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Smartphone-Mediated Language Learning Strategies and Learner Autonomy among Pre-university Learners in EFL Reading Context

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ABSTRACT

This study reports on a qualitative experimental research that investigated the application of smartphone-mediated language learning strategies (SMLLS) in relation to learner autonomy (LA) of pre university students in EFL reading context in Saudi Arabia. A class of 35 students who received a strategy-training programme participated in the study. The data were collected using an observational checklist and a semi-structured interview. The findings showed that smartphones assisted the learners' employment of LLS; memory strategies and social strategies were reported as highly used, followed by cognitive strategies. The learners' application of SMLLS helped impact their autonomous learning skills. Further studies are recommended.

1. INTRODUCTION

Calls for student-centred language learning approaches that contribute to learners' proficiency and motivation have been under investigations since 1970s. Out of those investigations have emerged two main interchangeable approaches; learner autonomy (LA) and language learning strategies (LLS). LA and LLS working in the field of second/foreign language learning share the learner's charge of his own language learning. In this digital century, mobile-assisted language learning (MALL) has become good avenues to support the employment of LLS and growth of LA in EFL context as learners who are exposed to EFL learning materials can utilise their smartphone features and applications and apply LLS on their own in independent learning settings to improve autonomous learning skills and thus language competence. Therefore, this study investigates the implementation of SMLLS that impact LA in EFL reading context among pre university students in Saudi Arabia.

2. LITERATURE REVIEW

Learner Autonomy, Language Learning Strategies, and Smartphones

LA, emerged first in 1980s, focuses on the idea that learners of a second/foreign language should take charge of their learning in all aspects of language learning processes (Benson, 1997; Dickinson, 1995; Holec, 1981; Little, 1991. This notion goes in line with the researchers' investigation on what strategies good learners apply in their learning of a language (O'Malley & Chamot, 1990; Oxford, 1990) because both concepts shed light on the greater enrollment of learners in the process of language learning. To explain further, LA for LLS is a goal (Oxford, 1990, 2008, Wenden, 1991). That is to say language learners claim control and responsibility over their own learning through using learning strategies can be autonomous (Bialystok, 1991; Green & Oxford, 1995; O'Malley & Chamot, 1990; Oxford, 1990; Wenden, 1991). LLS are capable to develop new learning systems that promote learners' autonomous language learning as argued by Ellis (1994), Grenfell and Macaro (2007), Mahdavi and Mehrabi (2013), McDonough (2002), and Williams and Burden (1997). Hsiao and Oxford (2002) emphasise that learning strategies are an essential factor in building LA that assist learners to acquire a high level of responsibility for their processes of language learning. Ample evidence proves the strong link between LLS and LA i.e. learning strategies are the key to achieve LA (Beach, 1994; Ellis, 1994; Holec, 1981; Hsiao & Oxford, 2002; Kumaravadivelu, 2006; Little, 1997; Macaro, 2007; Mistar, 2015; Nguyen & Gu, 2013; O'Malley & Chamot, 1990; Oxford, 1990, 2003, 2008; Su & Duo, 2010; Thanasoulas, 2000; Wenden, 1985, 1991; Williams & Burden; 1997). Hsiao and Oxford (2002) rearticulate the definitions of LA as willingness to carry out a language task involving the appropriate use of foreign/second LLS to accomplish the task. This shows the importance of LLS as prerequisites for developing LA (Kumaravadivelu, 2006). Nguyen and Gu (2013) conclude that strategy-based instruction programmes like Cognitive Academic Language Learning Approach (CALLA) have the ability to promote LA. Oxford (2008) argues that learning strategies symbolise learner autonomy (LA) in general and learning strategies in second/foreign

language assist in the promotion of LA (Hsiao, & Oxford, 2002). That is to say as the learner accepts more and more responsibility for language learning; he/she will assume both the direction and execution as part of his/her own learning (Oxford, 1990, p. 16). In summary, language learning is continuous and not limited by time, place, context, etc. and in order for learners to keep a sustainable path of language learning after formal learning settings, they need to learn how to get to knowledge, interact with others, control over their emotions. Learners also need to employ learning strategies that help on the development of their charge of language autonomous learning.

With the changing nature of young people and the wide spread of internet and smartphones and their integration in education, this study hypothesises that EFL learners who will receive a strategy instruction and employment mediated by smartphones will impact their LA in EFL reading context. Therefore, this study investigated the use of SMLLS that impact LA among Saudi pre university students in EFL reading context. Smartphones have been proved as learning tools that contribute the best of learners. Pegrum (2014) argues that smartphones can be tools for language learning by which students get access and engage with materials at any place and any time. According to Cote, Milliner, Flowers, and Ferreira (2014), mobile technology can offer students exciting possibilities in language learning.

The use of smartphones would not yield great benefits in language learning if not accompanied with a training programme on the use of LLS through smartphone features and applications, so learners can learn on their own. Theoretically, Lyddon (2016, p. 304) argues that 'with the inclusion of training on how to take advantage of them in learner training programmes, these powerful technologies should additionally lead to greater learner autonomy.' The review of literature showed a gradual role of using smartphones in the learners' empowerment to take charge of their language learning (Alzubi & Kaur (2018; Hazaea & Alzubi, 2018; Leis, Tohei, & Cooke, 2015; Bekleyen & Hayta, 2015; Purwati, 2018; Ramamuruthy & Rao 2015). However, the previous research shows that very limited studies investigated the triangle relationship between learner autonomy and language learning strategies mediated by smartphones. Therefore, the study utilises the following theoretical framework to examine the research question 'To what extent do smartphones support the employment if language learning strategies that impact learner autonomy in EFL reading context among undergraduates in Saudi Arabia?':

Language learning strategies + smartphones= learner autonomy in EFL reading context

3. METHODOLOGY

In this qualitative research design, the data were collected via an observational checklist and a semi-structured interview focusing on the participants' use of SMLLS inside and outside the classroom of reading in relation to the perspective of LA in EFL reading skills during and post the programme implementation.

