

Original Article

Iranian EFL Learners' Self-regulation Development through Computer-Assisted Autonomous Language Learning

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Submission date: 30-07-2024

Acceptance date: 06-12-2024

Abstract

This study investigated the effect of implementing Computer-Assisted Autonomous Language Learning (CAALL) on the development of self-regulation in Iranian EFL learners through a mixed-methods design. Convenience non-random sampling was run to select the participants. A sample of 220 advanced EFL learners from four private English language institutes in Iran participated in this study. A quick placement test, a self-regulation questionnaire, and a learners' perceptions semi-structured interview were used to collect the required data. The learners' self-regulation questionnaire was administered to all the participants. Teachers, both autonomous and non-autonomous, separately implemented CAALL practice for 110 participants (experimental and control groups). Two teachers trained the experimental group on how to be autonomous in their reading performance, and they received CAALL in virtual mode. The control group underwent virtual reading practice. However, the control group did not receive the CAALL practice and instead received traditional reading instruction. The practice was presented through WhatsApp Messenger for 16 ninety-minute sessions. Following the instructional phase, we conducted interviews with the participants to explore their perspectives on the effectiveness of CAALL practice and autonomous learning. They were required to answer some semi-structured questions in a 20-minute interview, after which their answers were transcribed completely. The findings revealed that CAALL developed Iranian EFL learners' self-regulation. Moreover, Iranian EFL learners perceived CAALL as an effective approach to their learning development. This study offers valuable pedagogical insights for EFL teachers, learners, and designers of language teaching syllabuses.

Keywords: Autonomous Learning, CALL, CAALL, Learners' Autonomy, Self-regulation

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1. Introduction

New technologies in language teaching and use, commonly known as computer-assisted language (CALL), are a relatively new phenomenon (Chun, 2016; Hubbard, 2008). Increasing access to the Internet and computers in schools and foreign language teaching contexts has led to the use of technology in education and second language use (Hubbard & Levy, 2006). Consequently, teachers' potential lack of reasonable familiarity with CALL may lead to a sense of incompetency and ineffectiveness.

Information technology has significantly enriched independent content and forms. Multiple ways of access, including digital television sets, the Internet, electronic collections, and cloud platforms, offer materials for independent use (Truscott & Sharwood Smith, 2019). On the other hand, autonomy occurs in ubiquitous ways based on the constraints of time or place and the individual goals of students (Leaver et al., 2021).

Short-term workshops deliver traditional professional development, focusing on teaching discrete skills and techniques (Salomon & Kolikant, 2016). However, this approach may not be effective for integration tasks that necessitate subject-specific conceptual and theoretical knowledge. From a more practical point of view, it also requires the support of basic and specialized operations to solve technical problems (Nami et al., 2015).

Since exposure to countless information about each topic may confuse students in choosing options from the information set, advances in the introduction of technology to the language teaching field should be accompanied by teaching students to decide what they are going to do. Some prerequisites for autonomous learning include self-regulation and self-efficacy, which are the two main elements of independence. CAALL, on the other hand, allows students to participate more independently in technology-integrated learning.

Computer-assisted autonomous learning (CAALL) involves the development and use of technological tools to use a foreign language (FL) or second language (L2) through practice, allowing the learners to create and develop themselves (Lim & Ariadost, 2022). CAALL is independent in that it provides a tool for language users to improve their L2 proficiency, whether or not they are taking formal courses in the language they are learning. Thus, CAALL can be used by students with formal L2 study or by learners who do not participate in L2 classes (Tafazoli et al., 2020). You can integrate CAALL activities into formal L2 courses or use them for supplementary study in L2 courses. Non-native L2

teachers can employ CAALL to enhance their L2 skills and teach students how to interact more effectively in the classroom (Ghufron & Nurdianingsih, 2021).

CAALL represents all forms of electronic technology that can contain L2 information. This includes computer tools and internet technology, as well as other forms of communication technology, such as wired and wireless telephones, television and radio (broadcast, satellite, and cable), and the integration of older communication with newer information technologies (Luu et al., 2021). CAALL is based on the latest theory and research in second language acquisition, psychology, and CALL. Research, theories, and concepts offer valuable insights into leveraging technology to enhance L2 proficiency in listening, speaking, and reading. The development of CAALL tools and activities applies principles derived from L2 research and theory (Park & Son, 2022).

Self-regulated learning (SRL) is defined as a systematic effort to manage and adjust the method to achieve certain characteristics. SRL involves the metacognitive, motivational, and behavioral participation of students in its processes (Ferreira et al., 2023). Students can activate controlling functions by using SRL strategies such as micro-activity plans, spontaneity, organization, repetition, self-monitoring, and self-evaluation (Lai & Hwang, 2016). Self-regulation encompasses not only the active regulation of strategies but also the management of various types of resources (Bai & Wang, 2023).

