“Manage My Learning”: Mobile Game-Based Vocabulary Learning and Self-Regulation Strategies

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Abstract

Vocabulary learning is fundamental to English as foreign language (EFL) proficiency and academic success. However, many EFL learners experience challenges such as low motivation, poor pronunciation and retention, and limited persistence. This action research examined how a mobile game-based vocabulary learning (MGBVL) app, paired with self-regulated learning (SRL) strategies, influenced the out-of-class vocabulary learning journey of five university EFL learners, focusing on learning outcomes, motivation, self-efficacy, and persistence. Quantitative and qualitative data were collected through learning journals, app logs, semi-structured interviews, and field notes.

The findings suggest that game elements and SRL strategies can effectively work together to enhance vocabulary learning outcomes, motivation, self-efficacy, and persistence. Specifically, the level-based game mechanism, combined with SRL strategies such as goal-setting and self-reflection, enhanced motivation and persistence, directly contributing to improved outcomes. Furthermore, game-based sensations of achievement, when paired with self-observation and self-reflection strategies like self-evaluation and self-reaction, strengthened self-efficacy and persistence. Game elements such as immediate feedback also supported engagement and learning outcomes when integrated with self-control and self-observation strategies.

This study contributes to a deeper understanding of how SRL strategies and game elements facilitate EFL vocabulary learning success. It also offers insights for EFL educators seeking to support adult students' out-of-class vocabulary learning. Future research is encouraged to expand and diversify sample sizes to further explore the impact of combining MGBVL apps with SRL strategies across broader learner groups and other language skills, such as speaking.

Key words: EFL vocabulary learning, mobile game-based learning app, self-regulated learning strategies

Declaration of Authenticity

"I, Meixia XU, declare that the PhD thesis entitled "Manage My Learning": Mobile Game-Based Vocabulary Learning and Self-Regulation Strategies is no more than 80,000 words in length including quotes and exclusive of tables, figures, appendices, bibliography, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work".
"I have conducted my research in alignment with the Australian Code for the Responsible Conduct of Research and Victoria University's Higher Degree by Research Policy and Procedures.

Signature Date

Ethics Declaration
"All research procedures reported in the thesis were approved by the Victoria University Human Research Ethics Committee [approved number: HRE21-123]."

Signature: Date:

Artificial Intelligence (AI) Declaration

AI was used for interview transcript translation. Any use of AI in the thesis was ethical, responsible and in keeping with the principles of academic and research integrity including honesty, transparency, fairness and accountability.

Signature: Date:

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Chapter 1 Introduction

1.1 Background and problem statement

The COVID-19 pandemic caused unprecedented disruption to educational institutions worldwide, compelling governments to implement swift and innovative measures to ensure continuity in education. In China, the pandemic led to nationwide school closures by the end of February 2020. To address the challenges posed by these closures, the Chinese government implemented an emergency policy "Suspending Classes without Stopping Learning," transitioning higher education to online platforms (Ministry of Education of the People's Republic of China, 2020). This policy minimized disruption and ensured that learning continued uninterrupted during lockdowns (Hebebci et al., 2020; Zhou et al., 2020). Online or web-based teaching emerged as a temporary substitute for traditional classroom instruction and became the primary mode of teaching delivery (Li, 2023). China's effective COVID-19 control measures allowed a large number of university students to return to campuses by June 2020, resuming their studies in a blended learning mode (Ying et al., 2021). This mode combined online and face-to-face instruction, marking a significant shift in how higher education was delivered.

For university students learning EFL, the transition to blended learning brought substantial challenges, particularly in vocabulary acquisition. Many learners struggled with the lack of a conducive learning climate—encompassing social, emotional, and physical conditions—that could support their EFL vocabulary learning. This issue was often exacerbated by the psychological burden and anxiety surrounding the social conditions triggered by COVID-19 (G. Chen et al., 2020; Yi et al., 2020; Zhang & Wu, 2022). Moreover, arduous learning environments, whether at home or in dormitories, imposed further challenges on learners' autonomy. Without the usual structure and discipline of classroom settings, students faced difficulties in independently managing their study routines (Ao et al., 2020; Chen & Zhang, 2022).

The shift to blended learning also resulted in decreased interaction with teachers and classmates, both during and outside of class, which further impacted learners' motivation and engagement (T. Chen et al., 2020; Qiao et al., 2021). This reduced social connection not only hindered collaborative learning opportunities but also contributed to a sense of isolation. Importantly, the blended mode placed greater responsibility on students to manage their learning, necessitating enhancement of their independent learning abilities.

These challenges gave rise to heightened levels of anxiety and demotivation, making it increasingly difficult for students to maintain their academic performance and meet the demands of exams (Ying et al., 2021; Yuan, 2023; Zhang, 2021). Such circumstances highlighted an urgent need for innovative

strategies and tools to support EFL learners in overcoming barriers and effectively adapting to the blended learning environment.

1.2 Why action research as the methodology framework

The various challenges faced by university EFL learners during the transition to blended learning highlighted the need for an approach that could address their specific struggles while empowering them to take ownership of their learning (Nambiar, 2020; Qiao et al., 2021; Yu, 2022). Action research was chosen as the methodological framework for this study because of its unique ability to provide context-specific solutions while engaging participants in a reflective and transformative process (Burns, 2009; Stringer, 2008).

Action research is participant-driven and reflective, allowing learners to actively examine their learning processes and identify strengths and obstacles within their specific context (Burns, 2009; Tran, 2009). This reflective approach not only deepens learners' understanding of their practices but also enables them to recognize the underlying factors influencing their progress. By involving participants in iterative cycles of action, observation and reflection action research fosters a sense of ownership and accountability, crucial for addressing the increased autonomy demanded by blended learning environments.

Most importantly, action research is inherently geared towards change and the improvement of practice (Burns, 2009). Unlike other methodologies that may focus solely on observation or analysis, action research is solution-oriented, leading to the development of practical, context-specific strategies that are tailored to the unique challenges faced by learners. This adaptability ensures that the interventions remain relevant and impactful, addressing not only the immediate needs of participants but also equipping them with tools for sustained, independent learning.

By focusing on reflective practice and problem-solving towards context-specific solutions, action research has great potential to bridge the gap between the challenges of EFL vocabulary learning imposed by the pandemic and the development of effective learning practices. It aligns with the study's goal of empowering EFL learners to actively engage with their learning process, overcome obstacles, and achieve meaningful improvement in their EFL vocabulary performance.

1.3 Self-regulated learning (SRL) as the theoretical framework for scaffolding

SRL, defined as the ability of learners to control and direct their own learning actions (Zimmerman, 2000), has emerged as a prominent focus in language learning research (Şahin Kızıl & Savran, 2018). This is particularly relevant in the context of Chinese university students' EFL vocabulary learning, where much of the learning takes place outside the classroom and depends heavily on learners' capacity to independently manage and direct their learning processes (Chen et al., 2024; Yang, Song, et al., 2023).

The growing interest in SRL reflects its potential to address the challenges of vocabulary acquisition (Şahin Kızıl & Savran, 2018), particularly in contexts where learners face diminished instructional support and increased autonomy, such as blended learning environments (Chen et al., 2024).

Recent studies (Bahrami et al., 2022; Muslim & Mahbub, 2023; Teng, 2023) highlight the need for more research to examine the internal complexities of EFL vocabulary learning within the SRL framework. These studies suggest that exploring the way learners regulate their vocabulary learning can provide valuable insights into strategies that enhance motivation (Hariri et al., 2021; Janitra et al., 2020), persistence (Muslim & Mahbub, 2023; R. Zhang et al., 2024), self-efficacy (Chu et al., 2022; Ueno & Takeuchi, 2022), and eventual learning outcomes. This highlights the importance of SRL as a lens for understanding and improving EFL vocabulary learning, particularly in challenging contexts such as those imposed by the pandemic.

SRL was also chosen as the theoretical framework to guide university learners towards successful EFL vocabulary acquisition because it encapsulates key elements of effective learning (Zimmerman, 2002). SRL highlights the significance of learner autonomy and active engagement, addressing the heightened responsibilities learners face in managing their own vocabulary learning progress in the blended learning context. Moreover, the cyclical model of SRL proposed by Zimmerman (2000) which divides the learning process into three interconnected phases—forethought, performance, and self-reflection—provides a comprehensive structure for fostering these capabilities in learning implementation.

As well, the alignment between the three phases of Zimmerman's SRL model and the stages of action research outlined by Kemmis and McTaggart (1988)—plan, act, and reflect—makes SRL an especially fitting framework for this study. The forethought phase corresponds to the planning stage, where learners set goals and strategize their learning. The performance phase aligns with the action stage, focusing on implementing strategies and monitoring progress. Finally, the reflection phase mirrors the reflective stage, where learners evaluate their performance and adapt their approach accordingly. This synergy enhances the integration of SRL strategies into the action research process, promoting iterative improvement and personalized learning.

By adopting SRL as the theoretical framework, this research seeks to empower learners with the tools and strategies necessary for autonomous and effective vocabulary learning. It aims to bridge the gap between theoretical understanding and practical application, ensuring that learners are equipped to independently and successfully navigate the complexities of EFL vocabulary acquisition.

1.4 Why a game-based learning app

Mobile digital game-based vocabulary learning was identified as a valuable tool to support university EFL learners in achieving sustainable, structured out-of-class vocabulary learning, particularly under the blended learning mode prompted by the pandemic (Krouska et al., 2022).

First, mobile-assisted language learning (MALL) offers significant advantages over traditional classroom learning by overcoming constraints of time and space and provides learners with a rich, convenient, and continuous learning experience in real time (Klimova, 2021a; Lin & Lin, 2019). This enables flexibility and accessibility which are particularly relevant in the context of the COVID-19 pandemic, where learners faced disruption in their educational routines and environment.

Second, digital game-based vocabulary learning (DGBVL) has been shown to enhance learner autonomy and reduce learning anxiety (Peterson & Jabbari, 2022; Peterson et al., 2022) by providing a pleasant learning environment and enhancing positive learning emotions (K. Li, M. Peterson, & J. Wan, 2022; K. Li, M. Peterson, & Q. Wang, 2022; Vnucko & Klimova, 2023; Zou et al., 2019). These characteristics are especially critical for addressing the challenges faced by EFL learners during the blended learning mode, such as diminished social support, increased responsibility for independent learning, and negative learning emotions. And learning autonomy is also a key element of SRL (Zimmerman, 2002; Zimmerman & Schunk, 2012), which is fundamental for learners to effectively manage their learning processes. By lowering anxiety and fostering autonomy, game-based learning tools provide a supportive foundation for the application of SRL strategies.

With a preponderance of quantitative studies on DGBLV, there is growing recognition of the need for innovative qualitative research to improve understanding of digital game-based vocabulary learning across diverse educational contexts (Peterson & Jabbari, 2022; Peterson et al., 2022). While previous studies have established the benefits of DGBVL, such as improving motivation, engagement, and learning outcomes, a gap remains in understanding how games or game factors operate within specific settings. This was particularly important in blended learning environments during the pandemic, where learners faced unique challenges and opportunities. And while research has suggested that digital game-based learning can promote learners' SRL awareness, the mechanisms through which this occurs remain underexplored (Mahayanti et al., 2020; R. Zhang et al., 2024). Investigating how game factors interact with SRL strategies in EFL vocabulary learning under a blended learning and challenging context with action research can provide valuable insights into their role in, and a domain specific measure for, fostering sustainable learning habits and empowering learners to independently navigate long-term vocabulary learning.

1.5 Research objectives and questions

Kemmis and McTaggart (1988) suggest that a general form of the overarching research question in action research is: “I intend to do X with a view of improving Y” (p. 12). This framing assumes a situation of type Z, and proposes a solution type X to achieve an outcome of general type Y. In the present study, this framework is adapted as follows:

Objective Statement

I intend to introduce a MGBVL app as a learning resource and integrate SRL strategies for learning management to university EFL students in China, with a view to enhancing their vocabulary learning during the pandemic-induced challenges.

This research seeks to address a core educational need by proposing and testing innovative tools and strategies to improve the vocabulary learning experience and outcomes of struggling EFL learners facing significant external challenges. Specifically, it aims to explore whether and how the combined use of MGBVL and SRL strategies provides a sustainable, structured, and effective vocabulary learning framework.

Overarching Research Question

How can the use of a MGBVL resource and SRL strategies provide a sustainable and effective means of enhancing the EFL vocabulary learning of struggling young adult participants under the challenging circumstances imposed by the pandemic?

Kemmis and McTaggart (1988) emphasize that each cycle of action research should interrogate the extent to which desired outcomes were achieved and whether they resulted from the proposed interventions. In this study, these inquiries are encapsulated in the following subsidiary questions:

Subsidiary Research Question 1

In what ways do the participants use the MGBVL resource and SRL strategies to support their new word learning and retention?

This question investigates the participants' engagement with the tools and strategies provided, focusing on their practical application and effectiveness in achieving vocabulary growth and quality retention.

Subsidiary Research Question 2

What are the enablers and constraints of using MGBVL resources and SRL strategies to enhance learning motivation, persistence, and self-efficacy?

This question draws on McTaggart (1994) emphasis on sustainability as a criterion for evaluating action research initiatives. It explores factors that facilitate or hinder the long-term integration of these tools and strategies into the participants' learning practices.