Sample of the Study

The study was applied to students in preparatory year programmes in Saudi Arabia. Based on the preparatory year objectives and unlike school, students are supposed to be able to more responsible and qualified well for the university study. Homogenous purposive sampling was applied to select a reading class of 35 students who were enrolled in foundation year for two semesters before they specialise in the medical and science colleges as per the qualities shown in the following table:

Table 1: Qualities of Participants

Qualities	Participants
Educational background	High school (science stream)
English language as a foreign language	8 years at school
Age	18-20
Gender	Male
Nationality	Saudi Arabia
Mother tongue	Arabic
Foreign language	English
Level of study	First year: first semester
Smartphones	Yes

Instruments

Two qualitative instruments were employed to collect the data. An observational checklist targeted the participants' employment of SMLLS during their learning of reading skills inside and outside the classroom. A semi-structured interview was conducted to clarify the relationship between SMLLS and promotion of LA with regard to feedback on the use of affective strategies, activities, place, and time.

Observational Checklist

An observational checklist was used to observe the participants' use of smartphone features and applications and LLS both inside and outside the classroom. An observational protocol was set and included a number of steps as shown in the following table:

Table 2: Observational Protocol *(Adapted from Creswell, 2012)*

N.	Observational Steps	Current Study
1	Place	inside and outside the classroom
2	Time	anytime
3	Access	language knowledge
4	Identification of who	interventional group
5	What to observe	LLS and smartphone features and applications
6	Duration	12 weeks
7	Role determination	the EFL reading class teacher
8	Observational instruments	observational checklist

The observational checklist was initiated after the training programme and continued for 12 weeks. It included the necessary information such as student, week, day, time, place, contents, LLS being used, smartphone features and applications (camera, dictionaries, internet search engines, notes, and recorders). Two kinds of observation were conducted: direct observation inside the classroom and indirect observation outside the classroom. The direct observation was conducted inside the classroom during the class time by the teacher of the interventional group's reading class using the observational checklist. Regarding observation outside the classroom, the present study used the social network of WhatsApp as an avenue for participants to communicate and interact with peers and teacher at any time and any place to extend the reading activities. A WhatsApp group was created and named with the reading course and code (Reading-140). The observational checklist was also used to observe the participants' use of LLS outside the classroom. The teacher observed the learners' use of SMLLS outside the classroom through the WhatsApp group using the observational checklist based on the interventional group' postings of chats, interaction, tasks, assignments, etc.

Initial analysis was done using Excel programming to extract the sum of LLS and smartphone features and applications in terms of frequencies, then notes and evidence followed. It must also be noted that the used number of LLS and smartphone features and applications was session-based. Three sessions were considered per week. Each session in the classroom lasted for two hours (two times a week) as well as the outside interaction which was observed through the use of WhatsApp. The number of uses indicates that more than one participant employed LLS at the session which was considered as one use in each session in the analysis.

Semi-structured Interview

Semi-structured interviews were conducted after the interventional programme to allow researchers to have a more understandable explanation (Cohen & Grabtree, 2006). The semi-structured interview targeted the participants' use of smartphone features and applications to assist in the application of LLS inside and outside the classroom. The interviewees were asked about their utilisation of the features and applications of smartphones in learning EFL reading skills, their use inside and outside of the reading classroom, and employment to assist in the use of LLS. Participation in the semi-structured interview was voluntary. A sample of 12 students volunteered to participate in the semi-structured interview. Participants were asked to express their wish to take part in the semi-structured interview and those who agreed were requested to provide their mobiles and/or emails. Students in the interventional group were interviewed and approached during their free time in the researcher-teacher's office. The semi-structured interview was done one-to-one and lasted between 15-20 minutes. The interviewees were provided with a hard copy of a checklist including questions about the most use of smartphones, place, and time of use. The semi-structured interviews were employed and recorded using a smartphone application called Sound Recorder, so participants were asked if they would be comfortable with that. Soon after the semi-structured interviews were finished, they were transcribed and set for analysis thematically. It should be noted that the semi-structured interview went smoothly,

except for some issues including the door nocking and mobile notifications slightly disturbed the interviews. The interviewees were comfortable and relaxed to do the interview and did not have any problems using a voice recorder to record the interview. The interview was a question and an answer, in addition to some explanation provided by the interviewer to help the interviewees understand better the questions.

The use of thematic analysis was deemed useful to process the data gathered from the semi-structured interview. Based on Braun and Clark's (2006) six-component plan, themes were coded and traced in the participants' use of LLS mediated by smartphones to find themes related to them. The themes were matched with the coded variables, and the final report of results was written. The participants' participations about one topic for a week were included as one set in the analysis of data. A coding system was used for the student-participant in the semi-structured interview and WhatsApp group. SSI=1 stands for Student, Semi-structured, Interview. SWW=1 stands for Student-WhatsApp-Week. The numbers of sequences in SSI=1 and SWW=1 represent the number of each participant in SSI=1 and SWW=1.

Validity and Reliability

The observational checklist was validated by three qualified professors in the field of applied linguistics and computer-assisted language learning via email along with the study objectives. The content analysis of the experts' reviews revealed a number of issues mostly related to format in terms of reorganisation, addition, and deletion. The changes were made and the instrument was sent back in its last version and approved by the professors. In addition, the behaviours (LLS) and smartphone features and applications in the checklist were clearly identified. During the class, the teacher who had a short session of orientation and familiarity (30 minutes) about the use of the observational checklist and its particulars, had the observational checklist, made rounds inside the classroom, and ticked the students' employment of SMLLS. The outside observation was done through WhatsApp, the researcher observed the participants' use of SMLLS.

The semi-structured interview was validated through two channels: experts and pilot study. Four professors who do research in language blended learning and using technology in language learning were contacted through email. The questions of the semi-structured interview that were developed by the researcher and the research objective were sent to the professors through e-mail. In total, the professors approved the general content of the interview questions to fulfil the research objectives. Some observations and suggestions with regard to rewriting some items in a simpler and understandable way. It was also suggested that some questions be deleted as they were repetition. In the pilot study, five students other than those participating in the study were requested to sit for the semi-structured interview to check for a number of issues related to time, place, technicality, and question clarity. The sessions of the semi-structured interview lasted between 15 to 20 minutes. The interviewees managed to understand the questions, but failed to understand some points which were made understandable through the use of examples.