Thus, technology implementation describes self-regulatory language learning (SRL) as the development of strategies such as planning and resource management, as well as reflection on and evaluation of behavior and results by learners (Shen & Bai, 2024). Thus, technology-based English language use strategies aim to introduce learners to the English language or enhance their English skills within the context of technology use (Enaiti & Gilekjani, 2020). Previous studies in various research fields have identified several SRL technologies, including consulting online dictionaries, using translation software, reading texts on the computer, searching the web for information, listening to the radio, and exploring cultural knowledge on YouTube, among others (Lou & Noels, 2019).

2. Literature Review

The development of autonomy in language has become complex and multifaceted, serving as a critical concept in educational fields for more than two decades (Ding & Shen, 2022). Besson (2013) defines learner autonomy as self-responsibility, which autonomous learners

who possess the ability and knowledge to develop self-regulation and self-management skills accept (Lai, 2019). Some studies examine the role of CALL and learner autonomy, while others demonstrate the enhancement of language through the integration of technology into the environment (Honarзад & Rassaei, 2019).

In recent years, extensive use of technologies has been made due to their integration into learners' social methods. Reinders and White (2016) consider the social and environmental aspects of others as a fundamental component of language study, noting "the role of others in learning and their contributions, and the ways in which learners work with and restructure aspects of their learning conditions moment by moment" (p. 149). Therefore, a well-structured lesson that has space to reduce the burden of decision-making responsibilities for students and teachers and provides a social environment for learners is one of the basic features of changing the learner's program (Fathi & Ebadi, 2020).

The growth of computer technology and the increasing use of computers in language teaching environments around the world may contribute to the popularity of learner autonomy (Marandi, 2023). CALL has much to offer to foster autonomy because of its ability to provide multiple and varied opportunities for self-direction and the possibility of using computers to provide strategic instruction (Shortt et al., 2023). Promoting learner autonomy, the language context is a key factor in the successful use of digital technologies for second language development (Lai, 2017; 2019). Ariebowo (2021) further highlights the importance of encouraging the independence of language teaching as a fundamental factor in the successful application of digital technologies for second language development.

Autonomy helps to improve lifelong skills and implement a set of training procedures to obtain those specific skills, emphasizing the significantly important role of the teacher in the design of independent and technology-assisted courses (Amer, 2020). In a self-contained high-tech classroom, teachers do not play the role of transmitters of information or sources of facts. In a self-contained high-tech classroom, teachers primarily serve as agents, managing classroom activities and assisting learners in making long- and short-term plans. The teacher must collaborate closely with the learners, ensuring they are always aware of their expectations (Amini & Krueger, 2022).

Education targets autonomy for several reasons. Learner autonomy is relevant in applied linguistics, not only because it allows him to take the lead in his own process but

also because it enables him to be an independent user of language (Mehdiyev, 2020). This means that students have an active role not only in what they learn but also in creating their own goals and how to achieve them. Autonomy, additionally, makes students' performance more reflective and critical of what is happening around them, creating particularities around the world (Kashefian-Naeeni & Kouhpeyma, 2020).

Self-regulated learning (SRL) is the metacognitive, motivational, and behavioral participation of students in their process (Morshedian et al., 2017). Students can actively control assessment by using SRL strategies such as planning activities, spontaneity, organization, repetition, self-monitoring, and self-evaluation (Sun et al., 2018; Ziman, 2008). Over the past decade, self-regulation has become a central topic in educational, neurocognitive, and child development research (Hernandez et al., 2017; Schmidt et al., 2019; Slot & Von Suchodoletz, 2018).

There is a growing awareness of self-regulation for school readiness, classroom behavior, and academic achievement (Hernandez et al., 2017; Ribner et al., 2017). Furthermore, excellent self-regulation is associated with positive developmental outcomes. Children with higher levels of organizational skills are better off mentally and financially when they become adults (Hernandez et al., 2018; Puranik et al., 2019). Good attention and persistence in early childhood increase the likelihood of college graduation (Lonigan et al., 2017). At the same time, students with low self-regulation skills are more likely to be at risk for emotional and behavioral problems and have difficulty in positive relationships with peers and teachers (Hernandez et al., 2017, 2018).

Transforming education can be challenging for beginning teachers. Teachers should help learners develop self-regulation strategies and supervise students in their task management to create a more inviting learning space (Jansen et al., 2019). Consideration of students' skills, abilities, styles, cooperation, and community participation increases their autonomy (Carter et al., 2020). Expecting learners to develop work and independence requires language experts to choose the most appropriate materials and activities to create authentic and experiential journals, such as interacting with real people, reading online engineering, writing essays based on real situations, listening to daily news, etc. (Matcha et al., 2019).

Self-regulation and autonomy, as a concept, derive from motivational theories (Jansen et al., 2019). Self-related styles, metacognitions, and theories are also influential in

the case of autonomy. A large-scale examination of self-regulatory processes encompasses activation planning, metacognitive monitoring, regulation, and attentional use (Granberg et al., 2021). According to Zhu et al. (2020), self-regulation is directly linked to behavioral and contextual regulation strategies. Self-regulated, intrinsically motivated, independent learners use a set of self-regulated learning strategies to participate in their learning process actively (Carter et al., 2020).