1.6 Structure of the thesis

This thesis is organized into nine chapters, each addressing a specific aspect of the research. Collectively they provide a comprehensive account of the study, from the introduction to the final conclusions and implications. The structure is as follows:

Chapter 1: Introduction

The first chapter introduces the background and context of the research, including the challenges faced by Chinese university EFL learners during the COVID-19 pandemic and the rationale for choosing action research as the methodological framework. It outlines the research objectives and questions, emphasizing the aim of enhancing vocabulary learning outcomes and experiences through MGBVL and SRL strategies.

Chapter 2: Key terms and theoretical framework

This chapter defines the key terms essential to the study, including SRL, digital game-based learning, and EFL vocabulary learning. It also presents the theoretical frameworks underpinning the research, particularly Zimmerman's SRL model and its alignment with action research principles.

Chapter 3: Literature review

The literature review critically examines existing studies on SRL, digital game-based vocabulary learning, and the challenges of EFL vocabulary learning. It identifies research gaps and positions this study within the broader academic discourse, highlighting its contribution to addressing the specific needs of struggling EFL learners.

Chapter 4: Methodology

This chapter details the research design and methodology, explaining the action research framework adopted for the study. It describes the participants, data collection tools, and procedures, along with ethical considerations and the approach to data analysis.

Chapters 5–7: Findings from Cycles 1–3

These three chapters present the findings from the first three cycles of action research. Each chapter begins with an overview of the cycle, including the actions implemented and the participants' responses. The analysis focuses on key aspects such as vocabulary growth, motivation, persistence, and self-efficacy, providing insights into how the interventions influenced participants' learning experiences.

Chapter 8: Independent learning and follow-up

This chapter explores the participants' experiences during the one-week independent learning phase and the one-month follow-up period. It analyses their continued use of SRL strategies and the MGBVL app, examining the sustainability of their learning behaviour and the long-term impact of the interventions.

Chapter 9: Discussion and conclusion

The final chapter summarizes the key findings and discusses their implications for theory, practice, and policy. It reflects on the research process, addressing limitations and suggesting directions for future research. Recommendations are provided for educators and policymakers to more effectively support struggling EFL learners.

Chapter 2 Theoretical framework

This chapter establishes the theoretical foundation for the study which investigates how the integration of SRL and a MGBVL app can enhance English vocabulary acquisition, motivation, persistence, and self-efficacy in challenging educational contexts. The first three sections examine key concepts and theories of SRL strategies, game-based learning principles and vocabulary learning theories. The following three sections define key concepts and present theories explaining the fluctuation of motivation, persistence and self-efficacy throughout the learning journey. These frameworks underpin the study's design and analysis, offering a comprehensive understanding of participants' learning journeys.

2.1 Self-Regulated Learning

2.1.1 Introduction

SRL is an essential concept in educational psychology, emphasizing the active role learners play in controlling their own learning processes. Zimmerman (1989) described SRL as the process by which learners actively manage their thoughts, behaviour, and emotions to achieve their learning goals. This concept is particularly relevant in contexts such as university-level education, where learners need to take more responsibility for their own success.

SRL is not a single event but a cycle that involves three key phases: forethought, performance, and self-reflection. These phases help learners continuously evaluate and adjust their learning strategies based on their goals and feedback.

1. **Forethought phase**
    1) This phase involves planning and goal setting, where learners decide what they intend to achieve and how they will achieve it. Motivation is a key component here, as learners must find the desire to engage with the learning material, in this case English vocabulary.
    2) The use of goal-setting and task analysis is critical, especially for EFL learners, as it helps break down complex learning tasks (such as mastering new vocabulary) into smaller, manageable steps. The learner's self-efficacy, or their belief in their ability to succeed, is also shaped during this phase.
2. **Performance phase**
    1) During this phase, learners implement planned strategies and monitor progress. Key processes include self-control (managing distractions and maintaining focus) and self-observation (tracking one's own progress).

2) For EFL learners, the use of a MGBVL app can facilitate this phase by providing real-time feedback and monitoring tools. Learners can adjust their strategies based on their performance and the feedback provided by the app, enhancing engagement with the material.

3. **Self-Reflection phase**
    1) In this final phase, learners evaluate their performance and outcomes. They reflect on what worked and what didn't work, allowing them to make adjustments in future learning tasks.
    2) Reflection also fosters self-efficacy, as successful completion of learning tasks can boost confidence and motivation to tackle new challenges. In the context of vocabulary learning, learners may reflect on their progress in mastering new words and consider strategies for future learning sessions.

2.1.2 SRL models and theories

Several models and theories of SRL provide a framework for understanding how learners regulate their learning processes:

- **Zimmerman's cyclical model of SRL**: Zimmerman's model is one of the most widely used frameworks in SRL research. It emphasizes the cyclical nature of learning, where learners continually assess and modify their strategies based on the feedback they receive. This model is highly relevant to the current research, as it aligns well with how university EFL learners interact with a MGBVL app, moving between goal setting, strategy implementation, and reflection.
- **Pintrich's SRL model**: Pintrich (2000) expanded on Zimmerman's work by identifying four areas where SRL operates: cognition, motivation/affect, behaviour, and context. This model emphasizes how learners' cognitive processes, emotional regulation, and contextual factors (such as the use of a MGBVL app) influence their ability to self-regulate. It is particularly useful for understanding how EFL learners manage their motivation and emotions while learning vocabulary.
- **Boekaerts' dual processing model**: Boekaerts (1997) introduced a model that distinguishes between growth and well-being goals**.** Growth goals refer to academic progress, while well-being goals focus on maintaining emotional balance. This model could be applied to research by exploring how EFL learners balance their desire to improve vocabulary (growth goals) with their need to stay motivated and manage stress (well-being goals).

The action design of this research follows Zimmerman and Moylan (2009) model.

2.1.3 Zimmerman and Moylan's cyclical model of self-regulated learning (SRL)

Zimmerman and Moylan (2009) cyclical model of SRL is one of the most widely applied frameworks in educational research. It presents self-regulation as a dynamic process that involves continuous adjustment of learning strategies across three main phases: forethought, performance, and self-reflection. This cyclical nature makes it particularly relevant to vocabulary learning, where learners need to constantly assess their progress and adapt methods to meet their goals.

1. **Forethought phase**

The forethought phase occurs before the learning activity begins. It is characterized by processes that set the stage for successful learning. Two major components of this phase are task analysis and self-motivation beliefs.

1) **Task analysis:** In this stage, learners identify the task at hand, break it down into manageable parts, and set specific goals. For EFL learners using a MGBVL app, task analysis might involve setting a goal to learn a specific number of new words in a session or mastering a particular level in the app.
    a) **Goal setting:** Effective learners set proximal goals that are achievable in the short term, which helps maintain motivation and persistence. In research, this is reflected in the MGBVL app's ability to allow learners to set smaller vocabulary milestones, reinforcing persistence through immediate feedback.
    b) **Strategic planning:** Learners develop plans for how they will achieve their goals. For instance, EFL learners might plan to use specific features of the MGBVL app, like spaced repetition or vocabulary games, to enhance retention.
2) **Self-motivation beliefs**: This component includes factors like self-efficacy, outcome expectations, and task interest/value.
    a) **Self-efficacy**: Zimmerman and Moylan emphasize the role of self-efficacy in SRL, where learners' belief in their ability to succeed influences motivation and effort. In the context of the current research, learners' confidence in mastering vocabulary through the MGBVL app can drive their persistence and willingness to engage with challenging tasks.
    b) **Outcome expectations**: Learners anticipate the benefits or rewards of completing a task. For vocabulary learning, they might expect improved language proficiency or success in an upcoming exam as a result of their efforts.
    c) **Task interest/value**: The value learners place on the task determines their level of engagement. If the game elements in the MGBVL app make vocabulary learning enjoyable, learners are more likely to invest effort in mastering the content.

2. **Performance phase**

The performance phase takes place while learners are actively engaged in the learning task. It involves processes that help them focus on goals and monitor performance. The two key components here are self-control and self-observation.

1) **Self-control**: This refers to the learner's ability to manage their thoughts, emotions, and behaviour to stay on the task.
    a) **Attention focusing**: Learners concentrate on relevant vocabulary tasks, using strategies to minimize distractions. For example, in the context of the MGBVL app, they might mute unrelated app notifications or set specific times to focus on vocabulary tasks.
    b) **Task strategies**: Learners use specific strategies to complete tasks. In vocabulary learning, these could include mnemonic devices, repeated practice using the app, or visual imagery to help retain new words.
    c) **Self-instruction**: Learners may use verbal or mental cues to stay motivated. For example, telling oneself to "keep going" after completing a challenging task in the app can help maintain persistence.
2) **Self-observation**: This process involves learners monitoring their own performance in real-time.
    a) **Metacognitive monitoring**: Learners track their understanding of vocabulary words and the effectiveness of the strategies they are using. The MGBVL app's real-time feedback can support this process by showing learners their progress through levels or mastery of vocabulary lists.
    b) **Self-recording**: Learners may keep track of how many words they've mastered or how much time they've spent on learning activities. The app's dashboard feature could facilitate this self-monitoring, allowing learners to review their progress visually and make any necessary adjustments.

3. **Self-reflection phase**

The self-reflection phase occurs after the learning task is completed, where learners evaluate their performance and adjust strategies for future tasks. It includes self-judgment and self-reaction.

1) **Self-judgment**: Learners assess their performance against the goals they set in the forethought phase.

a) **Self-evaluation**: Learners compare their actual performance (e.g., vocabulary learned, time spent) with their goals. In the current study, learners might evaluate their progress based on how many new words they have successfully learned through the GBVL app.
b) **Causal attribution**: Learners reflect on the reasons for their success or failure. Did they succeed because they used effective strategies, or did they struggle because the task was too challenging? This reflective process helps learners understand what worked and what didn't work.

2) **Self-reaction**: Learners respond to their performance in ways that influence future learning.
a) **Self-satisfaction/affect**: Positive performance can boost learners' motivation and self-efficacy for future tasks, while negative performance might lead to frustration or disengagement. In the context of this research, learners who achieve success in the MGBVL app may feel more confident in their ability to learn new vocabulary, while those who struggle may need to adjust their strategies.
b) **Adaptive inferences**: Based on their reflection, learners make decisions about how to approach future tasks. For instance, if they struggled with a particular vocabulary set, they might decide to spend more time using the app's practice features or focus on easier words first.

4. Cyclical nature of SRL in vocabulary learning

The cyclical nature of Zimmerman's model emphasizes that learning is an ongoing process of adjustment and reflection. For university EFL learners using a MGBVL app, this cycle is crucial to sustaining long-term vocabulary learning. Each time learners complete a vocabulary task, they reflect on their success, adjust their goals and strategies, and re-enter the cycle with a renewed sense of self-efficacy and improved task strategies.

In the current research, this model can serve as a guide to explain how learners regulate their learning across multiple sessions with the app. For example, after completing a vocabulary level, learners reflect on their performance, adjust goal-setting and strategies for the next session, and re-engage with the app's features to continue progressing.

2.2 Game-based learning (GBL)

2.2.1 Key terms

GBL refers to the use of games—digital or non-digital—as educational tools to achieve specific learning outcomes. GBL leverages the intrinsic features of games such as rules, goals, challenges, interactivity, and feedback to create an immersive learning environment. In GBL, the game itself is

designed to be an integral part of the educational process, and playing it leads directly to acquiring or reinforcing knowledge, skills, or competencies (Plass et al., 2015; Plass et al., 2020; Qian & Clark, 2016).

In contrast, gamification in learning involves incorporating game-like elements (e.g., points, badges, leaderboards, or challenges) into non-game contexts to motivate learners and enhance engagement without using a fully-fledged game (Sailer & Homner, 2019). Gamification focuses on adding external motivational elements to existing activities or tasks, while GBL embeds learning content and objectives within the gameplay.

Aspect	Game-based learning	Gamification
Nature	Uses actual games with gameplay that directly supports learning objectives.	Adds game-like mechanics to non-game activities.
Learning Process	Knowledge acquisition or skill development happens within the game.	Learning happens outside the game-like elements, which serve as motivational tools.
Objective	Focused on learning through the gameplay experience.	Focused on enhancing engagement and motivation.
Example	A vocabulary-learning game where players learn and apply new words through levels and challenges.	Adding a leader-board to track students' performance in traditional learning tasks.

Table 2.2-1 Key difference between GBL and gamification

2.2.2 Gee (2006)'s seven features of video games for learning

James Paul Gee (2006) highlights seven design features of video games that make them effective tools for learning and explain why video games can foster engagement, critical thinking, and skill development, making them a promising model for educational tools. These features are outlined below, followed by their relevance to Kaixincichang, a popular mobile game-based EFL vocabulary learning app.

1. **Interactivity**

1) **Description**: Games engage players in interactive processes where they must make decisions and take actions, leading to meaningful learning experiences.
2) **Kaixincichang application**: The app requires learners to actively engage with vocabulary through tasks such as passing levels, completing quizzes, and participating in *PK* competitions. This interactivity promotes cognitive engagement and deeper learning.

2. **Customization**

1) **Description**: Games allow players to customize experiences, adapting to their individual preferences and learning needs.
2) **Kaixincichang application**: Learners can tailor their learning pace and focus areas by choosing specific vocabulary lists, scheduling reviews, and engaging in tasks like contextual learning or meaning-matching activities. This customization caters to diverse learner needs.

