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Original Article

Tackling Iranian Epileptic EFL Learners' Foreign Language Anxiety and Vocabulary Learning via a Social, Meta-cognitive, and Problem-Solving Skills Training Package: Online and Traditional Contexts in Focus

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Abstract

The problems of epileptic EFL learners are more serious than those of normal learners. Mostly, in the context of language learning, they perform weakly in productive and verbal skills. This study investigated whether a social, meta-cognitive, and problem-solving skills training package affects foreign language anxiety, and vocabulary learning of epileptic EFL learners. The participants were selected through purposive sampling from among those referring to the Long Term Video EEG Monitoring Center in Kerman. To collect the data, the FL Anxiety Scale, TOEFL Vocabulary Test, Quick Placement Test, and the Social, Meta-cognitive, and Problem-solving Skills Training Package were recruited. To analyze the data, descriptive statistics, and ANCOVA were run. The findings of the study showed that the effectiveness of the mentioned training package on Iranian epileptic EFL learners' FL anxiety and vocabulary learning ~~in~~ online was more effective than in the traditional context. The results have implications for ~~the~~ epileptic EFL learners and EFL teachers.

Keywords: Epileptic EFL Learners, Foreign Language Anxiety, Online Context, Social, Meta-cognitive and Problem-Solving Skills Training Package, Traditional Context, Vocabulary Learning

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1. Introduction

Expectedly, the problems of EFL learners suffering from neurological disorders, including epileptic EFL learners, are more serious, noticeable, and remarkable than those of normal learners. Mostly, such patients, in the context of language learning, perform weakly in productive and verbal skills (Golshan et al., 2019). What is more, they deeply suffer from over-anxiety in the process of learning, which can be attached to their increased fear of failure. Moreover, problems related to a lack of social, problem-solving, and metacognitive skills are among the repeatedly reported challenges of epileptic EFL learners (Shawahna & Nairat, 2021).

This is why most ~~of~~ epileptic learners do not experience much success in social interactions and communicating with others in language classrooms. This has even led some researchers to propos~~ing~~ the hypothesis that being epileptic is significantly correlated with unwillingness to communicate (Abedi, 2009). Be proved or not, this hypothesis also implies that the problems of neurologically-impaired learners with verbal language skills, vocabulary learning, and other aspects of English learning cannot be simply neglected. In supporting this, Alshehri (2022) recommended that language instructors working with neurologically impaired learners adapt their teaching strategies to the difficulties and complexities such learners experience in learning productive skills. In the same vein, in the studies by Hashim et al. (2022) and Bailey et al. (2021), it has been vividly shown that epileptic learners have their own problems with language learning; the problems were more serious in terms of vocabulary learning.

Given that the best solutions are tightly tied to the problems themselves, the solutions of epileptic learners' problems with verbal and communicative skills can be traced to the main problems to which these learners are exposed. ~~As~~ the key fundamental problems of epileptic learners, serious learning anxiety, lack of social skills, lack of metacognitive skills, and problems with problem-solving skills can be enumerated. Accordingly, exploring such problems may contribute to solving (at least partially) the anxiety and vocabulary learning problems (Hashim et al., 2022) they encounter in the process of EFL learning.

However, reviewing the existing literature shows that although several studies have so far dealt with the trend analysis of basic factors required in EFL classrooms for learners with neurological problems in general (e.g., Abedi, 2009; Alshehri, 2022; Golshan et al., 2019) and epileptic learners in particular (Hashim et al., 2022), still there exists research scarcity

on the ways training on different skills can lead to improvements in epileptic learners' vocabulary learning and reduction of foreign language anxiety.

Last but not least, despite the research attempts on epilepsy as connected to learning contexts, there is still a remarkable gap in the literature on practical training, whose aim is to help epileptic EFL learners in the process of EFL learning. With a view to these issues, and considering that vocabulary learning is a main component of EFL learning, this study sought to see whether a social, meta-cognitive, and problem-solving skills training package has any effect on foreign language anxiety and vocabulary learning of Iranian epileptic EFL learners. To add to the richness of the study and considering the prevalence of online learning in recent years in different countries, both online and traditional EFL learning contexts were explored in the present study.

