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The Effects of Web 2.0 Tools on EFL Students' Vocabulary Knowledge and Retention

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Abstract

This experimental study investigates the effects of a Web 2.0 tool -Smart Draw- on the recognition and retention of L2 vocabulary by drawing a comparison between paper-based methods (activities on a sheet of paper or book) and web-based language learning. A mixed methods approach is employed to eliminate the drawbacks of qualitative and quantitative research design. Two intact classes (a total of 28 students) from a state university in Turkey participated in this study. The experimental group was instructed the words with a Web 2.0 tool, Smart Draw, while the control group was taught the target words on a sheet of paper. To investigate the effectiveness of instruction, a word familiarity test was administered prior to the treatment (pre-test) and after the treatment (post-test). Three weeks after the application of the post-test, the same word familiarity test was implemented to measure the retention level of students. The quantitative data were analysed by means of SPSS program while a content analysis was generated for the interviews. Results reveal that there was a significant improvement over time for the experimental group. Additionally, semi-structured interviews with five students from the experimental group revealed that students gratify the use of interactive web-based technologies in L2 classes.

Keywords: Vocabulary knowledge; retention; semantic mapping; Web 2.0 tools

Introduction

As the extent of EFL students' vocabulary knowledge is decisive in their success of conveying meaning and communicating in the target language, vocabulary knowledge is of significance in language learning process and considered as the backbone of learners'

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competency which enables them to conduct language tasks effectively. Vocabulary learning activities have a substantial role in language acquisition processes, and accordingly there exists a need for a systematic approach to vocabulary teaching methods employed considering the central and integral role of words in first and second language acquisition processes. A common vein of the research is to examine the effects of vocabulary knowledge on language acquisition process and scholars contend that it has a facilitative role in language tasks.

Visual materials employed in EFL classes make the learning process more enjoyable and memorable while providing suitable solutions for problems that teachers encounter in this process. On the other hand, paper-based methods are regarded as ineffective in assisting students to associate new information with their background knowledge. As visual and interactive materials motivate students to get further learning outcomes, the integration of these learning tools is of great importance in terms of the quality of the language learning milieu. In most prominent studies, scholars posit that visual and verbal aids are to be used in tandem, complementing the deficiencies of each other (Mayer & Sims, 1994). Additionally, the incorporation) between motivation and use of Web 2.0 tools in EFL classes is specified by a whole host of authors inasmuch as Web Based Language Learning (WBLL) as one of the multidimensional tools of Computer Assisted Language Learning Approach (CALL) has a facilitative role in terms of students' short-term vocabulary learning and retention outcomes. In line with this fact, Terrell (2013) drew attention to the role of Web 2.0. tools in enhancing English learning opportunities outside the classroom by focusing on the role of motivation in this significant study.

Over the last decades, the pendulum has swung back to the other extreme as a result of innovations and progress in technology and related educational tools. As aforementioned in the previous paragraphs, it is plain that technological advances bolster the idea that WBLL approach has superiority over paper-based (conventional) approaches. Considering the factors mentioned above, there exists a popular belief that WBLL activities add flavour to vocabulary acquisition processes in terms of motivation, innovative ideas, and catchy visual designs. Accordingly, the main research question reflected in this study is whether WBLL approach gives an edge over the paper-based language activities in offering assistance to students to acquire and retain new vocabulary items.

Literature Review

Approaches to Vocabulary Teaching

As a well-known fact, the strategies employed by the language teacher in an EFL setting are of note as they aid students in overcoming unknown vocabulary items and linguistic deficits so as to facilitate effective communication (Oxford, 2011). In other words, vocabulary knowledge plays a significant role in receptive and productive skills of students to amplify communication and foster information exchange with native speakers. Vocabulary teaching methods, moreover, are to provide a macro-level specific learning strategies rather than a micro level one. These macro-level strategies validate learners to achieve commitment control, metacognition control, satiation control, emotional and environmental control. In line with this fact, there exists research-based evidence that indicates the multifaceted dimensions of technology in improving students' L2 vocabulary knowledge (Chang, 2005, Lai & Gu, 2011)

Nation (2002) favours the use of a systematic vocabulary teaching method rather than an incidental one as the core component of a language course. On the other hand, Laufer (2010) criticizes communicative approaches for ignoring the accuracy of the language structures while just focusing on the fluency practices. She claims that word-focused instruction is more fruitful when compared with incidental vocabulary acquisition from input provided in that milieu. At this juncture, Focus on Form (FonF) and Focus on FormS approaches can be applied to vocabulary instruction, albeit directly related with grammar teaching approaches. In the former, Ellis (2001) denotes that language learners view themselves as language users while they focus on discrete lexical items in non-authentic language tasks in the second one.

