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Teachers' Perceptions of Digital Language Learning Strategies:
The Case of a Private Egyptian University

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ABSTRACT

The last four decades witnessed a plethora of research on language learning strategies (LLS) in the English as a foreign language (EFL) classroom. However, there is a paucity of research on the newly developed digital language learning strategies (DLLS), particularly with reference to teachers' perceptions. For this study, the authors examined the perceptions of university teachers of the importance of DLLS for EFL learners. To this end, they collected data using Kim and Bae's 60-item survey from 52 teachers at a private Egyptian university. Using exploratory factor analysis (EFA), they removed 10 items from the survey because they revealed unsatisfactory loading numbers toward other variables. The EFA outcomes extracted six factors that described 54.13% of the total variance. In this context, the teachers perceived several cognitive, metacognitive, memory, compensation, affective, and social strategies as extremely important for students. This study calls for the systematic incorporation of the DLLS in the EFL classroom, particularly through explicit intervention. Additionally, it calls for further research on the DLLS for their great significance in our new digital world.

KEYWORDS

Digital Language Learning Strategies, EFL, Exploratory Factor Analysis, Language Learning Strategies, Perception Research, Students' Perceptions, Teachers' Perceptions, Teaching and Learning

INTRODUCTION

Language learning strategies (LLS) are "specific actions taken by the learner to make learning easier, faster, more enjoyable, more effective, and more transferrable to new situations" (Oxford, 1990, p.8). They are extremely important steps that language learners take to improve their communicative competence. LLS reflect active, self-directed involvement by the learners to enhance their language proficiency and boost their self-confidence (Oxford, 1990). Because of this importance of LLS, the past four decades have produced a plethora of relevant research, particularly with respect to learners' preferences in strategy use (Psaltou-Joycey et al., 2018). Nonetheless, the teachers' perceptions

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of the importance of these strategies did not receive the necessary attention, although teachers' perceptions play an extremely important role in the effectiveness of language teaching (Griffiths, 2007). Additionally, the increased use of online learning, especially during and after the COVID-19 pandemic, and the various affordances of digital learning tools in the last two decades have called for a revision of these LLS in light of the new digital era. As language learners have become digital natives, it is important to adapt the long-existing LLS to suit the needs of the digital age.

The revision of LLS was emphasized since Prensky's (2001) introduction of the term "digital natives," which refers to a new generation that has grown up with technologies. Ever since the introduction of this term, several similar terms emerged, such as "digital generation" and "net generation." These new terms further highlighted the importance of exploring how language learners use digital technologies to improve their language competence. Some of the relevant studies in this direction focused on the use of computers (e.g., Khatoon et al., 2022; Park & Kim, 2016; Vincent & Hah, 1996), mobile phones (e.g., Alzubi & Singh, 2017; Nurhaeni & Purnawarman, 2018; Stockwell, 2021) and blogs (e.g., Hourigan & Murray, 2010; Murray et al., 2007; Poza, 2017). However, a dire need still exists to examine a comprehensive set of digital LLS, including, for example, the use of mobile phones, Youtube videos, electronic dictionaries, online blogs and websites, social media, and learning management systems. Understanding the students' and teachers' perspectives about a comprehensive set of strategies will help both learners and teachers better cope with the digital age and make best use of the technological advances to enhance the learners' communicative competence.

We designed this study to address two goals that were not sufficiently examined in the literature. First, in this study, we validated a survey for digital language learning strategies (DLLS) using exploratory factor analysis (EFA). We validated a model for digital English language learning strategies that Kim and Bae (2020) proposed. This model represented an adaptation of Oxford's (1990) Strategy Inventory for Language Learning (SILL) in combination with suggestions from other studies (e.g., Bae & Kim, 2018; Lee & Kwon, 2007; Liang, 2009). Kim and Bae (2020) used their survey to examine the students' perceptions of DLLS while learning English. However, they did not apply EFA to validate their survey.

Second, in this study, we examined university teachers' perceived importance of the use of DLLS and thus address a gap in research because previously published literature rarely investigated teachers' perceptions in this regard. Hence, our study is significant because it will present a valid instrument for future studies on DLLS and will shed light on teachers' perceptions about the recent DLLS. Additionally, the present study gains special significance owing to its setting because Egyptian learners and teachers are underrepresented in the DLLS literature.

THEORETICAL FRAMEWORK

Oxford (1990) classified LLS under two major categories: direct and indirect. Direct strategies, on the one hand, directly involve the target language and cover memory, cognitive, and compensation strategies. All direct strategies require mental processing of the language, although each subcategory of strategies may approach this processing differently. Memory strategies, such as reviewing well and creating mental linkages, help students store and retrieve information. Cognitive strategies, such as practicing and reasoning, allow students to produce language in different forms. Compensation strategies, including guessing and predicting, enable students to overcome their knowledge gaps while using the language.

On the other hand, indirect strategies, which encompass metacognitive, affective, and social strategies, manage the language learning process. Metacognitive strategies, such as planning and evaluating one's learning, allow learners to control their own cognition. Affective strategies, including handling one's anxiety and encouraging oneself, help to regulate one's emotions, attitudes, and motivation. Social strategies, such as asking questions and cooperating with others, help students improve their learning through interactions with others. Oxford's (1990) framework constituted the

basis of the instrument that was used in this study, and its classification of strategies was extensively used in the literature (e.g., Aljuaid, 2010; Chuin & Kaur, 2015; Fayez et al., 2023; Ozfidan, 2021; Rachmawati, 2013). Hence, we used the same categories to analyze the data in this study.