2. Literature Review

2.1 Theoretical Framework

This study is theoretically founded on empowerment theory. Empowerment theory is the interface between individual well-being and the broader socio-political context. It re-conciliates mental well-being to mutual scaffolding and the effort to generate a responsive society. It encourages us to imagine the following dichotomies: Health versus disease, ability versus inability, and strong points versus weak points. Accordingly, empowerment-laden treatments support wellness, reduce problems, provide the ground for knowledge and skills development, and recruit experts as collaborators (Zimmerman et al., 1992).

2.2 Empirical Studies

Ansarian (2019) developed a model of problem-solving skills to be employed in EFL classes, particularly when teaching ~~the~~ speaking skill. Karademir (2019) explored whether the problem-solving skills and curiosity levels were significantly related in pre-service teachers. The findings showed that those teachers with higher problem-solving skills were more curious. Karaoğlan-Yilmaz et al. (2019) probed the relationship between metacognitive abilities, critical thinking, and teaching self-efficacy among EFL teachers. It was uncovered that a significant go-togetherness was there between critical thinking and metacognitive skills. It was also true about the correlation between critical thinking and teaching self-efficacy. Additionally, metacognitive abilities were significantly associated with teaching

self-efficacy. In another recent study, Amini et al. (2020) adopted an SEM approach to estimate the causal relationships between three types of metacognitive reading strategies and self-regulation in affecting reading proficiency. The results indicated that higher scores in self-regulation strategies predicate higher scores on reading comprehension. Kian et al. (2020) sought to predict the social skills of students based on their attitude toward school and the school environment. 'Responsibility,' 'attitude towards teacher and class,' and 'student-teacher relations' had the highest mean scores in public schools. 'Responsibility,' 'motivation/self-regulation,' and 'student-teacher relations' had the highest mean in non-public schools. In addition, there was a positive correlation between some 'school climate' dimensions and 'attitude to school' and 'social skills.' A study by Daguay-James and Bulusan (2020) showed that Filipino participants used a high level of reading strategies while reading academic texts in English, with problem-solving reading strategies as their prime choice, followed by support reading strategies and global reading strategies. Based on the results of a meta-analysis addressing metacognitive strategies and reading comprehension, Navarro (2021) stated that the problem of reading comprehension is not only a problem in Basic Education students, but it also manifests itself in the study of foreign languages and only 25% of studies addressing this issue are conducted in Asia. Yamini, Rashidi, and Shafiei (2010) investigated the effect of training on problem-solving skills on EFL learners' foreign language anxiety and proved a significant effect of problem-solving skills training on decreasing the learners' language anxiety. Mohamadpour, Talebinezhad, and Tabatabaei (2019) reported a significant effect of instruction on meta-cognitive strategies on EFL learners' language anxiety. Mohammadi (2017) probed the impact of training on problem-solving skills on the vocabulary knowledge of EFL learners and showed significant improvements in the learners' vocabulary knowledge after exposure to the problem-solving training. Samadani and Shangarffam's (2019) research dealt with the effectiveness of cognitive training on EFL learners' vocabulary knowledge and showed the significant impact of the former on the latter.

The place of an empirical study on the effectiveness of a social, meta-cognitive, and problem-solving skills training package on foreign language anxiety and vocabulary learning of Iranian epileptic EFL learners is empty in the reviewed studies. This study sought to remove this gap. In so doing, the following research questions were proposed:

1. What is the effect of a social, meta-cognitive, and problem-solving skills training package on Iranian epileptic EFL learners' foreign language anxiety in online and traditional contexts?

2. What is the effect of a social, meta-cognitive, and problem-solving skills training package on Iranian epileptic EFL learners' vocabulary learning in online and traditional contexts?

3. Methodology

3.1 Design

In this study, through a quasi-experimental pre-test post-test control group design, the effectiveness of the social, meta-cognitive, and problem-solving skills training package on foreign language anxiety and vocabulary learning of the Iranian epileptic EFL learners in traditional and online contexts was assessed.