3. **Strong identities**

1) **Description**: Games enable players to adopt identities that motivate them to engage and perform in the game world.
2) **Kaixincichang application**: Through features like progress badges and rankings, the app allows learners to build a sense of identity as successful vocabulary learners, motivating them to persist in their learning journey.

4. **Well-ordered problems**

1) **Description**: Games present problems in a well-structured sequence, starting with simple problems and gradually increasing in complexity to reinforce learning.
2) **Kaixincichang application**: The app organizes vocabulary into levels that progress from simpler to more complex words. Learners must master earlier levels to unlock new ones, ensuring a gradual and manageable increase in difficulty.

5. **Games are pleasantly frustrating**

1) **Description**: Games maintain a balance between challenge and skill, keeping players engaged without overwhelming them.
2) **Kaixincichang application**: The app's level-based mechanism provides challenges appropriate to learners' current proficiency. Features like retries and spaced reviews offer support, ensuring that the challenges remain stimulating but achievable.

6. **Games are built around the cycle of expertise**

1) **Description**: Games encourage players to practice skills until they reach automaticity, then introduce new challenges to deepen expertise.
2) **Kaixincichang application**: *Kaixincichang* reinforces vocabulary through repeated exposure and retrieval tasks. Once learners achieve mastery of one set of words, the app introduces new levels to further expand their vocabulary knowledge.

7. **“Deep” and “fair”**

1) **Description**: Games offer meaningful challenges that test players’ understanding and skills fairly, allowing success through effort and strategy.
2) **Kaixincichang application**: The app provides meaningful challenges such as *PK* competitions, where learners can test their vocabulary knowledge. Success depends on effort and the use of effective strategies like contextual learning and review scheduling.

2.3 EFL vocabulary learning and retention theories

Vocabulary learning is a fundamental process in second language acquisition, serving as the building blocks of a learner’s language system (Alqahtani, 2015). It involves acquiring, consolidating, and integrating word knowledge into long-term memory which is crucial for effective language use (Nation, 2001). A successful vocabulary learning journey results in the integration of word knowledge into the learner's long-term memory, enabling fluent communication and comprehension (Zou et al., 2019). To explain the mechanisms underlying vocabulary learning, this section draws on the following key theories: memory systems, cognitive load theory, levels of processing, and spaced review theory which provide a foundation for understanding how tools like Kaixincichang support learners.

2.3.1 Vocabulary knowledge: definitions and dimensions

Vocabulary knowledge, a cornerstone of language acquisition, encompasses more than mere word recognition. According to Nation's (2000**)** framework, it involves a range of components that capture both the breadth and depth of lexical understanding. Nation categorizes vocabulary knowledge into three key dimensions —form, meaning, and use— each of which is further divided into receptive (recognition) and productive (usage) aspects, reflecting the multifaceted nature of vocabulary learning. For instance, knowing a word entails an understanding of its spelling, pronunciation, grammatical features, meaning, collocations, and appropriate contextual use.

Building on this framework, Milton (2009) introduces a practical perspective by delineating vocabulary size, breadth, and depth:

1. **Vocabulary size and breadth**

   Vocabulary size refers to the total number of words a learner knows, encompassing both receptive and productive vocabulary. Breadth, closely related to size, captures the range of word families a learner can recognize or produce. Milton emphasizes that vocabulary size serves as a fundamental measure of linguistic competence, linking it directly to language proficiency. For example, achieving increased vocabulary size is often critical for learners preparing for standardized language tests like the College English Test band 6 (CET-6).

2. **Vocabulary depth**

   Depth pertains to the richness of a learner's knowledge about a word, including its multiple meanings, associations, collocations, and nuances. Depth of vocabulary knowledge extends beyond recognizing or using a word, to understanding its semantic network and contextual applications. Milton emphasizes the importance of depth as it contributes significantly to fluent language use and comprehension, particularly in advanced learners engaging with complex texts.

Together, vocabulary size and depth form the dual pillars of lexical competence. While size supports the breadth of exposure and initial comprehension, depth underpins nuanced understanding and effective communication. Understanding these dimensions is crucial for assessing and fostering vocabulary acquisition, particularly in EFL learners striving to meet rigorous academic and professional language demands.

2.3.2 Memory systems in vocabulary learning

Memory is central to vocabulary acquisition, involving the encoding, storage, and retrieval of word knowledge. Three primary memory systems contribute to this process (Baddeley, 2003):

1. **Short-term memory**: Temporarily holds new information for immediate processing. In vocabulary learning, short-term memory captures the orthographic and phonological forms of new words during initial exposure.
2. **Working memory**: Supports the active manipulation and rehearsal of information. Working memory is particularly relevant in tasks such as associating word forms with meanings or constructing sentences using new vocabulary.
3. **Long-term memory**: Stores information for future retrieval. The ultimate goal of vocabulary learning is to transfer word knowledge to long-term memory, enabling its retrieval and use in communicative contexts (Nation & Meara, 2013).

Kaixincichang leverages these systems by presenting words in structured levels that encourage immediate interaction (short-term memory), facilitate rehearsal and manipulation (working memory), and promote long-term retention through spaced review (long-term memory).

2.3.3 Levels of processing theory

Levels of processing theory (Craik, 2002) posits that deeper processing of information results in better retention. Vocabulary learning with Kaixincichang aligns with this theory by engaging learners in multi-modal and hierarchical processing:

1. **Shallow processing**: Initial exposure involves recognizing visual and phonological forms of words.
2. **Intermediate processing**: Learners associate word forms with meanings and morphological structures.
3. **Deep processing**: Words are contextualized through example sentences, usage scenarios, and semantic relationships.

Kaixincichang supports these levels by:

1. Providing audio-visual representations during initial exposure.
2. Facilitating retrieval tasks that link forms and meanings.
3. Encouraging contextual understanding through example sentences and translations.

These varied levels of processing enhance the depth of word knowledge, supporting both retention and application.

2.3.4 Cognitive load theory

Cognitive load theory (Sweller, 1988) explains how learners manage cognitive resources during learning. It identifies three types of cognitive load:

1. **Intrinsic load**: The inherent complexity of the material. For Kaixincichang, the number of words in a level (e.g., 5 vs. 10) directly affects intrinsic load. Participants in this study reported increased difficulty when the level size grew to 10 words, leading to more failures in passing levels.
2. **Extraneous load**: The cognitive effort required due to poor instructional design. Kaixincichang minimizes extraneous load with its intuitive interface, clear instructions, and engaging activities.
3. **Germane load**: The cognitive effort devoted to schema construction and automation. By organizing words into manageable levels and integrating diverse retrieval tasks, Kaixincichang promotes schema-building and deep learning.

The observed challenges when transitioning to larger levels highlight the importance of managing cognitive load, especially for learners with varying proficiency levels.

2.3.5 Spaced review theory

Spaced review theory (Ebbinghaus, 1913) emphasizes revisiting learned material at optimal intervals to combat forgetting and strengthen memory traces. This approach is particularly effective for

vocabulary retention (Kim & Webb, 2022; Seibert Hanson & Brown, 2019). Kaixincichang implements spaced review by:

1. Using an algorithm based on the forgetting curve to schedule reviews.
2. Marking challenging words for repeated practice.
3. Providing adaptive review lists tailored to individual learner performance.

Participants in this study highlighted that spaced review reinforced retention by ensuring timely and frequent encounters with words, especially those which were initially challenging.

These theories collectively explain the mechanisms behind Kaixincichang's effectiveness and offer a framework for understanding its role in supporting sustainable and successful vocabulary learning. This integration highlights the app's potential to address key challenges in EFL vocabulary acquisition.

2.4 Motivation theories: self-determination theory (SDT) and the ARCS model

Motivation, defined as the internal drive that initiates, directs, and sustains learning behaviour, is a fundamental component of successful learning. In the context of SRL, motivation not only drives goal-setting and persistence but also influences how learners adapt and sustain their efforts over time. However, motivation is not static; it fluctuates based on various internal and external factors. This section begins by defining motivation and its relevance to EFL vocabulary learning. It then introduces key theories that explain the mechanisms behind motivation fluctuations, highlighting their application to game-based learning environments such as MGBVL apps, which aim to enhance learner engagement and persistence.

2.4.1 Self-determination theory (SDT): motivation categorization and definition

SDT, proposed by Ryan and Deci (2017), is a comprehensive framework for understanding human motivation. It distinguishes between different types of motivation based on the degree to which individuals are self-motivated and autonomous. In the context of EFL vocabulary learning, SDT helps explain why learners engage with the Kaixincichang app and persist in their vocabulary learning journey.

SDT identifies three fundamental psychological needs that drive motivation (Ryan & Deci, 2020, p. 86):

1. **Autonomy**: The need to feel in control of one's own actions and decisions.
2. **Competence**: The need to feel capable and effective in one's activities.
3. **Relatedness**: The need to feel connected to others and to experience a sense of belonging.

These needs influence the types of motivation learners experience, which fall into two broad categories—intrinsic motivation and extrinsic motivation —each with several subtypes.

2.4.1.1 Intrinsic motivation

Intrinsic motivation refers to engaging in an activity for the inherent pleasure and satisfaction derived from it (Ryan & Deci, 2017, p. 14). The activity itself is the reward, and learners do not expect any external outcomes or rewards for their efforts. As Ryan and Deci (2020) explain, intrinsic motivation is the most autonomous form of motivation and is driven by internal psychological needs. It leads to deep engagement and persistence because the activity is fulfilling.

Key characteristics of intrinsic motivation:

1. Curiosity: Learners are naturally curious about the subject or activity and find the learning process enjoyable.
2. Challenge: Learners are motivated by the intellectual or practical challenge that the task presents.
3. Interest: Learners engage because they have a genuine interest in the topic or skill.
4. Enjoyment: There is inherent pleasure derived from performing the activity, whether it's mastering vocabulary or progressing through a game.

In educational contexts, intrinsic motivation is considered the ideal form of motivation because it promotes deep learning, creativity, and persistence. Learners are driven by curiosity, interest, or enjoyment. In the context of Kaixincichang, intrinsic motivation might arise when learners find the game enjoyable, engaging, and challenging in a way that fosters their love of learning.

Intrinsic motivation in Kaixincichang:

1. Learners might enjoy progressing through different levels, completing challenges, or mastering new words simply because it's fun and rewarding.
2. The design of the app, which offers gamified elements like rewards, achievements, and challenges, enhances autonomy and competence which may fulfill psychological needs and in turn drive learners' intrinsic motivation.

2.4.1.2 Extrinsic motivation

Extrinsic motivation involves engaging in an activity as a means of achieving an external outcome or reward, such as passing an exam or receiving praise (Ryan & Deci, 2017, p. 14). In contrast to intrinsic motivation, learners are motivated by external factors or rewards such as grades, praise, or meeting

deadlines. SDT recognizes that extrinsic motivation is not inherently negative and can range from more controlled to more autonomous forms.

Extrinsic motivation exists on a spectrum from controlled (least autonomous) to self-determined (most autonomous), which is represented by different types of extrinsic motivation. These sub-types of extrinsic motivation are categorized based on the degree of autonomy or self-regulation involved:

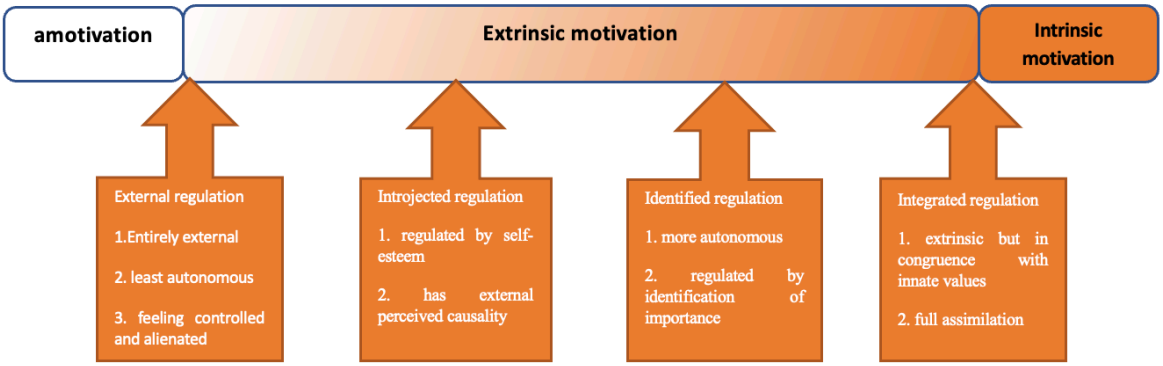

Figure 2.4-1 Motivation continuum

1. **External regulation**: This is the least autonomous form of motivation, where learners engage in an activity solely to meet external demands or avoid punishment (Ryan & Deci, 2017, p. 184). Here, the motivation is entirely driven by external factors, such as rewards or consequences imposed by others, such as teachers or parents. In the case of Kaixincichang, learners might use the app because they are required to pass a vocabulary test or meet academic expectations.
    1) Characteristics: The activity is performed solely for external reasons, such as getting a good grade, receiving a reward, or avoiding negative consequences (e.g., punishment or failure).
    2) Example: A learner using the app to meet a course requirement or to prepare for a vocabulary test.
    3) Application in MGBVL: A learner might use Kaixincichang because they are required to learn vocabulary for a course or need to prepare for a test.
2. **Introjected regulation**: This form of motivation involves internal pressure, where learners engage in activities to avoid guilt or to enhance their self-esteem (Ryan & Deci, 2017, p. 185). While the motivation is internal, it is not fully autonomous, as the individual feels internal pressure to act in a certain way. Introjected motivation is driven by feelings of obligation or the desire to maintain a sense of self-worth. In the case of vocabulary learning, learners may feel compelled to learn vocabulary to meet their own expectations or avoid feelings of failure.