LITERATURE REVIEW

There is a plethora of perception research on EFL students' perceived strategy use. Most of these studies have employed questionnaires that were adopted or adapted from Oxford's (1990) SILL. For example, Aljuaid (2010) investigated the perceived strategy use of 111 Saudi Arabian English major university students through the use of SILL. The results showed that the students used the LLS with high to medium frequency. The metacognitive strategies were perceived as the most frequently used, whereas the memory strategies were considered the lowest. Similarly, Chuin and Kaur (2015) examined 73 Malaysian English major students' perception of using LLS through SILL and focus group interviews. The results showed that the participants used the strategies with high frequency. Among the English majors, the metacognitive strategies were the most preferred, whereas the least preferred strategies were related to memory use. The study also showed a divergence in students' perspectives regarding LLS. Although some students perceived LLS positively because the strategies helped develop language competence, others viewed LLS with negativity because these participants either lacked awareness of LLS or thought that LLS required conscious effort for implementation.

Other scholars examined the students' perceptions of LLS use in specific contexts. For example, Rachmawati (2013) focused on the use of LLS while learning speaking skills. Using a combination of quantitative (i.e., SILL) and qualitative (i.e., interviews) methods, Rachmawati (2013) produced results that showed that the compensation strategies were the most preferred while learning speaking by an exemplary class in an Indonesian high school. Additionally, differences in LLS use between low achievers and high achievers were noted in terms of frequency of use, strategy category, and the variety of strategies. Another example of examining students' perception of LLS use comes from Hanafiah et al. (2021), who investigated the LLS employed by 54 successful Malaysian EFL learners. The results of SILL showed that the respondents preferred to use several metacognitive, compensatory, social, memory, and cognitive strategies. This finding strongly indicated that successful language learners are highly aware of their LLS use.

In the same vein, Damanik (2022) focused on the LLS use in learning English for International English Language Testing System (IELTS) as a high-stakes exam. To this end, 61 Indonesian adult learners who had taken IELTS completed a version of SILL. The IELTS scores of the participants indicated their proficiency levels. The results revealed that the participants mostly preferred to use metacognitive strategies. This preference was followed by cognitive, compensation, social, affective, and memory strategies. Interestingly, increased language proficiency did not result in any significant differences in LLS use. Another interesting study by Perea (2023) was longitudinal in nature because it collected data quantitatively and qualitatively from seven undergraduate students at different points in time over a period of 3 years. The results revealed that the students' perceptions of the use of LLS changed over their learning journey. Some strategies that were initially perceived as useful were later perceived as neutral, useless, or obtrusive, whereas other strategies reflected the reverse pattern. The results emphasized the importance of longitudinal research on the study of LLS use and the significance of the concept of variation in perception research.

Despite the extensive research carried out on students' perceived strategy use, much less attention was paid to teachers' perceptions regarding the importance of the LLS. One important study in this regard is Griffiths (2007), who compared the reported frequency of strategy used by 131 international students with the perceptions of 34 teachers regarding the importance of these strategies for language learners. The results indicated that teachers highly valued the use of LLS, and there was a high level of accord (71%) between the students' perceived language use and the teachers' importance ratings. Likewise, Sen and Sen (2012) examined the perspectives of 70 EFL teachers at a private Turkish

university regarding the potential incorporation of LLS in their lessons. Additionally, the study investigated the perceived LLS use by 100 Turkish students at the same institution. Data were collected using different versions of SILL in addition to semi-structured interviews. The results indicated the teachers' willingness to incorporate LLS in their classes if the teachers are aware of LLS, believe in their effectiveness, and find them easy to apply. Besides, great similarity was found between teachers and students in terms of frequency of strategy use in the most/least preferred strategy categories.

Other scholars focused on the teachers' perspectives regarding the promotion of LLS in EFL classes. For example, Fajriyandi et al. (2018) examined practicum teachers' perceptions of EFL learning strategies and how they taught the strategies in their English classrooms. Data were collected from the participants through SILL, semi-structured interviews, and classroom observations. The results showed that the teachers' perceptions of LLS influenced their teaching practices. The results also showed that most strategies lack explicit instruction because teachers did not prefer to explain the purpose of strategy selection or how to evaluate its use. In the same vein, Psaltou-Joycey et al. (2018) investigated the instructional practices of EFL teachers in relation to LLS. Data were collected from 92 teachers in mainstream and Muslim minority schools in Greece using a newly developed questionnaire that was specially designed for the THALES project in Greece. The results showed that teachers' age and teaching experience influenced the promotion of certain strategy categories (i.e., cognitive and compensation), but the teachers' type of school and educational qualification did not influence their instructional practices.