Strategy Use Training

Wenden (1991) and Oxford (2008) emphasise the importance of LLS strategy training and instruction in the support of LA in language learning. Therefore, a training programme was held for the participants in the interventional group to assist them in the employment of LLS mediated by smartphone features and applications appropriately. The training programme was conducted by a teacher-observer of the interventional group, who has training certificates on language learning strategies and has two publications in which he conducted two training programmes on the utilisation of smartphone features and applications in EFL reading. Strategy use training was based on Oxford's (1990) model that includes seven implementing steps of strategy use training that relates to the determination of the learners' needs and resources, assignment of the strategies, consideration of the advantages hoped from the training and motivation aspects, preparation of training activities and materials, condition of the training, and finally evaluation of the training process. The interventional group attended the strategy use training which included tasks and activities from the textbook, Basic Reading Power 1 (Jeffries & Mikulecky, 2005) in the first semester of the 2017- 2018 academic year and the identified strategies to be taught. The teacher-trainer provided these activities for the purpose of training students on the employment of direct and indirect language learning strategies (LLS) which would impact the learners' LA in EFL reading context. In addition, the strategy use training involved activities from Oxford (1990). The participants of the interventional group received training in the first three weeks on how to employ LLS in relation to the reading textbook. The training programme was conducted in the first three weeks over ten sessions. In these sessions, the participants received training on the direct LLS: MS (storing and remembering new information), CS (understanding and producing in the second/foreign language), and CSs (communicating in the second/foreign language in spite of knowledge gaps). There was also training on the use of indirect LLS: MSs

(setting goals, planning, monitoring, and evaluating language learning), AS (emotions, motivations, and attitudes), and SS (asking questions and cooperating with others).

4. RESULTS

LLS Mediated by Smartphones

The data analysis of the observational checklist revealed that the interventional group used LLS through smartphone features and applications inside and outside the classroom about 181 times over three sessions per week for 12 weeks. The direct strategies of memory, cognition, and compensation had the majority of use (131 times), whereas the indirect strategies of metacognition, affection, and society registered a use of 50 times. The cognitive strategies (CS) topped the strategies with a use of 88 times inside and outside the classroom, followed by memory strategies (MS) which had 37 uses. Social strategies (SS) came third with 24 times whereas metacognitive strategies (MSs) scored 20 times. Finally, affective strategies (AS) and compensation strategies (CSs) scored evenly, six times each.

Affective strategies (AS) relate to anxiety reduction, encouragement, and feelings strategies. A section about the use of AS was added in the semi-structured interview as it was difficult to observe the participants' anxiety, encouragement, and feelings. Participants were asked how smartphones helped them employ these affective strategies (AS). First, reducing anxiety strategies varied in the participants' answers. Seven participants approved the use of these strategies with different techniques (SSI=1,2,5,8,10,11,12). Strategies such as taking part, sharing, communicating with no fear, sleeping, playing games on the mobile, chatting others, listening to music, and social networking like twitter were employed to reduce anxiety encountered while learning reading both inside and outside the classroom. A participant (SSI=2) added, '*Well, I play candy crush on mobile.'* Another student (SSI=8) said, *'I talk with friends in WhatsApp.'* One participant (SSI=1) said, *'Umm, I relax on bed.'* Second, based on the participants' answers of how they encourage themselves to read through the use of smartphone features and applications that may be considered as a sort of strong encouragement for them since they used their own smartphone that what accompanies them all the time and wherever they go. All of them agreed that they employed their smartphones to encourage themselves to learn reading. The participants' replies were divided into two main themes: information and practice. Participants (SSI=5,6,8,10,12) told that smartphones encouraged them to get and look for information such as the meaning of new words, answers, translation, etc. To give some examples, some participants added answers such as *'to get all information want'* (SSI=5), *'helps me to get information I needed in the book'* (SSI=6) and, *'it helps me get every word I don't know'* (SSI=8). The second theme is related to practise as evident in the interviewees' answers (SSI=2,4,7,9,10,11). For example, a participant (SSI=2) said, *'mobiles help me read for exam.'* Another participant (SSI=11) added, *'I encouraged to read words good. I worry no about mistakes.'* Others told that smartphones encouraged them to do constant practice everywhere (SSI=7), and to contact other people (SSI=10,12) to help do better in the exam (SSI=4). To sum up, smartphones are considered as encouragement for participants to learn reading thanks to more knowledge and practice that they received as one participant (SSI=1) said, *'now I can enjoy myself and get all I need.'* Finally, on the part of the discovery of feelings, attitudes, and motivation towards learning reading through smartphones, participants' answers mostly revolved around one strategy, talking to people. The participants' replies did vary much as most of the participants told that they preferred to talk to other people such as friends and relatives using smartphones to express their feelings about learning reading (SSI=2,10,11,12). One participant (SSI=12) added, *'I read about good people on internet.'* Overall, participants knew how to discover their feelings about what they learn on their own as clear in *'I use mobile to be happy and love to read more to express myself and feelings. I can check others' feelings about me and information.'* (SSI=1).

As for the place of the use of LLS, it was clear that participants employed some strategies only inside the classroom, or only outside the classroom, or both inside and outside the classroom. In more details, eight sub-strategies were only used inside the classroom, only outside the classroom had 17 strategies, and both inside and outside the classroom had 14 items. At the level of LLS that were used only inside the classroom, the cognitive strategies (CS) included the biggest number of items (item=11,13,14,19,21). Participants in the interventional group used their smartphones to say and listen to new words several times only in the classroom (item=11). They also used and practised the new words using smartphones only inside the classroom (items=13,14). In addition to that, they compared words in English with those in Arabic (item=19) and checked the meaning of new vocabulary based on their parts (item=21). Concerning the metacognitive strategies (MSs) that contained two sub-strategies; trying to find ways to read (item=31) and looking for opportunities to read as much as possible (item=37) were only observed inside the classroom. Finally, the compensation strategies (CSs) had only one sub-strategy (item=26). Understanding unfamiliar English words by making guesses using suffixes, prefixes, and word order was only used inside the classroom.