1) Characteristics: Learners are motivated by internal pressures, such as the need to avoid guilt or shame, or to boost their ego. Although the motivation comes from within, it is still a form of control.
2) Example: A learner who feels obligated to use the app regularly because they want to maintain their self-image as a "good student."
3) Application in MGBVL: A learner may use Kaixincichang regularly because they want to maintain their self-image as a diligent language learner, rather than due to genuine interest in the vocabulary tasks.

3. **Identified regulation**: This is a more autonomous form of extrinsic motivation where learners recognize the personal importance of the activity and willingly engage in it because they see value in achieving the goal, even if the task itself is not inherently enjoyable. Identified regulation reflects a sense of personal investment in the outcome (Ryan & Deci, 2017, p. 187). In the case of vocabulary learning, learners see its value for long-term benefits, such as improving language proficiency or achieving career goals.
    1) Characteristics: Learners identified with the value of the activity and internalized its importance. They recognize that engaging in the task will benefit them in the long term so they willingly participate, even if the task itself is not intrinsically motivating.
    2) Example: A learner who uses Kaixincichang because they believe it will help them become proficient in English and achieve future goals.
    3) Application in MGBVL: A learner may use Kaixincichang because they know that mastering vocabulary is essential for their future success, such as passing a language proficiency exam or improving their communication skills.
4. **Integrated regulation**: This is the most autonomous form of extrinsic motivation, where the activity is fully aligned with the learner's personal values and identity (Ryan & Deci, 2017, p. 188). It occurs when individuals fully integrate the value of an activity into their own sense of identity and personal goals. The activity aligns with their values and beliefs, and although it is extrinsically motivated, it feels self-determined. The learner integrates the importance of vocabulary learning into their sense of self, making the activity feel personally meaningful.
    1) Characteristics: The learner perceives the activity as part of their identity and life goals. The motivation is fully self-regulated because the learner's actions align with their internal values and aspirations.
    2) Example: A learner who views using the app as part of their identity as a language learner, consistently engaging with it because they value language mastery as part of their long-term development.
    3) Application in MGBVL: A learner may use Kaixincichang consistently because they view language mastery as integral to their identity and personal growth, not just as a means of passing exams or achieving specific outcomes.

8. The continuum of motivation in SDT

It is important to note that SDT presents motivation on a continuum, ranging from controlled forms of motivation (e.g., external regulation) to autonomous forms (e.g., intrinsic motivation and integrated regulation). As learners move along this continuum, they experience increasing levels of autonomy and internalization of their goals.

1) Controlled Motivation: Includes external and introjected regulation, where learners' actions are driven by external demands or internal pressures.
2) Autonomous Motivation: Includes identified and integrated regulation, as well as intrinsic motivation where learners engage in tasks because they have internalized the value of the activity and/or enjoy the activity itself.

In the context of EFL learning, moving learners from more controlled forms of motivation (for example using a vocabulary app to learn EFL vocabulary because itis required) towards more autonomous forms (for example using the app to learn EFL vocabulary because they recognize its value or enjoy the process) is essential for long-term persistence and success.

The design of Kaixincichang has potential to support both intrinsic and extrinsic motivation by providing challenges that are enjoyable (intrinsic) and rewarding (extrinsic). The level-based system and achievement features also enhance autonomy, as learners can progress from one level to another at their own pace, and competence as they feel capable of mastering vocabulary. Any social features may also enhance relatedness, as learners could compare their progress with others, fostering a sense of community or competition.

2.4.2 ARCS model of motivation

The ARCS Model developed by John Keller (1987) focuses on four key components that enhance learner motivation: Attention**,** Relevance, Confidence**,** and Satisfaction. It is widely used in instructional design to create engaging learning environments and can be directly applied to the design of game-based learning apps like Kaixincichang.

1. Attention

Attention involves capturing and maintaining the learner's interest in the task. In the context of Kaixincichang, attention is gained by using game elements like interactive tasks, visually engaging interfaces, and the challenge of progressing through different levels.

Kaixincichang application: The app uses elements such as dynamic exercises, animations, and varied vocabulary tasks (e.g., spelling, meaning matching, sentence usage) to capture learners' attention and keep them engaged.

2. Relevance

Relevance refers to the perceived value and usefulness of the learning material in the learner's life. Vocabulary tasks in Kaixincichang can be made relevant by demonstrating how mastering new words directly benefits learners, whether for academic purposes, social interaction, or career advancement.

Kaixincichang application: The app connects vocabulary learning to practical language use (e.g., applying words in sentence contexts) and could show learners how this vocabulary can be applied in real-life situations, making the learning process feel valuable and relevant.

3. Confidence

Confidence refers to the learner's belief in their ability to succeed. Learners are more motivated when they feel they can control their success and master tasks. Kaixincichang's level-based system, where learners progress at their own pace and receive immediate feedback, helps build confidence by allowing learners to experience small, manageable successes.

Kaixincichang application: As learners move through levels and complete vocabulary challenges, they receive feedback that enhances their sense of competence, reinforcing the belief that they can achieve learning goals.

4. Satisfaction

Satisfaction comes from experiencing positive outcomes and reinforcement for learning efforts. This could be through rewards, personal achievements, or feedback. Kaixincichang can provide satisfaction through rewards such as points, badges, or unlocking new levels, reinforcing learners' motivation to continue.

Kaixincichang application: The app may offer badges, points, or even leader-boards to reward learners for their achievements, ensuring that they feel a sense of accomplishment and are motivated to continue their vocabulary learning journey.

2.4.3 Goal-setting theory and motivation

Goal-setting theory, introduced by Locke and Latham (1990), emphasizes the critical role of goals in directing behaviour and enhancing motivation. It suggests that specific and challenging goals, when accompanied by feedback, lead to higher levels of performance compared to vague or easy goals. Goals act as cognitive representations of desired outcomes, shaping attention, effort, and persistence (Locke & Latham, 2002). This theory aligns with the principles of SRL, as learners actively set and pursue their own objectives.

In the context of language learning, goal-setting plays a significant role in sustaining motivation. Proximal goals—short-term, achievable targets—enhance learners' intrinsic motivation by providing frequent opportunities for accomplishment and self-efficacy reinforcement (Bandura & Wessels, 1994, 1997). To maximize the effectiveness of goals, the SMARTER framework (Specific, Measurable, Achievable, Relevant, Time-bound, Evaluated, and Reviewed) has been widely adopted (Les MacLeod, 2012). It ensures that goals are clear and actionable, fostering better engagement and adaptability in dynamic learning environments.

In this study, participants were guided to set SMARTER weekly goals for their vocabulary learning. For example, instead of vaguely aiming to "learn many words," participants defined specific targets, such as "mastering 50 CET-6 words this week." These well-defined goals provided structure to their learning and fostered a sense of autonomy and competence, as emphasized by self-determination theory (Ryan & Deci, 2000). Regular evaluation and adjustment of these goals also allowed learners to effectively respond to challenges, such as the disruptions caused by the pandemic.

Goal-setting theory also mediates the fluctuations in motivation. Learners who achieve their goals experience increased motivation and enhanced self-efficacy, whereas unmet goals may temporarily reduce persistence (Zimmerman, 2000; Zimmerman, 2002). To mitigate this, reflective practices were incorporated into the study, encouraging participants to dynamically adjust their objectives based on progress and external constraints.

Kaixincichang’s level-based mechanism has the potential to further support this process by embedding goal-setting elements. The app's design of manageable word groups per level provided participants with tangible, incremental goals. Its feedback system, including progress tracking and celebratory elements, reinforced learners’ motivation through consistent achievement and adaptive goal refinement. This synergy between goal-setting theory, the SMARTER framework, and game-based learning tools demonstrates the potential of combining SRL strategies with technological scaffolds to sustain and enhance learner motivation.

2.4.4 Proximal and distal goals in vocabulary learning

Proximal goals are short-term, immediate goals that can be achieved relatively quickly, while distal goals are long-term objectives that require sustained effort over time (Latham & Seijts, 1999). Both types of goals are important in EFL vocabulary learning, as they keep learners motivated in the short term while guiding them towards larger achievements.

1. **Proximal goals**

   These goals keep learners motivated by providing immediate rewards and a sense of accomplishment. For example, learners might set a goal of mastering 10 new vocabulary words by the end of the week. The app supports proximal goals by allowing learners to complete tasks and levels in short sessions, giving them immediate feedback and rewards.

2. **Distal goals**

These are broader, long-term goals such as achieving fluency in academic English or passing a major proficiency exam that require sustained effort. Learners may use the app as part of a long-term strategy to build a large vocabulary base over several months, aiming to achieve fluency or proficiency.

2.4.5 Task value theory and motivation

Task value theory, a component of expectancy-value theory (Eccles & Wigfield, 2020), posits that an individual's motivation to engage in a task is significantly influenced by its perceived value. This theory identifies four key components of task value:

1. **Intrinsic value**: The inherent enjoyment or interest in performing the task.
2. **Attainment value**: The importance of the task in achieving personal goals or aligning with one's self-concept.
3. **Utility value**: The perceived usefulness of the task in achieving future goals.
4. **Cost**: The perceived negative aspects of the task, such as effort or lost opportunities for alternative activities.

The balance between these factors determines the overall task value, which in turn impacts the learner's motivation to engage with and persist in the task.

In the context of this research, task value theory helps explain how learners' perceptions of the value of EFL vocabulary learning influenced their motivation. For instance, participants who recognized the utility value of mastering CET-6 vocabulary for academic or professional advancement showed stronger

and more consistent engagement. Similarly, intrinsic value, such as the enjoyment derived from using Kaixincichang's interactive and gamified features, contributed to sustained motivation. However, perceived costs, including the time and cognitive effort required to learn challenging words, sometimes inhibited motivation, particularly for learners facing external pressures like tight schedules or emotional stress during the pandemic.

Task value also plays a critical role in the fluctuation of motivation. When learners' experiences reinforce the perceived value of learning a level of CET-6 (College English Test Band 6) words—such as improved CET-6 practice results or recognition of task relevance to broader goals—their motivation is enhanced. Conversely, when the perceived costs outweigh the benefits, motivation may decline. This study therefore integrated strategies to boost task value, including:

1. Encouraging learners to set meaningful, personalized goals aligned with their academic and personal aspirations.
2. Promoting intrinsic enjoyment through Kaixincichang's gamified design, such as progress tracking, achievement celebrations, and competitive features like PK (player vs. player competition).
3. Highlighting utility value by connecting vocabulary learning to real-life applications, such as improved reading comprehension and CET-6 performance.

By increasing task value through these strategies, the research aimed to sustain participants' motivation, even in challenging circumstances. This alignment between task value theory and SRL strategies further emphasizes the potential of integrating motivational frameworks with practical tools to support long-term EFL learning success.

2.5 Persistence

2.5.1 Defining and understanding persistence in learning

Persistence, as defined by Peterson and Seligman (2004), is the "voluntary continuation of a goal-directed action in spite of obstacles, difficulties, or discouragement" (p. 229). It represents an individual's steadfast effort in the moment, refusing to quit and continuing to strive until a task is accomplished. This concept captures the essence of resilience in learning, especially when challenges arise (DiNapoli, 2023).

Persistence often relates to the pursuit of short-term goals. However, sustained persistence towards these immediate objectives can accumulate over time, leading to significant long-term achievements (Constantin et al., 2011). For instance, consistent daily effort to learn a set of vocabulary words contributes not only to immediate retention but also to broader language proficiency in the long run.

2.5.2 Psychological foundations of persistence over challenges

Several psychological factors contribute to an individual's ability to persist in challenging circumstances (Di Paula & Campbell, 2002; Peterson & Seligman, 2004). These are:

1. **Self-esteem**

   High self-esteem provides resilience against the negative effects of initial failure, preventing individuals from feeling overly disheartened. Favourable expectancies of future success also encourage persistence, as learners maintain faith in eventual accomplishments which can boost their self-esteem when success is achieved (F. Zhang et al., 2024).

2. **Positive mood**

   A good mood fosters resilience and provides the emotional energy necessary for sustained effort. Positive emotions create a supportive mental environment, allowing learners to maintain their focus and motivation (Liew & Tan, 2016; Mohammad, 2023).

3. **Self-control capacity**

   Self-control plays a crucial role in persistence, particularly when learners encounter challenging tasks. It enables them to override the natural tendency to quit or avoid discomfort and instead remain focused on achieving their goals. Self-control allows learners to delay immediate gratification, regulate negative emotions, and maintain commitment to long-term objectives despite temporary frustrations or setbacks (Duckworth et al., 2019; Zhu et al., 2016).