The aforementioned studies mainly attempted to examine the perceived LLS use/importance by students/teachers in conventional settings. However, the increased use of online learning in the last two decades and the sudden outburst of the COVID-19 pandemic that enhanced the need of learning languages in the digital environments have led several scholars to examine the use of LLS within a digital context have called for the examination of DLLS. Few studies have taken this path, and they have mainly used an adaptation of SILL to assess the students' perceived use of these strategies. For example, Sodak and Cakir (2015) examined the use of LLS of 274 Turkish e-learners of English. The results revealed that although participants used cognitive and affective strategies least, they preferred to take advantage of metacognitive and memory strategies the most. Additionally, the results revealed a significant effect for gender on the use of LLS with a clear advantage for females in cognitive strategies and for males in metacognitive ones.

Similarly, Mokhtar and Khairol Anuar (2021) examined EFL learners' preferences for LLS while learning English in an online distance setting. A total of 78 Malaysian university students who were enrolled in an online English language course as part of the curriculum participated in the study. Data were collected using an adapted version of SILL. The results showed that the participants greatly valued the use of compensation strategies while studying English online. Additionally, the results revealed a significant difference in the learners' preferences in relation to the learners' gender. The female learners preferred the use of metacognitive strategies, but male students showed a stronger tendency to use compensation strategies. In the same vein, Ariffin et al. (2021) examined EFL learners' strategy use in learning English online and the correlation of the strategies with their academic performance in the subject. A total of 112 students studying an English language course at a diploma level at a Public Turkish university took part in the study. Data were collected using an online language learning strategy questionnaire (OLLSQ) that was adapted from Kuana (2016), Tsai (2009), and Styles and Zariski (2000). The results showed that the students were high online strategy users. The results also showed that they highly preferred the use of metacognitive strategies because they helped the students in planning and organizing their studies. As for the influence of the strategies, the results revealed that the strategies helped the students cope with the online learning mode, but there was low correlation between the use of strategies and academic performance.

Another extremely relevant study for the current research is Kim and Bae (2020), who developed the digital English learning strategies (DELS) survey that we used in this study. Data were collected from 400 students in two universities in South Korea. The results showed that the compensation

strategies were the most frequently used, followed by memory and metacognitive strategies. Additionally, the study showed a significant relationship between learner factors and the use of DELS. On the contrary, no significant relationship was found between DELS and the duration of using digital devices. This study aims to extend the work of Kim and Bae (2020) through (1.) validating their new questionnaire using exploratory factor analysis (EFA) and (2.) identifying the categories/strategies that contribute most to the explanation of variance in the questionnaire results. Additionally, the study aims to fill the gap in teachers' perception research. As shown above, there is a paucity of research in the field of teachers' perceptions when it comes to DLLS. Hence, in this study, we examined the teachers' perceived importance of the strategies to their students. More specifically, we addressed the following research question:

What is the university teachers' perceived importance of the DLLS to their students?

METHODOLOGY

Participants

Fifty-two Egyptian teachers who worked at a private university in Alexandria, Egypt, participated in this study. They were randomly selected, as the survey was sent out via email and the teachers were allowed to respond upon their consent. A total of 75 English language teachers received the survey, including full-timers and part-timers, so the response rate reached 69%. The participants' ages were between 26 and 57 (mean = 35.7). They were all native speakers of Arabic who obtained an English language university degree, whether in linguistics, teaching English to speakers of other languages (TESOL), or literature. The participants included 22 BA holders, 16 MA holders, and 14 PhD holders. Their experience in teaching English ranged between 2 and 30 years with a mean of 13.2. They were all highly experienced in using technology in language teaching because the university requires their regular participation in technology-enhanced language teaching programs. (We note that the university in which the study took place was the institution where the third researcher worked, thus facilitating the data collection.)

Instrument

For this study, we employed a questionnaire that was developed by Kim and Bae (2020). The questionnaire was originally based on Oxford's (1990) SILL, which consisted of 50 items assessing the use of LLS and was used as the basis for several relevant studies (e.g., Aljuaid, 2010; Chuin & Kaur, 2015; Rachmawati, 2013). Kim and Bae (2020) adapted their questionnaire from SILL by modifying some items and adding others from earlier studies on the learning of English in digital environments (i.e., Bae & Kim, 2018; Lee & Kwon, 2007; Liang, 2009). The final questionnaire consisted of 60 items, all of which were about learning English in digital environments. The questionnaire requested the participants to rate the items on a 5-point scale ranging from always (5) to never (1).

Our instrument consisted of three parts. The first part was a consent form that the participants had to complete before being able to read the questionnaire. The second part was Kim and Bae's (2020) 60-item questionnaire. However, the participants did not rate the statements based on their frequency of use. Instead, they were asked to rate the statements based on their degree of importance for their students (i.e., 5 = extremely important and 1 = extremely unimportant). The third part of the instrument included some questions about demographic information, such as age, qualification, nationality, and years of experience.

RELIABILITY AND VALIDITY

We validated the survey instrument by checking Cronbach's alpha coefficient. Cronbach's alpha coefficient was calculated as 0.88. Nunnally (1978) asserted that "a minimum value of .70 for

Cronbach's alpha is considered acceptable" (p. 54). Accordingly, Cronbach's alpha score for this study showed that the scale is reliable. We also highlighted each factor's Cronbach's alpha scores.

