Technology-Supported Self-Regulated Language Learning: A Systematic Review

Ceyda YALÇIN, ORCID ID: 0000-0003-4530-2830

Abstract

In this study, studies on technology-supported self-regulated language learning conducted between 2011 and 2022 are examined in terms of subject and focus points, applied techniques, and research findings. Thirty studies are addressed in this context. The findings of numerous original studies are synthesized and merged by using systematic review. The content analysis method was used to analyze the data. With this method, the data were coded by categorizing them into themes. The findings demonstrated that using technology in self-regulated language learning improves and promotes students' language learning in affective, linguistic, metacognitive, cognitive, and sociocultural areas. Thematically, studies focused mostly on affective and linguistic aspects. The research primarily used quantitative and mixed approaches as methodology. The findings revealed that, from an affective standpoint, the use of technology favorably influences learners' attitudes, motivation, and perceptions toward self-regulated language learning. Linguistically learners' language skills improved and language-learning outcomes progressed positively. In metacognitive terms, students' ability to plan their own learning increased. It is determined that learning cooperatively in the sociocultural sense improves self-regulated language learning. In terms of cognition, using cognitive strategies is found to support technology-supported self-regulated language learning. The study ends with some implications for doing more practical studies on the use of technology in self-regulated language learning.

Keywords: Technology, self-regulated language learning, systematic review.

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GENİŞ ÖZET

Giriş

Yaşadığımız yüzyılda teknolojinin gelişimi birçok alanda olduğu gibi eğitim alanında da hızlı biçimde kendini göstermiştir. Teknolojinin dil öğreniminde kullanımı da giderek daha yaygın hale gelmektedir. Bu yeni ortam, dil öğrenenler için zamandan ve mekândan bağımsız olarak yeni fırsatlar sunmaktadır. Bununla birlikte teknolojinin yaygın kullanılmasıyla kendi kendine öğrenmenin önemine daha fazla vurgu yapılmaktadır. Bu durum son yıllarda yabancı dil öğreniminde öz düzenlemeli öğrenme (SRL) kavramının belirginliğini artırmıştır. Bu bağlamda çalışmanın, teknoloji destekli öz düzenlemeli dil öğrenimi ile ilgili araştırmaların öğrenenler ve eğitimciler tarafından daha iyi anlaşılmasına katkı sağlayacağı ve alandaki mevcut eksikliklerin giderilmesinde önemli olduğu düşünülmektedir.

Amaç

Bu çalışmanın amacı, teknoloji destekli öz-düzenlemeli dil öğrenimine yönelik 2011-2022 yılları arasında yapılan araştırmaları, konu ve odak noktaları, uygulanan yöntemler ve araştırma sonuçları kapsamında incelemektir. Bu bağlamda 30 çalışma ele alınmıştır. Çok sayıda orijinal çalışmaların sonuçları sistematik biçimde sentezlenerek birleştirilmiştir. Çalışmada üç tane araştırma sorusuna yer verilmiştir: (1) İncelenen çalışmaların odak noktası ve araştırma konuları nelerdir? (2) İncelenen çalışmalarda hangi araştırma metotları kullanılmıştır? (3) İncelenen çalışmalarda öz düzenlemeli dil öğrenimini desteklemede teknolojinin etkisi nedir?

Yöntem

Çalışmada öncelikle yabancı dil öğretiminde teknoloji destekli öz-düzenlemeli dil öğrenimine yönelik araştırmalar taranmıştır. İlk olarak problemi tanımlayan anahtar kelimeler kullanılarak birincil ve gelişmiş aramalar yapılmıştır. Kendi kendini düzenleyen öğrenme, öz düzenlemeli dil öğrenimi, teknoloji destekli dil öğrenimi, teknolojiyle geliştirilmiş dil öğrenimi, yabancı dil öğrenimi, telefon, bilgisayar, mobil öğrenme gibi terimler kullanılarak kapsamlı bir literatür taraması yapılmıştır. Verilerin toplanmasında dâhil etme ve hariç tutma kriterleri uygulanmıştır. Veriler Educational Resources Information Center (ERIC), Web of Science (WOS), Scopus, Elsevier, Google Scholar gibi akademik veri tabanlarından elde edilmiştir. Sadece kaliteli ve hakemli dergilerin çevrimiçi olarak ulaşılabilen araştırma makaleleri seçilmiştir. 2011-2022 yılları arasında yayınlanmış çalışmalar dâhil edilmiştir. Bu yıllar arasında İngilizce yazılmış çalışmalar ele alınmıştır. Verilerin analizinde içerik analizi yöntemi kullanılmıştır. Veriler üç araştırma sorusunu cevaplamak için üç adımda analiz edilmiştir. Veriler yorumlanmak üzere temalara ayrılmış ve kodlamıştır.

Bulgular

Sonuçlar, öz-düzememeli dil öğreniminde teknoloji kullanımının duyuşsal, dilsel, üst bilişsel, bilişsel ve sosyokültürel alanlarda öğrencilerin dil öğrenimini geliştirdiğini ve kolaylaştırdığını ortaya koymuştur. Çalışmalar tematik olarak en fazla duyuşsal ve dilsel alanlara odaklanmıştır. Tek bir alana odaklanan çalışmalar olduğu gibi bazı çalışmalar birden fazla alanla ilgilenmiştir. Yöntem olarak çalışmalarda nicel ve karma yöntemler ağırlıklı olarak kullanılmıştır. En az nitel araştırma yöntemleri kullanılmıştır. Nitel verilerin analizinde genellikle tanımlama ve kodlama yapılarak içerik analizi yöntemi kullanılmıştır. Nicel verilerin analizinde çeşitli istatiksel yöntemlerden yararlanılmıştır. Bulgular, duyuşsal açıdan teknoloji kullanımının öğrenenlerin öz-düzenlemeli dil öğrenimine yönelik tutum, motivasyon ve algılarını olumlu etkilediğini gösterdi. Dilsel açıdan öğrenenlerin dil becerileri gelişti ve dil öğrenme çıktıları olumlu yönde ilerledi. Üst bilişsel açıdan, öğrencilerin kendi öğrenmelerini planlama, çaba ve öz denetim becerileri arttı. Sosyokültürel anlamda işbirliği içinde öğrenmenin, öz-düzenlemeli dil öğrenmeyi geliştirdiği saptandı. Bilişsel açıdan bilişsel stratejiler kullanmanın, teknoloji destekli öz-düzenlemeli dil öğrenimini desteklediği tespit edildi.

