks since they learn within the same learning environment for both semesters.

The next research question (number 4) is to identify whether age is a factor in the use of the 3 strategies. Analysis of variance (ANOVA) was used to indicate whether there is a difference between age and strategy used by the adult learners. These were tested by H_0 and H_2 which are given by:

H_0 *There is no significant difference between age and strategy employed by the adult learners.*

H_2 *There is a significant difference between age and strategy employed by the adult learners.*

Table 4 shows the Analysis of Variance (ANOVA) for age and strategy employed by the adult learners.

Table 4: Analysis of Variance (ANOVA) for age and strategy employed by the adult learners

		Sum of Squares	df	Mean Square	F	Sig. (p-value)
GLOBAL	Between Groups	.594	3	.198	.921	.432
	Within Groups	32.895	153	.215		
	Total	33.489	156			
PROBLEM-SOLVING	Between Groups	.554	3	.185	.678	.567
	Within Groups	41.676	153	.272		
	Total	42.230	156			
SUPPORT	Between Group	.325	3	.108	.409	.747
	Within Groups	40.593	153	.265		
	Total	40.918	156			

Table 4 reveals that there is no significant difference in the age and the metacognitive strategy employed by the adult learners (Global strategy p-value = 0.432, Problem-Solving strategy p-value = 0.567 and Support strategy p-value = 0.747) since the p-values are greater than 0.05, at 5% level of significance. Hence, the null hypothesis (H_0) is not rejected.

It shows that the learners' age categories (i.e. 20-30 years old, 31-40 years old, 41-50 years old, more than 51 years old) do not influence the strategy used. However, it is important to note that 74.5% of the selected respondents were from 20–30 years old age group, followed by 31–40 years old age group at 22.3% and only 1 person more than 51 years old. This means that given the age distribution of the selected learners, this finding indicates that age may not be a determining factor when the learners use metacognitive strategies. In terms of which types of strategies (i.e. Global strategy, Problem-Solving strategy and Support strategy), Support strategy is the least likely to be influenced by age with p-value = 0.747. These findings suggest that age category would not influence the use of support features like using a dictionary, taking notes, underlining, or highlighting textual information in reading online in the LMS.

The final research question (number 5) investigates whether there is an association between the frequency of log into i-Class and strategy (Global, Problem-Solving and Support Strategy) employed by the adult learners. In the questionnaire, there are 15 statements for Global strategy, 11 statements for Problem-Solving strategy and 9 statements for Support strategy. To determine

the Chi-square value for each strategy, the values that the students rated (Likert scale 1–4) for the strategies were summed and ranged. The range of scores for each of the strategies is presented in Table 5.

Table 5: Range of scores for each strategy

	Global	Problem-Solving	Support
Median	53	30	21
Minimum	26	17	12
Maximum	72	40	28

Using the median, minimum and maximum scores, the scores were further divided into four equivalent ranges to categorize learners into those who 'never or almost never', 'only occasionally', 'usually', 'always or almost always' use the features in the LMS. Then, a Chi-square test was carried out to determine the association. The hypotheses to test the objective are given by:

H_0 *There is no association between the frequency of log into i-Class and strategy employed by the adult learners.*

H_3 *There is an association between the frequency of log into i-Class and strategy employed by the adult learners.*

Based on Table 6, 7 and 8, the overall data shows that the majority (41.4%) of learners who used Global strategy, Problem-Solving strategy and Support strategy logged into i-Class 1–3 times per week. This is followed by learners (33.1%) who log into i-Class 4–6 times. The least number of learners (25.5%) logged more than 7 times per week. None of them never logged into i-Class. The following tables illustrate this finding.

Table 6 shows that learners who used Global strategy usually logged into i-Class. Of those who logged in 4–6 times every week, 51.9% of them rated their usage of Global strategy as usual. While, learners who logged into i-Class 1–3 times per week, 49.2% of them expressed that they usually used Global strategy. 19 of 40 learners who logged into i-Class more than 7 times, (47.5%) of them also indicated that they usually used Global strategy. Furthermore, 12 of 40 learners who logged in more than 7 times indicated that they always or almost always used the strategy.

It can be concluded that the majority of learners who usually used Global strategies were those who regularly logged into i-Class between 4–6 times a week. These regular logins demonstrated the fact the learners have a clear purpose in mind when they choose to log in. Although the metacognitive strategies are for reading online, there is a strong association or link between these variables (i.e. login frequency and Global strategy use). The learners who log into i-Class frequently were the learners who would likely use Global strategy.