Table 1. Reliability scores of each factor

No.	Factor Descriptions	Number of Items	Cronbach's Alpha
1	Memory	7	.91
2	Cognitive	13	.88
3	Compensation	6	.87
4	Metacognitive	10	.85
5	Affective	12	.90
6	Sociable	3	.91

For the validity, the researchers used content validity procedures. According to Lawshe (1975), "content validity is used to ensure that each item represented an accurate measure" (p.75). Two scholars in the field of applied linguistics reviewed the survey questions to evaluate and revise the instrument before it was administered. The scholars communicated via emails and Zoom to discuss each demographic and Likert scale question in the survey and revised the items to ensure their clarity.

Data Collection

Data were collected from one private university in Egypt in April 2023. The survey was disseminated through a Google Form that included a consent form. After the participants opened the link, they read the consent form and had to approve it before the survey opened for them. The link to the Google Form was disseminated through email to all the English language teachers at the target university.

Data Analysis

For data analysis, we used SPSS statistical software. We used two different phases. In the first phase of the study, we used an EFA to test the feasibility and logic of the instrument. EFA "is a statistical technique that is used to reduce data to a smaller set of summary variables and to explore the underlying theoretical structure of the phenomena" (Thompson, 2004, p.12). In the second phase of the study, we used descriptive statistics to clearly describe each factor that came from the EFA outcomes.

FINDINGS

Initially, we analyzed the raw data to report the outcomes of the EFA. The EFA outcomes extracted six factors. Subsequently, the descriptive statistics of digital language learning were examined.

Exploratory Factor Analysis

Kaiser-Meyer-Olkin (KMO) highlights the appropriateness of a survey instrument for an EFA. KMO is "an assumption that must be met in determining the appropriateness of using factor analysis. Values can range between 0 and 1" (Ballesteros 2003, p.102). Ballesteros (2003) affirmed that "the KMO test can be used to determine the overall sampling adequacy of the sample or to measure each individual variable" (p. 121). Jolliffe's (2002) guidelines acknowledged that a "value of 0 shows the sum of partial correlations is large relative to the sum of correlations, which indicate diffusion in the correlations pattern; therefore, factor analysis is probably inappropriate" (p. 95). Joliffe (2002)

asserted that "if the value is close to 1, patterns of correlations are quite compact and factor analysis indicates different and reliable factors" (p. 99). Kaiser (1974) stated that a value higher than 0.5 is acceptable, emphasizing that "values between 0.5 and 0.7 should be considered mediocre, values between 0.7 and 0.8 should be considered good, values between 0.8 and 0.9 should be considered great, and values of more than 0.9 should be considered superb" (Anderson & Gerbing, 1984, pp. 136–137). Table 2 displayed that the KMO value is 0.82 for the current study, which fell into the great range. Consequently, we found that the data were appropriate for an EFA (see Table 2).

Table 2. KMO and Bartlett's test

KMO Measure of Sampling Adequacy		.823
Bartlett's Test of Sphericity	Approx. Chi-Square	814.231
	df	169
	Sig.	<.001

We examined a total of 60 items linked to digital language learning using principal component analysis (PCA) with Varimax (orthogonal) rotation because the PCA reduced a larger set of variables to a smaller set. The EFA outcomes for the entire set of variables extracted six factors describing 54.13% of the total variance. The first factor was labeled *memory* and explained 9.54% of the variance. The second factor was labeled *cognitive* and explained 10.33% of the variance. The third factor was labeled *compensation* and explained 9.24% of the variance. The fourth factor was labeled *metacognitive* and explained 10.21% of the variance. The fifth factor was labeled *affective* and explained 11.43% of the variance. Lastly, the sixth factor was labeled *social* and explained 3.48% of the variance. Each factor in our study represented different standpoints of digital language learning.

Table 3. Pattern matrix

#	Items	1	2	3	4	5	6	Communality
3	Memorizing new words as to sounds/rhymes	.815						.894
5	Searching for sentences with new words	.790						.785
4	Memorizing new words by visualization	.739						.789
7	Reviewing regularly	.751						.799
6	Searching for related words to remember new words	.796						.738
8	Memorizing new words by using digital programs/ applications	.790						.793
1	Classifying new words by using digital tools	.765						.890
18	Using digital devices to search for words/meanings		.796					.887
10	Practicing repeatedly by digital tools and programs (for speaking/writing)		.756					.790
19	Skimming whole texts quickly to understand overall meaning		.788					.789
13	Watching English video materials		.793					.875
11	Using words in varied ways through digital programs/ applications		.721					.789