SRL is an active and constructive agent and requires support, scaffolding, and explicit training when developing one's self-regulatory practices (Zhu et al., 2020). Self-regulated learners are more likely to succeed academically and also be optimistic about their future, highlighting the importance of SRL for lifelong observation (Matcha et al., 2019). Learners with higher levels of SRL are more likely to succeed than those with lower levels, which highlights the important role that SRL plays in education (Zhu et al., 2020). Learners with superior self-regulation skills tend to be more academically motivated and demonstrate effective learning ability (Granberg et al., 2021). When learners align their sights with adapters, they are considered self-regulated. Targeted learning can teach and learn the skill of self-regulation (Jahnsen et al., 2019). Learners who build their teaching skills and can self-assess through affect and assessment can develop individual strategies that will help them succeed (Carter et al., 2020).

The self-regulation program has emerged as a crucial component of language learning, suggesting that self-regulated language learners are more likely to develop independent skills and ultimately achieve success (Ellis, 2019; Lonigan et al., 2017). Research even demonstrates that learners with the highest self-regulation exhibit fewer behavioral issues and devote more time to their studies. Learners with higher self-regulation are more likely to have assertive teachers, and learners with lower self-regulation are more likely to have supportive teachers (McEown & Oga-Baldwin, 2019). Ardasheva et al. (2017) suggest that we can utilize students' self-regulation to enhance their participation, understanding, knowledge, and persistence.

Good self-regulation allows students with weaker academic skills to catch up with peers with more advanced skills. Some students who demonstrate lower initial academic skills have better self-regulation (Hernandez et al., 2018; Ribner et al., 2017). At the same time, low self-regulation skills in preschool put children at risk for academic difficulties two years later (Roethlisberger et al., 2013). Typically, learners who have a stronger sense

of self-confidence or self-efficacy can organize themselves better and move faster to develop their searches, while learners with a lower degree of self-efficacy are less motivated (Lai, 2017; Lai et al., 2018; McEown & Oga-Balin, 2019).

The lack of efficient and appropriate student participation in the review process is one of the basic problems in English learning, especially as an independent field (Burman et al., 2015). Learner autonomy refers to a learner's capacity and willingness to assume responsibility for their own learning (Benson, 2007, 2011, 2013).

One of the common problems in the English language education systems in Iran is the dependence of students on teachers in the learning process. Teachers expect students to passively copy the concepts they present and refrain from participating in classroom activities. On the other hand, highly self-regulated learners are able to accurately determine the target, manage the method, and find therapeutic solutions to follow the path. (Kheiri et al., 2019).

The existing literature has shown that no coherent or related study in the field of TEFL examines the potential effects of CAALL on EFL learners' self-regulation. Thus, it is a novel attempt to investigate this issue in a single study, at least in Iran as an EFL context. Hence, the present study sought to inspect the effect of implementing CAALL on Iranian EFL learners' self-regulation development, with a focus on the following research questions:

1. Does computer-assisted autonomous language learning significantly affect Iranian EFL learners' self-regulation?
2. What are Iranian EFL learners' perceptions of the effectiveness of computer-assisted autonomous language learning?

3. Methodology

3.1. Research Design

The study followed a mixed-methods design consisting of both quantitative and qualitative data collection procedures. The necessary data for the quantitative phase was collected following an experimental design through self-regulation questionnaires as pre-test and post-test instruments, accompanied by treatment in the form of CAAL practice. In contrast, for the qualitative phase, a semi-structured interview was used to collect the required data on language learners' perceptions of the main variables of the study.

3.2. Participants

Convenience non-random sampling was used for participant selection. This study involved a sample of 220 advanced EFL learners from four private English language institutes in Iran. The researcher administered a Quick Placement Test (QPT) to all available learners to determine the appropriate skill level for participants. The study population comprised male and female advanced-level EFL learners aged 18 to 30 years. From an ethical standpoint, the participants executed consent forms that ensured the secrecy of their involvement. Table 1 demonstrates the demographic information of the participants.

Table 1.

Demographic Information of Participants

No. of Students	
Gender	134 Females & 86 Males
Native Language	Persian
Setting	Shokoufa Language Center (39) Kish Language Institute (42) Chista Language School (51) Kanoon Language Center (88)
Time of Data Collection	Around 3 months

3.3. Instruments

3.3.1. Quick Placement Test (QPT)

A placement test (QPT) was administered to measure the participants' language proficiency and ensure the homogeneous inclusion of participants. QPT is developed by Oxford University Press and the University of Cambridge Local Examinations, requiring 30 minutes for completion. All questions were in multiple-choice format, and according to the rubric of the test, participants who received scores higher than 36 were identified to be at the advanced level. Only the advanced participants were asked to participate in other tests.