3.2. Participants

The participants of the study, who consisted of about 60 epileptic learners from both male and female groups, were selected through purposive sampling (Dörnyei, 2007) from among those referring to the Long Term Video EEG Monitoring (LTM) center in Shafa Hospital (affiliated to Kerman Medical University, Kerman, Iran). All Participant diagnosis of epilepsy [based on electroencephalography (EEG) and medical records, with local seizure) diagnosed by a neurologist. Inclusion criteria included being in the 25-42 age range, lack of exposure to any training course on social, meta-cognitive, and problem-solving skills within the last six months at the time of the study, and already being an advanced EFL learner at the time of the study (Dörnyei, 2007). The participants were divided into four groups of 15 learners randomly: two groups for the online context and two groups for the traditional context. Moral issues were considered in the sample selection. That is, the consent of the participants was the main issue in selecting them. They were ensured that no mental or physical harm would threaten them during the study. Their personal information was not shared with any third party, be it personal or organizational.

3.3. Instruments

The required data were collected through the following instruments

3.3.1 FL Anxiety Scale

FL Anxiety Scale, developed by Shao et al. (2013), was used to assess the level of FL anxiety of the participants at the beginning and end of the study. The questionnaire consists of 33 5-point Likert-type items (1 strongly disagree, 2 disagree, 3 neutral, 4 agree, 5 strongly agree). Cronbach's alpha reliability of the questionnaire has been reported as .92. Its validity has been established by factor analysis (Shao et al., 2013). In the case of the present study, Cronbach's Alpha reliability of the scale was obtained .87, and a team of four English Language Teaching experts confirmed its validity.

3.3.2 TOEFL Vocabulary Test

A vocabulary test, taken from the TOEFL test, was employed for the purpose of measuring the participants' vocabulary test. It consists of 40 multiple-choice items with a range of scores from 0 to 40. It took about 35 minutes to take this test.

3.3.3 Quick Placement Test (QPT)

The standardized Quick Placement Test (QPT) was used to make the participants homogenized in terms of their English language proficiency at the start of the study. QPT comprises 40 multiple-choice items, including grammar, vocabulary, and cloze test items. The test took about 40 minutes to administer.

3.3.4 The Social, Meta-cognitive, and Problem-solving Skills Training Package

At the start of the study, the researcher and a clinical psychologist designed a social, meta-cognitive and problem-solving skills training package through joint qualitative analysis of the related relevant materials in the existing literature. In so doing, the two raters, including the researcher and a colleague expert in qualitative data analysis, qualitatively analyzed the files by hand to extract a package based on both the relevant files and the experience of the clinical psychologist. The package was designed so that social skills training could be done in four sessions, meta-cognitive skills training in four sessions, and problem-solving skills training in four sessions. To remove the potential shortcomings of the package, a team of three clinical psychologists were invited to comment on it. Specifications of the package are shown in Table 1.

Table 1.

Specifications of a Social, Meta-Cognitive, and Problem-Solving Skills Training Package

	Social Skills Training
Session 1	The importance of social skills and training on social skills training were explained, and some general definitions of social skills were provided.
Session 2	Training on life literacy, personal empowerment skills, self-expression skills, empathy and sympathy, asking for help, and convincement
Session 3	Training on peace and trust, accountability, fairness, and citizenship rights
Session 4	Training on socio-cultural competence, good decision making, practicing no-saying, acknowledgement, and self-acceptance.
	Meta-Cognitive Skills Training
Session 1	The importance of meta-cognitive skills and training on meta-cognitive skills were explained, and some general definitions of meta-cognitive skills were provided.
Session 2	Training on planning, monitoring, and evaluating strategies
Session 3	Training on modifying strategies, time and place management strategies, duty orientation, and goal-setting,
Session 4	Training on organizing the environment of studying, correct breathing, sport, self-evaluation, self-correction, and concentration
Session 1	The importance of meta-cognitive skills and training on meta-cognitive skills were explained, and some general definitions of meta-cognitive skills were provided.
	Problem-solving skills training
Session 1	The importance of problem-solving skills and training on problem-solving skills were explained, and some general definitions of problem-solving skills were provided.
Session 2	Training on problem-solving confidence, approach-avoidance styles, and creativity
Session 3	Training on search skills, analysis skills, decision-making skills, and communicative skill
Session 4	Training on awareness of time skills, concentrating on the solution instead of problem skill, answering important WHYS skills, simplification skills, and making a list of all possible solution skills

