



## Self-regulated cognitive strategies and ICT to enhance EFL speaking skills

Estrategias cognitivas autorreguladas y TIC para mejorar la expresión oral en inglés como lengua extranjera

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### ABSTRACT

The integration of self-regulated learning (SRL) with Information and Communication Technologies (ICTs) has the potential to significantly enhance language learning by providing tools for independent study. However, there is a limited understanding of how EFL learners effectively utilize SRL strategies in conjunction with ICTs to improve their speaking skills. The main objective of this research is to investigate the use of SRL cognitive strategies and ICTs among EFL learners to enhance their speaking proficiency. This qualitative phenomenological study employed semi-structured interviews to gather data on learners' experiences and practices. The interviews were analyzed using IN VIVO coding to identify categories and themes directly from the participants' own words. Results indicate that learners leverage SRL strategies such as repetition, translation, self-correction, and spoken interaction, alongside various ICT tools, to improve their fluency, pronunciation, vocabulary, spoken grammar, and accent. These findings highlight the significant, often unconscious, impact of SRL strategies and digital tools on the enhancement of speaking skills. In conclusion, the study underscores the crucial role of SRL and ICTs in optimizing EFL speaking proficiency, suggesting a step-by-step approach for learners to effectively utilize these resources for language development.

**Keywords:** Self-regulated learning; EFL speaking skills; SRL students; ICTs; cognitive strategies.

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### ARTICLE INFORMATION

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The study highlights the importance of combining self-regulated learning strategies with ICT tools to improve EFL speaking skills, emphasizing the need for a step-by-step approach for effective language development.

### RESUMEN

La integración del aprendizaje autorregulado (SRL) con las Tecnologías de la Información y la Comunicación (TIC) tiene el potencial de mejorar significativamente el aprendizaje de idiomas al proporcionar herramientas para el estudio independiente. Sin embargo, existe una comprensión limitada de cómo los estudiantes de inglés como lengua extranjera (EFL) utilizan eficazmente las estrategias de SRL en conjunto con las TIC para mejorar sus habilidades orales. El objetivo principal de esta investigación es investigar el uso de estrategias cognitivas de SRL y las TIC entre los estudiantes de EFL para mejorar su competencia en expresión oral. Este estudio cualitativo de enfoque fenomenológico empleó entrevistas semiestructuradas para recopilar datos sobre las experiencias y prácticas de los estudiantes. Las entrevistas se analizaron utilizando la codificación IN VIVO para identificar categorías y temas directamente a partir de las propias palabras de los participantes. Los resultados indican que los estudiantes aprovechan estrategias de SRL como la repetición, la traducción, la autocorrección y la interacción oral, junto con diversas herramientas TIC, para mejorar su fluidez, pronunciación, vocabulario, gramática hablada y acento. Estos hallazgos destacan el impacto significativo, a menudo inconsciente, de las estrategias de SRL y las herramientas digitales en la mejora de las habilidades orales. En conclusión, el estudio subraya el papel crucial del SRL y las TIC en la optimización de la competencia oral en EFL, sugiriendo un enfoque paso a paso para que los estudiantes utilicen eficazmente estos recursos en el desarrollo del idioma.

**Palabras clave:** Aprendizaje autorregulado; habilidades de expresión oral en inglés; estudiantes de aprendizaje autorregulado; TICs; estrategias cognitivas

## INTRODUCTION

The importance of self-regulation is becoming increasingly apparent. Self-regulation is the learning process where students take control of their learning, enhancing their language skills. In English as a Foreign Language (EFL), self-regulated learning allows students to develop effective learning strategies, becoming more independent and motivated to achieve their academic goals (Theobald, 2021). Self-regulated learning facilitates innovative teaching and learning methods by providing streamlined access to ICT resources and materials thanks to technological advances. SRL benefits people by empowering them to identify their study methods and EFL preferences through mastery of self-regulation elements and ICT utilization (Zhang et al., 2023). Educators can similarly integrate various SRL strategies with classroom materials and technological tools, prioritizing speaking skills to foster EFL development and achieve desired learning outcomes (Anthony et al., 2020).

In this sense, many researchers have documented the impact of self-regulation and ICTs on EFL in various countries worldwide. For instance, it has been found that self-regulation assisted by digital literacy has a positive effect on students' oral skills, improving speaking assessment, enthusiasm for learning, and autonomy (Menggo et al., 2022; Rosado & Vaca-Cárdenas, 2023). Students can work on their weaknesses and refine strategies to enhance aspects such as grammar, vocabulary, comprehension, fluency, and pronunciation. On the other hand, technological tools enrich the learning process, as demonstrated by (Wang & Chen, 2020), which indicates that students predominantly utilize English-teaching videos as learning resources, setting clear objectives for educational purposes. In fact, technology has a potential impact on self-regulated learning and has increased students' interest and motivation (Theobald, 2021).