Tartışma ve Sonuç

İncelenen çalışmaların çoğu öz-düzememeli dil öğreniminde teknoloji kullanımının duyuşsal, dilsel, üst bilişsel, bilişsel ve sosyokültürel alanlarda öğrencilerin dil öğrenimini geliştirdiğini ve kolaylaştırdığını göstermiştir. Günümüze kadar taranan literatür ve yapılan deneysel çalışmalar da bu savı destekler niteliktedir. Çalışmada teknoloji destekli öz düzenlemeli dil öğrenimini ele alan araştırmaların son yıllarda arttığı, ancak genel anlamda bu alandaki çalışmaların henüz yeni olduğu tespit edilmiştir. Bununla birlikte bu konunun ele alındığı çalışmalar daha çok İngilizce yazılmıştır. Aynı zamanda çalışmalarda yabancı dil olarak çoğunlukla İngilizce tercih edilmiştir. Bu anlamda çalışmalarda teknoloji destekli öz-düzenlemeli dil öğrenimi konusunda hem farklı dilleri ele almaya, hem de farklı dillerde yapılmış çalışmalara ihtiyaç vardır. Bu bahsedilen konuda daha sağlıklı bir karşılaştırma zemini sağlamak için gereklidir. Çalışmalarda öğrenmede motivasyon ve keyif alma gibi duyuşsal faktörlere daha çok odaklanılmıştır. Dilsel alana da ağırlık verilmekle birlikte, öğrenme çıktılarının ölçüldüğü çalışma sayısı azdır. İleriki çalışmalarda dil becerilerinin gelişimine ve dil öğrenme çıktılarına daha çok odaklanılması önerilmektedir. Bunun için daha çok deneysel çalışmalar yapılmasına ihtiyaç vardır. Bu bağlamda öğretmenlere ve eğitimcilere de görevler düşmektedir. Öğrenciler teknoloji ile harmanlanmış ortamlara hazırlanmalı ve kendi öğrenmelerini planlayıp düzenleyecekleri uygulamalı eğitimlere alınmalıdır. Burada eğitimciler rehber görevinde öğrenenlere yardımcı olmalıdırlar. Sonuç olarak çalışmalar teknolojinin, öz-düzenlemeli dil öğrenimini geliştirmede faydalı olduğunu ortaya koymaktadır. Bu çalışma, bu konuda son yıllarda yapılan çalışmaları kapsamlı sunması bakımından ileriki çalışmalar için yol gösterici dir. Teknoloji çağında dil öğrenenlerin enerjilerini planlı ve verimli kullanmaları açısından, teknoloji destekli öz-düzenlemeli dil öğrenimine yönelik araştırmalar önemsenmekte ve bu konudaki çalışmaların artırılması tavsiye edilmektedir.

Teknoloji Destekli Öz-Düzenlemeli Dil Öğrenimi: Sistematik Bir İnceleme

Ceyda YALÇIN, ORCID ID: 0000-0003-4530-2830

Öz

Bu çalışmada, teknoloji destekli öz-düzenlemeli dil öğrenimine yönelik 2011-2022 yılları arasında yapılan araştırmalar konu ve odak noktaları, uygulanan yöntemler ve araştırma sonuçları kapsamında incelenmiştir. Bu bağlamda 30 çalışma ele alınmıştır. Çok sayıda özgün çalışmanın bulguları sistematik derleme kullanılarak sentezlenmiş ve birleştirilmiştir. Verilerin analizinde içerik analizi yöntemi kullanılmıştır. Bu yöntemle veriler temalar halinde kategorize edilerek kodlanmıştır. Sonuçlar, öz-düzememeli dil öğreniminde teknoloji kullanımının duyuşsal, dilsel, üst bilişsel, bilişsel ve sosyokültürel alanlarda öğrencilerin dil öğrenimini geliştirdiğini ve kolaylaştırdığını ortaya koymuştur. Çalışmalar tematik olarak en fazla duyuşsal ve dilsel alanlara odaklanmıştır. Yöntem olarak çalışmalarda nicel ve karma yöntemler ağırlıklı olarak kullanılmıştır. Bulgular, duyuşsal açıdan teknoloji kullanımının öğrenenlerin öz-düzenlemeli dil öğrenimine yönelik tutum, motivasyon ve algılarını olumlu etkilediğini göstermiştir. Dilsel açıdan öğrenenlerin dil becerileri gelişmiş ve dil öğrenme çıktıları olumlu yönde ilerlemiştir. Üst bilişsel açıdan, öğrencilerin kendi öğrenmelerini planlama becerileri artmıştır. Sosyokültürel anlamda işbirliği içinde öğrenmenin, öz-düzenlemeli dil öğrenmeyi geliştirdiği saptanmıştır. Bilişsel açıdan bilişsel stratejiler kullanmanın, teknoloji destekli öz-düzenlemeli dil öğrenimini desteklediği tespit edilmiştir. Çalışma sonunda eğitimcilere dil öğreniminde teknoloji kullanımı ve öz-düzenlemeli öğrenme konusunda daha çok uygulamalı çalışmalar yapmaları hususunda önerilerde bulunulmuştur.

Anahtar Kelimeler: Teknoloji, öz-düzenlemeli dil öğrenimi, sistematik inceleme.

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Technology-Supported Self-Regulated Language Learning: A Systematic Review

1. Introduction

In the century we have lived in, the development of technology has shown itself rapidly in the field of education as well as many other areas. These advancements may also be seen in language teaching and learning, and the use of technology in language learning is becoming increasingly common (Kartal, 2020). This innovative environment provides a fresh solution for language learners, regardless of configuration or location. With the extensive use of technology, the value of self-learning is becoming increasingly important. This condition has heightened the importance of the notion of self-regulated learning (SRL) in foreign language learning in recent years.

SRL was created in the 1980s and 1990s to describe the characteristics of successful students (Schloemer & Brenan, 2006). Self-regulation is the process through which students direct and coordinate their emotions, ideas, and efforts in order to attain their learning objectives (Zimmerman, 2000). Students develop goals for their learning in this constructive and active process, and by following these goals; they control and try to regulate their cognitive, behavioral, affective, and motivational states (Dörnyei, 2005; Pintrich, 2000). Academic performance, social adjustment, and emotional condition are all influenced by self-regulation (Mischel et al., 1988). Self-regulated learning aims to explain how children can thrive or fail academically, regardless of their mental talents, social and environmental circumstances, or any benefits or disadvantages they may have in school quality (Abadikhah et al., 2018). Sinclair (2000) states that students need to be aware of learning outcomes and results in order to organize their own learning data, and they also need to develop expertise in controlling and managing learning.

Self-regulation, which has an important place in the field of psychology and education today, is also gaining importance in the field of foreign language teaching. Despite the fact that research on learning strategies is ongoing, there is a trend in the field toward studies of self-regulated language learning (Dörnyei & Ryan, 2015). Language learners need sufficient practice both inside and outside the classroom (Seker, 2016). Learners, on the other hand, must be strongly motivated in order to reach their goals through strengthening their self-efficacy (Zimmerman & Kitsantas, 2005). Language learners must also define learning objectives, plan learning procedures, choose learning strategies, and assess learning outcomes. In other words, they are expected to be self-regulatory learners (Afflerbach et al., 2008; Yigzaw & Fentie, 2013). Furthermore, it is important for language learning that the learning environment is designed in a way that facilitates students' self-regulation (Supriyono et al., 2020). In this regard, Schwienhorst (2002) advises using a virtual environment to boost motivation, increase cognitive engagement, and improve language learners' self-regulation processes.

The use of technology in language learning has risen in recent years, notably with the growth of online education, and self-regulated language learning in online environments has begun to be emphasized (Kızıl & Savran, 2016). Technology provides students with many resources to engage in language learning activities on their own, and with the advent of technology instruments, the idea of SRL in the context of language learning has gained new dimensions. Learners in technology-supported self-regulated language learning use learning methods such as planning and resource management, as well as evaluating learning behaviors

and outcomes (Carneiro et al., 2005). Language research on the impact of technology has revealed that learners in technology-supported contexts are self-directed and very active (Watts &Lloyd, 2001). Because virtual learning environments necessitate more self-regulation. Learners are more dedicated to self-observation, self-motivational attitudes, and self-control in these situations (Wandler & Imbriale, 2017). A well-designed and technology-enhanced learning environment can assist learners in developing self-regulated learning practices and maintaining their interest in this topic (Shih et al., 2010).