The strategies that were only observed outside the classroom were 17. The outside use included three sub-strategies in the memory strategies (MS). The strategies were using notes to remember new words (item=7), acting out new words (item=8), and remembering new words or phrases by location (item=10). Four sub-strategies in the cognitive strategies (CS) were observed outside the classroom. Participants read real texts from various sources such as newspapers, magazines, stories only outside the classroom (item=15). They also wrote notes, messages, letters, or reports reading passages (item=16) and took notes of important information while reading a passage (item= 24) outside the classroom. Finally, they summarised information about reading (item=25) outside the classroom. Furthermore, the use of metacognitive strategies (MSs) contained three sub-strategies: 'I notice my mistakes and use that information to help me do better in reading in future' (item=32), 'I look for people I can talk to about what I read' (item=36), and 'I assess my progress in learning reading skills' (item=38). The affective strategies (AS) had two items that relate to the recognition of being tense or nervous when reading (item=42) and talking to people about what I feel toward learning reading (item=44). The social strategies (SS) included four items that were only used outside the classroom. Participants in the experiment only asked other people to slow down or say the reading again when they did not understand (item=45). They also asked people whose English is better to correct for them (item=46). In addition, they sought help from the good speakers of English when doing a reading task (item=48). Moreover, participants asked questions about a reading passage (item=49). Finally, the compensation strategies (CSs) had only one strategy that was employed outside the classroom. Participants in the interventional group tried to understand a reading passage without looking up every new word (item=29).

Finally, 14 strategies were reported to be used both in the inside and outside of the classroom through smartphone features and applications. The observation revealed that the memory strategies (MS) included four sub-strategies that were used both inside and outside of the classroom. All participants used their smartphone features and applications to classify what they read into groups to help them understand (item=1). They also used new words into sentences in order to remember them (item=2). In addition, they made connections between the new words and their sounds or pictures (item=4). Moreover, they categorised the new words in general concepts (item=5). Finally, they reviewed lessons about reading frequently (item=9). The cognitive strategies (CS) included five sub-strategies that were used in and out of the classroom. Participants skimmed and scanned reading passages (item=17). They also used available recourses like dictionaries to understand in the second/foreign language (item=18) and made use of the grammatical and vocabulary formation to get the meaning of new words (item=20). Finally, they translated into the second/foreign language (item=22) and, transferred the new vocabulary into their Arabic language to help get the meaning (item=23).The rest of the strategies included only one strategy in each that were used in both places; inside and outside the classroom. In the compensation strategies (CSs), participants made up new vocabulary while summarising a reading passage (item=28). They overviewed the questions and vocabulary, and pictures of a reading passages (items=30) in the metacognitive strategies (MSs). In the use of affective strategies (AS), participants encouraged themselves to read (item=40), and in the use of social strategies (SS), they practised English with other participants inside and outside the classroom (item=47).

The results of the semi-structured interview revealed that the participants' use of the features and applications of smartphones inside, outside the classroom or both was various. First, all participants agreed on the use of dictionary through smartphones both inside and outside the classroom to learn reading in the autonomous sense. This agreement coincides with the participants' degree of use of dictionary (M=5.16). A participant (SSI=5) added that he used smartphone dictionaries everywhere and anytime as shown on the following excerpt:
I use Google Translate everywhere. When at the café and read some new words, I looked it up by dictionary.
Second, the use of WhatsApp was reported mostly outside the classroom with a means of 5.00. When asked *'why do not you use WhatsApp inside the classroom to learn?'* A participant (SSI=5) answered, '*I use WhatsApp at home to text friends and teacher.* Internet search engines scored third (M=3.91) where voices of their use were divided both inside and outside the classroom (SSI=1,5,6,7,8,10,12) and outside the classroom (SSI=2,3,4,9,11). Outside of the classroom, one participant (SSI=4) said *'I use internet outside to read newspaper and do assignments.'* Almost all participants in the semi-structured interview except (SSI=6,11) employed the camera inside and outside of the classroom to assist in the use of LLS to improve their learning of reading skills in the autonomous sense. This is may be expected as participants used the camera to scan texts and new vocabulary to get them translated through Google Translate. One student (SSI=8) answered *'I use the camera to scan text and translate in Google Translate.'* Fifthly, notes received a means of 2.66 and were used most probably outside the classroom. Finally, recorders that came last and reported the lowest means (M=1.33) were mostly reported outside the classroom. Maybe the nature of notes and recorders features and applications does not allow their use inside the classroom and the existence of the

teacher, students, learning materials, and hard notebooks also made it difficult to use them inside the classroom where time was not enough. A participant (SSI=7) said, *'I don't use notes in class coz I have notebook.'*

Third, participants were asked to specify the outside places where they employed the smartphone features and applications to learn reading. They added various answers. All of them said that they used smartphones to learn reading at home. One participant (SSI=10) said, *'I always use mobile to do homework at home.'* While some participants (SSI=1,2,3,4,5,8,9,11) added that café was their most second destination to utilise smartphones to learn reading, the rest of them did not prefer the café to use smartphones to learn reading (SSI=6,7,10,12). The cafeteria was a good choice for participants to learn reading using smartphones, especially in the break times at the university (SSI=7,8,9,10,11). One interviewee (SSI=1) added *'when I have break between classes, I go to cafeteria and read some newspapers.'* Transports and outdoors were divided between the participants: some liked them as a good place to employ smartphones to learn reading (SSI=1,2,3), some others did not use smartphones to learn reading in them (SSI=4,7,8,11). A participant (SSI=3) said *'on way to university, I take photos reading summaries and notes when exam.'* Almost all the participants except one participant (SSI=4) did not use smartphones to learn reading at gyms. Finally, the class of *others* included parks (SSI=1), university (SSI=3,5,6,), bedroom (SSI=2), and apartment (SSI=11). The rest of the participants did not provide any other places.

The results that concern the place where smartphone features and applications were utilised to assist in the employment of LLS so as to impact the learners' autonomous learning features may have an indication. The participants in the interventional group used the smartphone features and applications outside the classroom more than they did inside the classroom, which indicates that they had more roles of responsibility in almost teacherless environments to use and practise reading skills on their own.

Smartphone Features and Applications

The following table displays the frequency of smartphone features and applications that were observed during the employment of LLS interventional programme inside and outside the classroom as checked in the observational checklist.

Table 3. Frequency of Smartphone Features and Applications in the Observational Checklist

Dictionaries	WhatsApp	Camera	Notes	Internet search engines	Recorders	Total
97	83	23	23	22	2	250

Participants in the interventional group scored a total of 250 times in the use of smartphone features and applications. The frequency of use can be classified into three categories: high, medium, and low. In the high categories came dictionaries and WhatsApp that had 97 and 83 times in order. Second, camera, notes, and internet search engines had almost an equal use (times=23, 23, 22) respectively. Finally, recorders had the lowest use (2 times).