In addition to this side of vocabulary teaching approaches, Hulstijn and Laufer (2001) espouse a view based on the idea that retention of words is directly related with the amount of task-induced involvement. Based on their Involvement Load Hypothesis, the retention of unfamiliar words is contingent upon the amount of time, search and energy devoted to each set of words in a language class. As it is widely recognized by English language teaching (ELT) practitioners, students generally prefer to utilize repetition strategies for vocabulary acquisition; notwithstanding, trying to learn vocabulary by just reciting words is a painful and ineffective way to develop wide vocabulary knowledge (Li, Yang & Chen, 2010).

Rote Memorization versus Semantic Mapping Tools

In connection with the bandwagon effect of word knowledge and language acquisition on L2 studies, vocabulary teaching methods are significant in this process. To begin with, semantic mapping is defined as 'a visual representation of knowledge, a picture of conceptual relationship' (Antonacci, 1991, p.174). This definition displays the significance of semantic maps in helping learners anchor the full conceptual meanings of a given set of words. Accordingly, Carrell (1984, p.334) stipulates that "schema theory research shows that the greater the background knowledge of a text's content area, the greater the comprehension of a text." In other words, semantic maps serve for the need of learners in terms of making connections between words and referring to past learning outcomes. L2 learners have the chance to visualize a sense of network while analysing the inter- and intra- relationship between words. In a similar vein, the introduction of Web 2.0 technologies has allowed the incorporation of visual materials into EFL courses with the aim of making the vocabulary acquisition process more meaningful and memorable. Lai et al. (2012) emphasized the gravity of integrating technology into language classes and concluded that experimental group significantly outperformed the control group in their study with the help of these tools.

Implicit vocabulary learning and explicit vocabulary learning are two functional approaches in the vocabulary learning processes. Intentionality is the essential feature of explicit vocabulary learning while implicit learning process refers to an unconscious one. Semantic mapping tools embrace two of these two processes and function as a versatile tool in helping L2 learners selectively attend to it and evaluate the connections among this bundle of words. In this regard, Zahedi and Abdi (2012) managed a study with a control and treatment group and concluded that semantic mapping strategy resulted in a significant difference in terms of English language learners' vocabulary knowledge. As a well-known fact, semantic mapping is superior to paper-based memorization techniques in that it aids learners in expanding their word knowledge in a more enjoyable way. During the last decades, ELT practitioners conflate opposition to the idea of word memorization while adopting constructivist, communicative and thought-oriented strategies. The proponents of this approach assert that rote memorization has a shallow nature and is a counterproductive educational practice as it does not induce deep learning skills. Accordingly, distinct cognitive strategies, demanding a deeper level of data processing, have been introduced in order to enrich L2 learners' word knowledge. More specifically, semantic mapping tools are more functional in

enabling learning to acquire receptive retrieval skills when compared with their productive retrieval processes. Little and Box (2011) firmly addressed the role of these tools in language learners' vocabulary learning process and claimed that the strategy of semantic mapping, as with all advanced graphic organizers, paved the way for the acquisition of new concepts. Notwithstanding the abundance of theoretical claims estimating the significance of semantic mapping in developing L2 vocabulary, some other studies are to be generated in different EFL settings in order to question their effectiveness as a viable pedagogical device.

The Role of Web-Based Language Learning Approach in Vocabulary Teaching

Of great interest is whether providing EFL learners with interactive Web-based activities would enhance and facilitate the internalization of target words in language classes. In a similar vein, the application of computer technology in teaching languages has increased substantially over the last two decades as it enables language teachers to present information in multifarious activities and incompatible formats. The studies implemented in this field conclude that very often students and teachers express a preference for the incorporation of web-based language teaching materials. Similarly, Robb (2006) contends that the number of opportunities for EFL teachers is to be augmented to help them experience 'with technology both new and old, to interact with their colleagues and to access other sources of information on technology' (p.346). Judging from this, it is also plain that fostering positive attitudes towards the integration of technology into EFL classes is to be achieved by meeting the requirements of the course with appropriate examples of good practice. In this vein, Chaiprasurt and Esichaikil (2013) concluded that the use of these tools was effective and instrumental in heightening language learners' attention and engagement in classroom activities.