Table 6: Association between the frequency of log into i-Class and Global strategy

Frequency of login	Strategy Type: GLOBAL				
	Never or almost never (%)	Only occasionally (%)	Usually (%)	Always or almost always (%)	Total (%)
1- 3 times	1	26	32	6	65
	(1.5)	(40.0)	(49.2)	(9.2)	(100.0)
	(0.6)	(16.6)	(20.4)	(3.8)	(41.4)
4 - 6 times	2	15	27	8	52
	(3.8)	(28.8)	(51.9)	(15.4)	(100.0)
	(1.3)	(9.6)	(17.2)	(5.1)	(33.1)
More than 7 times	2	7	19	12	40
	(5.0)	(17.5)	(47.5)	(30.0)	(100.0)
	(1.3)	(4.5)	(12.1)	(7.6)	(25.5)
Never	0	0	0	0	0
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Total	5	48	78	26	157
	(3.2)	(30.6)	(49.7)	(16.6)	(100.0)
	(3.2)	(30.6)	(49.7)	(16.6)	(100.0)
Chi-Square = 20.225					p-value = 0.027

Furthermore, the chi-square test shows that there is a significant association between the frequency of log into i-Class and Global strategy employed by the adult learners with a chi-square value of 20.225 and p-value of 0.027 which is less than 0.05, at a 5% level of significance. Therefore, the null hypothesis (H_0) is rejected.

49.0% of the learners revealed that they used Problem-Solving strategy only occasionally. The majority (55.8%) of learners who logged into i-Class 4–6 times every week revealed that they only used Problem-Solving strategy only occasionally. 32 of 65 (49.2%) learners who logged into i-Class 1–3 times every week used the strategy only occasionally. For those who log into i-Class more than 7 times, 40.0% of them used the strategy only occasionally. In addition, out of the 40 learners who logged in more than 7 times per week, 11 (27.5%) indicated they always or almost always used the strategy.

From Table 8, it can be highlighted that those who logged in very frequently (more than 7 times) were inclined to rate Problem strategy as always or almost always. The majority may indicate that the strategy use is at occasionally only, there is an association with the level of frequency of login and the use of the strategy.

Table 8: Association between the frequency of log into i-Class
and Problem-Solving strategy

Frequency of login	Strategy Type: PROBLEM-SOLVING				
	Never or almost never (%)	Only occasionally (%)	Usually (%)	Always or almost always (%)	Total (%)
1- 3 times	11	32	14	8	65
	(16.9)	(49.2)	(21.5)	(12.3)	(100.0)
	(7.0)	(20.4)	(8.9)	(5.1)	(41.4)
4 - 6 times	4	29	11	8	52
	(7.7)	(55.8)	(21.2)	(15.4)	(100.0)
	(2.5)	(18.5)	(7.0)	(5.1)	(33.1)
More than 7 times	3	16	10	11	40
	(7.5)	(40.0)	(25.0)	(27.5)	(100.0)
	(1.9)	(10.2)	(6.4)	(7.0)	(25.5)
Never	0	0	0	0	0
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Total	18	77	35	27	157
	(11.5)	(49.0)	(22.3)	(17.2)	(100.0)
	(11.5)	(49.9)	(22.3)	(17.2)	(100.0)
Chi-Square = 7.680					p-value = 0.262

The Chi-square test indicates that there is no significant association between the frequency of log into i-Class and Problem-Solving strategy employed by the adult learners with chi-square value of Chi-Square = 7.680 and p-value = 0.262 which is greater than 0.05, at a 5% level of significance. Hence, the null hypothesis (H_0) is not rejected.

Finally, Table 9 shows the association between the frequency of log into i-Class and Support strategy.

For learners who used Support strategy, most of them (51.6%) indicated that they used the strategy only occasionally. 29 of 52 (55.8%) learners who rated Support strategy usage as only occasionally logged into i-Class 4–6 times per week. This is followed by 36 of 65 (55.4%) learners were learners who logged in 1–3 times per week and revealed that they only occasionally used Support Strategy. 16 learners of 40 learners (40%) indicated that they only occasionally used Support strategy logged into i-Class more than 7 times every week.

Table 9: Association between the frequency of log into i-Class and Support strategy

Frequency of login	Strategy Type: SUPPORT				
	Never or almost never (%)	Only occasionally (%)	Usually (%)	Always or almost always (%)	Total (%)
1- 3 times	9	36	10	10	65
	(13.8)	(55.4)	(15.4)	(15.4)	(100.0)
	(5.7)	(22.9)	(6.4)	(6.4)	(41.4)
4 - 6 times	5	29	15	3	52
	(9.6)	(55.8)	(28.8)	(5.8)	(100.0)
	(3.2)	(18.5)	(9.6)	(1.9)	(33.1)
More than 7 times	3	16	10	11	40
	(7.5)	(40.0)	(25.0)	(27.5)	(100.0)
	(1.9)	(10.2)	(6.4)	(7.0)	(25.5)
Never	0	0	0	0	0
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Total	17	81	35	24	157
	(10.8)	(51.6)	(22.3)	(15.3)	(100.0)
	(10.8)	(51.6)	(22.3)	(15.3)	(100.0)
Chi-Square = 11.935					p-value = 0.063

These results highlight the fact that Support strategy is mostly rated as only occasionally by those who log into i-Class regularly. Even though these results show Support strategy as less important or less used by the learners, there is a number of students who log into i-Class more than 7 times indicating that they always or almost always use Support strategy. Interestingly, this points out that the learners who frequently log into i-Class would regularly require and use features to assist them like printing hard copies of text or using aids such as tables, figures, or even dictionaries. With this association, there is a tendency for these learners to log into i-Class frequently and use help features that are available when they read online.