Despite the relevance of ICTs in facilitating self-regulated learning strategies for EFL students, there is a significant gap in the literature review regarding a deep examination of how EFL learners use cognitive strategies with technological tools to improve their speaking skills. For example, the literature review shows that mobile technologies, such as smartphones and associated apps called MALL (mobile-assisted language learning), are increasingly being integrated into higher education environments as supplementary resources, particularly for language acquisition purposes. However, a comprehensive understanding of the language skills and areas addressed by the mobile apps is currently lacking (Dashtestani, 2016). There is also limited attention to how autonomous learners use mobile apps, including their experiences, preferences, and strategies they employ to enhance their input and output skills (Nami, 2020). Although other studies concluded that self-regulated learning strategies are essential and beneficial for EFL students, it did not explain what these strategies are or how university students use them in the EFL context (Hung, 2022).

Addressing this gap is essential for adequate management of ICTs, which can help learners become more independent in developing their learning strategies. Following this line, the purpose of this study is to analyze how independent EFL students use their cognitive learning strategies to improve their speaking skills by using ICTs. In Ecuador, little is known about self-regulated learning, and even less is known about the cognitive strategies that university students use while applying technological tools. For these reasons, it was essential to conduct a literature review that would delve into self-regulation cognitive strategies to enhance EFL speaking skills.

To achieve this objective, the following research questions are presented:

**RQ1.** What do students understand about self-regulation?

**RQ2.** What ICTs do self-regulated learning students use to develop their speaking skills?

**RQ3.** How do autonomous students use their self-regulated learning cognitive strategies to practice speaking skills through ICTs?

**RQ4.** What components do self-regulated learning students develop more when using SRL strategies aided by ICTs?

## LITERATURE REVIEW

Self-regulated learning arises from the need for individuals to take control of their own learning process, using cognitive and metacognitive strategies to be more independent in achieving their academic goals (Theobald, 2021). Additionally, Zimmerman conducted extensive research to validate his SRL model, which includes metacognitive phases called forethought, performance and self-reflection. These phases aim to make learners aware of their cognitive processes (Dignath & Veenman, 2021). While metacognition offers awareness and management of cognitive actions, cognition involves specific mental processes that learners need to understand, retrieve, and apply knowledge to develop a specific learning task (Wang, 2023). In the context of learning English as a foreign language, achieving proficiency in speaking skills requires a significant mental effort. Language learners must simultaneously engage in both speaking and thinking about how to

communicate fluently (Ghufron, 2017). Thus, learners need to develop specific cognitive strategies to make learning more enjoyable. Supporting this, another study has shown that interesting learning materials can motivate students to seek effective cognitive strategies that help them better understand the content (Teng, 2024).

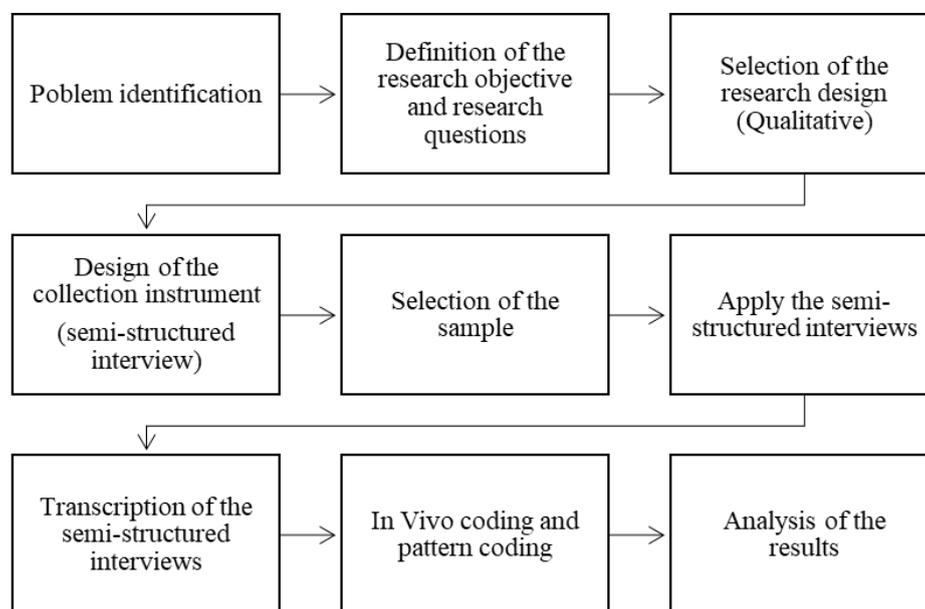
With the advent of technology, many SRL students seek additional resources beyond traditional ones, allowing them to learn at their own pace and adapt to their learning style (Wei, 2022). Some studies demonstrate that technology-based tasks and activities promote collaborative learning and enhance language proficiency (Zhang, 2022). Furthermore, the widespread ownership of technology has facilitated positive learning experiences through digital literacy, thereby enhancing students' autonomy to improve their outcomes (Anthonysamy et al., 2020). In this sense, ICT tools such as language learning apps, online courses, and interactive platforms provide students with ample opportunities to practice speaking in authentic and engaging contexts. These tools often incorporate speech recognition software that offers instant feedback on pronunciation, helping learners refine their spoken English (Ahmadi, 2018).