Smartphone Dictionaries

The use of smartphone features and applications was LLS-based. That is to say the participants' use of smartphones to employ LLS was observed inside and outside the classroom. First, the use of dictionaries through smartphones such as Google Translate, Merriam-Webster, etc. was observed over 10 weeks (SWW=4,5,6 ,7,8,9,10,11,12,13) mostly employed in the cognitive strategies (CS) (69 times). Participants mostly employed their smartphone dictionaries to practise the sub-strategies of using available dictionaries and resources (18 times) and translating what they read into my own language to understand the reading passage (22 times) in the cognitive strategies (CS). The memory strategies (MS) followed CS in the use of dictionaries (13 times). Metacognitive strategies (MSs) had a medium use (7 times). The rest of the strategies scored very low use of dictionary; CSs (4 times), SS (3 times), and AS (1 time). The participants' use of their smartphone monolingual and bilingual dictionaries covered five themes: listening and saying the new words, meanings and definitions, comprehension skills, grammar, and vocabulary building. First, participants benefited a lot from their smartphone dictionaries to listen and say the new words several times which helped them read fast (SWW=4,5,6,8). Second, they mostly relied on their smartphone dictionaries to get the meanings and definitions of new words to assist them to understand the reading passage and produce in the second/foreign language (SWW=4,5,7,8,11,10,12,13). To explain, they used their smartphone Google Translate and Merriam Webster to check the meaning of new words such as disease, insurance, effect, etc. (SWW=12).

Third, smartphone dictionaries helped in the employment of comprehension skills such as previewing, predicating, inferences, scanning, skimming, thinking skills, and reading fast (SWW=4,5,6,8,10,11,12,13). That is to say

participants in the interventional group used their dictionaries to assist them to understand reading passages and thus produce in the English language. In order for participants to be able to understand reading texts, they need to have a good command of words to help master skills. For instance, in previewing information on personal and business envelopes, pictures of vacations, and passages about famous artists, and animals like gorillas and pigeons, participants used their dictionaries on their own to get the meaning of new words (SWW=4). They also employed dictionaries to help them make good inferences about conversations, stories, and passages, so they could read between the lines (SWW=5).

Fourth, participants used their smartphone dictionaries to get the new words' parts of speech, recognise the various patterns of organisation such as listing, time order, comparison, cause/effect, etc., refer pronouns to their referents, and suffixation (SWW=5,8,7,11). Participants managed to understand new words through the use of suffixes and prefixes which assisted in making guesses (SWW=8). They also looked up the meanings of signal words referring to comparison such as unlike, similar, different, both, also, etc., in order to manage to do exercises and use them correctly (SWW=11). Finally, vocabulary building was improved through the use of smartphone dictionaries. Participants in the interventional group asked the help of dictionaries via smartphones to classify words under one general topic or concept, practise their use in the new words, synonyms, and antonyms (SWW=4,5,7,8,10,11,12). To give instances, participants were asked to suggest words under general concepts such as countries, continents, sports, relatives, animals, etc. (SWW=7). They also found word opposites in a reading passage such get on/get off, far/near, colourful/plain, etc. (SWW=10).

In addition to the use of smartphone dictionaries in the employment of direct strategies, dictionaries assisted in the employment of indirect strategies (MSs, AS, SS) as well. Smartphone dictionaries helped overview the next reading text through previewing the questions, and vocabulary (SWW=4,5,6) and decide the purposes of exercises and reading passages (SWW=6,7,8,11). Participants also got a chance to practise the language with other participants who shared the work in groups (SWW=7,8,11) and were encouraged to read not fearing committing mistakes; therefore, they were able to comprehend texts better (SWW=7).

WhatsApp

WhatsApp was employed over 12 weeks. It was highly used in the employment of the memory strategies (MS) and social strategies (SS) outside the classroom. MS were used 25 times where the use of notes to remember new words and revision of reading lessons topped the strategies in this category with an equal use of six times. SS had a use of 21 times through WhatsApp and the sub-strategy of asking questions about the reading passage topped these strategies falling under this category (seven times). In addition, WhatsApp covered the use of cognitive strategies (CS) over 16 sessions where reading real texts topped the sub-strategies (4 times), followed by the metacognitive strategies (MSs) which were employed over 13 sessions. Noticing mistakes and using information to do better in the future leaded the MSs over six sessions. Finally, compensation strategies (CSs) and affective strategies (AS) were least used: three and five times in order.

To shed more light on the real use of WhatsApp in EFL reading skills, especially outside the classroom, the analysis revealed that the participants' content in WhatsApp groups focused mainly on four themes: exercises and revision, real use of language, immediate feedback, and feelings and emotions. First, participants found in WhatsApp group a chance and space to do exercise and revise their work. At the beginning, participants in general were reluctant to participate and share tasks and assignments in the group as they are used only to face-to-face situations inside the classroom where the teacher writes on the board, and they copy down in their notebooks. Besides, perhaps, participants were not used to utilise WhatsApp for learning purposes. It can be noted that participants used WhatsApp to share their answers and revise their learning reading content. This action prevailed over the weeks of the interventional programme as the textbook includes a lot of exercises related to previewing, skimming, looking for the topic, scanning, guessing, making predictions, etc. that could not be covered in the classroom. Therefore, participants did exercises and shared them in the group in form of notes, photos, text, etc. (SWW=4,5,6,7,8,10,11,12,13). For example, they used notes to provide answers to the previewing, scanning, and guessing quizzes taken from real texts from the internet in the WhatsApp group (SWW=4). They had a chance to make revision of the textbook comprehension skills (SWW=5). They made notes of concepts such as transportation, university, sports, food, etc. (SWW=6) and topics such as jobs, thing and places, travel, and talking about work and shared them along with answers in form of notes or photos of hand written papers in WhatsApp (SWW=7,8).