4. **Expectancy of future success**

   The belief that success is attainable in the future plays a pivotal role in sustaining persistence. Expectancy of future success enables learners to maintain faith that their efforts will eventually lead to a boost in self-esteem and tangible achievements (Loh, 2019; Nagle, 2021). This forward-looking optimism provides the psychological resilience needed to continue striving, even during setbacks (Lee & Song, 2022; Loh, 2019).

2.5.3 Persistence with Kaixincichang: continuance learning with technology

The Expectation Confirmation Model (ECM), originally proposed by Bhattacherjee (2001), provides a robust framework for understanding users' decisions to continue using technology. The model suggests that users form initial expectations about a technology's efficacy before its use. During and after their interaction with the technology, they assess its performance based on their experiences. If the actual

performance meets or exceeds initial expectations, users experience satisfaction which fosters their intention to persist in using the technology (Dai et al., 2020). Conversely, if the experience falls short of expectations, dissatisfaction can lead them to stop using it.

In the context of persistence in educational technology, ECM offers insights into how learners sustain engagement with tools like MGBVL apps (Huang & Liu, 2024). For instance, if learners perceive an app like Kaixincichang as useful for improving vocabulary retention and meeting academic goals, and this perception is confirmed through positive learning outcomes (e.g., successful retention or noticeable progress), their satisfaction increases. This satisfaction reinforces motivation and commitment to persist in using the app for vocabulary learning.

Key constructs of ECM relevant to persistence include:

1. **Expectation confirmation**: Learners continuously compare their expectations with the actual utility of the technology. For example, when Kaixincichang's spaced review system aligns with learners' expectations for effective retention, it strengthens their persistence.
2. **Perceived usefulness**: This is a central determinant of continued use. When learners find that using the app significantly contributes to vocabulary learning outcomes, it enhances their motivation to continue.
3. **Satisfaction**: Positive confirmation of expectations leads to satisfaction which acts as a mediator between perceived usefulness and the intention to persist.

The ECM framework aligns well with persistence theories, suggesting that learners' satisfaction and motivation are influenced by how effectively the technology fulfills their needs and expectations. For instance, learners who initially expect the app to support long-term retention, and find that its features such as review schedules and progress tracking deliver on this promise, are more likely to persist in its use.

2.5.4 Implications for Learning

Understanding the psychological foundations of persistence is critical for designing effective learning environments. Interventions that enhance self-esteem, promote expectancy of future success, foster positive emotions, and strengthen self-control can significantly boost learners' ability to persist. For example:

1. **Building expectancy of success**: Incremental goal-setting and frequent opportunities for success can help learners develop faith in their ability to achieve long-term objectives.

2. **Boosting self-control**: Encouraging learners to adopt SRL strategies, such as time management and realistic goal-setting, helps them stay on track despite challenges.
3. **Fostering positive emotions**: Celebrating incremental achievements through feedback and gamified elements can create a positive mood which bolsters resilience and motivation.
4. **Building self-esteem**: Providing constructive feedback and creating opportunities for learners to experience success strengthens confidence in their abilities.

In EFL vocabulary learning, persistence is vital as consistent, incremental efforts lead to gradual mastery of language skills. Mobile game-based learning tools with structured and engaging tasks can support learners' persistence by providing immediate feedback, celebrating milestones, fostering expectancy of success, and promoting self-regulation. This ensures steady progress towards long-term goals.

2.6 Self-efficacy theory

Self-efficacy theory (Bandura & Wessels, 1997), introduced by Albert Bandura, refers to an individual's belief in their ability to successfully complete a task or achieve a specific goal. Self-efficacy influences not only how learners approach tasks but also their persistence, resilience, and overall performance. In educational contexts, self-efficacy is critical because learners with higher self-efficacy are more likely to take on challenges, persist in the face of difficulties, and ultimately achieve better outcomes.

2.6.1 Sources of self-efficacy

1. Mastery experiences

Mastery experiences are the most powerful source of self-efficacy. Success in completing a task strengthens learners' belief in their abilities, while repeated failure can undermine it. Each time learners successfully complete a task their self-efficacy increases, motivating them to tackle more difficult tasks.

The app's level-based progression offers learners incremental mastery experiences. As learners successfully complete vocabulary tasks—such as spelling or meaning matching—they build confidence in their ability to master increasingly challenging vocabulary. The sense of accomplishment that comes with progressing through levels can reinforce learners' self-efficacy.

2. Vicarious experiences

Vicarious experiences occur when learners observe others successfully completing a task. Seeing peers or role models succeed can strengthen learners' belief that they too can achieve similar success.

This research included weekly group meetings and built WeChat group for learners to share their progress and experience, which allowed them to see how others were progressing. Observing peers successfully completing levels or achieving high scores may inspire learners to believe they can achieve the same results, thus boosting their self-efficacy.

3. **Verbal persuasion**

Verbal persuasion refers to the encouragement and feedback learners receive from others. Positive reinforcement from teachers, peers, or even the app itself can enhance learners' belief in their ability to succeed.

The app provides positive feedback when learners succeed in passing one level, such as congratulatory messages or points for completing levels. The researcher also sent congratulations at the end of the week when learners had completed a week's vocabulary learning. This form of verbal persuasion has the potential to reinforce learners' belief in their abilities and motivate them to continue progressing.

4. **Emotional and physiological states**:

Learners' emotional and physiological states—such as anxiety, stress, or fatigue—can impact their self-efficacy. High levels of anxiety can reduce learners' belief in their ability to succeed, while a positive emotional state can enhance it.

The app's gamified design reduces stress by making vocabulary learning enjoyable and engaging. Features like immediate feedback and rewards help maintain a positive emotional state which enhances learners' self-efficacy. As well, the app breaks tasks into smaller chunks, reducing the risk of overwhelming learners and helping them feel more in control. The researcher also sent encouragement at the beginning of every week, which might help to promote their positive emotions.

2.6.2 Self-efficacy's influence on learning

Bandura (1994) emphasized that perceived self-efficacy—the belief in one's capability to organize and execute actions required to manage prospective situations—plays a pivotal role in shaping individuals' motivation, behaviour, and emotional well-being. Its influence is multifaceted, affecting goal-setting, effort, persistence, and resilience.

1. **Goal setting and commitment**

The stronger the perceived self-efficacy, the more ambitious the goals individuals set for themselves and the greater their commitment to achieving them. High self-efficacy learners are likely to take on challenging tasks, such as mastering a demanding vocabulary list, because they trust their ability to

succeed. Conversely, those with lower self-efficacy tend to aim for smaller or less ambitious goals, reflecting doubts about their capability.

2. Motivation

Self-efficacy beliefs contribute to motivation by influencing:

1) **Goal orientation**: People with strong self-efficacy are more likely to set goals that stretch their capabilities, leading to enhanced learning outcomes.

2) **Effort expenditure**: Believing in their capacity to succeed encourages individuals to invest more time and energy in achieving objectives. For example, learners with strong self-efficacy may persist in reviewing difficult vocabulary because they trust the effort will pay off.

3) **Persistence in adversity**: Self-efficacy determines how long people persevere when faced with difficulties. Learners with robust self-efficacy remain engaged even when progress slows or tasks become challenging and demonstrate resilience.

4) **Resilience to failures**: High self-efficacy provides a buffer against the demoralizing effects of setbacks. Rather than perceiving failures as indicative of inability, confident learners view them as opportunities to refine their strategies and improve.

3. Emotional regulation

Self-efficacy beliefs also influence how individuals cope with stress and maintain emotional balance in the face of challenges. Bandura (1994) noted the following:

1) **Stress management**: Individuals with strong self-efficacy experience lower stress levels in threatening situations because they believe in their ability to handle them effectively.

2) **Reduced anxiety and depression**: When people trust their coping capabilities, they are less likely to succumb to feelings of helplessness or despair. For instance, in this study, learners with high self-efficacy were better equipped to navigate the uncertainties of the pandemic and blended learning, avoiding excessive anxiety about their academic progress.

4. Application in vocabulary learning

In the context of this research, these principles explain how participants' self-efficacy influenced their vocabulary learning journey:

1) Learners like Alex who demonstrated high self-efficacy, consistently set challenging goals (e.g., mastering hundreds of new words weekly), maintained firm commitment, and displayed resilience despite setbacks (e.g., adapting during lockdowns).

2) Those with moderate self-efficacy, such as Fay, showed incremental improvement but occasionally faltered when faced with obstacles, reflecting the fluctuating nature of self-efficacy in response to context.

3) For learners with initially low self-efficacy, such as Daisy, early mastery experiences were essential for gradually building confidence, highlighting the importance of scaffolding and structured progress.

By emphasizing the interconnectedness of self-efficacy with motivation, effort, persistence, and emotional resilience, Bandura's framework provides a robust foundation for understanding how learners navigate challenges and achieve success, particularly in demanding educational contexts like EFL vocabulary learning during a pandemic.

Chapter 3 Literature Review

This chapter reviews key studies in self-regulated vocabulary learning and digital game-based vocabulary learning. Specifically, it explores the impact of SRL strategies on fostering learners' motivation and persistence, while examining how game elements such as feedback, rewards, and challenge levels, enhance self-efficacy and long-term vocabulary retention.

The chapter concludes by outlining how this research aims to extend existing knowledge by investigating how the combination of SRL strategies and DGBL can assist struggling EFL learners on their long-term vocabulary learning journey.

3.1 EFL vocabulary learning

3.1.1 The importance of EFL vocabulary knowledge and challenges faced by struggling learners

Struggling EFL learners often face significant challenges in achieving their desired academic performance, and vocabulary plays a critical role in this struggle. Hezam et al. (2022) and Kang (2020) identified that insufficient vocabulary knowledge, particularly in terms of both vocabulary breadth and depth, contributes to difficulties in reading comprehension and overall reading performance. Similarly, the foundational importance of aural EFL vocabulary knowledge in enhancing listening proficiency has been highlighted by Bian et al. (2021) and Zhang and Graham (2020). Vocabulary knowledge is also a key predictor of success in productive skills such as writing. Wu et al. (2021) found that a learner's vocabulary knowledge directly influences their writing performance. However, despite the well-recognized importance of vocabulary in EFL learning, many students struggle with vocabulary acquisition and find it difficult to improve, even with considerable efforts to explore and assist the learning process (Boroughani et al., 2023; R. Zhang et al., 2024).

3.1.2 Difficulties of EFL vocabulary learning

Vocabulary mastery involves a deep understanding of three significant aspects: form, meaning, and use (Nation, 2000). Each of these dimensions presents unique challenges for EFL learners, making vocabulary acquisition a complex and demanding process.

1. Difficulties in mastering the form of vocabulary

Knowing the form of a word requires understanding of its spoken form (pronunciation), written form (spelling), and word parts such as prefixes and suffixes. Several studies have identified the difficulties learners face when mastering these components. Machfudi (2022) and Woodeson et al. (2023) both highlighted the challenges students encounter when learning the spoken form of words. Irregular words, which do not follow typical grapheme–phoneme correspondence, make pronunciation especially challenging, as noted by Krepel et al. (2021). This difficulty in mastering pronunciation can hinder learners' ability to acquire other aspects of the word, such as its meaning and use (Lutfiyah et al. (2022).

Similarly, mastering the written form of vocabulary poses challenges for learners at all levels. Machfudi (2022) and Woodeson et al. (2023) observed that discrepancies between a word's spelling and pronunciation often lead to confusion. In a survey of thirty students, Lutfiyah et al. (2022) found that mismatches between spelling and pronunciation make spelling particularly difficult for learners. In addition, the varied grammatical forms of words, such as pluralization and conjugation, further complicate the mastery of word forms (Machfudi, 2022; Woodeson et al., 2023).

2. Difficulties in understanding the meaning of vocabulary

Knowing the meaning of a word involves understanding the connection between a concept and its referent. However, learners frequently struggle with words that have multiple meanings. Woodeson et al. (2023) and Surmanov and Azimova (2020) found that learners encounter significant difficulty when trying to acquire words with several meanings, as determining the correct meaning can be confusing. Moreover, Machfudi (2022) noted that meaning overlaps between similar words often lead to confusion. The influence of learners' first language also contributes to misunderstandings in vocabulary learning. Salawazo et al. (2020) observed that learners sometimes transfer meanings from their first language to the target language, resulting in incorrect word usage and interpretation.

3. Difficulties in using vocabulary

Using vocabulary accurately is another challenging aspect of vocabulary learning. Salawazo et al. (2020), in a study involving 72 participants, found that grammatical factors play a significant role in learners' incorrect use of vocabulary as they often struggle with selecting the appropriate grammatical form of a word, leading to mistakes in both spoken and written communication. Furthermore, Surmanov and Azimova (2020) highlighted that vocabulary usage can be context-dependent, and learners frequently misuse words when they fail to understand how the word's meaning changes according to context. This challenge is compounded by learners' difficulty in selecting the most suitable meaning for a given situation (Machfudi, 2022; Woodeson et al., 2023).

3.1.3 Causes of and solutions for vocabulary learning difficulties

1. Low motivation or passive learning and solutions

One of the key challenges in vocabulary acquisition is low motivation or passive engagement. Learners who lack motivation tend to spend less time interacting with vocabulary materials and engage at a more superficial level. Machfudi (2022) and Alharbi (2021) found that low motivation is a significant factor contributing to EFL learners' difficulties in developing vocabulary knowledge. Low motivation leads to reduced effort and time invested in learning, which in turn limits vocabulary retention and expansion.