A key finding from the aforementioned studies is the positive impact of ICT application in SRL, but there is still a need for further investigation into how SRL cognitive strategies can be effectively utilized with ICT tools to enhance EFL speaking skills. While learning strategies are essential for achieving good learning outcomes, only a few students utilize effective cognitive learning strategies (Williams, 2021). Although some research highlights the general benefits of SRL and the positive impact of ICT tools, there is still less frequent use of cognitive strategies; this may be due to an unclear understanding of these strategies and the detailed processes step by step that autonomous students utilize to develop their speaking skills (Wang, 2023). To effectively support SRL for EFL learners, it is essential to investigate how cognitive self-regulatory strategies function, their relationship with ICTs, and their impact on EFL speaking skills.

## METHODOLOGY

This study uses a qualitative phenomenological approach that focuses on understanding people's experiences (Campbell et al., 2020; Williams, 2021). This method explores learners' perceptions in a tech-enhanced environment, revealing how their motivations, self-regulation, and strategic use of ICT tools influence their speaking proficiency. The diagram in Figure 1 describes the research methodology.

**Figure 1.** Methodology research map



**Source:** Ramirez, P & Revelo, J (Authors)

### Sample and selection of participants

We use a purposive sampling method to select participants or data sources that are best suited to answer specific research questions (Campbell et al., 2020; Mweshi & Sakyi, 2020). Therefore, this facilitates the collection, coding, and analysis of preliminary data before proceeding with further data collection and analysis (Staller, 2021).

We selected thirty-one students from 19 to 22 years old from a private university in Ecuador due to their B1 English proficiency level. Their prior experience with ICTs in language learning and their keen interest in improving their EFL speaking

skills beyond the classroom was a factor in their selection. This specific group provided valuable insights into self-regulation processes for enhancing speaking skills, thereby maximizing the range of perceptions relevant to the study. Before joining the study, all participants provided informed consent, adhering to ethical guidelines and ensuring respect for fundamental research principles. To address participants' concerns about anonymity, only background information such as their age and English level was collected.

**Table 1.** Distribution of participants

	Gender				N.-	Total
	Male	%	Female	%		
Group 1	3	50.0	3	50.0	6	19.35
Group 2	6	75.0	2	25.0	8	25.81
Group 3	5	50.0	5	50.0	10	32.26
Group 4	4	57.14	3	42.86	7	22.58
Total	18	58.06	13	41.94	31	100%

**Source:** Own elaboration with research data

### Data collection instrument

To gather information face-to-face, semi-structured interviews served as the primary tool, comprising a script with 15 specific questions. To validate the semi-structured interview script, we conducted a pilot test with a small sample resembling the target participants. This allowed for the identification of any ambiguities or issues with the questions, facilitating necessary revisions before administering the script on a larger scale to the final sample of self-regulated learners. The semi-structured format provided participants with the flexibility to elaborate on their opinions and experiences, facilitating a comprehensive exploration of the research's focal points (Adeoye-Olatunde & Olenik, 2021). The final interview script encompassed four categories tailored to answer the research questions and was structured as follows:

#### Self-regulated learning meaning

1. Why do you think you are a self-regulated learner?
2. What do you think self-regulated learning is?
3. How important do you think self-regulated learning is for improving speaking skills?
4. What do you think is better to develop your speaking skills, learning on your own or having a teacher?
5. How do you think you have improved your speaking during the university levels by being an English independent learner?
6. When do you think you started using self-regulated learning to improve your English-speaking skills? Why?

#### TICS to enhance speaking skills

7. How do you integrate technology into your speaking practice?
8. Which apps and platforms do you use to practice speaking and how do you use them?
9. How did these apps help you improve your speaking skills?

#### Self-regulated learning strategies

10. What specific activities do you use to develop your speaking skills on your own? Name them then one by one describe them
11. Why do you choose the aforementioned activities to develop your speaking skills?
12. How do you know if an activity works to develop your speaking skills?
13. Where do you get from the activities to develop speaking skills?

#### Speaking language components

14. Which of the next language components do you focus on more when developing your speaking skills: spoken grammar, vocabulary, pronunciation, intonation, accuracy, fluency, accuracy, and accent? Explain why
15. How do you know you have improved each of these components?