Moreover, participants remembered new vocabulary and opposites based on their location in the reading textbook about the topic and associated some pictures with new words to help them remember them such as 'lightning, the Florida Everglades, immigrants, etc.(SWW=10). They answered the topic and main idea questions as revision of what they studied into the classroom as well as they summarised the similarities and differences in the newspaper text and shared them as notes in the WhatsApp group (SWW=11). Participants searched the internet to get information on the differences between the use of because and because of. They provided the differences and examples in form of notes in the WhatsApp group for the benefit of all (SWW=12). Another participant posted a note of all signal words relating to pattern of organisation in the WhatsApp group to help participants remember them and locate the similarities and differences between them (SWW=12). Finally, they reviewed lessons about thinking skills and speed reading through doing real text taken from the internet. They were required to think about the text and complete the missing blanks accordingly (SWW=13).

The use of WhatsApp has become more practical to send and receive reading files such as assignments, quizzes, extra materials, etc. regardless of time and place, especially when it is not obligatory for students to attend classes amid war situations at the southern borders of Saudi Arabia and Yemen. Second, learners needed to practise the sense of language and get exposed to real life situations. Participants in the interventional group had a chance to practise what they learn, especially outside the classroom where they kept in touch with their peers and the teacher. Using language has been represented into a number of pictures such as discussion, asking questions, and employment of comprehension skills as explained in the following examples.

In the discussion part, participants were able to talk to their peers and teacher about reading texts on doing the exercises in relation to word meanings based on context, and mistakes. Having finalised the correct answers, silent participants benefited from other participants' work (SWW=7). They also discussed the reading mid-term exam issues such as level of difficulty, time, and results; in addition to the assignments regarding deadline, how to submit them, their number (SWW=9). The discussion in the group helped them better understand more and produce in the English language. They had an opportunity to talk to their peers and teacher (SWW=9). WhatsApp has become easier for participants to communicate in the English language and interact with their peers and teacher. The WhatsApp group has become like an open discussion classroom unlimited by time or place.

As for asking questions, participants had enough space and time to raise questions and get answers immediately at the time of study. The thing that assisted them to ask questions about what they did not understand or could not answer, thus more time and efforts were saved (SWW=5,7,9,11,12). Finally, participants were able to employ various reading comprehension skills. They practised verbs into sentences (SWW=6). They also wrote main idea sentences about a given topic 'camels' (SWW=10). Participants categorised the signal words for patterns of organisation of comparison in a text taken from a newspaper (SWW=11). They practised signal words of cause/effect pattern in sentences on pieces on paper and posted them in the WhatsApp group as photos taken by their camera (SWW=12).

Third, immediate feedback which considered as an essential aspect in the process of learning EFL reading skills had a good command in the use of WhatsApp and helped learners check their answers, monitor mistakes, and evaluate performance. To provide examples, participants made notes of important information about what they read and had a chance to notice their mistakes through comparing their answers with their peers' in the WhatsApp group (SWW=5). For example, they worked on words that ended with certain suffixes such ion, ive, ize, and ly and then checked each other's work in the WhatsApp group (SWW=6). They checked the difference between topic and main idea (SWW=10). They were also required to evaluate their reading speed using a timer and voice recorder to check the way they read and what words they read or not (SWW=13). Participants' interaction and communication in the WhatsApp group helped them notice their mistakes and correct them accordingly.

Finally, participants' use of WhatsApp for learning reading enhanced their feelings and emotions. A number of evidence has been observed in their interactions in the group. To give some instances, they had a chance to find people to practise English and talk to people about reading, and what they feel (SWW=6) and employed emojis to express their ideas and emotions about a certain topic (SWW=9). Participants also recorded their reading of a small paragraph of their choice in the textbook and expressed how they felt about that. They responded that it was a good experience (SWW=10). All in all, participants were encouraged to participate in the group without being afraid of committing mistakes (SWW=11).

Camera Features

Camera helped participants mostly in cognitive strategies (CS) where it was observed in 16 sessions both inside and outside the classroom. To translate what participants read so to understand had the maximum use (8 times). Memory strategies (MS) involved the use of camera in five sessions in which participants used their camera to categorise related words under general concepts twice. Metacognitive strategies (MSs) were observed twice through the smartphone camera. No use of camera was observed in the other three strategies (CSs, AS, SS). Camera was used over eight weeks (SWW=4,5,6,7,8,9,11,12). The use of smartphone cameras helped participants in previewing information on personal and business envelopes, pictures of vacations, passages about famous artists, animals (SWW=4). The use of camera also assisted participants in improving their vocabulary building and completing exercises at home (SWW=4,5,7,8,11,12). One participant (SWW=8) summarised important information, took a photo of it, and shared it in the WhatsApp group (Appendix G). In addition, taking photos of important information helped in revising the materials all the time (SWW=4,9,12). A participant (SWW=12) made a list of signal words to revise and shared that in the WhatsApp group (Appendix G). Moreover, the features of scanning in the camera assisted in understanding texts and deciding the purpose of reading through translating them into the mother tongue (SWW=5,8,12).

M-Notes

Notes scored a good frequency in the use of memory strategies (MS) and cognitive strategies (CS) (14, 9 times) respectively. Using notes through smartphone m-notes to remember new words marked the use of MS over six sessions. On the other side, writing notes about passage leaded CS in three sessions. As for the other four strategies (CS, MSs, AS, SS), no use of m-notes was observed. Eight weeks involved the use of notes to employ MS and CS (SWW=4,5,6,7,8,10,11,12). To explain, participants in the interventional group mainly used their smartphone note applications such E-notes, Memo, Notepad, etc. to make notes while previewing and scanning passages from the internet (SWW=4,5,8,11); guessing through doing exercises (SWW=5); vocabulary building such as topics (SWW=8), new words and meanings (SWW=5,7), concepts (SWW=6), verbs (SWW=4), comparison (SWW=12). One example can be seen in the participants' notes in the WhatsApp group in which they previewed a passage and had a list of the new and difficult vocabulary and then checked it using their mobile dictionaries.