3.3.2. Self-Regulation Questionnaire

The Self-Regulation Scale was developed by Gaumer-Erickson et al. (2015) and included 22 items on the Likert scale ranging from "not very like me" to "very like me". This questionnaire was designed to measure learners' level of self-regulation, requiring 20

minutes for completion. This study used pre-test and post-test to rate learners' self-regulation magnitudes before and after the instructional phase, respectively. The reliability coefficient was calculated through Cronbach's Alpha formula, indicating a value of around 0.90. The researcher asked for an expert (TEFL Ph.D. holder) judgment as a validator to check the validity of the questionnaire. Hence, the validity of the questionnaire was examined through the opinions of three validators. This questionnaire was administered to find learners' self-regulation ability in the pre-test and post-test.

3.3.3. Learners' Perceptions Semi-Structured Interview

A researcher-made semi-structured interview was run to investigate learners' perceptions of the effectiveness of experiencing CAALL practice and the autonomous learning experience. The interview had 10 items asking the participants about the different dimensions of their perceptions of the CAALL approach. The participants were required to answer the interview questions in a 20-minute interview. The answers were codified and categorized into some codes based on their underlying themes for ease of results analysis. Regarding validity, the researcher ran an item analysis on the interview's items, asking three experts in the TEFL field to comment on the validity of the test and then revising the test based on the comments, respectively.

3.4. Data Collection Procedure

All participants received a learners' self-regulation questionnaire prior to the instructional phase. Teachers, both autonomous and non-autonomous, separately implemented CAAL practice for 110 participants (experimental and control groups). Two teachers trained the experimental group on how to be autonomous in their reading performance while they received CAALL in virtual mode. Teachers gave learners the flexibility to ignore some feedback and concentrate on aspects of writing they found more interesting, like topic development. Rather than taking points off for not fixing marked errors, the teacher asked the students to defend their editing and revision choices. In this way, the teacher gave them a chance to be more independent, and their success rate depended on the strength of their defense. To determine learners' mental necessities and incorporate them into the day's lesson, the educator can ask the learners what they need. The other type of autonomy-supportive practice involves educators giving learners the time to solve a problem in their

own unique way, allowing their interests and inclinations to guide their class activities. The teachers provided them with information about the CAALL and guided them through the CAALL procedure during their reading lessons. Teachers encouraged them to use CAALL to share and receive feedback on their own work, enabling them to revise or reconstruct it. The control group experienced the reading practice virtually. However, the control group did not receive the CAALL practice and instead received traditional reading instruction. We presented the practice through WhatsApp messenger over 16 ninety-minute sessions. The collected data were analyzed through SPSS to answer the research questions. Following the instructional phase, we conducted interviews with the participants to explore their perspectives on the efficacy of CAALL practice and autonomous learning. They were required to answer some semi-structured questions in a 20-minute interview, and their answers were transcribed completely. The obtained qualitative data were categorized and codified based on some specific observed themes, and then the frequency of each theme was reported and considered for descriptive analysis.

4. Results and Data Analysis

To answer this question, the descriptive statistics for pre-test scores are initially presented in Table 2.

Table 2.

The Descriptive Statistics for Pre-Test Scores

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Self Reg Ex Pre	110	60	24	84	53.44	14.454	208.927
Self Reg Crl Pre	110	49	24	73	52.26	12.785	163.462

As can be seen in Table 2, the means of pre-test scores are 53.44 and 52.26, respectively. Here, the mean for the experimental group is higher than that of the control group ($53.44 > 52.26$), but it needs to be checked whether this difference is significant or not. To do so, the calculation of the normality of datasets was required at first. Since the sample size was less than 100, the Shapiro-Wilk test was run to check the normality of the pre-test scores, the results of which are presented in Table 3.

Table 3.

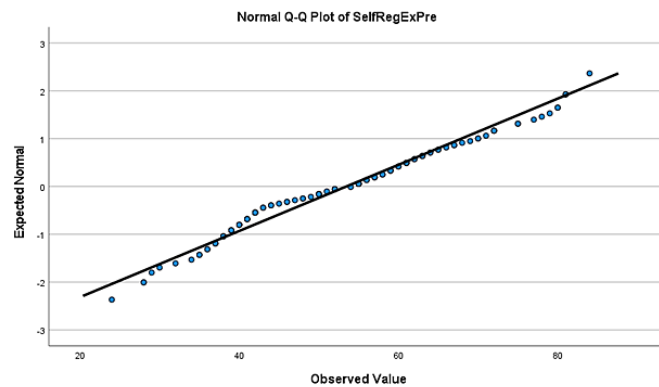
The Normality Statistics for Pre-Test's Scores

	Shapiro-Wilk		Sig.
	Statistic	df	
Self Reg Ex Pre	.972	110	.022
Self Reg Crl Pre	.943	110	.000

As can be seen in Table 3, the sig. values of the pre-test scores are 0.002 and 0.000, respectively, which are less than the critical value of 0.05 ($0.05 > 0.002$ and $0.05 > 0.000$). This means that the scores are not normally distributed. The following figure shows the distribution diagram for the experimental group pre-test scores.