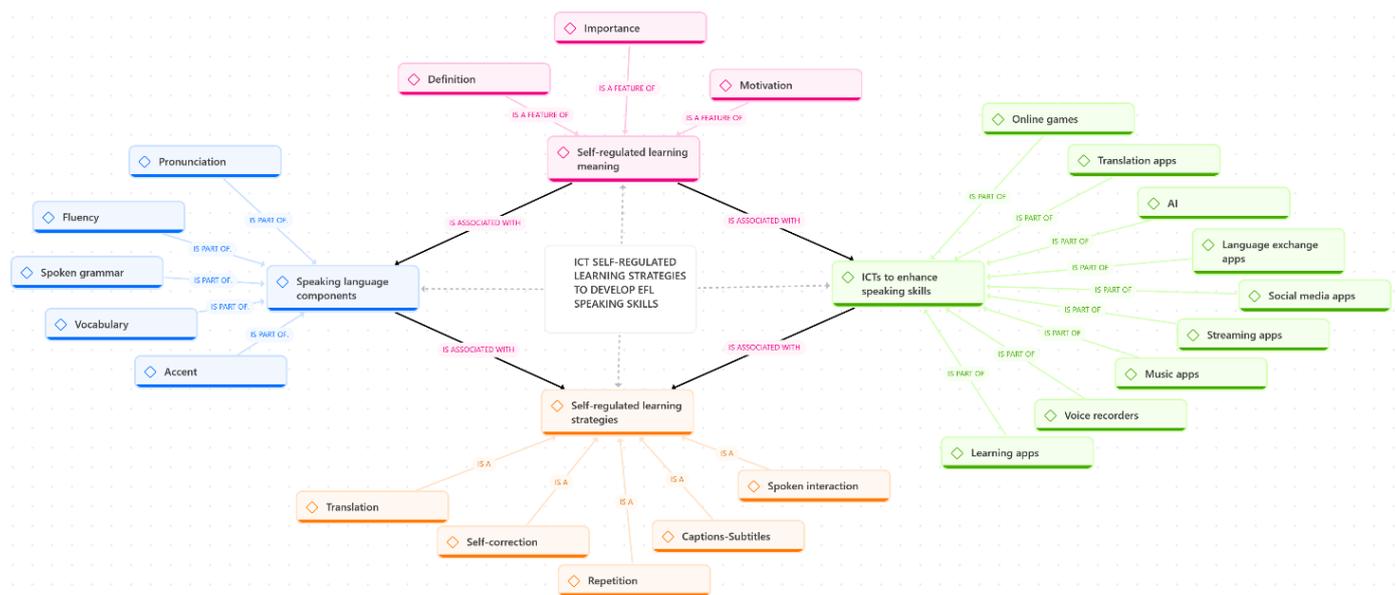
## Data collection and analysis procedure

The semi-structured interviews were conducted in four sessions of two hours each and recorded with participants' consent for subsequent transcription and analysis. Before the sessions, participants received a brief overview of the study, emphasizing its phenomenological approach to minimizing response bias.

We employed the techniques of In Vivo coding and Pattern coding to examine the data from the interviews, as this qualitative analysis prioritizes the real spoken words of the participants in this study (Maher et al., 2018). While transcribing the data, the researchers identified several emerging themes. This observation aligns with a study, which suggested that themes often emerge during the transcription stage as researchers become deeply immersed in the data (Arije et al., 2021). Therefore, we assigned interpretative labels to segments of data that were meaningful regarding ICTs and self-regulated learning cognitive strategies to develop speaking skills. Then, recurring patterns or relationships across the database were identified. This process helped organize the data into categories that provided insights to answer the research questions. The coding process was developed by the two main researchers together. Then, we analyzed the information to agree on the relevance of each code, to develop a final register. This helped to reinforce the credibility of the analysis.

Four categories resulted from the data analysis. The first category, self-regulated learning meaning encompasses how much students know about self-regulation. The second category is about how ICTs enhance speaking skills, where students explain how they integrate these technological tools into their learning process. The third category is about self-regulated learning cognitive strategies, which describe the different strategies that students use to self-regulate their learning. Finally, the fourth category about speaking language components explains what students improve when they use these tools in their speaking practice. To present the findings, the most crucial data collected from participant interviews was analyzed to ensure alignment with the study's objectives and pre-established categorization.

**Figure 2.** Semantic network of categories and subcategories derived from the participants' responses.



Source: Ramirez, P & Revelo, J (Authors)

## RESULTS AND DISCUSSION

We used a thematic analysis of the participants' responses to the four research questions in the interviews' transcripts, which revealed four categories:

- (1) Self-regulated learning meaning;
- (2) ICTs to enhance speaking skills;
- (3) Self-regulated learning cognitive strategies;
- (4) Speaking language components;

The first category "self-regulated learning meaning" focuses on the perceptions students have about SRL regarding EFL learning speaking skills. In this sense, three subcategories were found from the evidence of participants' responses in this category as follows.