A potential solution for enhancing motivation in vocabulary learning is the integration of game-based learning. Woodeson et al. (2023) pointed out that game-based learning has the potential to significantly boost EFL learners' vocabulary learning motivation. This finding is supported by Vnucko and Klimova (2023) , whose systematic review of digital game-based vocabulary learning found that the use of digital games can enhance learners' motivation by sparking their interest and making the learning process more engaging. The interactive and immersive nature of games can create a more dynamic learning environment, encouraging learners to take an active role in their vocabulary acquisition.

SRL strategies offer a solution by promoting strategic goal-setting, which boosts motivation. Bahrami et al. (2022) established a positive correlation between SRL and EFL vocabulary learning performance, with goal-setting mediating learners' motivation. Muslim and Mahbub (2023)'s multi-case study provided a more comprehensive understanding of the whole learning journey. They found that learners can maintain motivation by realizing the importance of their goal even while facing obstacles. Both studies proved that by setting goals, learners can maintain focus and motivation throughout the learning process.

2. Lack of systematic and spaced practice and solutions

Another primary cause of vocabulary learning difficulties is the lack of systematic, time-spaced practice. Salawazo et al. (2020) identified that learners who do not engage in regular and structured repetition of vocabulary tend to forget newly learned words quickly, which creates a significant barrier to improving vocabulary knowledge. This finding aligns with Machfudi (2022), research which reported that learners often struggle to retain vocabulary because they do not engage in sufficient repetition, which is essential for solidifying word knowledge.

Repetition has been widely recognized as a key factor in successful vocabulary learning. Webb (2007) emphasized that repeated exposure to new words—especially more than ten times—is critical for achieving substantial vocabulary gains. Furthermore, Candry et al. (2018) found that both written and

aural repetition contribute positively to vocabulary retention, with written repetition offering distinct advantages in reinforcing word forms and meanings.

A potential solution to this problem is the use of digital game-based learning to provide varied and time-honoured repetition. Vnucko and Klimova (2023) confirmed in their systematic review that digital game-based learning offers diverse forms of repetition which can help reinforce vocabulary knowledge and improve retention. The integration of spaced repetition within game-based platforms ensures that learners encounter new vocabulary multiple times in different contexts, helping to prevent forgetting and promote long-term retention.

Yang, Song, et al. (2023) research found that a mobile app with a SRL scheme can promote persistent, strategic learning. Muslim and Mahbub (2023) noted that consistent use of SRL strategies allows learners to feel their progress, which in turn enhances their self-efficacy and motivates further learning. Furthermore, Zhang and Zou (2024) in their systematic review highlighted that SRL strategies, particularly metacognitive and cognitive strategies, encourage learners to adopt more strategic approaches to language learning. However, the systematic review of Yang, Wen, et al. (2023) about technology enhanced self-regulated language learning found that most of the research failed to support the whole process and the outcomes were varied. But the research paid limited attention to the language learning processes and the usage of technology in supporting different phases of self-regulated language learning.

3. Lack of Proper Learning Facilities, Tools, and Materials

Another significant barrier to vocabulary acquisition for EFL learners is the lack of access to proper learning facilities, tools, and materials (Alsalihi, 2020; Machfudi, 2022; Salawazo et al., 2020). Many learners, particularly those in under-resourced educational settings, face difficulties accessing high-quality vocabulary learning resources (Machfudi, 2022). This gap in access can hinder their ability to engage with diverse and effective vocabulary learning materials, thereby limiting their vocabulary development. Alharbi (2021) and Salawazo et al. (2020) both noted that inadequate access to tools and resources, such as dictionaries and textbooks. can impede learners' ability to practice and improve their vocabulary knowledge, leading to stagnation in their language learning progress.

In recent years, the availability and popularity of mobile phones has allowed mobile technology to emerge as a potential solution to this problem, particularly through the use of mobile vocabulary learning apps (Klimova, 2021b). These apps provide learners with flexible, on-demand access to vocabulary learning resources that can be used anytime and anywhere (Chen et al., 2024; Klimova, 2021b). Mobile game-based vocabulary learning apps are particularly effective because they incorporate the engaging features of game-based learning (Vnucko & Klimova, 2023). Gunel and Top

(2022) highlighted the motivational advantages of using educational video games, noting that their interactive design and competitive elements keep learners engaged and motivated to continue practicing.

Summary

This is no doubt that EFL vocabulary knowledge is fundamental for the development of one's EFL proficiency. However, struggling EFL learners face several key challenges in vocabulary acquisition, including low motivation, lack of systematic practice, and insufficient learning tools or materials. Low motivation limits learners' engagement and persistence, while inconsistent and unspaced practice leads to poor retention of new vocabulary. Furthermore, limited access to appropriate learning facilities and tools hinders learners' ability to fully engage in vocabulary learning.

To address these challenges, SRL strategies offer a promising solution. SRL promotes strategic goal-setting, enhances motivation, and encourages persistent and systematic learning. Consistent use of SRL strategies has the potential to assist EFL learners to overcome obstacles and improve their learning progress. In addition, DGBVL apps provide engaging, flexible, and accessible tools that can potentially promote motivation, repetition, and vocabulary retention. Further investigation is required of mechanisms for integrating SRL strategies and DGBVL tools to assist learners to overcome vocabulary learning difficulties and achieve long-term success in their language acquisition journey.

3.2 Self-regulated learning strategies and EFL vocabulary learning

Overview

Earlier studies (Bai et al., 2024; Yang, Wen, et al., 2023) indicated that SRL strategies can play a significant and beneficial role for learners navigating the complexities of EFL acquisition, as SRL enables them to take charge of their own learning process through active goal setting, planning, monitoring, and self-evaluation. In EFL contexts, where learners must master multiple skills—listening, speaking, reading, writing, and vocabulary—SRL fosters autonomy, allowing students to strategically plan their study routines, reflect on their language learning experiences, and adjust their methods to maximize effectiveness (Broadbent & Poon, 2015).

In practice, the application of SRL strategies in EFL learning has been shown to significantly enhance learners' ability to manage the demands of language acquisition. These strategies help learners focus on specific areas that require improvement, break down the learning process into achievable steps, and maintain motivation, especially in the face of challenges (Bai et al., 2024; Fukuda, 2018; Nakata, 2010). By encouraging learners to be active participants in their own learning, SRL helps them develop not

only language proficiency but also metacognitive skills that contribute to long-term success in language learning (Fukuda, 2018; Zhang & Zou, 2024).

Within the broader context of EFL learning, vocabulary acquisition is a key component and SRL strategies have a particularly strong and positive influence in this area (Muslim & Mahbub, 2023; Teng, 2023), as vocabulary learning requires consistent effort and regular practice, both of which could be effectively managed through SRL. Strategies such as goal-setting enable learners to prioritize specific vocabulary sets, while self-monitoring and reflection allow them to track progress and adapt their approaches when necessary (Muslim & Mahbub, 2023).

In vocabulary learning, SRL strategies such as the use of task strategies (e.g., flashcards, mnemonic devices), self-monitoring, self-control and self-evaluation are crucial for improving the quality and good retention of one's vocabulary knowledge (Teng, 2023). Learners can also regulate their environment to minimize distractions, ensuring more focused practice sessions. The cyclical nature of SRL—where learners set goals, monitor their progress, and reflect on outcomes—creates a structured framework that enhances vocabulary retention and recall (Nakata, 2010).

While this section briefly highlights the importance of SRL in EFL vocabulary learning, an in-depth exploration of its theoretical underpinning and detailed application will be presented in the previous theory chapter (please see Chapter 2).

3.2.1 SRL and EFL Vocabulary Learning Outcomes

Given the mechanism of SRL, it can potentially empower learners to take control of their vocabulary learning process by making strategic decisions about goal-setting, monitoring progress, reflecting on their performance, and managing their learning environment (Muslim & Mahbub, 2023; Nakata, 2010). For EFL learners, these strategies are particularly crucial, as vocabulary acquisition requires persistent effort and the use of effective learning techniques. Recent research has showcased the effectiveness of SRL in improving vocabulary learning outcomes, demonstrating its role in enhancing retention, motivation, and overall language proficiency.

1. Goal-setting and vocabulary mastery

Goal-setting is one of the most explored areas of the influence of metacognitive strategies in vocabulary learning. Goal-setting for SRL emphasizes "specific academic outcome at a particular point in time" as it initiates an explicit reference for self-evaluation at the end of one SRL cycle (Zimmerman & Moylan, 2009).

Earlier research findings (Chang, 2012) indicated that learners who established clear, actionable goals for their vocabulary learning, such as mastering a specific number of words per week, are more focused and motivated to engage in consistent practice and could achieve improved learning outcomes. Ping et al., 2014) explored the needs of vocabulary learning and identified that goal-setting helped self-regulated learners to plan their learning activities more effectively, making it easier to stay on track and achieve more productive learning. Han and Lu (2017) surveyed the metacognitive and cognitive strategies employed for EFL vocabulary learning by university learners and found a significant and positive correlation between goal setting and the number of learning strategies employed. Moreover, the employment of learning strategies can be positively correlated with successful vocabulary learning (Zhang et al., 2017). A recent study by He and Loewen (2022) examined the influence of goal-setting on words retention which plays a critical role in guaranteeing the quality of one's EFL vocabulary knowledge. They noted that university EFL learners who set vocabulary learning goals performed better in both short-term recall and long-term retention, compared to learners who lacked structured goals.

In summary, earlier research provided evidence that clear and approachable goal-setting can greatly promote the quantity and quality of self-regulated EFL vocabulary learning outcomes, by boosting learning motivation and encouraging the use of effective learning strategies.

2. Self-monitoring and progress tracking

Self-monitoring, a fundamental component of SRL, requires learners to track their progress and adapt learning strategies based on their performance (Zimmerman & Moylan, 2009, p. 301). In the context of vocabulary learning, this can involve activities such as regular self-assessment, using mobile apps to track word mastery, or maintaining vocabulary logs. A study by Duque Micán and Cuesta Medina (2015) which analysed students' learning logs, found that EFL learners who engaged in self-monitoring were more successful in identifying their strengths and weaknesses in vocabulary knowledge. These learners adjusted their learning strategies accordingly, leading to improved performance and more effective vocabulary acquisition.

Building on these findings, a more recent study by Hsu et al. (2023) investigated EFL learners' vocabulary learning behaviour patterns in an AI-supported vocabulary acquisition environment. It revealed that learners who regularly monitored and evaluated their word recognition progress outperformed those who did not engage in consistent self-monitoring. Specifically, the results indicated that learners who frequently tracked their progress exhibited significantly higher rates of vocabulary retention compared to those who did not use self-monitoring strategies. The real-time tracking allowed learners to better identify which vocabulary items they had mastered and which required further practice, resulting in more personalized and effective learning experiences. These findings demonstrate the

importance of self-monitoring in vocabulary learning, particularly in technology-enhanced environments where learners can receive immediate feedback and make adjustments in real-time.

3. Self-control for better vocabulary learning outcomes

Self-control in SRL refers to learners' use of strategies such as task approaches, time management, environment structuring and so on to control their learning processes metacognitively and cognitively (Zimmerman & Moylan, 2009, p. 301). Some research (Fukuda, 2019; Teng, 2023; Ueno & Takeuchi, 2022; Zhang & Zou, 2024) identified a significant and positive correlation between one's SRL capacity to metacognitive and cognitive strategies employed during EFL learning, which is often associated with positive EFL learning performance.

A recent study (Teng, 2023) utilized confirmatory factor analysis to examine the reliability and impact of three categories of SRL strategies—planning, monitoring and controlling, and evaluating—on EFL vocabulary learning performance. The findings revealed that all three groups significantly and positively contributed to participants' vocabulary learning outcomes. Among these strategies, metacognitive strategies, which include monitoring and controlling strategies, demonstrated the strongest correlation with vocabulary learning performance. This suggests that learners who actively monitor progress and adjust their learning approaches as required are better able to retain and apply new vocabulary. Their study highlights the critical role of metacognitive awareness in vocabulary acquisition, as learners who are more reflective and adaptable in their learning tend to achieve better results. These findings underscore the importance of integrating SRL strategies, particularly metacognitive ones, into vocabulary learning interventions to optimize learners' performance and support long-term retention.

SRL also encourages the use of task-related cognitive learning strategies —such as mnemonic devices, elaborate rehearsal, and self-testing —which significantly enhance vocabulary retention. Recent studies emphasize the importance of strategic learning in vocabulary acquisition, especially for university EFL learners, to address their need for academic development and building professional identify (Boroughani et al., 2023).

However, Zhang et al.'s (2024) mixed-method study had varied results. It explored the effectiveness of SRL strategies in promoting EFL vocabulary acquisition within a digital game-based learning environment and found that SRL was effective with participants who had rich cognitive resources but not with those who had limited cognitive resources. The study employed regression analysis, which revealed that the use of SRL strategies significantly enhanced learners' vocabulary knowledge development. These quantitative findings were further supported by qualitative data from participant interviews. Learners with rich cognitive resources reported that SRL strategies not only improved their

comprehension of vocabulary but also facilitated the deeper internalization of word meanings. Participants with limited cognitive resources reported that they had to exert considerable effort to understand and memorize the vocabulary learning materials during their SRL journey, but they did not perceive that SRL strategies played an important role. Nevertheless, both groups acknowledged the pivotal role of SRL in structuring their learning process and enhancing use of cognitive strategies. These insights suggest that SRL is only effective for improving EFL vocabulary acquisition in learner populations with high cognitive capacity.