The Chi-square test shows that there is no significant association between the frequency of log into i-Class and Support strategy employed by the adult learners with a chi-square value of 11.935 and p-value = 0.063 which is greater than 0.05, at a 5% level of significance. Hence, the null hypothesis (H_0) is not rejected.

Thus, only Global strategy has a significant association with the frequency of log into i-Class with p-value = 0.027. Problem-Solving and Support strategies do not have significant associations. This statistical test shows that before they logged into the LMS, the learners would have a clear purpose in mind. These learners would employ the strategies (Global, Problem-Solving and Support strategies) based on the needs of the tasks at hand.

DISCUSSION

The results of the survey showed that the metacognitive reading strategy that these learners employed while reading online, was not determined or influenced by the learners' age or the semester of the learners. The survey reveals that the learners were mostly in their 20s in semester 1 and semester 2. From the statistical tests (t-test and ANOVA) on the significance of these variables towards the online reading strategies used, both tests indicated no significant difference. It is found that in using the three types of metacognitive online reading strategies between semester 1 and 2 there is no significant difference. The test reveals that the three p-values (Support strategy 0.640, Problem-Solving strategy 0.589, Global strategy 0.999) are greater than 0.05 level of significance. Results revealed that there is no significant difference at 0.05 level of significance in the age and the metacognitive strategy employed by the adult learners (Global strategy p-value = 0.432, Problem-Solving strategy p-value = 0.567 and Support strategy p-value = 0.747). It can be concluded that whether adult learners are in their early 20s or late 40s and whether they are in semester 1 or 2, these variables do not affect them in strategy use. Thus, more importantly, in ensuring the success in learning online and online reading is providing them with appropriate features that suit their purpose to learn or read. For system developers, in providing or designing appropriate features for reading online in an LMS, considerations whether they are from generation X or Y should not be a factor.

The survey of this study elicits data regarding the use of the LMS features by the learners as well as their metacognitive strategies in reading online. The analysis of the quantitative data reveals that strategy use was subjective to the learners themselves and the learning environment that they were engaged in. Variables such as the semester that they were in do not seem to affect their learning strategy use. What was accessible to them, in terms of learning facilities within the learning environment, determined how they planned and regulated their learning. In the case of the present study, these ESL adult learners may have the appropriate metacognitive strategies to help them read online, however, the learners were affected by the availability of features in the LMS. Statistical tests also have shown the extent the variables like age and frequency of log into i-Class influence strategy use as well as the use of features in i-Class. There is no significant difference and association between learners' age as well as the frequency of log into i-Class with learners' strategy use. Therefore, the institution needs to provide ample resources and facilities in the LMS to further engage and direct these learners. For example, links to online dictionaries and online libraries may be useful for language learners if they are made easily accessible. The usual practice is learners need to log into another system to access these features. The LMS should be a "one-stop center" for these learners. Learners of this study demonstrated that they had self-directedness and metacognitive online reading strategy awareness in achieving their learning goals, however, restricted features and learning tools in the LMS could affect their online engagement.

CONCLUSION

Hence, investigating the strategy use of the learners offers possibilities not only to the researchers, instructors but also to learners on ways to improve reading online. With such knowledge, learners can improve their reading and ultimately learn the targeted language. These language learners need language learning online support like a feature that allows them to highlight words or phrases and even take online notes while they read. Highlighting and taking notes in reading are effective metacognitive strategies. Metacognitive strategies as mentioned by previous researchers such as Cohen (2003), Anderson (2002), Mokhtari and Sheorey (2002) as well as Carrell (1989) proved to be crucial in second language learning. With effective use of the strategies, learners can regulate and monitor their learning which is even important for distant learners online. As for the instructors, such information will assist in creating a more conducive learning environment so that these distant adult learners are more engaged especially in reading online. Through investigating the learners' metacognitive skills in an LMS environment, it is hoped that the research can contribute to best practices for educators to create better learning experiences for online learners.

Therefore, designing and developing LMS for language learning requires the understanding of learner needs and characteristics. Specifically, for online reading for adult learners, it is paramount that there are support features to aid reading and to get them engaged.

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