The growing importance of technology-supported self-regulated language learning necessitates a thorough evaluation of research in this area. Because it is becoming increasingly vital for language learners to develop their technology-based self-regulated language learning skills and performance, and for teachers to coach students in this setting. As a result, in this review, studies from the last 12 years on technology-supported self-regulated language learning have been examined. The following research questions are specifically addressed in the study:

1) What are the focus points and research topics of the studies?
2) For the reviewed studies, what types of research methods were used?
3) How did technology assist self-regulated language learning in the studies reviewed?

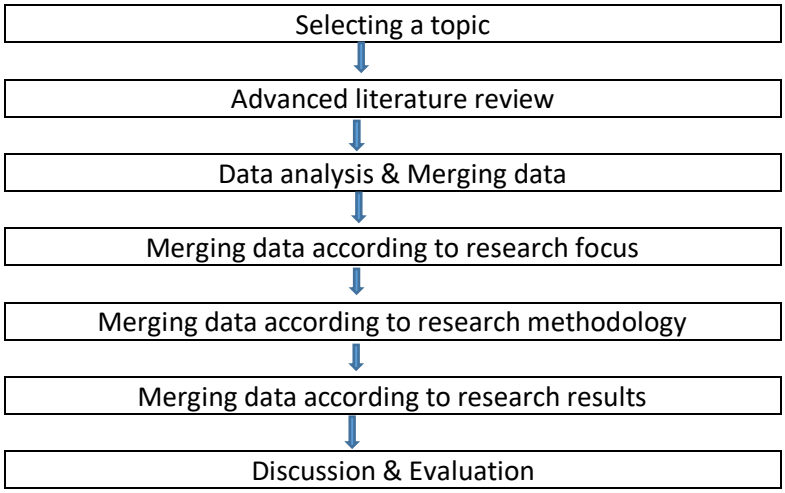
It is thought that the research will help learners and educators gain a better knowledge of technology-supported self-regulated language acquisition and that existing gaps will be filled.

2. Method

A systematic review (SR) is a scientific review in which original research on a specific topic is reviewed in great detail and extensively, and the findings are synthesized using exclusion and inclusion criteria (Aslan, 2018). A systematic review is a literature review that aims to identify all available evidence on a topic to reduce the impact of bias on the review findings (Booth et al., 2016). Systematic reviews strive to synthesize the findings of a large number of original investigations using scientific and methodical approaches (Petticrew & Roberts, 2006). The inclusion and exclusion criteria were used in the data collection part of the study. In data analysis, content analysis method was used.

Figure 1.

Research process



2.1. Data Acquisition

Inclusion and exclusion criteria were used in data gathering to maximize the emphasis on relevant studies. The emphasis has been placed on recent years, during which technology has been widely utilized in education and language learning. As a result, studies published between 2011 and 2022 are included. Simultaneously, research authored in English was discussed. Studies in other languages are excluded. The papers all discuss self-regulation in foreign language learning and the impact of technological instruments on self-regulated language learning. Studies in other disciplines are excluded. For data gathering and literature review, primary and advanced searches were conducted by using keywords characterizing the topic. A complete literature review was undertaken using terms such as self-regulated learning, self-regulated language learning, technology-supported language learning, technology-enhanced language learning, computer-assisted language learning, and mobile-assisted language learning. Data were acquired from academic databases such as the Educational Resources Information Center (ERIC), Web of Science (WOS), Scopus, Elsevier, and Google Scholar. Only high-quality research publications from peer-reviewed journals that were freely available online were chosen. As a result of the research, a total of 55 studies were registered for review. Among these, those written after 2011 and directly related to foreign language education were discussed. In addition, studies from high-quality journals were selected for review. Journals with lower indexes were excluded. Taking into account the aforementioned criteria, 30 papers were chosen for analysis in the current study during the final stage of data collecting.

Table 1.

Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
1. Technology-supported self-regulated language learning 2. Studies between 2011-2022 3. Studies in the English language 4. High quality peer-reviewed journals with online access 5. 30 studies are included	1. Studies in other disciplines 2. Studies before 2011 3. Studies in other languages 4. Lower indexes journals were excluded 5. 25 studies are excluded

2.2. Data Analysis

The content analysis approach was used in data analysis. Content analysis is a research method used to make valid inferences from verbal, visual, or written data to both describe and quantify certain phenomena (Downe-Wambolt, 1992). Through content analysis, the data were categorized into themes for interpretation. The studies examined in the research were analyzed in three steps. First of all, the studies examined to answer the first research question were coded and analyzed according to the research focus and topics. At this stage, the studies are divided into affective, linguistic, metacognitive, sociocultural, and cognitive areas. To evaluate the second research question, the research methods of the selected studies were coded and analyzed. These are from a general point of view; classified as quantitative, mixed, and qualitative methods. At this stage, experimental studies and non-experimental studies are

grouped. Data collection tools and data analysis methods were examined. In the third stage, the results of the studies were examined to investigate the effectiveness of technology in self-regulated foreign language learning, and then the positive and negative results of the relationship between technology and self-regulated language learning were grouped according to the categories of the affective domain, linguistic domain, metacognitive domain, sociocultural domain, and cognitive domain. Linguistically, the studies are also categorized according to the language skills they are interested in.

3. Findings

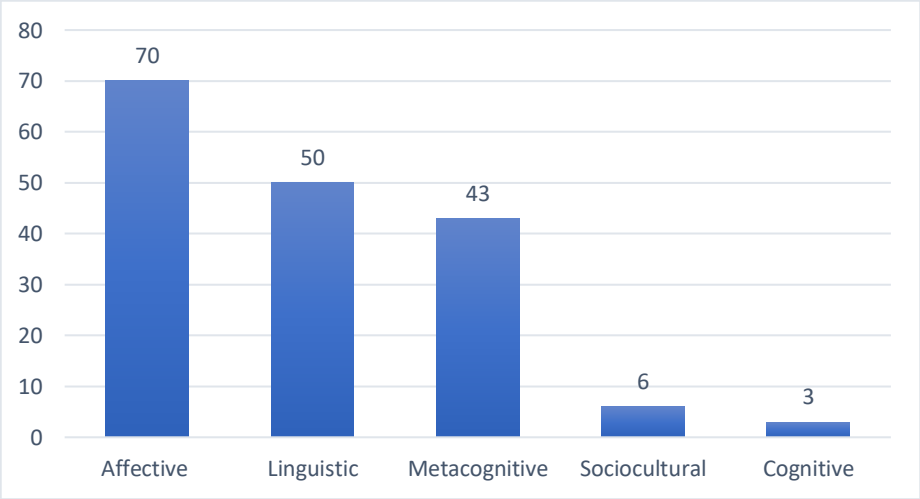
3.1. Focus of Studies and Research Topics

Looking at the topics and focal points of the selected studies, it was seen that the focus was on the role of technology in supporting self-regulated language learning, but the issue was discussed from different angles. In terms of research focus; affective, linguistic, metacognitive, cognitive, and sociocultural areas. Some studies have dealt with more than one area, just as there have been studies that have focused on a single area.