Internet Search Engines

Various internet search engines through smartphones were only employed in memory strategies (MS) and cognitive strategies (CS) which had an equal use (11 times) for each. However, the classification of information into meaningful groups (4 times) and using new English words in sentences (3 times) both inside and outside the classroom topped the MS sub-strategies. As for CS, reading real texts such e-newspapers, magazines, stories, etc. were mostly employed by the participants (4 times). The use of internet search engines covered 8 weeks (SWW=4,5,6,7,8,10,12,13). To provide instances, participants in the interventional group used their smartphone internet search engines such as Google Chrome, FireFox, Internet Explorer to preview texts from the internet in relation to the textbook (SWW=4,5). They did other skills like scanning and guessing through quizzes from the internet (SWW=5) as well. For example, a participant searched the internet to practise scanning a restaurant menu. The use of internet also helped them enhance their vocabulary building such as using words in sentences (SWW=6), getting definitions (SWW=6), connecting words to actual pictures from the internet (SWW=6), and looking for words belonging to a certain topic (SWW=7). To explain more, participants did exercises on vocabulary building about jobs, things and places, travel, work, etc. (SWW=7). For instance, participants filled in the blanks with vocabulary about hotel. In addition, they used the internet to help them understand better. They checked the differences between topic and main idea, because and because of (SWW=10,12) (Appendix G). Finally, the internet assisted participants to review lessons about thinking skills and speed reading (SWW=13).

Recorders

Recorders had the lowest use in the application of language learning strategies (LLS). They were only used in cognitive strategies (CS) in practising the sounds and new words, and noticing when nervous or tense when reading in affective strategies (AS) for one time each (SWW=10,13). If of any indication, participants used recorders the least, maybe because they did not concentrate on the sound of new words even though they are required to say them right since pronouncing words correctly helps them understand better and read faster.

In the semi-structured interview, participants were asked about the smartphone features and applications they used to employ LLS in the reading course either inside, outside, or both. The analysis revealed that participants used smartphone features and applications to employ LLS in EFL reading context either inside or outside the classroom.

All of the interviewees added that they used camera, various dictionaries such as Google Translate, Merriam-Webster, etc., WhatsApp, and internet search engines (SSI=1,2,3,4,5,6,7,8,9,10 ,11,12). One interviewee (SSI=3) said *'Google Translate is very good.'* Another participant (SSI= 6) added *'In WhatsApp I talk to mates and teacher.' 'I get what I miss in the class.'* Participants' responses to the use of recorders and notes varied. While participants claimed the use of recorders through smartphones to learn reading (SSI=1,2,4,5,7,8,10,12), participants did not use them (SSI=3,6,9,11). A participant (SSI=9) added *'I use no the smartphone recorders to check sounds coz it no important.'* As for notes via smartphones, two participants (SSI=2,7) out of 12 participants who did the semi-structured interview did not utilise them a lot to learn reading skills. The participants' answers to the employment of the smartphone features and applications to assist in the use of LLS to learn reading autonomously had different degrees of use. These degrees of use that relate to the features and applications that learners employed are seen in the use order from 1-6 where means were extracted. Based on the means of the degree of use of smartphone features and applications, the use of dictionary had the highest means (M=5.16), followed by WhatsApp (M=5.00). Internet search engines recorded a means of 3.91. Participants in the semi-structured interview reported close means of using camera and notes (M=2.91, 2.66) in order. Recorders had the lowest means (M=2.16).

Time-based Use of Smartphones

The time of using smartphone features and applications either inside and outside of the classroom revolved around one theme 'when I need'. As for the inside the classroom, seven participants reported that they used smartphones to learn reading all the time (SSI=2,4,5,6,7,8,11). One participant (SSI=11) said *'mobile is always ready to help me.'* The other participants' answers included the sometimes idea. That is to say they used smartphones to learn when they needed. One participant (SSI=12) added, *'I do exercises, I use mobile.'* The use of smartphones to learn reading inside the classroom for the rest of the participants varied between during and after the class (SSI=1), in the beginning of the class (SSI=3,9), and sometimes (SSI=10). The outside use of smartphones had almost a sense of a freedom in time. Around five participants added that they used their mobiles to learn reading in their free time (SSI=1,2,3,4,6). The rest of them added various answers related to the parts of the day: always (SSI=5), at night (SSI=7), when study (SSI=8, 10,12), and sometimes (SSI=11). One participant (SSI=12) said that he used his mobile *'When having problems in new words'* to get the meaning of new vocabulary.

5. DISCUSSION

Learners of a second/foreign language need to improve their autonomous learning skills that enable them take charge of their own learning inside and outside the classroom amid the rapid advances in the use of internet and technology that has made teacher as one source of knowledge. This divergence in learning is imposing a lot of changes on learners, teachers, stakeholders, etc. to vary their methods of learning and teaching from learning the knowledge itself to learning how to get to the knowledge since knowledge has made available at any time and any place. The current study reported the learners' actual use of LLS through smartphones in formal and informal learning settings of EFL reading context to examine LLS and their effects and reflection on the degree of learner autonomy (LA). It is shown that learners enjoyed more autonomous learning roles after having applied language learning strategies (LLS) through smartphones inside and outside the classroom. This finding is discussed with previous research that had examined this relationship.

Regarding the high use of LLS in the social strategies (SS) and memory strategies (MS) that were reported as most used by participants in the interventional group who utilised smartphone features and applications in EFL reading compared with MS and CSs in Chen and Pan's (2015) and MSs and SS in Javid et al.,'s (2013) study. Maybe, the space of freedom and sense of responsibility that students were given; that they were allowed to utilise their own smartphones to employ language learning strategies (LLS) inside as well as outside the classroom has contributed to much more interaction and motivation. This notion is supported by Radwan's (2011) call to seek communicative and oriented strategies that substitute the traditional strategies that actively engage learners in acquiring a second/foreign language, seeking chances to practise the use of language, and cooperating with others. Similarly, the findings of MS of the current study are coherent with Sato, Murase, and Burden (2015) who emphasised the rising role of mobile devices in promoting the acquisition of vocabulary in EFL context, and thus enhancing learner autonomy (LA) in its motivational aspect where the learners' language learning has become more effective.

The use of cognitive strategies (CS) was similarly reported as medium use in in this study. CS are considered the core process of language learning that are used to process the learning of a language into the mind and thus create the cognitive frames (Oxford, 2008). That is to say, without them, learners are not able to get a second/foreign language. Therefore, they are a must and other factors that may vary their use may have a secondary effect on their priority of use among learners. For Chen and Pan (2015), learner autonomy (LA) and CS are correlated with regard

to activity dimension. The less score of MSs in the current study indicates that learners did not apply most of them in their mode of the study. This finding may be justified by the idea that learners apply what they need or feel a must based on the regular mode of the study where they felt that for some strategies such as previewing questions, vocabulary, and pictures, setting clear objectives and goals for improving reading skills, deciding the purpose of reading, assessing progress in learning reading skills, etc. Learners have still felt their reliance on the teacher to do these sub-strategies. White (1995) reported that the mode of study (distance learning) would contribute to the more use of metacognitive strategies, and thus promote LA.