**Table 2.** Self-regulated learning meaning.

Category	Subcategories	Findings
Self-regulated learning meaning	Definition	Interview 7: "When you like to improve on your own. When you like something, you want to improve by many ways like apps or talk to someone." Interview 18: "It is a person that learns on his own. For example, he can make different activities to improve his English without the need of a teacher."
	Importance	Interview 14: "The teacher's information is not enough, so self-regulation you can improve your vocabulary and pronunciation" Interview 20: "It helps to know more expressions, to speak fluently. Also, it helps to communicate with other people more easily."
	Motivation	Interview 11: "There are two moments, the first when my father motivated to study more not only English but also always read or have a discussion... The second experience was when I was in a shopping mall and there were foreigners who didn't speak Spanish, and I found the way to help them." Interview 12: "A funny experience a girl from Sweden asked to go around the city and I didn't know any English and I said to myself I have to learn."

Source. Own elaboration with research data

Participants expressed that the meaning of being independent learners involves studying and improving their skills, guided by their preferences and favorite learning methods. Additionally, the importance of self-regulation lies in reinforcing specific language skills, such as vocabulary, pronunciation, and fluency. Additionally, interviewees illustrated the influence of external motivating factors, such as parental encouragement and real-world interactions, on fostering autonomous learning. Together, these perspectives highlight the nature of self-regulated learning as found by (Blau et al., 2020; Öztürk & Çakıroğlu, 2021). The findings indicate that independent learning is driven by personal choice and external factors.

The second category Using ICTs to Improve Speaking Skills centers on the technological tools that SRL learners utilize to enhance their speaking abilities, known as web-based tools:

**Table 3.** ICTs to enhance speaking skills

Category	Subcategories	Findings
ICTs to enhance speaking skills	Online games	Interview 5: "Call of duty to play and interact with people of other counties." Interview 19 "I like video games. I put them in English, and I try to repeat the dialogues the characters say."
	Learning apps	Interview 12: "... Duolingo Stories, where you can listen to short conversations and then repeat them loud. I find it helpful because it's like having a conversation partner on my phone" Interview 9: "... Babel have interactive lessons where you can listen to dialogues and then repeat them. I also like the aspect where you can record yourself and compare it to the native speaker's pronunciation." Interview 8: FluentU has videos with subtitles in my language. "I usually watch the videos and then try to repeat what the speakers are saying. It's like having a language tutor." Interview 27: "...tongo gives me daily quizzes with memory cards."
	Language exchange apps	Interview 20: "When I use the speak pal I can speak with other people and I can understand what they say to me. I can learn native expressions, accent and pronunciation and more new words." Interview 18: "Tandem lets me practice with other people from another country in calls. It let me improve my English in real situations"
	Social media apps	Interview 1: "Omegle for conversations in native English" Interview 2: "I choose discord because I can practice with foreigners without the stress of making mistakes."
	Music apps	Interview 13: "I like to listen to music and look for the lyrics and imitate the pronunciation." Interview 3: "... when I listen to music, I can practice my pronunciation and memorize different native expressions."
	Translation apps	Interview 18 "...use google translator to practice my pronunciation. For example, I need to put a word in the app then I repeat and I improve my speaking skills." Interview 27 "I use Deepl to learn and listen to the meaning of words".
	Streaming apps	Interview 9: "I like to watch English-speaking YouTubers and try to imitate how they speak. It helps me learn new words and phrases." Interview 28: "I use You Tube music because I can see the lyrics and I memorize vocabulary." Interview 29: "With Netflix, I see some series with subtitles. I can try to translate some words."
	AI	Interview 26: In ChatGPT, I can have a conversation about different topics in English. It helps me to improve the grammar structure and know new words" Interview 11: "I use apps like Speechling and ELSA to practice speaking. It has different exercises, and you can record your voice to compare it with native speakers. I usually do the daily challenges and try to mimic the native speakers' pronunciation, so I get accurate feedback from the apps."
	Voice recorders	Interview 21: "I record myself in my cellphone and I listen my voice and my pronunciation." Interview 15: "I listen to music and record my voice when I say the lyrics of the song and I listen my audios. Sometimes, I record my voice and my pronunciation."

Source. Own elaboration with research data

Online games serve as a source of enjoyment through playing and interacting with others in virtual environments using English as the primary language of interaction. The participants attempted to imitate the dialogues spoken by the characters within the games. These findings are validated by the literature review, which states that gamers can improve their communication skills through the verbal communication required when playing online (Toufik & Hanane, 2021).

These results suggest that the immersive nature of these games provides a dynamic environment where learners are motivated to practice speaking in real-time, interact with diverse players, and mimic authentic dialogues, which enhances their language proficiency.