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Table 3. Continued

#	Items	1	2	3	4	5	6	Communality
9	Practicing repeatedly using digital contents (for reading/ listening)		.697					.786
17	Avoiding word-by-word translation		.745					.789
12	Seeking patterns of language through digital resources		.712					.891
20	Using digital translators to understand in depth		.743					.785
16	Using digital messengers to practice speaking		.710					.791
15	Reading digital texts for fun		.698					.844
14	Using social network system (SNS) to practice with natives		.776					.879
37	Seeking better digital programs/applications to fit your learning objectives		.781					.780
23	Guessing unknown words from contextual clues			.785				.749
26	Predicting content while watching or reading digital materials			.721				.799
27	Looking up similar words in the mother tongue			.756				.890
24	Guessing unknown words from linguistic clues			.726				.785
30	Making up new words when needed			.696				.825
34	Looking for new methods to practice in digital contexts				.739			.795
36	Having clear goals and targets for studying				.739			.799
40	Noticing mistakes to improve				.761			.798
38	Planning proper digital activities to achieve the goals				.791			.754
35	Planning to ensure enough time				.746			.874
32	Avoid distraction by not activating unnecessary programs or browsers				.729			.779
43	Self-evaluating the efficiency of the learning process				.788			.886
31	Building associations to entire contents				.754			.887
42	Self-evaluating the improvement of one's learning				.764			.791
41	Self-reflecting on the progress in learning				.766			.815
46	Coping with emotional difficulties in the learning process					.791		.743
44	Trying to relax when being afraid of using the language					.774		.769
45	Thinking positively to continue language learning					.780		.646
48	Noticing tension in learning or using the language					.764		.841
53	Seeking help from natives					.772		.785
47	Rewarding oneself when doing well					.688		.780
56	Sharing information with fellow learners					.691		.826
49	Using self-reflection checklists					.761		.749
54	Asking teachers or professors through online access					.770		.881
51	Talking to others about how you feel in learning					.790		.795
57	Practicing the language with fellow learners					.793		.765
59	Practicing the language with foreigners					.768		.887
52	Asking for clarification or repetition						.695	.747

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Table 3. Continued

#	Items	1	2	3	4	5	6	Communality
58	Participating in collaborative work to improve English						.689	.775
60	Learning the target cultures						.770	.891
	Eigenvalues	3.06	3.39	3.45	3.76	3.91	2.01	
	% of variance	9.5	10.3	9.2	10.2	11.4	3.5	
	Total Variance						54.1	

The EFA outcomes showed that some items in the survey instrument (respectively, 2, 20, 21, 25, 28, 29, 33, 39, 50, and 55) revealed unsatisfactory loading numbers toward other variables (see Appendix B). Therefore, we removed these items from the instrument. The communality scores on the pattern matrix table emphasized the common variance in the structure of the data. The table highlighted that the communalities' average is bigger than 0.7, and commonalities after extractions were also bigger than 0.9. According to Table 3, the average of commonalities was 0.82 after adding all of them up. Note that we used an oblique (nonorthogonal) rotation to determine the number of each loaded factor.

Descriptive Statistic Analysis for Each Factor

Six factors were extracted from the EFA outcomes: memory, cognitive, compensation, metacognitive, affective, and social. In this part of the study, we report descriptive statistics of each extracted factor.

As shown in Table 4, the first factor revealed that teachers highlighted the importance of several memory strategies while dealing with digital content. They particularly emphasized the importance of memorizing new words through visualization and through searching for sentences that include these new words. They also found it important to memorize new words as to sounds/rhymes, review new words regularly, and search for related words to remember new ones. Additionally, using digital programs/applications/tools to memorize and classify new words was perceived as significant.

Table 4. Memory strategies

Items	Extremely Important-Important (%)	Neutral (%)	Not Important at All - Not Important (%)	Mean	SD	N
Memorizing new words as to sounds/rhymes	79.6	12.9	7.5	4.1	0.9	51
Searching for sentences with new words	83.3	8.3	8.4	4.4	1.1	51
Memorizing new words by visualization	86.7	7.3	5.0	4.7	1.0	50
Reviewing regularly	78.9	12.6	8.5	4.0	1.1	51
Searching for related words to remember new words	78.4	13.1	8.5	4.0	0.9	51
Memorizing new words by using digital programs/ applications	78.3	16.5	5.2	4.3	1.0	51
Classifying new words by using digital tools	77.9	12.4	9.7	4.0	1.0	51

(Note: 1 = Not important at all, 2 = Not important, 3 = Neutral, 4 = Important, and 5 = Extremely Important)

The second factor was related to cognitive strategies. As shown in Table 5, several strategies were perceived as important to students. The teachers particularly emphasized the importance of several digital strategies, including practicing the four skills repeatedly using digital programs, using digital devices to search for words/meanings, using social network systems to practice with native speakers, and seeking effective programs to fit one's learning objectives. The teachers also valued the importance of watching video materials in the target language, using words in varied ways using digital tools, reading digital texts for fun, using digital messengers to practice speaking, using digital translators for understanding, and using digital resources to identify useful language patterns. Additionally, skimming texts for understanding and avoiding word-by-word translation were perceived as significant.

Table 5. Cognitive strategies

Items	Extremely Important-Important (%)	Neutral (%)	Not Important at All - Not Important (%)	Mean	SD	N
Using digital devices to search for words/meanings	84.7	9.6	5.7	4.5	1.2	51
Practicing repeatedly by digital tools and programs (for speaking/writing)	84.3	10.3	5.4	4.4	1.0	51
Skimming whole texts quickly to understand overall meaning	85.0	10.3	4.7	4.6	1.1	50
Watching video materials in target language	78.9	12.6	8.5	4.5	1.1	51
Using words in varied ways through digital programs/applications	73.4	17.1	9.5	4.0	1.0	51
Practicing repeatedly using digital contents (for reading/listening)	85.5	9.8	4.7	4.5	0.9	51
Avoiding word-by-word translation	74.8	15.7	9.5	4.2	1.1	51
Seeking patterns of language through digital resources	75.3	15.3	9.4	4.0	1.0	51
Using digital translators to understand in depth	74.6	15.3	9.1	4.0	1.2	51
Using digital messengers to practice speaking	75.5	18.1	9.4	4.0	1.2	50
Reading digital texts for fun	77.3	15.3	7.4	4.1	1.0	51
Using social network system (SNS) to practice with natives	85.3	8.5	6.2	4.5	0.9	51
Seeking better digital programs/applications to fit your learning objectives	84.3	10.3	5.4	4.4	0.9	50