3.4. Data Collection Procedure

To launch the study, first, a social, meta-cognitive, and problem-solving skills training package was designed, as explained above. Then, Adobe Connect (for the training sessions) was selected as the online platform for the online groups. In comparison, the traditional face-to-face classes were considered for the traditional groups. Then, all ~~the~~ four groups, which had already been homogenized using the QPT, sat the FL anxiety scale and TOEFL vocabulary test before the treatment phase as the pre-test in online and traditional contexts. Next, the two experimental groups of the study were exposed to the social, meta-cognitive, and problem-solving skills training package in twelve sessions in online and traditional contexts. However, the two control groups were not exposed to the package at all. Next, all ~~the~~ four groups re-sat the FL anxiety scale and TOEFL vocabulary test after the treatment phase as the post-test in online and traditional contexts.

3.5. Data Analysis Procedure

The qualitative data analysis was conducted manually where the package was going to be designed. Quantitative data analysis was done descriptively and inferentially. Descriptive statistics were run on the pre-test and post-test scores for the former to be done. A one-way Analysis of Covariance (ANCOVA) and a follow-up Bonferroni test were run for the latter.

4. Results

4.1 Results of the first research question

To answer the first research question, 'What is the effect of a social, meta-cognitive and problem-solving skills training package on Iranian epileptic EFL learners' foreign language anxiety in online and traditional contexts?', the first one-way ANCOVA was run.

However, descriptive statistics were run for the foreign language anxiety and vocabulary learning variables before running the one-way ANCOVA. Table 2 shows the results of descriptive statistics for emotional regulation.

Table 2

Results of Descriptive Statistics for Foreign Language Anxiety

Group	N	Mean	Std. Deviation
Experimental (online pre-test)	15	140.00	.18
Control (online pre-test)	15	140.30	.25
Experimental (online post-test)	15	38.00	.20
Control (online post-test)	15	138.55	.23
Experimental (traditional pre-test)	15	140.50	.28
Control (traditional pre-test)	15	140.66	.30
Experimental (traditional post-test)	15	49.00	.19
Control (traditional post-test)	15	139.33	.15

Shown in Table 2 are the mean foreign language anxiety scores belonging to the experimental (M= 140.00, SD= 0.18) and control groups (M= 140.30, SD= 0.25) in the online condition, and the mean scores obtained by the experimental (M= 140.50, SD= 0.28) and control groups (M= 140.66, SD= 0.30) in the traditional condition in the pre-test. Moreover, the mean foreign language anxiety scores belonging to the experimental (M= 38.00, SD= 0.20) and control groups (M= 138.55, SD= 0.23) in the online condition, and the

mean scores obtained by the experimental (M= 49.00, SD= 0.19) and control groups (M= 139.33, SD= 0.15) in the traditional condition in the post-test can be seen in Table 2.

Table 3 shows the results of Kolmogorov-Smirnov and Leven test to examine normality and equality of variance for foreign language anxiety.

Table 3

Results of Kolmogorov-Smirnov and Leven Tests to Examine Normality and Equality of Variance for Foreign Language Anxiety

	Groups	Kolmogorov-Smirnov (Normality)			Leven test (Equality of variance)		
		Statistic	df	Sig.	Statistic	df	Sig.
Online	Experimental pre-test	.35	15	.19	.73	56	.34
	Control pre-test	.26	15	.31			
	Experimental post-test	.28	15	.26			
	Control post-test	.32	15	.43			
Traditional	Experimental pre-test	.41	15	.29	.69	56	.41
	Control pre-test	.39	15	.39			
	Experimental post-test	.65	15	.34			
	Control post-test	.52	15	.61			

As revealed in Table 3, both assumptions of normality ($p>0.05$) and equality of variance ($p>0.05$) were met for foreign language anxiety. Then, one-way ANCOVA was run to investigate the effect of a social, meta-cognitive, and problem-solving skills training package on Iranian epileptic EFL learners' foreign language anxiety in online and traditional contexts. The results are shown in Table 4.

Table 4

Results of ANCOVA for Foreign Language Anxiety

Source	*SS*	*df*	*MS*	*F*	*P*	*Partial Eta Squared*
anxiety (pre-test)	3.00	3	18.00	1.55	0.1139	0.011
Group	163.821	3	163.821	8.216	*0.003	0.200
Error	1367.50	56	31.340			

* Significant at the 0.05 level.