Figure 1.

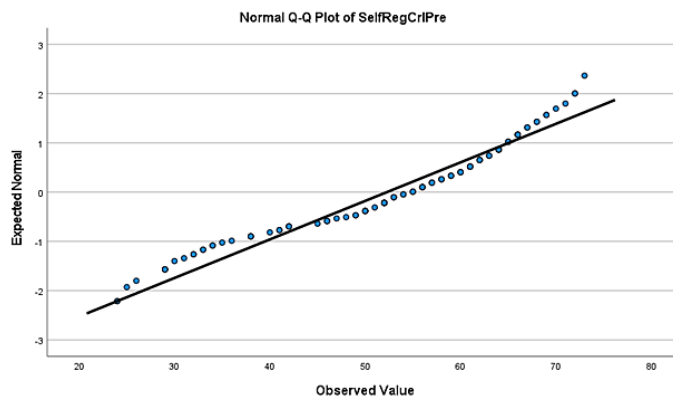
The Distribution Diagram for Experimental Group Pre-Test Scores



The following figure shows the distribution diagram for the control group pre-test scores.

Figure 2.

The Distribution Diagram for Control Group Pre-Test Scores



Since the pre-test scores were not normally distributed, a non-parametric test (the Mann-Whitney U-Test) was used (because two sets of scores belonged to two different groups) to present inferential statistics for the comparison of means. Table 4 presents the inferential statistics of pre-test scores.

Table 4.

The Inferential Statistics for Pre-Test Scores

Self-regulation Pre-test	
Mann-Whitney U	5949.500
Wilcoxon W	12054.500
Z	-.213
Asymp. Sig. (2-tailed)	.831

As Table 4 shows, the sig. value is 0.831, which is more than the critical value of 0.05 ($0.831 > 0.05$). In other words, the difference between the two means of pre-test scores was not statistically significant. To continue the analysis, the researcher analyzed the post-test scores, initially presenting the descriptive statistics for the post-test scores (Table 5).

Table 5.

The Descriptive Statistics for Post-Test Scores

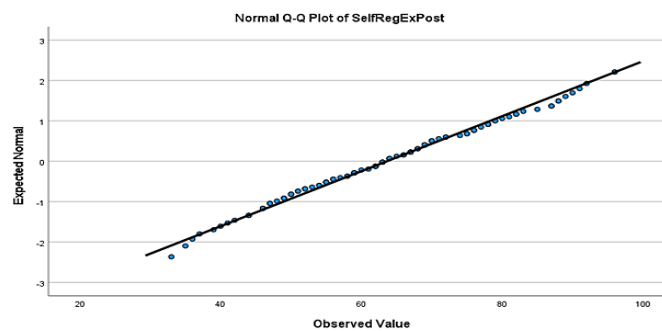
	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Self Reg Ex Post	110	63	33	96	63.61	14.681	215.543
Self Reg Crl Post	110	54	20	74	50.12	12.777	163.261

Table 5 depicts the means of post-test scores of 63.61 and 50.12, respectively. Here, the mean for the experimental group is more than that of the control group ($63.61 > 50.12$), but it needs to be checked whether this difference is significant or not. To do so, the calculation of the normality of datasets was required at first. Since the sample size was less than 100, the Shapiro-Wilk test was run to check the normality of the pre-test scores, the results of which are presented in Table 6.

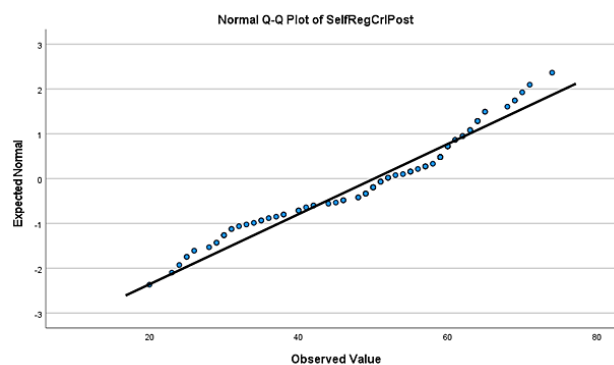
Table 6.*The Normality Statistics for Post-Test Scores*

	Shapiro-Wilk		
	Statistic	df	Sig.
Self Reg Ex Post	.988	110	.420
Self Reg Crl Post	.946	110	.000

As can be seen in Table 6, the sig. values of the pre-test scores are 0.420 and 0.000, respectively. As the second sig. value is less than the critical value of 0.05 ($0.05 > 0.000$), it can be concluded that the post-test scores are not normally distributed. Figure 3 shows the distribution diagram for the experimental group post-test scores.