(Note: 1 = Not important at all, 2 = Not important, 3 = Neutral, 4 = Important, and 5 = Extremely important)

As shown in Table 6, the third factor is related to compensation strategies. Under this category, the teachers highly valued the importance of guessing unknown words from linguistic and contextual clues, looking up similar words in the mother tongue, making up new words when needed, and predicting content while watching or reading digital materials.

Table 6. Compensation strategies

Items	Extremely Important-Important (%)	Neutral (%)	Not Important at All - Not Important (%)	Mean	SD	N
Guessing unknown words from contextual clues	80.6	9.7	9.7	4.2	1.2	51
Predicting content while watching or reading digital materials	83.5	9.3	6.2	4.4	0.9	51
Looking up similar words in the mother tongue	84.9	8.7	6.4	4.6	0.9	51
Guessing unknown words from linguistic clues	75.4	15.1	9.5	4.1	0.9	51
Making up new words when needed	75.3	16.5	9.2	4.0	1.1	51

(Note: 1 = Not important at all, 2 = Not important, 3 = Neutral, 4 = Important, and 5 = Extremely important)

The fourth factor, which described the metacognitive aspect, highlighted the importance of several strategies in the digital context, as shown in Table 7. The teachers emphasized the significance of having clear goals for studying, planning time effectively, noticing one's mistakes, building associations across content, and evaluating one's progress. They also highly valued the importance of using digital tools to practice the foreign language, planning proper digital activities, and avoiding digital distractions.

Table 7. Metacognitive strategies

Items	Extremely Important-Important (%)	Neutral (%)	Not Important at All - Not Important (%)	Mean	SD	N
Looking for new methods to practice in digital contexts	84.7	9.6	5.7	4.5	1.0	50
Having clear goals and targets for studying	85.0	10.3	4.7	4.6	0.9	50
Noticing mistakes to improve	78.9	12.6	8.5	4.5	0.9	51
Planning proper digital activities to achieve the goals	75.4	16.1	8.5	4.0	1.1	51
Planning to ensure enough time	85.5	9.8	4.7	4.5	0.9	51
Avoid distraction by not activating unnecessary programs or browsers	76.8	15.7	7.5	4.2	1.0	51
Self-evaluating the efficiency of the learning process	74.3	17.3	8.4	4.0	1.1	51
Building associations to entire contents	73.6	16.3	9.1	4.0	1.1	51
Self-evaluating the improvement of one's learning	79.5	14.1	9.4	4.1	1.0	51
Self-reflecting on the progress in learning	77.3	15.3	7.4	4.0	0.9	50

(Note: 1 = Not important at all, 2 = Not important, 3 = Neutral, 4 = Important, and 5 = Extremely important)

The fifth factor was related to the affective strategies. In this regard, teachers emphasized the importance of thinking positively, trying to relax, using self-reflection checklists, and asking questions while learning (see Table 8). Teachers also found it important for students to practice the language with fellow learners and with foreigners. Additionally, the teachers highlighted the significance of other affective strategies, including coping with tension/emotional difficulties, sharing concerns with fellow learners, rewarding oneself when doing well, discussing one's feelings with others and seeking help from native speakers.

Table 8. Affective strategies

Items	Extremely Important-Important (%)	Neutral (%)	Not Important at All - Not Important (%)	Mean	SD	N
Coping with emotional difficulties in the learning process	74.5	15.6	10.9	4.0	0.9	51
Trying to relax when being afraid of using the language	85.2	9.3	5.5	4.6	1.0	51
Thinking positively to continue language learning	86.0	9.3	4.7	4.6	1.1	51
Noticing tension in learning or using the language	78.9	12.6	8.5	4.4	1.0	51

continued on following page

Table 8. Continued

Items	Extremely Important-Important (%)	Neutral (%)	Not Important at All - Not Important (%)	Mean	SD	N
Seeking help from natives	78.4	14.1	7.5	4.1	1.2	50
Rewarding oneself when doing well	75.4	14.8	8.8	4.0	0.9	51
Sharing information with fellow learners	76.5	14.7	8.8	4.0	1.1	51
Using self-reflection checklists	84.3	7.3	8.4	4.2	1.0	51
Asking teachers or professors through online access	84.6	9.3	5.1	4.3	1.2	51
Talking to others about how you feel about learning	78.6	15.1	9.3	4.1	1.1	51
Practicing English with fellow learners	82.5	10.3	7.2	4.3	0.9	51
Practicing English with foreigners	83.3	10.5	6.2	4.3	1.1	50

(Note: 1 = Not important at all, 2 = Not important, 3 = Neutral, 4 = Important, and 5 = Extremely important)

In the six and last factor, which is represented in Table 9, teachers highlighted the importance of social strategies. The teachers found it extremely important for students to participate in collaborative work, ask for clarification, and learn the culture of the target language.