According to the findings, most of the studies (70%) focused on the affective area, followed by the linguistic area (50%). 21 studies about the affective area were examined. The affective area evaluated orientations such as learner motivation, interests, attitudes, and perceptions in technology-based self-regulated language learning. While there are eight studies that only deal with the affective area, thirteen studies deal with the affective domain as well as other areas. For example; the work of Lai et al. (2016) and likewise by Zheng et al. (2018) dealt only with the affective area Çelik et al., (2012) and An et al., (2021) were interested in both affective and linguistic areas.

Figure 2.

Research focus



15 studies focusing on the linguistic area have been found. These studies looked at whether technology-based self-regulated learning facilitates language learning and improves language skills. Among them, some studies have measured learning outcomes. Liu et al., (2014) measured vocabulary knowledge scores, while Garcia Botero et al., (2019) measured both writing ability and listening and reading scores. Similarly, Hromalik & Koszalka (2018) and Luu et al., (2021) examined learning outcomes. Other studies mostly focused on what language skills

learners use technology to develop. When looking at the studies according to language areas and language skills, writing ability was the most researched (60%) language skill. 13 (43%) metacognitive research concentrating on learner self-regulation and efficacy were found to be interesting in this topic. The metacognitive area, as well as other areas, were investigated in these studies. Lei et al., (2022) examined both word self-regulation skills and word learning attitudes to examine the metacognitive and affective areas. Similarly, Huang and Yu (2019) combined the metacognitive and affective areas. Karacan et al., (2022) on the other hand, concentrated solely on the metacognitive areas.

Figure 3.

Language skills

Cognitive and sociocultural areas were less examined in the studies. Lai (2013) investigated the sociocultural factors that determine learners' use of technology on their own. Liu et al., (2014) examined technology-based collaborative vocabulary learning. Only one study dealt with the cognitive domain. Chen & Hsu (2020) looked at self-regulated learning from a cognitive perspective through a mobile app.

3.2. Methods Used in Studies

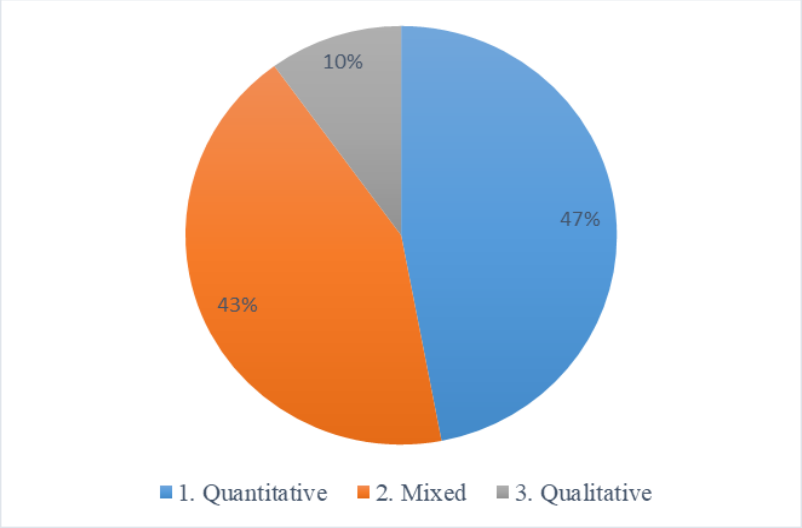
When the selected studies are examined, it is understood that different research methods are used to determine the effect of technology in supporting self-regulated language learning. Quantitative research methods are used in 14 studies (47%). In 13 studies (43%), mixed methods using a combination of quantitative and qualitative research are preferred, while qualitative methods are used in three studies (10%).

In quantitative research studies, experimental and quasi-experimental designs are used. Experiment design research includes investigations to investigate the influence of a technology-based application on self-regulated language acquisition (Chen et al., 2019; Garcia Botero et al., 2019). The bulk of research using experimental design is conducted with learners divided into experimental and control groups, and their self-regulation is monitored via tests and questionnaires. For example, Bai et al., (2021) used an experimental strategy to collect data in their investigations by administering pre- and post-tests as well as questionnaires. Exams are

used in research to measure students' language learning outcomes and their progress in language acquisition. Exams were found to be used as a data collection instrument in 9 (30%) investigations. For example, Chen and Hsu (2020) used pre and post-tests to assess reading and listening comprehension, Robillos (2021) used a writing pre-test, Liu et al. (2014) used quizzes to assess vocabulary knowledge, and Mohammadzadeh and Sarkhosh (2018) attempted to determine students' language proficiency using a speaking test.

Figure 4.

Research methodology



10 studies (33%) used an experimental approach, while 20 studies (67%) used a non-experimental strategy). These studies, in general, examined how students use technology to control their language learning. It was discovered that a questionnaire was used in 21 (70%) of the 30 studies. Open-ended questions are one example (Lai & Gu, 2011; Su et al., 2018). As a data-gathering tool, nine (30%) studies were undertaken (Fathi et al., 2019; Lai & Gu, 2011; Lai, 2015; Luu et al., 2021; Rahimi & Fathi, 2021; Robillos, 2021; Supriyono et al., 2020; Umamah & Cahyono, 2022; Wang & Chen, 2020). In addition, two studies were employed on a daily basis (Luu et al., 2021; Naseri & Matellebzadeh, 2016). In the analysis of qualitative data, it was determined that the content analysis method was generally used by identification and coding. Although descriptive statistics are mostly used in the analysis of quantitative data, different statistical methods such as t-tests, k-square test, Pearson correlation analysis, regression analysis, factor analysis, covariance analysis, moderation analysis, Path analysis ANCOVA test, and structural equation modeling were used.

3.3. The Effect of Technology in Supporting SRLL

Technology has been found in various studies to improve self-regulated language acquisition. Almost all (67%) of the research assessed in terms of affective domain concluded that technology-supported self-regulated learning promotes learners' positive views. For example, Lai et al. (2016) discovered that online education platforms favorably improve students' attitudes, perceptions, and use of self-regulated language learning. Zheng et al. (2018) discovered that students with positive thinking and motivation in language learning have superior self-regulation skills in online learning environments. However, Lai et al., (2022) found that most of the students use mobile technology for self-regulated language learning but are

extrinsically motivated. In only one study (Chien, 2019) examined in the affective domain, students reported that using self-regulated learning strategies without technology was more effective in terms of language teaching.