4. Self-evaluation and vocabulary learning outcomes

Self-evaluation, another key component of SRL, involves learners reflecting on their learning progress and assessing performance with reference to their earlier set learning goals (Zimmerman & Moylan, 2009, p. 304). This process allows them to identify strengths and areas for improvement, enabling them to take more targeted action to enhance their learning outcomes. In the context of vocabulary learning, self-evaluation plays a critical role in helping EFL learners develop metacognitive awareness and more effectively engage with their language acquisition process.

An early mixed-method study (Duque Micán & Cuesta Medina, 2015) explored how self-evaluation influences EFL vocabulary learning performance. Qualitative data, collected through participants' reflections on their learning journeys, revealed that learners perceived self-assessment, when paired with goal-setting, as a highly beneficial strategy. This combination not only supported vocabulary learning but also contributed to their fluency development and overall language processing. Participants noted that self-assessment helped them acknowledge both learning strengths and weaknesses, which was instrumental in guiding their learning actions. The practice of self-evaluation enabled them to set specific learning commitments and apply more effective learning strategies. By regularly assessing their progress, learners were able to raise awareness of language development and take further action where needed. Importantly, self-evaluation also complemented self-monitoring, as learners became more conscious of progress, allowing them to adjust their strategies in real-time. This reflective process fostered a more personalized and self-directed approach to vocabulary acquisition, promoting long-term retention and fluency development.

However, a more recent study (Teng, 2023) using confirmatory factor analysis presented a contrasting view on the influence of self-evaluation strategies in EFL vocabulary learning outcomes. The findings revealed that while self-evaluation strategies were beneficial, their impact was less significant compared to other SRL strategies such as self-monitoring or goal-setting. The study suggested that although self-evaluation helps learners reflect on their strengths and weaknesses, it may not directly lead to immediate improvements in vocabulary retention or acquisition without the active application of other SRL strategies. This highlights the importance of pairing self-evaluation with more dynamic strategies, such

as goal-setting or monitoring, to achieve more significant learning outcomes. These results indicate that while self-evaluation fosters awareness, its impact on vocabulary learning might be more indirect, acting as a supportive tool when used in conjunction with other strategies, rather than as a standalone approach.

Conclusion

SRL strategies have a profound and multifaceted influence on EFL vocabulary learning outcomes. The three distinct but interrelated dimensions of SRL—planning, monitoring, and evaluating—work together to empower learners to take control of their vocabulary acquisition process. Planning strategies, such as goal-setting, provide learners with direction and structure, allowing them to approach vocabulary learning with clear objectives. Monitoring strategies, such as self-assessment and real-time progress tracking, enable learners to adjust their methods based on performance, leading to more personalized and effective learning experiences. Finally, evaluation strategies help learners reflect on their strengths and weaknesses, fostering metacognitive awareness and informing future learning actions.

While all three groups of SRL strategies are positively correlated with vocabulary learning outcomes, research indicates that some strategies, particularly those related to metacognitive processes like monitoring and controlling, have a stronger influence on performance than others. For example, self-monitoring has been consistently shown to enhance vocabulary retention and mastery by allowing learners to track their progress and adjust approaches in real-time. In contrast, self-evaluation, while beneficial in raising awareness of learning strengths and weaknesses, appears to have a less direct impact on vocabulary outcomes unless paired with other active strategies like goal-setting and monitoring.

In conclusion, SRL strategies collectively promote more autonomous, motivated, and efficient vocabulary learning in EFL contexts. By integrating planning, monitoring, and evaluating processes, learners can optimize their learning journeys, achieve better vocabulary retention, and develop deeper linguistic competence. For struggling learners in particular, these strategies offer essential tools to enhance motivation, build confidence, and sustain persistence in vocabulary learning. However, future research should continue to explore how these strategies interact and can be tailored to meet the diverse needs of learners.

3.2.2 SRL and EFL vocabulary learning self-efficacy

Self-efficacy, a key construct in Bundura (1977) social cognitive theory, refers to an individual's belief in their ability to succeed in specific tasks or achieve specific goals. In EFL vocabulary learning, self-

efficacy plays a crucial role, being associated with learners' motivation, persistence, and overall success in acquiring new vocabulary. SRL strategies are potentially instrumental in enhancing self-efficacy by empowering learners to set achievable goals, take control of their learning processes, monitor progress, and self-reflect on performance (Mizumoto, 2013a). This section examines SRL strategies associated with self-efficacy in EFL vocabulary learning.

1. Goal-setting's influence on self-efficacy

Self-efficacy is closely tied to mastery experiences—where learners succeed in achieving specific tasks, reinforcing belief in their ability to accomplish future goals (Bundura, 1977). In the context of EFL vocabulary learning, mastery experiences occur when learners successfully retain and apply new vocabulary, contributing to a positive sense of self-efficacy. However, not all learners experience consistent success when evaluating their SRL outcomes which can hinder the development of self-efficacy, as repeated failures may lead learners to doubt their capabilities. To mitigate this, goal-setting plays a crucial role at the beginning of an SRL cycle. By setting proximal, clear and realistic goals, learners can create a pathway to success that reinforces positive mastery experiences (Schunk, 1990).

1) Goal Specificity

The specificity of goals plays a pivotal role in promoting self-efficacy and improving vocabulary learning outcomes in EFL learners. Specific goals, as opposed to vague or general ones like "Do your best," provide learners with a clear target and well-defined expectations. This clarity enables them to focus their efforts, monitor progress, and experience a sense of accomplishment once the goal is achieved. In vocabulary learning, setting specific targets, such as "learn 10 new words each day," is far more effective in guiding learners than a general aim to "improve vocabulary." Specific goals also help learners gauge the amount of effort required, providing them with concrete benchmarks to measure success.

Research by Bandura (1988) and Locke et al. (1981) found that specific goals lead to better performance because they provide learners with explicit performance standards. These goals activate self-evaluation and encourage learners to assess their progress more frequently. This process of continuous feedback allows learners to refine their strategies and maintain motivation, both of which are critical for building self-efficacy. Specific goals create opportunities for frequent, visible success, which in turn reinforce learners' belief in their ability to achieve more challenging tasks.

Chang, 2012) further explored the relative effects of specific versus vague goals on EFL students' self-efficacy and vocabulary learning performance. The research employed both qualitative and quantitative methods to examine how junior high school EFL students responded to different types of goal-setting

in their vocabulary acquisition. T-test results showed that specific rather than vague goals were significantly more effective in improving students' self-efficacy. Students who set specific goals, such as learning a predetermined number of vocabulary words within a set timeframe, demonstrated higher levels of self-efficacy and better performance in vocabulary learning tasks. In contrast, those who worked with more general goals experienced less improvement in both areas. This finding underscores the importance of clear, well-defined goals in promoting not only academic performance but also learners' confidence in their ability to succeed.

Qualitative data from the same study further revealed that learners who worked with specific goals were more motivated and engaged in their learning. They reported that the clarity of the goals helped them structure study sessions more effectively, track progress and adjust strategies as needed. They also found it easier to self-assess their learning outcomes, which contributed to a greater sense of control over vocabulary acquisition. These results highlight how specific, measurable goals can create a more structured and goal-oriented learning environment, which is essential for fostering both self-efficacy and long-term vocabulary retention in EFL learners.

2) Setting proximal goals

Setting proximal goals—those that can be achieved in the near future— can potentially play a crucial role in enhancing learners' self-efficacy. Proximal goals provide learners with frequent opportunities to monitor progress and experience success, making it easier to stay motivated throughout the learning process (Chang, 2012; Schunk, 1990). In contrast to distant goals, which may seem abstract or too far away to be tangible, proximal goals offer immediate reinforcement as learners work towards short-term objectives, such as mastering a specific set of vocabulary words within a week or month.

As Bandura (1994) notes, the ability to see incremental progress towards a goal fosters self-efficacy by reinforcing learners' belief that their efforts are leading to real outcomes. This perception of progress is especially important for younger learners who may struggle with conceptualizing distant goals. For EFL learners, the regular achievement of proximal goals, such as completing a vocabulary review within a set timeframe, provides continuous feedback and keeps them engaged and committed to learning tasks.

Zafarmand et al. (2014) examined the relationship between EFL learners' goal orientation and self-efficacy within a single framework. Quantitative data was collected via inventories, and the results demonstrated that specific and proximal mastery goal setting could significantly enhance students' sense of self-efficacy. Learners who set challenging, yet specific and short-term, goals were able to more readily see their learning progress. This sense of self-satisfaction derived from their performance accomplishments, which in turn bolstered their self-efficacy. The study highlighted that learners' ability to frequently track progress toward achievable, short-term goals not only increased their motivation but

also strengthened belief in their capacity to succeed in future learning tasks. By setting proximal goals, learners are continually reinforcing their confidence through regular accomplishments. This cyclical process of achieving smaller, time-bound goals leads to a greater sense of control over the learning process and encourages persistence. The research findings suggest that combining specificity with proximity in goal-setting enhances the effectiveness of SRL strategies, leading to better vocabulary learning outcomes and higher levels of self-efficacy in EFL learners.

2. Self-monitoring and self-reflection as contributors to mastery experience in EFL vocabulary learning

Mastery experience, defined by Bandura (1997) as successful task completion, is one of the most influential sources of self-efficacy. In the context of EFL vocabulary learning, mastery experiences significantly contribute to learners' belief in their ability to acquire and retain new vocabulary. Two key SRL strategies—self-monitoring and self-reflection—are closely tied to mastery experiences and help learners evaluate progress, adapt approaches, and improve their chances of achieving learning success, which in turn strengthens self-efficacy. This literature review explores the role of self-monitoring and self-reflection in fostering mastery experiences and enhancing EFL learners' vocabulary learning self-efficacy, while addressing gaps in research regarding the interaction between these SRL strategies and self-efficacy.

1) Self-monitoring and mastery experience

Self-monitoring, a core component of SRL strategies, allows learners to track their own progress and adjust learning strategies based on their performance. In vocabulary learning, this may involve regular self-assessment, tracking word retention, or revisiting vocabulary logs to ensure progress is being made. Zimmerman and Moylan (2009, p. 303) note that self-monitoring enables learners to be aware of their learning trajectory, making it possible to identify areas of strength and weakness. This awareness informs necessary adjustments in learning strategies, such as increasing review frequency or focusing on more challenging vocabulary.

When learners are actively engaged in self-monitoring, they are better equipped to meet their learning goals, increasing the likelihood of successfully completing learning tasks which constitute a mastery experience and in turn boosts learners' self-efficacy. The feedback loop created by self-monitoring, where learners continuously adjust their approaches to ensure success fosters a sense of control over the learning process. Learners who successfully adapt their strategies based on their self-monitoring efforts are more likely to experience mastery, reinforcing belief in their ability to tackle future learning challenges.

Despite the clear theoretical link between self-monitoring and mastery experience, limited research has explored how self-monitoring interacts with EFL learners' self-efficacy throughout their SRL journey. Studies such as Hsu et al. (2023) suggest that learners who frequently monitor their progress show greater self-efficacy and improved vocabulary retention, but more empirical research in required to explore the specific mechanisms through which self-monitoring contributes to mastery experience. A deeper understanding of how self-monitoring influences learners' perceptions of success and failure in vocabulary tasks could provide valuable insights into optimizing SRL strategies for EFL learners.

2) Self-reflection and mastery experience

Self-reflection, another critical SRL strategy, involves learners evaluating learning outcomes in relation to their initial learning goals (Zimmerman & Moylan, 2009, p. 304). This reflective process allows learners to assess the effectiveness of their strategies and make informed decisions about how to improve future learning experiences. In the context of EFL vocabulary learning, self-reflection enables learners to evaluate progress in mastering new words, identify gaps in their knowledge, and adjust study habits accordingly.

Self-regulated learners who engage in self-reflection gain a deeper understanding of their strengths and weaknesses, which directly influences their mastery experience (Duque Micán & Cuesta Medina, 2015). By reflecting on their performance, learners can pinpoint the strategies that have worked effectively and replicate these in future tasks, while also identifying areas for improvement. The process of evaluating past performances helps learners create a roadmap for success, increasing their likelihood of achieving mastery in subsequent tasks.

Teng and Zhang (2021) found that EFL learners who regularly engaged in self-reflection reported higher levels of self-efficacy and were more successful in vocabulary acquisition. The study highlighted that self-reflection, when paired with goal-setting and self-monitoring, contributed to mastery experiences by allowing learners to make more informed decisions about their learning strategies. By aligning reflection with specific learning goals, they were better equipped to make adaptations that led to successful task completion, reinforcing their self-efficacy.

While self-reflection clearly influences mastery experiences, there is still a gap in the literature regarding its direct interaction with self-efficacy in EFL learners. Current research often focuses on the broader impact of SRL on learning self-efficacy, without exploring the specific ways in which reflection shapes learners' perceptions of mastery (Bai et al., 2024; Ueno & Takeuchi, 2022). Further research is needed to examine how the depth and frequency of self-reflection influence EFL learners' ability to achieve mastery experiences and build self-efficacy over time.