Figure 3.*The Distribution Diagram for Experimental Group Post-Test Scores*

The following figure shows the distribution diagram for the control group post-test scores.

Figure 4.*The Distribution Diagram for Control Group Post-Test Scores*

Since the post-test scores were not normally distributed, the researcher used the non-parametric Mann-Whitney U-Test (because two sets of scores belonged to two different groups) to present inferential statistics for the comparison of means. Table 7 presents the inferential statistics of post-test scores.

Table 7.

The Inferential Statistics for Post-Test Scores

Self-regulation Post-test	
Mann-Whitney U	3139.500
Wilcoxon W	9244.500
Z	-6.169
Asymp. Sig. (2-tailed)	.000

As can be seen in Table 4.6, the sig. value is 0.000, which is less than the critical value of 0.05 ($0.000 < 0.05$), indicating that the difference between the two means of post-test scores was statistically significant. Thus, the researcher could safely reject the first null hypothesis of the study. However, it can be said that computer-assisted autonomous language learning significantly affects Iranian EFL learners' self-regulation.

4.2 Analysis of the Second Research Question

The researchers administered a semi-structured interview to elicit in-depth information for the qualitative part. The answers were categorized, and the frequency and percentage of each answer were recorded. Table 8 presents the statistics for each category.

Table 8.

The Descriptive Statistics for the Second Research Question

Code	Answer Category	Frequency	Percentage %
1. Do you think creativity is an important part of the learning process that you experienced in this study?			
	Yes, definitely.	14	70
	It depends on the teaching/learning context.	2	10
	No, it's not important as much.	3	15
	I have no idea.	1	5

2. Do you think learner autonomy plays an important role in EFL learning?

Yes, definitely.	14	70
It depends on the teaching/learning context.	2	10
No, it's not important as much.	3	15
I have no idea.	1	5

3. Do you control all the learning activities in your class?

Yes.	11	55
Yes, for some types of activities.	5	25
No, it cannot help students.	4	20
I have no idea.	2	10

4. Is learner autonomy promoted when learners have some choice in the kinds of activities they do?

Yes, exactly.	10	50
To a large extent yes.	6	30
I'm not sure it develops students' autonomy.	2	10
No, because it depends on many factors not just freedom in choosing the activity.	2	10

5. Do you agree that involving learners in decisions about what to learn can promote learner autonomy?

Yes, their autonomy will be increased by allowing them to share their own decision in class.	9	45
To a large extent, it is possible.	7	35
No, autonomy is something more than a simple decision-making process.	4	20

6. Do you have your own guidelines and procedures for learning?

Yes, of course.	10	50
Yes, when there is no certain syllabus.	4	20
No, I always follow the assigned syllabus.	3	15
I have no idea.	3	15

7. Does this learning process mainly focus on your own designed objectives?

Yes, of course.	13	65
Yes, I do it frequently but not always.	3	15
No, I do not do it.	3	15
It's not my concern in teaching.	1	5

8. Do you freely choose your learning strategies?

Yes, definitely.	12	60
In some cases, I do it.	5	25
No.	2	10
I have no idea.	1	5

Here are some comments from the participants:

"I usually define my learning goals in advance and try to realize them in the learning process."

This sentence can be indicative of the participant's awareness of the significance of setting a goal and approaching it as a guiding principle in his learning process. However, it must be noted that a discrepancy should be expected between what is stated and what is practiced.

"In my opinion, having control over the classroom activities is one of the necessities for learning. Thus, in my learning process, I try to carefully control the classroom activities."

It is important to strike the balance between class control by the teacher and learners' autonomy; too much control on the part of the teacher might suppress any inclination for autonomy that EFL learners might aspire for. Therefore, depending on the goal the teacher might seek, the level of theory dominating the class can be modified.

"To be honest, I seek to maximize creativity in my learning and encourage myself to keep it on. This will enable me to perform better."

In this comment, the learner refers to the prominent role of creativity in autonomy, emphasizes its effective contribution, and tries to work on creativity to place himself on the path of greater responsibility in the learning process. Of course, when increasing the attention on the creativity component, teachers should be cautious about giving too much freedom of action to learners to avoid the false direction preventing them from getting away from the path of achieving the defined goals.

Concerning this research question, 80% of the participants regarded creativity as an important element of their learning process. As mentioned earlier, creativity seems to be an influential factor in maximizing learners' autonomy. Out of participants, 70% considered autonomy a determining factor in their learning process. Regarding the role of autonomy in increasing the effectiveness of the learning process and improving the performance of learners, 80% had control over the learning activities during their teaching process. From