Table 9. Social strategies

Items	Extremely Important-Important (%)	Neutral (%)	Not Important at All - Not Important (%)	Mean	SD	N
Asking for clarification or repetition	84.5	9.4	5.1	4.3	1.2	51
Participating in collaborative work to improve English	85.6	9.7	4.7	4.5	1.0	51
Learning the target cultures	82.7	10.8	6.5	4.2	1.0	51

(Note: 1 = Not important at all, 2 = Not important, 3 = Neutral, 4 = Important, and 5 = Extremely important)

DISCUSSION

In this study we examined the university teachers' perceptions of the importance of DLLS for their students. To this end, 52 teachers from a private Egyptian university completed a survey that was originally developed by Kim and Bae (2020) to examine learners' perceived use of DLLS. Overall, the survey showed that teachers highly valued the DLLS, which is a result that matches the findings of earlier studies with traditional LLS (e.g., Griffiths, 2007; Sen and Sen, 2012). Apparently, teachers generally welcome the use of LLS and DLLS to support the learners' active, self-directed learning. Teachers are aware of learners' needs to exert concentrated and autonomous efforts to improve their language learning. DLLS will help language learners make best use of the available digital tools around them to improve their learning. This is most important in foreign language learning contexts, similar to this study because exposure to authentic foreign language is minimal and digital applications/programs represent valuable tools to overcome this major limitation.

In accordance with the current literature on LLS, the teachers' responses in this study were analyzed based on the six common categories of Oxford (1990). Although several earlier studies on the students' perceived use of LLS (e.g., Aljuaid, 2010; Chuin and Kaur, 2015) found that memory

strategies were the least used by students, teachers in this study found the memory strategies of high value. Teachers particularly recommended the use of memorizing by visualization, as well as regular reviewing and using several digital tools, among others. Despite this disagreement, the results of this study were in accord with former research on students' perceived use of LLS with respect to metacognitive strategies. The findings of this study were aligned with most earlier studies on students' perceived use of LLS, which showed that students highly valued the use of metacognitive strategies (e.g., Aljuaid, 2010; Ariffin et al., 2021; Chuin and Kaur, 2015; Kim & Bae, 2020; Sodak & Cakir, 2015). In this regard, teachers found several strategies extremely meaningful and important, such as having clear goals, noticing one's mistakes, planning for learning, avoiding distractions, and self-evaluating/reflecting.

With regard to cognitive and compensation strategies, earlier research on students' perceived use has generally granted them great significance, similar to metacognitive ones (e.g., Mokhtar & Khariol Anuar, 2021; Danamik, 2022). The case was similar in this study. In fact, considering the teachers' ratings of "extremely important" and "important," we clearly see that teachers highly valued these categories. The teachers recommended several cognitive strategies, such as skimming texts, reading texts for pleasure, watching video materials, and using digital tools for comprehension and practice. They also highly valued several compensation strategies, including guessing unknown words, predicting content, and making up new words. A noteworthy point is that teachers in this study expressed their views regarding the importance of DLLS in general, not in relation to a specific language skill. This finding explains why they viewed the compensation strategies differently than in some earlier studies. For example, Rachmawati (2013) found that students viewed the compensation strategies as the most frequently used because his study focused only on the speaking skill that foreign language learners could find particularly challenging and, hence, resort to several compensation strategies to meet this challenge.

As for the affective and social categories, teachers' perceptions were as positive as the other categories. This finding again comes against several earlier studies on students' perceptions that did not grant these two categories as much focus as the metacognitive and cognitive ones (e.g., Danamik, 2022; Hanafiah et al. 2021; Kim & Bae, 2020; Sodak & Cakir, 2015). This finding shows that teachers view some strategies that students may not use frequently as important. It also shows that teachers and students may not always be in accord, as was the case in Griffiths's study (2007) in which teachers and students' level of accord reached over 70%. In this study, teachers recommended various strategies for use. In terms of affective strategies, they positively perceived the strategies of coping with emotional difficulties, thinking positively, trying to relax, and rewarding oneself, among others. As for social strategies, they highly valued asking for clarification, joining collaborative work, and learning about the target culture.

CONCLUSION

This study showed that EFL teachers in the target private Egyptian university highly valued the importance of DLLS for their students. The teachers recommended the use of several cognitive, metacognitive, memory, compensation, affective, and social strategies, such as memorization through visualization, setting clear goals for learning, watching video materials, guessing the meaning of unknown words, coping with emotional difficulties, joining collaborative work, and learning about the target culture. These results are aligned with earlier research (e.g., Griffiths, 2007; Sen and Sen, 2012) that showed teachers' positive perception of LLS. However, they differ from some earlier studies that examined students' perceived use of LLS/DLSS (Aljuaid, 2010; Chuin and Kaur, 2015) because students in these studies tended to attach less importance to some strategies than others.