As it is vividly observed in the Table 4, the one-way ANCOVA results are significant ($F= 8.216$, $p<0.05$, $\omega^2 = 0.200$). Referring to Cohen's (1988) guidelines, the effect size is

large. The follow-up Bonferroni test was run to explore the location of the significant differences. The results are shown in table 5.

Table 5

Results of Bonferroni Test

Groups		Mean Difference	Std. Error	P
Experimental online pre-test	Experimental online post-test	-102.00*	0.41	0.005
Experimental online post-test	Experimental traditional post-test	-11.00*	0.41	0.008
	Control online post-test	-100.55*	0.41	0.002
	Control traditional post-test	-11.00*	0.41	0.001
Experimental traditional pre-test	Experimental traditional post-test	-91.50*	0.41	0.001
Experimental traditional post-test	Control traditional post-test	-90.33*	0.41	0.001
	Control online post-test	-89.55*	0.41	0.003

The Table 5 shows that, in regard to ~~the~~ foreign language anxiety, the experimental group in both online and traditional contexts is significantly less anxious ($p<.05$) than the control group. Moreover, a significant difference ($p<.05$) is there between the pre-test and post-test mean scores of the experimental groups in both online and traditional contexts. These show the effectiveness of a social, meta-cognitive, and problem-solving skills training package on Iranian epileptic EFL learners' foreign language anxiety in online and traditional contexts. Further, Table 5 a significant difference ($p<.05$) between the means scores of the experimental groups in online and traditional contexts. This shows that the social, meta-cognitive, and problem-solving skills training package has been more effective on Iranian epileptic EFL learners' foreign language anxiety in the online context than in the traditional context.

4.2 Results of the Second Research Question

To answer the second research question, 'What is the effect of a social, meta-cognitive, and problem-solving skills training package on Iranian epileptic EFL learners' vocabulary learning in online and traditional contexts?', first, descriptive statistics was run for the vocabulary learning variable. The results are shown in Table 6.

Table 6

Results of Descriptive Statistics for Vocabulary Learning

Group	N	Mean	Std. Deviation
Experimental (online pre-test)	15	21.00	.39
Control (online pre-test)	15	20.80	.11
Experimental (online post-test)	15	33.00	.55
Control (online post-test)	15	21.33	.40
Experimental (traditional pre-test)	15	21.50	.19
Control (traditional pre-test)	15	20.95	.33
Experimental (traditional post-test)	15	30.00	.37
Control (traditional post-test)	15	25.50	.45

Included in ~~the~~ Table 6 are the mean vocabulary scores of the experimental (M= 21.00, SD= 0.39) and control groups (M= 20.00, SD= 0.11) in the online condition, and the mean scores of the experimental (M= 21.50, SD= 0.19) and control groups (M= 20.95, SD= 0.33) in the traditional condition in the pre-test. Additionally, the mean vocabulary scores of the experimental (M= 33.00, SD= 0.55) and control groups (M= 21.33, SD= 0.40) in the online condition and the mean scores obtained by the experimental (M= 30.00, SD= 0.37) and control groups (M= 25.50, SD= 0.45) in the traditional condition in the post-test are included in Table 6.

Table 7 demonstrates the results of Kolmogorov-Smirnov and Leven test to examine normality and equality of variance for vocabulary learning.

Table 7

Results of Kolmogorov-Smirnov and Leven Tests to Examine Normality and Equality of Variance for Vocabulary Learning

	Groups	Kolmogorov-Smirnov (Normality)			Leven test (Equality of variance)		
		Statistic	df	Sig.	Statistic	df	Sig.
Online	Experimental pre-test	.24	15	.15	.62	56	.30
	Control pre-test	.15	15	.27			
	Experimental post-test	.17	15	.22			
	Control post-test	.21	15	.39			
Traditional	Experimental pre-test	.30	15	.25			
	Control pre-test	.28	15	.35			
	Experimental post-test	.54	15	.30	.65	56	.37
	Control post-test	.41	15	.57			

As confirmed by Table 7, both assumptions of normality ($p>0.05$) and equality of variance ($p>0.05$) were met for vocabulary learning.