the participants, 80% argued that choosing learning activities by students would increase their autonomy level. It can be said that the ability to control classroom activities can significantly expand the autonomous ability of learners to acquire the necessary skills and establish effective learning achievements. In delegating control over educational events, caution should be taken into account, and related corrective interventions should be provided by the teacher if necessary. In addition, 80% of interviewees believed that the decision-making process in learning is considered a constructive factor for autonomy development. Involving learners in decision-making and determining the educational process cooperatively and interactively significantly strengthens their level of autonomy and leads to more effective learning achievements. As revealed in this study, the learners felt that whenever they were allowed to make educational decisions in matters such as determining the topic of discussion, determining the time to answer questions, and how to conduct class activities, they considerably felt higher levels of autonomy. Of the participants, 70% asserted that they had their self-designed guidelines and procedures for the learning process. In addition, 80% of the participants followed their objectives for students' learning development. Finally, 85% of the participants freely selected their preferred strategies for learning. Activities based on the reconstruction of meaning, such as self-guidance, self-determination of goals, and self-selection of the field of knowledge, can significantly expand the autonomy of learners and prepare them to accept more responsibility for their learning. It can be concluded that a noticeable improvement in autonomy can be observed by relying on the knowledge reconstruction process.

5. Discussion

The results revealed that computer-assisted autonomous language learning would significantly affect Iranian EFL learners' self-regulation. Moreover, the analysis of the qualitative data indicated that learners found CAALL as a constructive factor for their creativity, flexibility, efficacy, self-management, and autonomy development. According to the first finding of this study, the corporate nature of CAALL can motivate learners to be independent in their way. A self-regulation device allows learners to engage in work-in-progress. Research conducted by Morshedian et al. (2017) on self-regulation models regarding the development of EFL language independence showed that EFL readers could

be successfully trained in the target SRL model and become able to self-regulate their learning journey.

In his recent study, Lee (2022) guided CAALL foreign language learners, strengthening their performance and allowing them to further develop and improve their independence. Motivational improvement can be considered a determining factor for the autonomy development of students who receive CAALL in their own process. From Tsai's (2022) point of view, CAALL allows students to self-select solutions to problems and enhance their sense of self-confidence and ultimately their cognitive functions thanks to providing two different modes with performance. Therefore, it can be concluded that CAALL improves self-confidence and allows students to strengthen their skill level.

Various characteristics represent autonomous learners. Psychologists recognize autonomous learners as self-regulated, emotionally intelligent, resilient, psychologically engaged, self-determined, existentially free, and effective (Lai et al., 2016; 2024). From an action-focused perspective, self-directed learners have the ability to establish their own objectives, choose suitable learning methods, monitor their progress using these methods, and assess their learning. According to Yang et al. (2024), autonomous learners engage in interactive learning activities to accomplish both short- and long-term learning objectives, all the while assessing their own progress.

Encouraging students to actively participate in their own learning and explore new information themselves, learner autonomy fosters a self-motivated desire to succeed, leading to improved productivity and performance. Thus, learners customize their learning journey according to their unique preferences and speed, leading to improved learning efficiency as each student can focus on the areas that require the most attention (Amini & Kruger, 2022). Regarding the matter of online autonomous training, a wide array of useful resources can be offered to enhance learning and make it more attractive (Le et al., 2023).

To see it from another angle, implementing CALL allows students to construct their meaning through this process and shape their constructed community. From the same perspective, Zou et al. (2022) view CAALL as an exercise that empowers students to independently carry out educational instructions, a crucial aspect for students who require more work. Moreover, according to Lai (2017), CAALL has a positive effect on students' adjustment and helps them regulate, guide, and participate more in class activities.

One possible reason for this finding is the adaptability feature of CAALL, which allows students to actively participate and readjust the course. As reflected in Ding and Shen's (2022) study, CAALL is more versatile, attractive, and adaptable for learners, thus allowing teachers to adapt to the specific needs and requirements of individual learners along with educational technologies in teaching. This finding is consistent with the view of Izadpanah (2022), who claims that CAALL has the potential to develop and expand students to improve their language skills. Tseng and Yeh (2019) see CAALL as a private practice that allows learners to use class time more successfully, engage and feel confident about participating in a different task, and feel more innovative.

The qualitative part of this research revealed that the learners had positive attitudes toward the practice of CAALL, and they stated that it strengthened their collaborative decision-making, allowing them to participate in English language classes more actively. Recent studies show that through autonomous learning activities, students build and strengthen their characters (Resnik & Dewaele, 2023), which allows them to participate in decision-making change processes (Wiranti & Widiyati, 2023), collaborative extrapolation (Tran & Vuong, 2023), and constructive motivation (Hosseini et al., 2023). These results are also in line with studies that show how important autonomous practice is in practice and method (Teng & Zhang, 202). These studies show that learners can automatically adapt their learning (Yu, 2022), move the educational goals forward, and solve problems in the processes (Ding & Shen, 2022) to make the educational design better (Ahundjanova, 2022).