Technology-supported self-regulated learning increases learners' language skills and language performance, according to studies in the linguistic profession (Çelik et al., 2012). Nine studies on the impact of technology on writing abilities in self-regulated language acquisition produced encouraging results. The findings primarily demonstrated that technology-based tools improved writing performance (Rahimi & Fathi, 2021), students rated their writing ability test scores (Garcia Botero et al., 2019), and students made significant gains in argumentative writing performance, such as task achievement, vocabulary and grammar range, and accuracy (Robillos, 2021). A study in the field of writing discovered that blog-mediated writing training reduced learners' writing self-efficacy (Fathi et al., 2019). The most investigated area after writing skills is listening comprehension. Six research examined the relationship between technologies and self-regulated listening skills. Luu et al., (2021), for example, found that language learners who used a technology-supported and self-regulated listening platform to assist them grasp what they listened to had more than twice as much listening comprehension abilities as those who did not. Reading, speaking, and vocabulary studies have also demonstrated the benefit of technology in these areas. Qiao et al., (2022) found that an integrated and gamified platform for morphological awareness learning with self-regulated learning support improved students' reading performance and achievements. Self-regulated learning with a smart tutoring system was proven to increase students' speaking skills significantly (Mohammadzadeh & Sarkhosh, 2018). Speaking ability was found to be the most important predictor of students' usage of technology-based self-regulated learning practices by An et al., (2021). Web-based applications improve vocabulary and boost learners' vocabulary scores (Liu et al., 2014), whereas mobile apps with self-regulated learning mechanisms improve students' vocabulary learning performance (Chen et al., 2019).

The use of technology in metacognitive self-regulated language learning increased students' self-regulation and self-management (Lei et al., 2022; Naseri & Motallebzadeh, 2016; Su et al., 2018). Robillos (2002) found that learners' awareness of planning, self-control, effort, and self-regulation increased. Sociocultural studies have found that collaborative learning and cooperative learning have a good effect on self-regulated language acquisition and the use of technology (Lai, 2013; Liu et al., 2014). Students were found to have higher self-regulation while studying in a technology-based program where they learned languages utilizing cognitive techniques.

4. Discussion

The main purpose of this study is to examine the studies on technology-supported self-regulated language learning within the scope of the topics and focal points they are interested in, the method applied and the findings and results obtained. Most of the studies examined have shown that the use of technology in non-self-corrective language learning improves and facilitates students' language learning in the affective, linguistic, metacognitive, cognitive, and sociocultural areas. The literature and experimental studies that have been scanned to date support this argument. These studies show that technology can help students self-regulate their learning (Azevedo et al., 2005; Hadwin et al., 2010).

When the focus points and subjects of the studies are examined, the affective field is examined more than other areas. The affective field, which deals with behaviors such as enjoyment of learning, motivation, interest in learning, attitude and perception, has been decisive in most of the studies. It is likely that here the affective sphere has been treated as more of a focal point in the studies as it is an effective field for action to learn. It is important that learners learn with pleasure. In this respect, technology-supported environments can offer students more opportunities in terms of learning. Instruction designed for a wide range of learning styles has consistently proven to be more effective than traditional teaching with a narrow range of styles (Felder & Brent, 2005). Learning a foreign language in an original and real-life manner makes learning more fun, thus increasing the intrinsic motivation of the students and enabling them to participate more actively in learning (Lee, 2022). After the affective area, the linguistic area has been the most prominent area in studies. In the linguistic domain, the effects and benefits of using technology in self-regulated learning on language learning were investigated. Some studies measured learning outcomes. Writing skill was the most studied area, followed by listening, reading, speaking and vocabulary, respectively. Some studies examined multiple language skills simultaneously. After the linguistic domain, the metacognitive domain was widely explored. In the metacognitive domain, which deals with learners' self-regulation and self-management, it was looked at how learners regulate their self-regulation skills. It was observed that socio-cultural and cognitive domains were relatively less addressed in the studies. The socio-cultural field evaluated the learning potentials that students can create by collaborating in technology-supported self-regulated language learning. The cognitive domain explored how using cognitive strategies in a technology-enabled practice affected self-regulation skills.

When the methodology followed by the studies is investigated, it is discovered that quantitative approaches are typically used, and mixed methods are frequently selected. Qualitative approaches were the least popular. Urbina et al., (2021) discovered quite similar findings in terms of approach in their study examining self-regulated learning and technology-supported learning in higher education. Only ten of the thirty studies employed an experimental design. Learning outcomes for language learners were examined using technological tools in only a few research. Studies on technology-enhanced language learning have largely focused on the elements that influence language learners' self-regulated language acquisition (Chien, 2019; Kızıl & Savran, 2016; Lai & Gu, 2011; Steel et al., 2012; Supriyono et al., 2020; Wang & Chen, 2020). These studies have not dealt with learners' language learning outcomes. Most of the data in descriptive studies was obtained through questionnaires and interviews. Several studies collected data from diaries and assignments. Less space was given to studies that covered students' own experiences and detailed analyses through technology-based applications. Questionnaires were the most widely used data collection tool, as studies often explored students' perceptions. In this regard, Arıkan (2018) stated that the results of the survey may not be as realistic and convincing as the experimental studies. On the other hand, descriptive statistics were the most frequently used data analysis method. It was determined that a wide variety of statistical data analysis techniques, especially descriptive statistics, was used in the analysis of quantitative data. It was determined that only the content analysis method was used in qualitative data analysis. It is evident from the studies that future studies on technology-supported self-regulated language learning and teaching need to use more experimental design methods. More evidence, or, in other words, more experimental results in this field, which is

still new, will enable the effect and continuity of technology in self-regulated language learning to be seen more clearly.

The results of the studies examined in the field showed that the technology had positive effects on self-regulated language learning. From an affective perspective, the use of technology positively affected learners' attitudes and perceptions towards self-regulated language learning. It was found that students with positive thinking and motivation enjoyed learning and were able to have better self-regulation skills in online learning environments. This situation also reflected positively on the success of the students. Because expectations and values directly affect students' performance, effort, and success (Wigfield & Eccles, 2000). Other experimental studies have also shown that interest in learning positively influences students' use of SRL strategies and learning achievement (Bai & Guo, 2019; Hong et al., 2017; Mun & Hwang, 2003). Learning self-regulation is part of social cognitive learning theory, which holds that student behaviors and motivations influence student accomplishment (Akpınar et al., 2004). The simultaneous use of technology can boost students' motivation and interest in language learning (Lenne et al., 2008; Shadiev & Yang, 2020). At the same time, believing in motivation promotes and sustains self-regulated learning (Pintrich, 1999). It has been shown that motivation and learning have a favorable impact on one another.

Technology-based self-regulation tools and practices have been found to increase learners' language skills in the linguistic area. Such activities have been demonstrated to improve typing performance and score higher on typing tests. Those who employed a technology-enabled self-regulating platform improved their listening comprehension by twofold. The benefits of using technology to improve reading, speaking, and vocabulary were also documented. Learners' reading comprehension, speaking and vocabulary acquisitions and performances increased in contexts where learning took place with the assistance of technology and self-regulated learning. Language skills research findings demonstrate both the opportunities provided by technology-supported language learning environments to language learners (Chang, 2007; Salaberry, 2001) and the benefits of knowing self-regulatory strategies in language learning (Camahalan, 2006; Chung, 2000; Miltiadou & Savenye, 2003). From a metacognitive standpoint, the use of technology in self-regulated language learning improved learners' self-regulation skills and raised their awareness in this regard. There is comparable evidence suggesting the use of the internet for learning and online environments facilitate metacognitive self-regulated learning (Azevedo et al., 2008; Banyard et al., 2006; Greene et al., 2010; Hu & Gramling, 2009). According to sociocultural research, collaborative learning has a good impact on technology-based self-regulated language acquisition. These findings are supported by research findings that show how online settings improve collaboration in learning and promote peer contact. (Kramarski & Mizarchi, 2006; Lee & Tsai, 2011). In a cognitive study, it was discovered that in a technology-based practice where students learn languages through cognitive techniques, they make more self-regulation. Similarly, Steffens (2008) discovered that technology supports cognitive components in self-regulated learning. Yang (2006) discovered that the usage of cognitive strategy in technology-based environments is on the rise. When the studies were analyzed, it was found that there was a need to increase the relevant studies in sociocultural and cognitive domains of language learning /teaching.