Beard, Wilson, and McCarter (2007) materialized research about the role and power of WBLL in language learners' vocabulary retention and memorization process. The results of this study indicate that language learners' level of motivation and achievement rates increased considerably in the end. Ayar (2021) also explicates the studies implemented in this field and emphasizes the role of Web-based simulations in fostering learner autonomy and boosting the personalization of language learning process. Ahmad (2016) additionally focuses on far-reaching impact of technology integration on augmenting students' performance in vocabulary learning process and adds that the super-diversity of digital learning offers a wide range of opportunities and scaffolding for the improvement of language learners' reading skills and vocabulary retention levels.

To further explicate the matter, it is considerably substantial to note that Web 2.0 tools enhance the meaningful and collaborative language learning milieu in appropriate settings (Gao, 2013). Additionally, there exists a substantial amount of research regarding the role of Web-based language education in terms of self-regulated learning and students' extrinsic and intrinsic motivation levels. As Web- based technology presents opportunities for authentic learning and meaningful communication, these tools likewise permit collaborative scaffolding and promote the use of multiple strategies for the internalization of word forms. There exists a continuous interplay between learners' perception of Web-based learning and L2 vocabulary strategy use. Therefore, the content of a language course is to be organized accordingly to elucidate the aforementioned relationships, along with some other factors. To that end, Web-based annotation tools should be incorporated into the syllabus to help students accomplish learning goals. In a similar vein, web-based mind mapping techniques facilitate language acquisition and retrieval with the help of visual and interactive materials.

Research Questions

The participatory, collaborative, and distributed practice opportunities provided by the latest technological advances motivate language learners to a great extent. In line with this fact, the aim of this current study is to measure and evaluate the effects of Web 2.0. tools in enhancing students' vocabulary knowledge and retention levels with an experimental research design. The comparison was made between the experimental and control groups. Because of the factors mentioned above, the researcher of the current study employed mixed methods research design comprising questionnaire and semi-structured interviews. With all these factors in mind, the study aims to find answers to the following questions:

- Does the use of Web 2.0 tools create statistically significant differences in EFL learners' vocabulary knowledge when compared with conventional paper-based methods?
- How does EFL learners perceive the use of interactive web-based tools in terms of their effectiveness in promoting L2 word knowledge?

METHODOLOGY

SmartDraw

As one of the promising computer software applications, SmartDraw facilitates the vocabulary learning process with the power of visual communication and by creating mind-maps. Additionally, this software strengthens students' creativity while providing support for the retention of vocabulary items. SmartDraw can also contribute to the process with the creation of innovative ideas while increasing students' motivation and participation in language classes, too.

Research Design

This study employed a mixed – methods research design and accordingly a word-familiarity test and semi-structured interviews were conducted with 28 participants from two preparatory class students. The aim is to interpret and reinforce the results of quantitative study with the help of qualitative data collection tools. It is commensurate with related literature that qualitative studies following up quantitative ones enable the researcher to elicit more detailed and specific information that cannot be gathered from the statistics of numerical tests. Bearing this fact in mind, the researcher adopted an explanatory sequential mixed methods design in which she employed quantitative and qualitative research methods respectively to strengthen the study through the use of diversified data collection methods. As the methodological rationale of mixed methods research design, the combination of two data collection methods serves for the triangulation and complementarity of the research findings elicited in this process. The combination of two discrete data collection methods unequivocally authorizes the researcher to elicit more reliable and valid results if he/she is to conduct required procedures. Furthermore, the use of both quantitative and qualitative data collection methods lessens the limitations of the study together with the discernible bias against the use of single data collection method.

Participants and Instructional Context

Based on previous studies conducted in this field, this explanatory sequential study aims to provide a better understanding of whether Web 2.0 tools and visual materials have a positive impact on students' vocabulary retention levels. As for the participants of this current study,

they were prep class English Language Teaching and English Language Literature students from a state university in Turkey. In total, 28 students participated in this study, and they were divided into two groups. The first group (experimental group) consisted of 13 students, three of whom were males, and the rest of the group were female students. The initial group was instructed the target words by employing a Web 2.0 tool, SmartDraw which offers different diagram types such as flowcharts. There were 15 students in the second group, four of whom were male students.