Besides, learning apps like Duolingo, Drops, Cake, Tongo, Babbel, and FluentU are described as essential in their learning process for their diverse range of exercises. The current research findings are consistent with other studies which confirmed the positive effect of learning apps on enhancing students' vocabulary growth and grammar structure. These studies show that learning apps are valuable because they include sentence completion and construction, quizzes with memory cards, word translation, error correction, and pronunciation practice (Ahmed et al., 2022; Ajisoko, 2020).

On the other hand, the use of language exchange apps like Speak Pal, Tandem, and Hello Talk to interact with speakers from other countries are considered effective developing speaking skills.

In line with this hypothesis, some studies found that users who engaged in video-based interactions with proficient English speakers developed spontaneity in their English language output, as learners could enhance their intercultural communication skills (Freiermuth & Huang, 2021). These results suggest that language exchange apps offer authentic and immersive oral practice in the target language.

Participants used different social media apps such as Omegle, Discord to practice their English-speaking skills with people from other countries; and music apps like Spotify or Music Match to learn vocabulary and pronunciation from the lyrics. Similar results indicates that students who spend more time on productive tasks like social media chatting or emailing others often view themselves as more proficient in using communication strategies with foreigners (Ahmed et al., 2022; Lee & Drajadi, 2019).

On the other hand, it was found that the students' perceptions about using music in their learning had significantly helped them acquire a substantial number of words and phrases, contributing to improved pronunciation (Panggabean & Batubara, 2022).

Based on this, both social media apps and music apps foster language accuracy, fluency, and active participation in diverse learning activities among learners by providing an enjoyable environment for them to practice their speaking skills.

Google Translate and Deep were employed to research the meanings of words and practice their pronunciation. Similar findings indicate that Google Translate is easy to use due to its convenience and potential to enhance pronunciation skills (Khasanah et al., 2022). It supported students in learning independently at any time and place. This means that translation has become crucial to aid in word comprehension and pronunciation practice.

On the other hand, streaming apps like YouTube to listen to music with lyrics or Netflix to watch films with subtitles to improve their vocabulary and pronunciation were common learning resources within participants. The results of this study agree with other which found that its quality subtitles, vivid mental pictures, and sounds enhance students' comprehension of English vocabulary (Damanik & Katemba, 2021; Robert & Marpaung, 2022). This advocates that exposure to foreign films and music with lyrics introduces students to new vocabulary and good pronunciation effortlessly.

Participants also used AI resources like ChatGPT, Speechling and ELSA Speak to record their voices and compare them to native speakers or simulate human conversation. It was observed that there was a positive association between AI and self-regulated learning with chatbots since they are useful for simulating human conversation and facilitate genuine and realistic conversations (Sáiz-Manzanares et al., 2023; Xia et al., 2023). This establishes that AI is effective for improving speaking skills by providing accurate feedback through voice comparison.

Interviewees shared that they use voice recorders on their phones to record themselves while imitating the pronunciation of songs. Their goal is to compare their pronunciation and evaluate their progress. For instance, through these recorders students feel more independent and responsible to practice their speaking skills (Lancini, 2019). In other words, voice recording enhances English-speaking skills through increased engagement and self-assessment.

Regarding the third research question on how self-regulated learners use cognitive strategies, all thirty-one participants employed various approaches to improve speaking skills outside the classroom.

These strategies included: (a) repetition, (b) translation, (c) self-correction, (d) spoken interaction, (e) subtitles, and (f) self-talk, tailored to their preferred learning styles.

**Table 4.** Self-regulated cognitive learning strategies.

Category	Subcategories	Findings
<b>Self-regulated cognitive learning strategies</b>	Repetition	<p>Interview 28: "I watch videos and listen to music because I repeat words, and I memorize vocabulary. They help me with my pronunciation and improvisation."</p> <p>Interview 22: "I play videogames where I hear dialogues and try to repeat them or words that I don't understand. Also, I hear many songs in English. I repeat the words or phrases that I don't understand"</p> <p>Interview 3: "I listen to music and learn the lyrics and try to repeat the same expressions" Interview 13: "I like to listen to music and look for the lyrics and imitate the pronunciation. I also watch series and check how they pronounce the words."</p>
	Translation	<p>Interview 8: "I watch movies only in English. First choose a short conversation. I then translate it into Spanish to be sure I understand each word. Then, I translate in English but no looking the Spanish text to remember vocabulary."</p> <p>Interview 12: "YouTube to listen to music and read the subtitles. The words that I don't understand, I put them in the translator, and I read the meaning"</p> <p>Interview 16: "Play video games. You can learn new vocabulary, new words, and if you do not understand, you can translate using an app".</p>
	Self-correction	<p>Interview 1: "The people of Study Stream help me to improve my listening and speaking and I learn to correct my mistakes."</p> <p>Interview 12: "I like to speak with people that know English and check the vocabulary and pronunciation. When I talk, I pay attention to my grammar and pronunciation. If I see a mistake, I stop and correct myself fast. After the conversation, I practice saying the correct sentences, so I not make the same mistakes when speaking with my friend again."</p>
	Spoken interaction	<p>Interview 17: "I speak with foreigners about different issues. I choose speaking with a foreigner because it's better to hear lively how he/she pronounces some words."</p> <p>Interview 28: "I've improved my pronunciation and improvising when talking with other people. I talk to other people, and this person understands me. And I know more words and can improvise with another person"</p>
	Subtitles	<p>Interview 31: "I use subtitles with songs because I memorize the vocabulary for example I listen and read the songs of Justin Bieber."</p> <p>Interview 25: "I also try to see series in English with subtitles to understand more of the words"</p> <p>Interview 24: "Listening to music and watching TV series. I put the subtitles to learn new words and if I don't understand the meaning of words I search in the Cambridge dictionary."</p>
	Self-talk	<p>Interview 13: "Well, I like to use my phone to record myself speaking in English. I talk about different topics, like my day or hobbies. Then, I listen again and try to improve my pronunciation and fluency."</p>