As for the findings on affective strategies (AS) that did vary in line with previous studies, the participants managed to reduce anxiety through taking part, sharing, communicating with no fear, playing games on the mobile, chatting others, listening to music, and social networking like twitter. They also encouraged to look for information and had a chance to practise the use of language. Finally, they managed to discover their feelings through talking to people like friends and relatives and searching the internet looking for successful people as a sort of motivation. In distance study mode, learners employed very limited number of AS (White, 1995). Chen and Pen (2015) also reported AS as least used and justified that saying that learners worry much when people correct their mistakes in language learning and get nervous fast. Finally, use of compensation strategies (CSs) did not score any significance among the participants in the interventional group which utilised smartphones in the inside and outside of the classroom. This finding corroborates Javid et al.'s (2013) ideas that suggested that the participants did not attempt to make up new vocabulary and did not like to read English apart from checking the meaning of new words. Mistar (2015) also reported the least use of Malang learners' use of compensation strategies (CSs) and recommended that more training and attention be paid so more autonomy is promoted. The variance between the findings of this study and previous research could be attributed to the use of smartphone technology in the current study which might have played a great role in the shifting and order of priorities of the EFL learners' use of strategies inside and outside the classroom in comparison with conventional classroom in the other two studies. Maybe, another explanation relates to the employment of LLS strategies in only the reading skill in the current study compared with all skills in Chen and Pan (2015) and Javid et al.,'s (2013) studies. Finally, the context difference between East Asia and the Middle East could have varied the learners' use of LLS in EFL context.

Smartphone Features and Applications

Based on the frequency of actual use of smartphone features and applications in the LLS intervention, the findings revealed that the participants' use of their smartphone monolingual and bilingual dictionaries revolved around five themes: listening and pronouncing the new words, meanings and definitions, comprehension skills, grammar, and vocabulary building in the inside and the outside of the classroom whenever needed. The use of WhatsApp revealed that the participants' content in WhatsApp groups focused mainly on four themes: exercises and revision, real use of language, immediate feedback, and feelings and emotions. Camera helped participants mostly in cognitive strategies (CS). Notes scored a good command of use in MS and CS. Various internet search engines through smartphones were only employed in MS and CS. Finally, recorders were only used in CS and in practising the sounds and new words, and noticing when nervous or tense when reading in AS once.

With regard to the place of use, camera, dictionaries, WhatsApp, notes, and internet search engines were used more effectively outside the classroom (at home, café, cafeteria, transports, university, outdoors, gyms, etc.). On the other hand, the use of smartphones inside the classroom was very limited to camera features and dictionaries either monolingual or bilingual such as Google Translate, Merriam-Webster, etc. Kukulska-Hulme (2012) reported on the potentials of mobiles outside the borders of educational institutions and divided the aspect of place into two major divisions: at home and other locations. At home, learners provided that they used mobiles to learning in kitchen while preparing food or eating, watching television in the living room, relaxing in the bedroom, doing households, or working in the garden. Outdoors, Kukulska-Hulme (2012) referred to places such as transport, leisure places (a gym, café, a park, a beach, etc.) and at work (at desk, walking, or travelling). Mobiles can offer learning in formal settings at educational institutions such as university, school, college, and kindergartens and in informal learning settings such as at home, in fun settings, or at work (Jaldemark, 2018). Time is another important aspect. It was shown that participants employed smartphone features and applications to aid their use and practice of language learning strategies (LLS) to learn EFL reading skills whenever they needed. Inside the classroom, they used smartphones when needed. They provided that smartphones were used on demand, all times, sometimes, and at the time of exercises. The outside use of smartphones had almost a sense of freedom in time. Smartphones for learning EFL reading was involved all the time, at night, when facing problems, and study time. Kukulska-Hulme (2012) reported two modes of using mobiles to learn informally: regular activities and spontaneous activities. The regular

activities are those that accompany daily routines (meals, at night, transporting). The spontaneous activities that arise at the moment. It is tied by the available time, opportunity to learn, readiness for learning (Kukulska-Hulme, 2012).

The notion of smartphone features and applications in EFL context is compared and discussed with previous studies. First, the notion of using aids to help learn a foreign language such as smartphone features and applications, etc., matches with what Seddigh and Shokrpur (2012) found that the dictionary use was the most frequently used strategies for the independent learning of vocabulary. The smartphones' promising role in assisting in the improvement of language learning has been also highlighted by Nino (2015) who reported that language learners employed their mobile applications of videos, newspapers, language practice to comprehend language skills such as reading, listening, and speaking; dictionaries and translation applications to get the meaning of new words; flashcard and note taking applications to memorise new words; chat or messenger applications to communicate with other people; and games applications to learn with fun to enhance their independent language learning at university. In addition, Hazaea and Alzubi (2016) proved the role of smartphones features and applications of WhatsApp, dictionaries, camera, etc. in enhancing the reading practices of the EFL readers in the code breaking and text participation. Moreover, Kim and Kwon (2012) showed that most reviewed mobile applications are included into two categories: resources of lists of words, slips of tongue, examples of writings, and games and tools of dictionaries, notes, voice recorders, and translators. The multimedia of the apps involved videos, music, images, etc. Voice recorders were used for repetition exercises. These features and tools can provide EFL learners with opportunities for more personal and student-centred language learning, thus helping them improve their motivation and autonomy as they allow them to learn regardless of time and place.

6- CONCLUSION

It is concluded that smartphone-based features and applications assisted learners of EFL reading skills in the employment of language learning strategies that supported their autonomous learning regardless of place and time. Smartphones assisted learners in the use and practice of LLS in doing assignments, goals and objectives, planning, evaluation, error and mistake correction, so learners can perceive and produce reading skills. Learners could connect with the society of practice and interact with their peers and teacher almost without any restrictions. Therefore, the findings of the current study recommend the integration of smartphones in the learning of EFL reading skills. It is suggested that further research be conducted in the female section as this study was implemented in the male section in order to have more generalisable and verifiable findings.

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