The university at which the participants are studying is a state university and one-year preparatory class is compulsory for ELT and ELL students. At the beginning of the term, a proficiency exam was registered in order to detect the students who had the necessary language skills to skip the preparatory class and attend the courses in their department. The classes are not divided into groups in corporation with their level of English. As for the proficiency level of students, they are at the intermediate level although the students are divided into sections heterogeneously. A strict syllabus is applied in all the classes. Each class receives 28 hours of English embracing ten-hour grammar, eight-hour reading, five-hour speaking and lastly five-hour writing classes, each one of which is taught by a different teacher. Speaking class teachers are two participants of US Fulbright Exchange Program, and they are expected to live in Turkey for one full academic year in order to teach English. The students' English language speaking skills improve immensely with the contribution of teachers from Fulbright Program. Fulbright exchange teachers offer a great opportunity to students by exposing them to authentic language use and enabling them to hear the pronunciation of a native speaker although they hold temporary lecturing positions.

Data Collection Tools

In association with the data collection part of the study, a vocabulary knowledge scale was administered to the participants and semi-structured interviews were conducted with them. Vocabulary Knowledge Scale was adapted from Wesche and Paribakht (1996) and the vocabulary items in the questionnaire were changed with the target words of the course book unit. The primary phase of the study provided the quantitative data for the study with its pre-test, post-test, and vocabulary retention parts. As the last data collection tool, a semi-structured questionnaire developed by the researcher herself was used to collect the related data. As its name suggests, semi-structured questionnaires incorporate open ended questions into the content. The disadvantages of utilizing one types of data collection tool are lessened with the

help of these distinct types as the drawbacks of one tool are eliminated with the support of qualitative and quantitative data collection tools.

Data Collection and Procedure

As for the data collection process, the researcher administered the pre-test to two groups during regular classroom hours so as to determine whether the target vocabulary items were familiar to participants. Thirty minutes was allocated to complete the pre-test part. Subsequent to the implementation of the first part, the researcher applied two different vocabulary teaching methods in the control group and experimental group. To start with the experimental group, the target words were taught by employing a Web 2.0 tool in the computer lab, while the control group was instructed through the use of conventional paper-based methods. Following the treatment part, the same word familiarity test was given as the post-test part. Three weeks later, the word familiarity test was administered to measure the participants' retention level. Qualitative data were gathered subsequent to the completion of the quantitative part. These interviews were generated by the researcher in face-to-face sessions. The participants of the interviews, selected with convenience sampling, were 5 students from the experimental group. The interviews were conducted in Turkish in order for the students not to feel nervous.

Data Analysis

Descriptive statistics of the pre-test, post-test and retention scores were computed by means of SPSS 22 program. To be able to carry out a t-test, the pre-test data were checked for normality assumptions and homogeneity of variances. This test was conducted to determine whether they started at the same level of proficiency. Test results did not reveal any significant differences between the two groups at the onset of the study. A Shapiro Wilk test along with the examination of the histograms, normal Q-Q plots and box plots designated that the pre-test scores of the treatment group were normally distributed with a skewness of .388 *(SE= .616),* and a Kurtosis of .917*(SE= 1,191),* and the scores of the control group were also normally distributed with a skewness of .546 *(SE= .616),* and a Kurtosis of .647 *(SE= 1,191)*. The analysis of the pre-test scores also revealed that the variances of the two groups were homogenous (Levene's test), *F*=.058, P=.812. Therefore, an independent samples t-test was conducted.