Based on these findings, two important pedagogical improvements are proposed. First, teachers need to be encouraged to raise their students' awareness of the importance of the DLLS. This task should not be challenging because teachers already perceive the importance of these strategies. As

earlier research has shown, teachers' perceptions about LLS greatly influence their instructional practices (e.g., Fajriyaidi et al., 2018; Sen & Sen, 2012). Second, owing to the differences in perceptions between students' use and teachers' value of LLS, explicit intervention in practicing these strategies may be needed as recommended in the literature (e.g., Fajriyaidi et al., 2018). For example, teachers can help students set goals for their learning, monitor their progress, notice their mistakes, and join others in collaborative work. They can also invite guest lectures about important affective strategies, such as coping with stress, handling test anxiety, and practicing relaxation techniques. Additionally, teachers can assign students videos to watch for discussions, create classroom blogs, integrate the use of digital dictionaries, and keep students' digital portfolios to encourage self-evaluation and reflection.

Based on the results of this study and our validation of Kim and Bae's (2020) DELS, we recommend three directions for future research. First, further research is needed with the use of the newly validated instrument across various populations and in different learning contexts to add further validation for the instrument. Second, more research is needed on teachers' perceptions of the use and importance of DLLS to make up for the paucity of research in this area. Third, it is important to extend our research work into studying the correlations between the use of DLLS and several other variables, including learning context, gender, motivation, and language proficiency.

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APPENDIX A

Table 10. Kim and Bae's (2020) list of strategies

Mem= memory
Cog=cognitive
Comp=compensation
Metacog=metacognitive
Aff=affective
Soc=sociable

Category		Strategy
Mem	1	Classifying new words by using digital tools
Mem	2	Associating new concepts to things already known
Mem	3	Memorizing new words as to sounds/rhymes
Mem	4	Memorizing new words by visualization
Mem	5	Searching for sentences with new words
Mem	6	Searching for related words to remember new words
Mem	7	Reviewing regularly
Mem	8	Memorizing new words by using digital programs/applications
Cog	9	Practicing repeatedly using digital contents (for reading/listening)
Cog	10	Practicing repeatedly by digital tools and programs (for speaking/writing)
Cog	11	Using words in varied ways through digital programs/applications
Cog	12	Seeking patterns of English through digital resources
Cog	13	Watching English video materials
Cog	14	Using social network system (SNS) to practice with natives
Cog	15	Reading digital texts for fun
Cog	16	Using digital messengers to practice speaking
Cog	17	Avoiding word-by-word translation
Cog	18	Using digital devices to search words/meanings
Cog	19	Skimming whole texts quickly to understand overall meaning first
Cog	20	Using digital translators to read in depth
Cog	21	Marking (or Recording) a favorite list to look up things when needed
Cog	22	Summarizing the information on electronic notes or word programs
Comp	23	Guessing unknown words from contextual clues
Comp	24	Guessing unknown words from linguistic clues
Comp	25	Using unrelated clues to guess the meaning of words
Comp	26	Predicting content while watching or reading digital materials
Comp	27	Looking up similar words in the mother tongue
Comp	28	Using alternatives to unavailable words
Comp	29	Making conversation with familiar topics
Comp	30	Making up new words when needed
Meta	31	Building associations to entire contents
Meta	32	Avoid distraction by not activating unnecessary programs or browsers
Meta	33	Paying attention while learning in digital contexts
Meta	34	Looking for new methods to practice English in digital contexts
Meta	35	Planning to ensure enough time for English
Meta	36	Having clear goals and targets for studying English
Meta	37	Seeking better digital programs/applications to fit the learning objectives
Meta	38	Planning proper digital activities to achieve the goals
Meta	39	Seeking chances to use English with digital tools
Meta	40	Noticing mistakes so as to improve
Meta	41	Self-reflecting on the progress in learning
Meta	42	Self-evaluating the improvement of one's learning
Meta	43	Self-evaluating the efficiency of the learning process
Aff	44	Trying to relax when being afraid of using English
Aff	45	Thinking positively to continue English learning
Aff	46	Coping with emotional difficulties in the learning process
Aff	47	Rewarding oneself when doing well
Aff	48	Noticing tension in learning or using English
Aff	49	Using self-reflection checklists
Aff	50	Writing diaries to record feelings about learning English
Aff	51	Talking to others about how you feel about learning English
Soc	52	Asking for clarification or repetition
Aff	53	Seeking help from natives
Aff	54	Asking teachers or professors through online access
Aff	55	Looking up others' experience or texts to correct errors
Aff	56	Sharing information with fellow learners
Aff	57	Practicing English with fellow learners
Soc	58	Participating in collaborative work to improve English
Aff	59	Practicing English with foreigners
Soc	60	Trying to learn about target cultures

APPENDIX B

Table 11. Removed survey items

Mem 2	Associating new concepts to things already known
Cog 20	Using digital translators to read in depth
Cog 21	Marking (or recording) a favorite list to look up things when needed
Comp 25	Using unrelated clues to guess the meaning of words
Comp 28	Using alternatives to unavailable words
Comp 29	Making conversation with familiar topics
Meta 33	Paying attention while learning in digital contexts
Meta 39	Seeking chances to use English with digital tools
Aff 50	Writing diaries to record feelings about learning English
Aff 55	Looking up others' experience or texts to correct errors

(Note: Mem = memory, Cog = cognitive, Comp = compensation, Meta = metacognitive, and Aff = affective)

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