5. Conclusion and Recommendations

In this study, 30 studies, according to their topics and focal points, methods and research results on technology-supported self-regulation language learning conducted between 2011-2022 were examined. Most of the studies considered have shown that technology in self-regulated language learning positively affects learners' metacognitive, cognitive, and socio-cultural skill areas, especially affective and linguistic. In the study, it was found that the research on technology-supported self-regulation language learning has increased in recent years, but in general, the studies in this field are still new. However, the studies dealing with this subject have mostly been written in English. At the same time, English was mostly preferred as a foreign language in the studies. In this regard, there is a requirement to address both distinct languages and studies on technology-supported self-regulated language acquisition undertaken in diverse languages. This is required to create a more balanced comparison ground on the subject at hand. Studies have tended to emphasize emotive elements like motivation and enjoyment of learning. The number of research that measures learning outcomes is rather minimal, despite the fact that the linguistic field is also given attention. It is suggested that future research concentrate on the development of language abilities and language learning outcomes. More experimental research is required for this. Teachers and educators have obligations in this area as well. Students should be prepared for technology-enhanced environments and given hands-on training to plan and organize their own learning. Educators should act as guides for learners in this situation. Finally, research shows that technology can help promote self-regulated language learning. This study serves as a model for future research by completely covering the investigations conducted in recent years on this topic. In order for language learners to use their energies in a planned and efficient manner in the era of technology, study on technology-supported self-regulated language learning is regarded as crucial, and more research on this issue is needed.

This review has some limitations. In this study, only papers written in English were discussed. The scope of the study can be expanded by examining studies written in different languages. In addition, studies with lower indexes were excluded. Future research can include all indexes. Publications such as symposium proceedings can also be included. Finally, the topic was examined within the scope of three main research questions. In future studies, the issue can be addressed in terms of different variables.

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Ethics Committee Decision

Ethics committee approval was not obtained as the study was a review article.

References

Abadikhah, S., Aliyan, Z., & Talebi, S. H. (2018). EFL students' attitudes towards self-regulated learning strategies in academic writing. *Issues in Educational Research, 28*(1), 1-17. http://www.iier.org.au/iier28/abadikhah.pdf

Afflerbach, P., Pearson, P. D., & Paris, S. G. (2008). Clarifying differences between reading skills and reading strategies. *The Reading Teacher, 61*(5), 364-373. https://doi.org/10.1598/RT.61.5.1

Akpınar, A., Hacısalihoğlu, H., & Mirasyedioğlu, Ş. (2004). *Matematik öğretimi: Matematikte işbirliğine dayalı yapılandırmacı öğrenme ve öğretme.* Asil Yayın Dağıtım.

An, Z., Wang, C., Li, S., Gan, Z., & Li, H. (2021). Technology-assisted self-regulated English language learning: Associations with English language self-efficacy, English enjoyment, and learning outcomes. *Frontiers in Psychology*, *11,* 1-14. https://doi.org/10.3389/fpsyg.2020.558466

Arıkan, R. (2018). Anket yöntemi üzerinde bir değerlendirme. *Haliç Üniversitesi Sosyal Bilimler Dergisi, 1*(1), 97-159. https://dergipark.org.tr/en/pub/husbd/issue/39647/452737

Aslan, A. (2018). Sistematik derleme ve meta-analizi. *Acta Medica Alanya, 2*(2), 62-63.

Azevedo, R., Cromley, J. G., Winters, F. I., Moos, D. C., & Greene, J. A. (2005). Adaptive human scaffolding facilitates adolescents' self-regulated learning with hypermedia. *Instructional Science, 33*, 381-412. https://doi.org/10.1007/s11251-005-1273-8

Azevedo, R., Moos, D. C., Greene, J. A., Winters, F. I., & Cromley, J. G. (2008). Why is externally facilitated regulated learning more effective than self-regulated learning with hypermedia? *Educational Technology Research and Development, 56,* 45-72. https://doi.org/10.1007/s11423-007-9067-0

Bai, B., & Guo, W. (2019). Motivation and self-regulated strategy use: relationships to primary school students' English writing in Hong Kong. *Language Teaching Research, 25*(3), 1–22. https://doi.org/10.1177/1362168819859921

Bai, B., Wang, J., & Zhou, H. (2021). An intervention study to improve primary school students' self-regulated strategy use in English writing through e-learning in Hong Kong. *Computer Assisted Language Learning, 35*(9), 2265-2290. https://doi.org/10.1080/09588221.2020.1871030

Banyard, P., Underwood, J., & Twiner, A. (2006). Do enhanced communication technologies inhibit or facilitate self-regulated learning? *European Journal of Education, 41*, (3/4), 473-489. https://doi.org/10.1111/j.1465-3435.2006.00277.x

Bland, L. S. (2005). *The effects of a self-reflective learning process on student art performance* [Unpublished doctoral dissertation]. The Florida State University.

Booth, A., Sutton, A., & Papaioannou, D. (2016) *Systematic approaches to a successful literature review*. Sage.

Camahalan, F. M. (2006). Effects of self-regulated learning on mathematics achievement of selected Southeast Asian children. *Journal of Instructional Psychology, 33*(3), 194-205. https://eric.ed.gov/?id=EJ764668

Carneiro, R., Steffens, K. & Underwood, J. (2005). *Self-regulated Learning in Technology-enhanced Learning Environments.* Proceedings of the TACONET Conference, Lisbon, 23 September 2005. Aachen: Shaker.

Chang, M. M. (2007). Enhancing web-based language learning through self-monitoring. *Journal of Computer Assisted Learning, 23*(3), 187-196. https://doi.org/10.1111/j.1365-2729.2006.00203.x

Chen, C. M., Chen, L. C., & Yang, S. M. (2019). An English vocabulary-learning app with self-regulated learning mechanism to improve learning performance and motivation. *Computer Assisted Language Learning, 32*(3), 237-260. https://doi.org/10.1080/09588221.2018.1485708

Chen, Y. L., & Hsu, C. C. (2020). Self-regulated mobile game-based English learning in a virtual reality environment. *Computers & Education, 154,* 103910. https://doi.org/10.1016/j.compedu.2020.103910

Chien, C. W. (2019). Taiwanese EFL undergraduates' self-regulated learning with and without technology. *Innovation in Language Learning and Teaching, 13*(1), 1-16. https://doi.org/10.1080/17501229.2016.1264076

Chung, M. K. (2000). The development of self-regulated learning. *Asia Pacific Education Review, 1,* 55-66. https://doi.org/10.1007/BF03026146

Çelik, S., Arkin, E., & Sabriler, D. (2012). EFL learners' use of ICT for self-regulated learning. *The Journal of Language and Linguistic Studies, 8*(2), 98-118. http://www.jlls.org/vol8no2/98-118.pdf

Downe-Wamboldt, B. (1992). Content analysis: method, applications, and issues. *Health Care for Women International, 13*(3), 313-321. https://doi.org/10.1080/07399339209516006

Dörnyei, Z. (2005). *The psychology of the language learner: Individual differences in second language acquisition.* Lawrence Erlbaum.