Table 1. *Descriptive Statistics for Tests of Normality*

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Experimental_Pre	,169	13	.200*	,963	13	,806
Experimental_Post	,120	13	.200*	,945	13	,532
Experimental_Retention	,168	13	.200*	,964	13	,815
Control_Pre	,131	13	.200*	,945	13	,528
Control_Post	,158	13	.200*	,969	13	,883
Control_Retention	,170	13	.200*	,907	13	,167

After the completion of quantitative part, interviews were conducted with students to elicit qualitative data. As the individuals' stories are worth listening to and having an interest in, it is not possible to convey the core meaning of educational issues only with numbers. Therefore, interviewing can be regarded as the best avenue of inquiry in making sense of the participants' experiences and evaluating their 'subjective understanding', thereby yielding results for researchers to conceive new ideas in the field. The data obtained throughout the interviews were transcribed verbatim after being audio-taped. The transcription of the interviews was fulfilled without adding any personal comments or ideas. Qualitative data collection method intends to enable the researcher to obtain a broad insight of the participants' perspectives, values, and ideas. With these facts in mind, the researcher specified the recurring themes in the verbatim transcriptions of interviews.

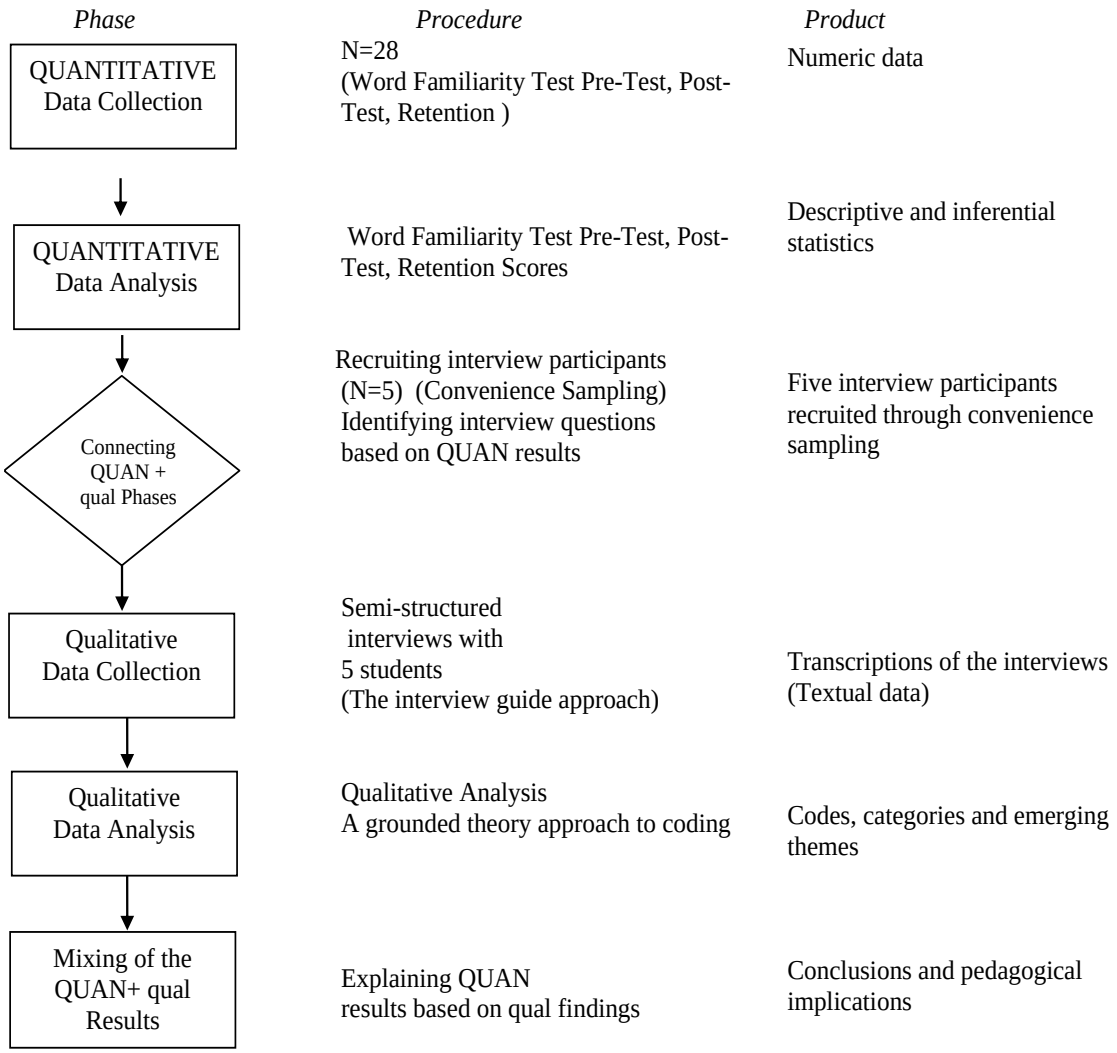

Figure 1. **Visual diagram of mixed methods sequential explanatory research design in this study**