**Source.** Own elaboration with research data

Findings demonstrated that one of the most frequently used self-regulated learning (SRL) strategies was repetition. Participants begin by listening to dialogues, videos, music, and series. Then, they repeat the words or expressions until they can pronounce them correctly. In fact, a study found that one benefit of the repetition technique is that it helps students accurately reproduce words, phrases, and sentences by modelling correct pronunciation, grammar, and structure (Bozorgian & Kanani, 2017). These results suggest that by consistently practicing and repeating language elements, learners can achieve significant gains in their speaking abilities.

A second strategy to improve speaking skills involves translation. Initially, they translate unfamiliar words and sentences from movies, songs and video games using various translation apps to understand their meanings. These results are consistent with studies which found that learners who engage in translation initially enhance their ability to understand and memorize vocabulary, which later supports their language production skills (Ratnasari, 2020). These results indicate that translation serves as a valuable tool for acquiring new English vocabulary and expressions by drawing comparisons with their meanings in their native language.

Participants mentioned self-correcting their pronunciation, grammar and vocabulary during conversations with different English speakers. These results are consistent with the literature on the use of technology in language learning, specifically the work of (Souri & Merç, 2020) who found self-correction can help improve vocabulary range, use of linkers, and the ability to provide additional details, clarify points, and build ideas in a way that enriches speech content. These results highlight that self-correction is beneficial for memory retention and future error prevention.

It was noted that interacting with foreigners on various topics helped them improve both pronunciation and vocabulary. Regular conversations also enhanced their ability to improvise, deepening their language understanding and expanding their vocabulary. This is also consistent with the conclusion of (Chen & Mei, 2024) on mobile technology for

intercultural communication, which found that social features on mobile platforms enhance the learning experience by enabling learners to connect with multicultural communities, share learning tips, practice together, and improve pronunciation. This finding suggests that EFL learners may achieve native-like oral fluency more naturally by practicing speaking with more proficient English speakers.

Participants used songs and series subtitles to memorize vocabulary and understand new words, complementing this practice with online dictionaries to clarify unfamiliar terms. Subtitles stimulate multisensory processes by engaging the mind with audio, images, and subtitles simultaneously (Tayari Ashtiani, 2017). Customizing subtitles in English music videos, adjusting their color, size, and position on screen captures significant attention and enhances comprehension, retention, and recall of lyrics, particularly among non-native English speakers. The results imply that by employing subtitles, individuals not only memorize vocabulary and understand new words but also improve their overall communication abilities, including pronunciation akin to that of native speakers.

The results highlighted self-talk as a valuable strategy for improving their pronunciation by listening to themselves speaking about different topics. Thus, the findings in this study are compatible with research that revealed students who were taught using the self-talk strategy tend to be more courageous, confident, and overall perform better in speaking English (Humairoh, 2022). It shows that self-talk not only aids in pronunciation correction but also enhances psychological factors like confidence and courage, which are crucial for language learning.

Finally, the category "speaking language components" encompasses the areas where the participants had improvements due to the use of the SRL cognitive strategies and ICTs. Evidence in this category is described as follows:

**Table 5.** Speaking language components

Category	Subcategories	Findings
<b>Speaking language components</b>	Fluency	Interview 2: "Fluency because I really like to sound like a native English speaker. I realized I improved when I keep more conversations and understand better." Interview 12: "I used to hesitate a lot when speaking, but now I can talk with more fluency without pausing too much."
	Pronunciation	Interview 1: "I can correct my pronunciation mistakes because before this I invented words..." Interview 13: "When I can listen to a new song, and I can understand the lyrics and I can imitate it. I know that I improved because I rap a song very well." Interview 19: "I've improved my pronunciation when I'm singing and repeat the song, and I understand the other words the teacher say."
	Vocabulary	Interview 7: "For vocabulary, I notice I can use more words when I speak." Like, I can explain things better without having to search for words all the time." Interview 9: "I improved a lot by using more like native expressions." Interview 22: "Now, I can understand paragraphs and unknown words and say sentences with a few mistakes."
	Spoken grammar	Interview 14: "I know I've improved my spoken grammar because when I listen to myself speaking, I feel I make fewer mistakes. I used to confuse with word order and verb forms, but now it feels more natural." Interview 6: "Well, I think I've improved in spoken grammar because I make fewer mistakes when I talk. Like, I don't confuse verb tenses as before."
	Accent	Interview 9: "When I speak I can hear me different. My friends even say I sound more like a native speaker now." Interview 17: "I watch videos and listen to the pronunciation of different people because you can practice different accents."

**Source.** Own elaboration with research data

The participants noticed an improvement in their English fluency by using ICTs, achieving a better understanding of conversations. They also reported a noticeable reduction in hesitation during speech, resulting in smoother and more fluid communication. Technological tools like videoconference programs help students improve their fluency by having natural conversations through this tool (Valero-Valenzuela & Kovacs, 2022). Based on the results, it is evident that learning a language through online devices significantly improved participants' English fluency.

Another area of improvement was their pronunciation, as participants became more aware of their mispronunciations while speaking. They were also able to sing and imitate songs with correct pronunciation. The audio materials in the learning apps assist students in developing accurate pronunciation, which in turn enhances their vocabulary acquisition (Lu et al., 2023). This result suggests that participants perceive improvements in pronunciation and enhancement across all language systems and skills.

The participants in the study reported significant improvements in their vocabulary through the use of various ICT learning resources. They noted that they could use more words to explain their arguments and incorporate native-like expressions into their speech. This aligns with a study which found that half of the 28 university students agreed they could

remember new words and phrases more effectively when using apps (Klimova & Polakova, 2020). Another study reported that its participants gave positive feedback about the mobile vocabulary apps, suggesting that they successfully fulfilled their requirements for learning and enhancing discipline-specific vocabulary (Kohnke & Ting, 2021). This suggests that students viewed the mobile app as an essential part of their learning experience and genuinely enjoyed using this new method of learning.

In addition, the findings reveal that using ICTs helps participants improve their spoken grammar by reducing hesitation, making fewer mistakes, and experiencing greater confidence in their speech. This aligns with a study by (Madhavi et al., 2023), which reported that students in their ICT group found using technology more enjoyable, beneficial, and productive for improving vocabulary, grammar, fluency, and sentence structure rather than non-ICT group students. Students, as digital natives, are comfortable with technology and tend to learn more effectively in tech-driven environments (Lastari & Rohim, 2023). This suggests that with mobile accessibility, learners can engage in grammar lessons and practice exercises anytime, anywhere, fostering a deeper understanding of grammar and other language components.

Finally, the participants noticed a change in their accent, supported by friends' observations, indicating ICT's role in achieving a more native-like accent. These findings are congruent with a study about the use of videos and lyrics to enhance students' proficiency in analyzing accents, fostering increased memory retention and motivation to learn the English accent (Yuhariah & Syafryadin, 2023). It is evident that the use of online resources to practice different accents, suggesting that ICT facilitates different pronunciation styles.

## CONCLUSIONS

One important contribution of this paper is to show the diverse nature of self-regulated learning in EFL speaking skills improvement, highlighting the key roles played by personal preferences, individual experiences, and external stimuli. The research demonstrates the transformative impact of digital tools on significantly enhancing spoken language proficiency. Furthermore, findings emphasize the effectiveness of specific SRL cognitive strategies and online learning devices and applications in fostering English oral communication. The use of ICTs had a positive impact on the development of certain strategies, such as repetition, translation, self-correction, and spoken interaction, as foundational components of independent learning. Therefore, to effectively utilize apps for educational purposes, particularly in language learning, the content within these apps should closely correspond to enhance their communication skills. Consequently, collaboration among educators, app designers, and curriculum developers is crucial to ensuring that language learning app exercises align with these pedagogical outcomes.

### Limitations and recommendations for further research

The study was limited to one private university, so the findings cannot be generalized to all universities. However, despite this limitation, the study still holds significance because the strategies and apps identified in the results can be adapted and applied in various settings to achieve similar positive learning outcomes. Recommendations for further research include applying this study to different educational institutions to provide a more comprehensive understanding of the impact of ICTs and self-regulatory cognitive strategies on EFL learning. Future research should also delve into the potential of the apps identified in this study across various language skills and learner contexts.

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B. data research and statistical analysis:	50%	50%
C. elaboration of figures and tables:	50%	50%
D. drafting, reviewing and writing of the text:	50%	50%
E. selection of bibliographical references	50%	50%
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