Dörnyei, Z., & Ryan, S. (2015). *The psychology of the language learner revisited*. Routledge.

Fathi, J., Ahmadnejad, M., & Yousofi, N. (2019). Effects of blog-mediated writing instruction on L2 writing motivation, self-efficacy, and self-regulation: a mixed methods study. *Journal of Research in Applied Linguistics, 10*(2), 159-181. https://doi.org/10.22055/rals.2019.14722

Felder, R. M., & Brent, R. (2005). *Understanding student differences. Journal of Engineering Education, 94*(1), 57-72. https://doi.org/10.1002/j.2168-9830.2005.tb00829.x

García Botero, G., Botero- Restrepo, M. A., Zhu, C., & Questier, F. (2019). Complementing in-class language learning with voluntary out-of-class MALL. Does training in self-regulation and scaffolding make a difference? *Computer Assisted Language Learning, 34*(8), 1013-1039. https://doi.org/10.1080/09588221.2019.1650780

Greene, J. A., Bolick, C. M., & Robertson, J. (2010). Fostering historical knowledge and thinking skills using hypermedia learning environments: The role of self-regulated learning. *Computers & Education, 54*(1), 230-243. https://doi.org/10.1016/j.compedu.2009.08.006

Hadwin, A. F., Oshige, M., Gres, C. L. Z., & Winne, P. H. (2010). Innovative ways for using Study to orchestrate and research social aspects of self-regulated learning. *Computers in Human Behavior, 26*(5), 794-805. https://doi.org/10.1016/j.chb.2007.06.007

Hromalik, C. D., & Koszalka, T. A. (2018). Self-regulation of the use of digital resources in an online language learning course improves learning outcomes. *Distance Education, 39*(4), 528-547. https://doi.org/10.1080/01587919.2018.1520044

Hong, J. C., Hwang, M. Y., Tai, K. H., & Lin, P. H. (2017). Intrinsic motivation of Chinese learning in predicting online learning self-efficacy and flow experience relevant to students'

learning progress. *Computer Assisted Language Learning, 30*(6), 552-574. https://doi.org/10.1080/09588221.2017.1329215

Hu, H., & Gramling, J. (2009). Learning strategies for success in a web-based course: A descriptive exploration. *Quarterly Review of Distance Education, 10*(2), 123-134. http://itecideas.pbworks.com/f/44895674.pdf

Huang, R. T., & Yu, C. L. (2019). Exploring the impact of self-management of learning and personal learning initiative on mobile language learning: A moderated mediation model. *Australasian Journal of Educational Technology, 35*(3), 118-131. https://doi.org/10.14742/ajet.4188

Karacan, C. G., Yıldız, M., & Atay, D. (2022). The relationship between self-regulated learning and EFL achievement in synchronous online language education. *Mextesol Journal, 46*(3), 1-14. https://files.eric.ed.gov/fulltext/EJ1364985.pdf

Kartal, G. (2020). An analysis of using technology in language learning in three flagship journals. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi*, (53), 515-532. https://doi.org/10.21764/maeuefd.645551

Kızıl, A. Ş., & Savran, Z. (2016). Self-regulated learning in the digital age: An EFL perspective. *Novitas-ROYAL (Research on Youth and Language), 10*(2), 147-158. https://files.eric.ed.gov/fulltext/EJ1167208.pdf

Kramarski, B., & Mizrachi, N. (2006). Online discussion and self-regulated learning: Effects of instructional methods on mathematical literacy. *The Journal of Educational Research, 99*(4), 218-231. https://doi.org/10.3200/JOER.99.4.218-231

Lai, C., & Gu, M. Y. (2011). Self-regulated out-of-class language learning with technology. *Computer Assisted Language Learning, 24*(4), 317-335. https://doi.org/10.1080/09588221.2011.568417

Lai, C. (2013). A framework for developing self-directed technology use for language learning. *Language Learning & Technology, 17*(2), 100-122. http://dx.doi.org/10125/44326

Lai, C. (2015). Modeling teachers' influence on learners' self-directed use of technology for language learning outside the classroom. *Computers & Education, 82,* 74-83. https://doi.org/10.1016/j.compedu.2014.11.005

Lai, C., Shum, M., & Tian, Y. (2016). Enhancing learners' self-directed use of technology for language learning: the effectiveness of an online training platform. *Computer Assisted Language Learning, 29*(1), 40-60. https://doi.org/10.1080/09588221.2014.889714

Lai, Y., Saab, N., & Admiraal, W. (2022). University students' use of mobile technology in self-directed language learning: Using the integrative model of behavior prediction. *Computers & Education, 179*, 104413. https://doi.org/10.1016/j.compedu.2021.104413

Lee, S. W. Y., & Tsai, C. C. (2011). Students' perceptions of collaboration, self-regulated learning, and information seeking in the context of Internet-based learning and traditional learning. *Computers in Human Behavior*, *27*(2), 905-914. https://doi.org/10.1016/j.chb.2010.11.016

Lee, S. M. (2022). A systematic review of context-aware technology use in foreign language learning. *Computer Assisted Language Learning, 35*(3), 294-318. https://doi.org/10.1080/09588221.2019.1688836

Lei, X., Fathi, J., Noorbakhsh, S., & Rahimi, M. (2022). The impact of mobile-assisted language learning on English as foreign language learners' vocabulary learning attitudes and self-

regulatory capacity. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.872922

Lenne, D., Abel, M. H., Trigano, P., & Leblanc, A. (2008). Self-regulated learning in technology enhanced learning environments: an investigation with university students. *Technology, Pedagogy and Education, 17*(3), 171-181. https://doi.org/10.1080/14759390802383751

Liu, S. H. J., Lan, Y. J., & Ho, C. Y. Y. (2014). Exploring the relationship between self-regulated vocabulary learning and web-based collaboration. *Journal of Educational Technology & Society, 17*(4), 404-419. https://www.jstor.org/stable/jeductechsoci.17.4.404

Luu, V. T., Lian, A. P., & Siriyothin, P. (2021). Developing EFL learners' listening comprehension through a computer-assisted self-regulated prosody-based listening platform. *CALL-Electronic Journal, 22*(1), 246-263. http://callej.org/journal/22-1/Luu-Lian-Siriyothin2021.pdf

Miltiadou, M. & Savenye, W. C. (2003). Miltiadou, M., & Savenye, W. C. (2003). Applying social cognitive constructs of motivation to enhance student success in online distance education. *AACE Review (formerly AACE Journal), 11*(1), 78-95. https://www.learntechlib.org/primary/p/17795/

Mischel, W., Shoda, Y, & Peake, P. K. (1988). The nature of adolescent competencies predicted by preschool delay of gratification. *Journal of Personality and Social Psychology, 54(*4), 687 -696. https://doi.org/10.1037/0022-3514.54.4.687

Mohammadzadeh, A., & Sarkhosh, M. (2018). The Effects of self-regulatory learning through computer-assisted intelligent tutoring system on the improvement of EFL learner' speaking ability. *International Journal of Instruction, 11*(2), 167-184. https://doi.org/10.12973/iji.2018.11212a