Results

Quantitative Results of The Study

The effect of the treatment on learning and retention of the vocabulary in the long run was significant. However, the control group did not demonstrate regression in vocabulary retention although they got lower scores in comparison with the experimental group. The results of this current study are in line with the findings of previous work in showing the positive attitudes towards the integration of technology into EFL classes together with its positive impact on students' vocabulary retention and achievement levels (Lai et al., 2012). Eren (2015) also examined the use of Web 2.0 tools to advance students' vocabulary knowledge and his study yielded similar results in terms of the effectiveness of these tools to enhance language learners' vocabulary knowledge. Additionally,

perceived usefulness and ease of use are of great importance in proportion to psychometric properties of goal-orientation and self-perceived abilities. It is postulated that Web 2.0 tools are far more effective in enhancing vocabulary knowledge level of students when compared with traditional paper-based methods. Such robust evidence has been provided in similar studies (Chang, 2005) and this present paper. All these factors led students to become more participative and communicative members of the experimental group.

Results indicated that there was not a statistically significant difference between the mean score of the experimental group and that of the control group. The 95% confidence interval for the pre-test mean ranged from -7, 75 to 4, 76. The groups mean scores were roughly equal before the instructional period. Thus, one can be confident that any gains that may have been obtained are the results of the treatment provided with the participants and not due to any prior knowledge.

Table 2. *Descriptive Statistics for the Word Familiarity Test*

	Group1	N	Mean	Std. Deviatio	Std. Error Mea
Experimental_Pre	Experimental	13	43,7692	8,18692	2,27064
	Control	15	45,2667	7,90539	2,04116
Experimental_Post	Experimental	13	75,9231	7,33100	2,03325
	Control	15	57,7333	9,95322	2,56991
Experimental_Retention	Experimental	13	79,3077	5,25015	1,45613
	Control	15	61,6667	8,86137	2,28799

Table 2 indicates the descriptive statistics of the word familiarity test for the two groups. Although both groups displayed improvement from the pre-test to the post-test, the gain scores for the experimental group were larger than those of the control group. Results of the t-test showed a statistically significant divergence for the experimental group between the pre-test and post-tests. Overall, the results showed that the scores of the experimental group were higher than those of the control group in both the post-test and retention tests. The mean scores encompassing the retention level of participants also confirm the importance of integrating visual and interactive web-based materials into the language classes so as to enable the learners to retrieve information from the recesses of their own mind. However, the results of retention test reflected that all students' scores went up at least by twelve points. The results of the independent samples test can also be seen in the

table provided below and confirms this conclusion, too. All in all, there exists a statistically significant difference in pre- test and post-test results of the experimental group while this is not the case in the control group.

Table 3. *Independent Samples t-test Results*

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower	Upper
Experimental_Pre	Equal variances assumed	.058	.812	-.492	26	.627	-1.49744	3.04531	-7.75716	4.76229
	Equal variances not assumed			-.490	25.152	.628	-1.49744	3.05322	-7.78374	4.78887
Experimental_Post	Equal variances assumed	.909	.349	5.430	26	.000	18.18974	3.34982	11.30409	25.07540
	Equal variances not assumed			5.551	25.401	.000	18.18974	3.27698	11.44608	24.93340
Experimental_Retention	Equal variances	1.897	.180	6.277	26	.000	17.64103	2.81034	11.86429	23.41776

Qualitative Results of The Study

Exploration of the research issue and triangulation are two crucial things that can be achieved by means of mixed methods research. Triangulation is defined as 'a research strategy that involves approaching a research question from two or more angles in order to converge and cross-validate findings from a number of sources, to exemplify, different data sources' (Jupp, 2006, p.180). At the last step of that continuum, the researcher has the chance of comparing results in a complementary way. In line with these scholarly publications, qualitative findings of the study confirmed the quantitative results, too. Five prep class students participated in the semi-structured interviews voluntarily and concluded that Web 2.0 tools and semantic mapping enabled them to internalize the vocabulary items better. Here is a direct quotation from S3:

"I think semantic mapping promoted my English vocabulary learning considerably inasmuch as traditional paper-based vocabulary learning is sometimes boring and demotivating.".