Next, another one-way ANCOVA was run. The results are shown in Table 8.

Table 8

Results of ANCOVA for Vocabulary Learning

Source	*SS*	*df*	*MS*	*F*	*P*	*Partial Eta Squared*
vocabulary (pre-test)	2.50	3	14.00	1.88	0.3990	0.231
Group	146.530	3	112.316	6.000	*0.001	0.342
Error	95066.10	56	25.210			

* Significant at the 0.05 level.

As it is clearly seen in the Table 8, the one-way ANCOVA results are significant (F= 6.000, p<0.05, ω^2 = 0.342). As argued in Cohen's (1988) guidelines, the effect size is large.The follow-up Bonferroni test was run to explore the location of the significant differences. The results are shown in Table 9.

Table 9

Results of Bonferroni Test

Groups		Mean Difference	Std. Error	P
Experimental online pre-test	Experimental online post-test	-12.00*	0.32	0.001
Experimental online post-test	Experimental traditional post-test	3.00*	0.32	0.005
	Control online post-test	11.67*	0.32	0.000
	Control traditional post-test	11.50*	0.32	0.000
Experimental traditional pre-test	Experimental traditional post-test	-8.50*	0.32	0.0009
Experimental traditional post-test	Control traditional post-test	4.50*	0.32	0.000
	Control online post-test	8.76*	0.32	0.000

Table 9 indicates that, regarding ~~the~~ vocabulary learning, the mean scores possessed by the experimental group in both online and traditional conditions are significantly different (p<.05) from those of the control group. Furthermore, a significant difference (p<.05) was there between the pre-test and post-test mean scores of the experimental groups in both online and traditional contexts. These confirm the significant impact of a social, meta-cognitive, and problem-solving skills training package on Iranian epileptic EFL learners' vocabulary learning in online and traditional conditions. Besides, ~~the~~ Table 9 reveals that the difference between the means scores of the experimental groups in online and traditional contexts is significant (p<.05). This leads to the conclusion that the social, meta-cognitive, and problem-solving skills training package has been more effective on Iranian epileptic EFL learners' vocabulary learning in online condition than in the traditional condition.

5. Discussion

This study was conducted to answer two research questions. The analysis of the data related to the first research question, 'What is the effect of a social, meta-cognitive, and problem-solving skills training package on Iranian epileptic EFL learners' foreign language anxiety in online and traditional contexts?' showed the effectiveness of a social, meta-cognitive and problem-solving skills training package on Iranian epileptic EFL learners' foreign language anxiety in online and traditional contexts. Further, it was shown that the social, meta-cognitive, and problem-solving skills training package has been more effective on Iranian epileptic EFL learners' foreign language anxiety in the online context than in the traditional context.

The mediating role of several variables can be discussed to interpret this finding. One of these variables can be the role of learning strategies, which is closely related to the notions of meta-cognitive and problem-solving strategies in a positive way and negatively tied to foreign language anxiety, as shown in the study by Sadeghy and Mansouri (2014). Another factor that can be referred to as a mediating factor in the findings is learners' autonomy, which, according to Tavallai and Marzban (2015), is significantly and positively influenced by the mastery of meta-cognitive strategies and negatively influential on foreign language anxiety.

Besides, the role of goal orientation as a mediator in the findings can be referred to in explaining the results since it has proved to be under the effect of different skills, including social skills, meta-cognition, and problem-solving. Moreover, in explaining the results, it can be argued that those learners with higher social skills feel competent at a task when they have performed well on the task relative to others (Hall, Hanna, Hanna & Hall, 2015). Apparently, this competency feeling is strong enough to help epileptic EFL learners cope with their foreign language anxiety.

To discuss the higher effectiveness of the social, meta-cognitive, and problem-solving skills training package ~~has~~ on Iranian epileptic EFL learners' foreign language anxiety in the online context than in the traditional context, it is worth noting that online settings improve self-regulation (Mohsen & Shafeeq, 2014; Yunus et al., 2013) and this leads to lower anxiety among the epileptic learners. Moreover, online contexts make one feel they have control over their learning (Jan et al., 2017; Radia, 2019), which can be associated with lower foreign language anxiety in epileptic learners. Another relevant matter to this finding

is that online contexts bring higher empowerment feelings (Bracket et al., 2010), which can contribute to lower anxiety.