Finally, we can assert that autonomous learning does not necessarily imply learning without guidance or teachers. Teachers must establish an environment for learning where learners can control both their learning and the opportunity to take on responsibility (Kim et al., 2024). Drawing from constructivist perspectives, four guidelines for CAALL environments include (1) active and engaged learning and (2) learning that involves the creation of knowledge through a process. (3) student operation with a metacognitive mindset, and (4) social negotiation as an essential part of the learning process (Ludwig & Tassinari, 2023). Although autonomy focuses on independent learning, social interaction is crucial for the educational experience. CAALL can promote a sense of community and teamwork by utilizing forums, discussion boards, and group activities. This element of social learning enables students to share thoughts, offer peer reviews, and participate in

joint initiatives, improving the educational process and creating a supportive learning environment (Li et al., 2024).

Considering the pedagogical aspect of learning, developing independence in online learning requires a comprehensive strategy that includes planning course structure, enhancing skills, promoting social interaction, and tailoring content to individual needs (Lai et al., 2024). By concentrating on these factors, CAALL and teachers can establish educational settings that provide knowledge and cultivate independent, critical, and self-driven students. As education progresses, the encouragement of learner independence will become more crucial in preparing learners for the demands of the contemporary world (Ozer & Yukselir, 2023).

6. Conclusion

Learner autonomy refers to a student's ability to control and guide their own learning process independently. It is a method of learning in which individuals are in charge of their education and do not depend solely on an instructor for guidance. Yang et al. (2024) expect students to take charge of deciding what they learn and how they learn it, organizing their schedules, establishing objectives, and selecting the most suitable learning materials for their requirements. Autonomy is essential in learning as it leads to a major shift in the typical educational setting, enabling students to control their learning. It gives students more power, promoting independent decision-making and the growth of essential skills like self-regulation. Furthermore, it boosts levels of inner drive, as students become more interested in learning when they are actively involved in constructing their understanding (Kim et al., 2024).

Training through CAALL optimizes learners' participation rate and quality (Alyaz & Genc, 2016). In a collaborative environment, CAALL fosters learner engagement with peers, teachers, and both internal and external tools. CAALL offers numerous advantages over traditional classroom settings. For example, it increases oral production, gives different types of learners the opportunity to speak, and helps them learn at their own pace (Enayati & Gilakjani, 2020). Students in a CAALL practice environment can learn quickly and stay on the assigned task, increasing learner autonomy (Ahundjanova, 2022). Typically, practicing CAALL in foreign language classes qualifies learners to enhance

their learning experience, increase their independence, and potentially motivate them to surpass their current capabilities (Ghufron & Nurdianingsih, 2021).

According to the studies that were conducted, the researcher concluded that CAALL has great potential for strengthening and independence of knowledge in research. Therefore, the researcher recommends implementing CAALL practice in education, particularly in cases where students exhibit low engagement in class discourse. English teachers are advised to develop their teaching in CAALL when they notice a lack of participation in class among their students. Furthermore, the qualitative findings of this study demonstrate that CAALL plays a positive role in fostering student autonomy, emphasizing that it serves as a solution to students' problems and lessens their dependence on their teachers for learning.

The findings of the present study have implications that may help English language teachers, students, English language learners, language curriculum policy-makers, and curriculum designers. Pedagogically, this study is useful for English teachers who experience CAALL, enabling them to significantly improve their mental level, enhance their actions, and boost their feelings before, during, and after the experience. It also enables learners to create initiatives based on their prior knowledge and educational experience to acquire new skills, techniques, and theories. In addition, it can be useful for the students' professional development in the future, encouraging them to develop different skills of decision-making, metacognition, and logical thinking. In addition, it enables teachers to improve their professional skills and develop a positive attitude toward themselves, strengthening their reflection by helping them collect and analyze classroom experiences. Through the practice of CAALL, teachers can discover their core beliefs, consequently providing an opportunity for them to increase their performance. As a teaching recommendation, the researcher advises English language teachers to implement CAALL in their teaching methods to help students take responsibility for themselves.

The current research has focused on the effects of the practice of CAALL on the performance of Iranian English language teachers. This study offers several recommendations for future research endeavors. 1) Considering other types of CAALL, such as Group CAALL, could be a promising research topic for future studies. 2) Since management has increased the consideration of psychological aspects of language, the researcher recommends investigating other psychological issues such as attitude, ambiguity

tolerance, and job satisfaction for further studies, and 3) lack of large-scale participants encouraged the researcher to examine Iranian EFL participants in this research. Therefore, it would be beneficial for other researchers to include participants from different English-speaking nationalities or use ESL participants in their planned research.

Consider the present study's findings in the context of its limitations. The field of study can be considered the main factor. The researcher intended to conduct this study in both the school and institutional contexts, but the Ministry of Education organization did not grant permission to conduct such a study at the school level. Therefore, the Ministry of Education deferred the researcher's plan to conduct the study solely at the organizational level. Examining the role of different contexts, such as comparing EFL versus ESL, can be a valuable decision. However, limited financial resources forced the researcher to examine only EFL control. Future studies can address this research limitation by using various sampling methods, thereby expanding the generalizability of the results. In addition, the researcher limited the research topic to the study of English speakers for ease of implementation, which needs consideration in future studies.

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