In a similar vein, another student drew attention to the role of Web 2.0 tools in enhancing their motivation and fostering vocabulary learning process:

"*As the dominant communication media in today's world, web-based language learning tools should be incorporated into L2 classes to harness the creativity of these media and foster our language learning process. I feel that I have benefited greatly from this semantic mapping tool and got motivated to take part in other activities in our language classes. (S4)*

In brief, the manual content analysis of verbatim transcriptions and direct quotations from the interviews indicated that language learners favour the use of semantic mapping tools in language classes since they find these tools motivating and effective in promoting their vocabulary knowledge in this continuum.

Discussion

Research Question 1:

'Does the use of Web 2.0 tools create statistically significant differences in EFL learners' vocabulary knowledge when compared with conventional paper-based methods?'

The descriptive statistics of the word familiarity test scores indicated that Web 2.0 tools were superior to rote memorization strategy in terms of their effectiveness in enabling learners to acquire the target words in a contextualized structure. Additionally, results of this study provide significant findings for English language teachers who are in search of influential strategies for improving students' vocabulary knowledge in the shortest amount of time possible. Control group students received relatively higher scores while the experimental group outperformed them. There is a need to incorporate these activities into ELT classes to help students internalize vocabulary items in a contextualized and enjoyable form. The belief that Web 2.0 tools are more effective in improving vocabulary knowledge of students permeates all levels of language educators and the results of this study confirm this notion, too. The quantitative findings of the study designate that experimental group students were more motivated and consequently successful in post-test scores. However, the retention test scores of the control group were not relatively low when compared with the experimental group. Apparently, conclusive evidence to the contrary notwithstanding, control group students' longstanding habit of memorization helped them in their retention of words.

Research Question 2:

'How does EFL learners perceive the use of interactive web-based tools in terms of their effectiveness in promoting L2 word knowledge?'

As mentioned before, many language professionals espouse a view based on the fact that contextualized vocabulary learning is far more effective than learning words in lists. Results of this current study confirm the significance of contextualized vocabulary knowledge as the participants chose Web 2.0 tools in preference to conventional vocabulary learning methods when the researcher posed a related question during the interview. Benefiting from these tools in ELT is effective in creating a positive learning environment and helping students improve self-learning skills in this process. In addition, these tools broaden the opportunities for a communicative learning milieu for English language learners and motivate them with the incorporation of communicative and collaborative activities into their classes. Participants of the interview also identified that these programs helped them construct their own language learning process in a meaningful way. As Basal (2014) emphasized in his work, the integration of Web 2.0 tools into language classes results in a collaborating and stimulated learning environment. This finding is corroborated by the participants of the interview since they likewise emphasized the importance of dynamic learning environment and variety of media in these classes.

Concluding Remarks and Suggestions

Initially, the results of the study indicate that use of web-based materials in L2 classes motivate students better than conventional methods. More specifically, interactive web-based language materials are far more constructive than conventional methods in enabling L2 learners to retrieve vocabulary knowledge. Secondly, L2 students favour the use of interactive and visual materials in vocabulary internalization process as they have a more memorable and enjoyable nature. In line with this fact, the experimental group, instructed through the use of Web 2.0 materials, outperformed the control group when post-test and retention scores were compared. Web-based semantic mapping tools are far more operative in providing an appealing classroom atmosphere to encourage students participate in L2 courses. In summary, web-based language learning, as one of the multidimensional parts of Computer-Assisted Language Learning Approach (CALL), has a facilitative role in helping L2 learners to constitute short term vocabulary retention and recall related items. Accordingly, we need to discover common ground to harness the creativity of CALL approaches in EFL settings.

It is a commonly held belief that the variety of methods used in a research study allows the researcher to the triangulate the data obtained. Additionally, the researcher has the opportunity to get a more representative sample of data by the virtue of prolonged data collection process. The data collection process lasted for four weeks in this study and the duration of data collection procedure is a limitation. If a similar study were regulated with the contribution of different methodologies, it would have given more valid and reliable results in the long run. In the same vein, the sample size of the data utilized in the current study is relatively small and a larger sample size is to verify the findings elicited in this study.

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