Mun, Y. Y., & Hwang, Y. (2003). Predicting the use of web-based information systems: self-efficacy, enjoyment, learning goal orientation, and the technology acceptance model. *International Journal of Human-computer Studies*, *59*(4), 431-449. https://doi.org/10.1016/S1071-5819(03)00114-9

Naseri, S., & Motallebzadeh, K. (2016). Podcasts: a factor to improve Iranian EFL learner' self-regulation ability and use of technology. *Journal of Educational Technology & Society, 19*(2), 328-339. https://www.jstor.org/stable/jeductechsoci.19.2.328

Petticrew, M., & Roberts, H. (2006). Exploring heterogeneity and publication bias. *Systematic reviews in the social sciences: a practical guide* (pp. 215-246). Blackwell Publishing. https://doi.org/10.1002/9780470754887

Pintrich, P. R. (1999). The role of motivation in promoting and sustaining self-regulated learning. *International Journal of Educational Research, 31*(6), 459-470. https://doi.org/10.1016/S0883-0355(99)00015-4

Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 451−502). Academic Press. https://doi.org/10.1016/B978-012109890-2/50043-3

Qiao, S., Chu, S. K. W., Shen, X., & Yeung, S. S. S. (2022). The impact of an online-gamified approach embedded with self-regulated learning support on students' reading performance and intrinsic motivation: A randomized controlled trial. *Journal of Computer Assisted Learning,* (38), 1379-1393. https://doi.org/10.1111/jcal.1268

Rahimi, M., & Fathi, J. (2022). Exploring the impact of wiki-mediated collaborative writing on EFL students' writing performance, writing self-regulation, and writing self-efficacy: a mixed

methods study. *Computer Assisted Language Learning, 35*(9), 2627-2674. https://doi.org/10.1080/09588221.2021.1888753

Robillos, R. J. (2021). Learners' writing skill and self-regulation of learning awareness using computer-assisted argument mapping (CAAM). *Teaching English with Technology, 21*(4), 76-93. https://files.eric.ed.gov/fulltext/EJ1324017.pdf

Salaberry, M. R. (2001). The use of technology for second language learning and teaching: A retrospective. *The Modern Language Journal, 85*(1), 39-56. https://doi.org/10.1111/0026-7902.00096

Schloemer, P., & Brenan, K. (2006). From students to learners: Developing self-regulated learning. *Journal of Education for Business, 82*(2), 81-87. https://doi.org/10.3200/JOEB.82.2.81-87

Schwienhorst, K. (2002). Why virtual, why environments? Implementing virtual reality concepts in computer-assisted language learning. *Simulation & Gaming, 33*(2), 196-209. https://doi.org/10.1177/1046878102332008

Seker, M. (2016). The use of self-regulation strategies by foreign language learners and its role in language achievement. *Language Teaching Research, 20*(5), 600-618. https://doi.org/10.1177/1362168815578550

Shadiev, R., & Yang, M. (2020). Review of studies on technology-enhanced language learning and teaching. *Sustainability, 12*(2), 524. https://doi.org/10.3390/su12020524

Shih, K.-P., Chen, H.-C., Chang, C.-Y., & Kao, T.-C. (2010). The Development and implementation of scaffolding-based self-regulated learning system for e/m-learning. *Educational Technology & Society, 13*(1), 80-93. https://www.jstor.org/stable/jeductechsoci.13.1.80

Sinclair, B. (2000). Learner autonomy: The next phase? In: B. Sinclair, I. McGrath, & T. Lamb (Eds.), *Learner autonomy, teacher autonomy: Future directions* (pp. 4–14). Longman.

Steffens, K. (2008). Technology enhanced learning environments for self-regulated learning: a framework for research. *Technology, Pedagogy and Education, 17*(3), 221-232. https://doi.org/10.1080/14759390802383827

Su, Y., Zheng, C., Liang, J. C., & Tsai, C. C. (2018). Examining the relationship between English language learners' online self-regulation and their self-efficacy. *Australasian Journal of Educational Technology, 34*(3), 105-121. https://doi.org/10.14742/ajet.3548

Supriyono, Y., Saukahb, A., Latiefc, M. A., Widiatid, U., & Suryatie, N. (2020). EFL learners' self-regulated learning in a technology-mediated language learning setting. *International Journal of Innovation, Creativity and Change, 10*(10), 270-285. https://www.ijicc.net/images/vol10iss10/101021_Supriyono_2020_E_R.pdf

Umamah, A., & Cahyono, B. Y. (2022). EFL university students' use of online resources to facilitate self-regulated writing. *Computer Assisted Language Learning, 23*(1), 108-124. http://www.callej.org/journal/23-1/Umamah-Cahyono2022.pdf

Urbina, S., Villatoro, S., & Salinas, J. (2021). Self-regulated learning and technology-enhanced learning environments in higher education: A scoping review. *Sustainability, 13*(13), 7281. https://doi.org/10.3390/su13137281

Wandler, J. B., & Imbriale, W. J. (2017). Promoting undergraduate student self-regulation in online learning environments. *Online Learning, 21*(2), 1-16. http://dx.doi.org/10.24059/olj.v21i2.881

Wang, H. C., & Chen, C. W. Y. (2020). Learning English from YouTubers: English L2 learners' self-regulated language learning on YouTube. *Innovation in Language Learning and Teaching, 14*(4), 333-346. https://doi.org/10.1080/17501229.2019.1607356

Watts, M., & Lloyd, C. (2001). Evaluating a classroom multimedia programme in the teaching of literacy. *Educational Research and Evaluation 7*(1), 35–52. https://doi.org/10.1076/edre.7.1.35.6929

Wigfield, A., & Eccles, J. S. (2000). Expectancy–value theory of achievement motivation. *Contemporary Educational Psychology, 25*(1), 68-81. https://doi.org/10.1006/ceps.1999.1015

Wirth, J., & Leutner, D. (2008). Self-regulated learning as a competence. Implications of theoretical models for assessment methods. *Journal of Psychology, 216*(2), 102-110. https://doi.org/10.1027/0044-3409.216.2.102

Yang, Y. C. (2006). Effects of embedded strategies on promoting the use of self-regulated learning strategies in an online learning environment. *Journal of Educational Technology Systems, 34*(3), 257-269. https://doi.org/10.2190/9472-TU0X-1M7J-3Y8Q

Yigzaw, A., & Fentie, A. (2013). The impact of students' self-regulated language learning on their reading achievement in Ethiopian high schools: Grade 9 in focus. *Journal of Media and Communication Studies, 5*(5), 44-51. https://doi.org/10.5897/JMCS2013.0345

Zheng, C., Liang, J. C., Li, M., & Tsai, C. C. (2018). The relationship between English language learners' motivation and online self-regulation: a structural equation modelling approach. *System, 76,* 144–157. https://doi.org/10.1016/j.system.2018.05.003

Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13–39). Academic Press. https://doi.org/10.1016/B978-012109890-2/50031-7

Zimmerman, B. J., & Kitsantas, A. (2005). Homework practices and academic achievement: The mediating role of self-efficacy and perceived responsibility beliefs. *Contemporary Educational Psychology, 30*(4), 397-417. https://doi.org/10.1016/j.cedpsych.2005.05.003

İletişim/Correspondence

Dr. Ceyda YALÇIN
ceydayalcin55@gmail.com