This finding is consistent with Yamini, Rashidi, and Shafiei (2010) studies, which showed the positive impact of problem-solving skills on reducing EFL learners' foreign language anxiety. Moreover, the results do support the findings of the research by Mohamadpour, Talebinezhad, and Tabatabaei (2019), wherein a significant effect of instruction on meta-cognitive strategies on EFL learners' language anxiety was reported.

About the second research question, 'What is the effect of a social, meta-cognitive and problem-solving skills training package on Iranian epileptic EFL learners' vocabulary learning in online and traditional contexts?', the significant impact of a social, meta-cognitive and problem-solving skills training package on Iranian epileptic EFL learners' vocabulary learning in online and traditional conditions was indicated. Besides, it was uncovered that the social, meta-cognitive, and problem-solving skills training package has been more effective on Iranian epileptic EFL learners' vocabulary learning in online condition than in the traditional condition.

In justifying the findings, it can be mentioned that potential engagement as a core concept in problem-based learning has led to significant improvements in the vocabulary learning of ~~the~~ epileptic EFL learners (Teoh et al., 2019). Moreover, self-direction encouraged in social skills instruction (Andujar et al., 2020) may have mediated the effect of a social, meta-cognitive, and problem-solving skills training package on Iranian epileptic EFL learners' vocabulary learning in online and traditional contexts. Additionally, since the learning content is linked to the students' real-life, it contributes to deeper learning in problem-solving and social skills. This, in turn, may lead to remarkable improvements in the vocabulary learning of ~~the~~ epileptic EFL learners (Kassem, 2018). Furthermore, it can be argued that creativity and higher-order thinking, which are products of problem-solving skill and meta-cognition enhancement, can make EFL learners better at EFL vocabulary by giving them self-evaluation power (Tan, 2021). Last but not least, as a result of collaboration as one of the main pillars in social skills learning, the EFL learners can better transfer meaning and experience, and this, in turn, can contribute to EFL vocabulary growth and efficiency among them (Shimizu et al., 2021). Regarding the higher effectiveness of the package in the online context than in the traditional context, what was argued above in the first research question discussion also seems true about this finding.

This finding is in line with the achievements of the study by Mohammadi (2017), it was revealed that the problem-solving learning instruction significantly impacted vocabulary learning of Iranian EFL learners. Similarly, the study by Kadhim (2019) showed the influence of the problem-based learning on EFL learners' English achievement. Additionally, this result is ~~of~~ consistent with Samadani and Shangarffam's (2019) results, which approved the significant effect of meta-cognitive training on EFL learners' vocabulary knowledge in English.

6. Conclusion

The present study's findings showed the effectiveness of a social, meta-cognitive, and problem-solving skills training package on Iranian epileptic EFL learners' foreign language anxiety and vocabulary learning in online and traditional contexts. Further, it was proved that the package was more effective in the online context than in the traditional context. Accordingly, it can be concluded that training on social, meta-cognitive, and problem-solving skills can positively affect foreign language anxiety and vocabulary learning among epileptic EFL learners. Given that epilepsy is a disorder associated with several learning and emotional problems, it can be concluded that social, meta-cognitive, and problem-solving skills can be recruited to help ~~the~~ epileptic EFL learners cope with their problems in the learning and emotional realms. Unfortunately, social, meta-cognitive, and problem-solving skills are of a nature that can be acquired both through formal instruction and self-study programs, ~~the~~ epileptic EFL learners can take advantage of such skills beyond the expectations of a pre-planned formal program. The findings are convincing enough for us to conclude that, contrary to the public opinion, EFL vocabulary learning is a factor which is not just affected by the cognitive strategies (e.g., problem-solving strategies) and it is seriously impacted by the meta-cognitive and social strategies. This is promising in the sense that in cases of cognitive problems in EFL learners, meta-cognitive and social skills can be resorted to. All in all, it is hoped that this study makes EFL vocabulary learning easier for ~~the~~ epileptic learners and empowers them with their foreign language anxiety.

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