3) Interaction between self-monitoring, self-reflection, and mastery experience

Both self-monitoring and self-reflection are integral to creating mastery experiences, as they enable learners to evaluate their progress and make necessary adaptations to achieve learning goals. The interaction between these two strategies is critical for fostering mastery experiences in EFL vocabulary learning. Self-monitoring provides learners with real-time feedback on their performance, while self-reflection offers a deeper, more comprehensive evaluation of learning outcomes. Together, these strategies create a continuous feedback loop that empowers learners to make informed decisions about their learning process, increasing the likelihood of success.

While there is substantial evidence that both self-monitoring and self-reflection contribute to mastery experiences, limited research has explored how these strategies interact and influence self-efficacy in EFL learners. Studies such as those by Mizumoto (2013b) suggest that learners who engage full stages of SRL learning report higher levels of self-efficacy, but further research is needed to understand the specific dynamics of this relationship. In particular, more empirical studies are required to investigate how self-monitoring and self-reflection complement each other in fostering mastery experiences and enhancing learners' self-efficacy.

Conclusion

SRL strategies significantly enhance EFL learners' self-efficacy in vocabulary acquisition by fostering goal-setting, self-monitoring, reflection, and resilience. These strategies empower learners to take control of their learning, recognize their progress, and build confidence in their ability to succeed. Recent research confirms that learners who actively engage in SRL strategies are more likely to experience increased self-efficacy, leading to more effective and sustained vocabulary learning outcomes. By promoting a growth mindset and facilitating mastery experiences, SRL strategies provide a strong foundation for learners to believe in their capacity to achieve long-term success in EFL vocabulary acquisition.

3.2.3 Self-regulated learning strategies' and EFL learning persistence

Persistence, defined by Rovai (2003) as "the behaviour of continuing action despite the presence of obstacles," is a critical factor in successful language learning, particularly in online or self-regulated environments. In the context of EFL learners, persistence refers to the learner's ability to stay engaged with learning tasks, overcome challenges, and maintain steady progress toward their language goals. SRL strategies, which include self-control, goal-setting, and self-reflection, play a pivotal role in promoting persistence by helping learners manage obstacles and maintain motivation. This literature review explores the influence of SRL strategies on learner persistence, drawing on both earlier and

recent studies to highlight the ways in which SRL can support learners' long-term engagement with their language learning journey.

1. Self-control strategies and academic support

Self-control is a core component of SRL that helps learners manage distractions, stay focused on their tasks, and seek help when needed. In the context of EFL learning, self-control strategies are critical for promoting persistence, particularly when learners face obstacles or challenges. Through self-control, learners are encouraged to take proactive steps, such as seeking academic support or scaffolding, to assist them in navigating difficult content or tasks.

An earlier literature review by O'Neill and Thomson (2013) on struggling adult learners identified several studies that recognized the key role of academic support in enhancing learner persistence. The review highlighted that learners who actively sought help were more likely to persist in their studies, as scaffolding from teachers or peers helped them overcome difficulties. Similarly, a recent study by Granziera et al. (2022) revealed that receiving tangible help from teachers was positively correlated with students' academic buoyancy—a term referring to their ability to bounce back from setbacks. This buoyancy, in turn, fostered greater engagement and persistence in learning. A study (Liu et al., 2022) with 466 EFL learners produced similar results, further confirming the importance of academic support in maintaining learners' persistence in language acquisition.

These findings emphasize the importance of integrating self-control strategies into SRL to promote persistence. By encouraging learners to seek help and effectively manage their learning environment, SRL empowers them to overcome obstacles and thereby enhance their ability to persist in the face of challenges

2. Goal-setting and long-term persistence

Goal-setting, another fundamental SRL strategy, plays a crucial role in fostering persistence among EFL learners. When learners set long-term, challenging goals, they are more likely to remain engaged with their learning tasks, as these goals provide a sense of direction and purpose. Specific, attainable goals can help learners focus on incremental progress, which motivates them to continue pursuing their objectives even when difficulties arise.

O'Neill and Thomson (2013) literature review also found that long-term goals were effective in promoting persistence among struggling learners. Learners who established clear, long-term goals were more likely to stay committed to their learning, as these goals provided a roadmap for future success. A recent multi-case study by Muslim and Mahbub (2023) confirmed these earlier findings, revealing

that EFL learners' persistence could be significantly enhanced by setting long-term goals. It found that learners who defined clear language acquisition goals, such as passing a proficiency exam or achieving fluency, were more likely to persist in their efforts despite challenges.

Goal-setting in SRL is essential for fostering persistence because it gives learners a sense of control over their learning trajectory. By regularly setting and achieving both short-term and long-term goals, learners develop the motivation and resilience required to persist in the face of obstacles.

3. Self-reflection and causal perceptions

Self-reflection is another SRL strategy that can significantly influence learners' persistence. It enables learners to evaluate their past learning experiences, assess progress toward goals, and make decisions about future learning strategies. This reflective process allows learners to understand the factors contributing to their successes and failures, thereby influencing both short and long-term persistence.

An earlier study by Andrews and Debus (1978) demonstrated that learners' causal perceptions—how they attribute their successes and failures—are strongly related to persistence. Learners who attributed their successes to internal factors, such as effort and strategy use, were more likely to persist in future learning tasks. Conversely, those who attributed their failures to external or uncontrollable factors were less likely to persevere. This highlights the importance of self-reflection in shaping learners' perceptions of their capabilities and influencing their persistence.

Zimmerman and Schunk (2007) also recognized the importance of self-attribution in SRL, emphasizing that learners who take responsibility for learning outcomes are more likely to make decisions that promote continued learning. When learners reflect on past performance and adjust their strategies accordingly, they are more likely to achieve mastery experiences, which further enhances persistence. By fostering a growth mindset and encouraging learners to view setbacks as opportunities for growth, self-reflection supports long-term engagement with learning tasks.

However, recent research in this area, especially in the context of EFL vocabulary learning, is still limited. Muslim and Mahbub's (2023) is one of the few studies that has explored the relationship between SRL and persistence in EFL learners, confirming that SRL strategies, particularly goal-setting and self-reflection, contribute to learners' long-term engagement with vocabulary acquisition. More research is needed to explore how SRL strategies interact with learners' persistence, especially in the EFL vocabulary learning context, where challenges such as vocabulary retention and mastery can be significant obstacles.

Conclusion

SRL strategies, particularly self-control, goal-setting, and self-reflection, play a vital role in promoting persistence in EFL learners. Self-control strategies encourage learners to seek academic support and effectively manage their learning environment, while goal-setting helps learners maintain focus on their long-term objectives. Self-reflection allows learners to evaluate learning progress and make informed decisions for future study, influencing both short and long-term persistence. Research confirms that SRL strategies not only enhance learners' persistence but also support their overall engagement and success in language learning.

3.2.4 SRL strategies and their relationship to EFL vocabulary learning motivation

SRL strategies and learning motivation are closely intertwined in EFL vocabulary acquisition (Han & Lu, 2017; Zhang et al., 2017). Strong learning motivation often enhances the use of SRL strategies, while certain SRL strategies in turn can boost learners' motivation. As motivation plays a key role in determining the persistence and success of EFL learners, understanding the relationship between SRL strategies and motivation is critical to improving vocabulary learning outcomes. This literature review explores the dynamic interaction between SRL strategies and motivation in EFL vocabulary learning, highlighting key findings from earlier research and recent studies.

1. The reciprocal relationship between SRL and motivation

The relationship between SRL strategies and motivation is dynamic and reciprocal, meaning that motivation enhances the effective use of SRL strategies, while successful application of these strategies in turn boosts learners' motivation. In the context of EFL vocabulary learning, this interaction creates a positive feedback loop that drives learners to persist, improve, and succeed in their language acquisition. Understanding this reciprocal relationship is crucial for optimizing both motivation and the application of SRL strategies in language learning.

1) Motivation enhances the use of SRL strategies

Motivation is a critical factor in SRL processes as it can drive learners to actively engage in the performance phases in despite challenging conditions (Zimmerman & Moylan, 2009; Zimmerman & Schunk, 2012). Learners with high levels of motivation are more likely to set ambitious goals, monitor their progress, and reflect on their performance, all of which are essential components of SRL (Zimmerman & Schunk, 2012). Achievement motivation, which refers to the desire to achieve success and master learning tasks (Dörnyei & Ushioda, 2021), can be particularly influential in promoting the use of SRL strategies. Han and Lu (2017) found that achievement motivation was positively and significantly correlated with cognitive, metacognitive, affective, and social strategies for EFL learning. The study highlighted that achievement motivation is particularly associated with goal-setting,

suggesting that learners who are motivated to achieve success are more likely to establish clear and challenging goals. Another more recent quantitative study by Hariri et al. (2021) found that learners' motivation can be an effective predictor of their use of SRL strategies, especially self-efficacy and the feeling of self-control over one's learning processes.

2) SRL strategies enhancing motivation

SRL strategies also have a significant impact on enhancing learners' motivation. By providing learners with tools to regulate learning processes, such as goal-setting, self-monitoring, and self-reflection, SRL strategies create a sense of control and agency, which boosts motivation to continue engaging with their tasks. The more learners experience success and progress by using SRL strategies, the more motivated they become to persist in their learning.

Zafarmand et al. (2014) demonstrated that self-reflection promotes motivation by providing learners with a clearer understanding of their strengths and weaknesses. The study showed that EFL learners who regularly reflected on their vocabulary learning experience were more likely to persist in their efforts and demonstrate higher levels of motivation, highlighting the importance of incorporating self-reflection into SRL practices to sustain motivation over the long term.

R. Zhang et al. (2024) further supports the positive impact of SRL strategies on motivation. The study's regression analyses revealed that SRL strategies had a statistically significant effect on improving motivation in EFL vocabulary learning. Interviews with participants indicated that SRL strategies helped learners regulate their emotional reactions to failures and difficulties in vocabulary learning, leading to improved motivation. Specifically, learners reported that SRL strategies, such as setting specific goals and reflecting on their progress, allowed them to manage negative emotions like frustration or anxiety. By reducing the impact of these emotions, SRL strategies contributed to a more positive learning experience which in turn strengthened learners' motivation to continue learning.

These findings align with previous arguments regarding the positive impact of SRL strategies on learner emotions (Hu & Zhang, 2017) Managing emotions is a key part of SRL, and when learners can effectively regulate their emotional responses to challenges, they are more likely to stay motivated and persist in their learning tasks. Moreover, research by Løvoll et al. (2017) and MacIntyre and Vincze (2017) highlighted the positive relationship between emotions and motivation, further demonstrating the importance of emotional regulation in sustaining learner engagement and motivation.

3) SRL's influence on motivation in technology-enhanced learning contexts

The positive relationship between SRL strategies and motivation has also been observed in technology-enhanced vocabulary learning environments. Technology-based learning tools, such as language learning apps or online platforms, often incorporate SRL features that allow learners to set goals, monitor progress, and receive feedback in real-time. These features not only enhance learners' engagement but also promote self-regulation, which further strengthens their motivation.

Several studies have demonstrated the effectiveness of SRL strategies in improving motivation in technology-enhanced vocabulary learning contexts. For example, Chen et al. (2024) and Boroughani et al. (2023) found that SRL strategies embedded in technology platforms significantly boosted learners' motivation by providing opportunities for self-directed learning and immediate feedback. Learners who used these platforms were able to set personalized goals, track their vocabulary learning progress, and reflect on their performance, all of which contributed to greater motivation.

Similarly, R. Zhang et al. (2024) observed that EFL learners who engaged in SRL strategies through technology-enhanced learning environments showed higher levels of motivation ,and further parameter estimates revealed that motivation fully mediated the relationship between SRL and participants' vocabulary knowledge development.

These findings indicate that the integration of SRL strategies in technology-enhanced learning contexts not only facilitates vocabulary acquisition but also reinforces learners' motivation. By providing learners with the tools to regulate their own learning, technology-based SRL strategies create a supportive environment that fosters both motivation and self-efficacy, leading to more effective and sustained vocabulary learning.

Conclusion

The reciprocal relationship between SRL strategies and motivation is a critical factor in EFL vocabulary learning. Strong motivation drives learners to engage more actively with SRL strategies, while the successful application of SRL strategies further enhances learners' motivation by providing structure, reducing negative emotions, and promoting a sense of control over the learning process. Recent research, including studies by Han & Lu (2017) and Zhang et al. (2024), confirms the positive impact of SRL strategies on motivation, highlighting the importance of goal-setting, emotional regulation, and technology-enhanced learning environments in sustaining learners' engagement and persistence in vocabulary learning.

3.2.5 Self-regulated learning with struggling EFL learners' vocabulary learning

Struggling EFL learners often face significant challenges in mastering vocabulary due to factors such as lack of motivation, poor retention, limited self-confidence, and inefficient learning strategies. For these learners, SRL strategies offer a pathway to overcome these obstacles by promoting autonomy, resilience, and the use of effective learning techniques. SRL strategies help struggling learners take charge of their vocabulary learning by setting clear goals, monitoring progress, reflecting on their learning processes, and managing setbacks (Bai et al., 2024; Fukuda, 2018; Zhang & Zou, 2024). This section explores how SRL strategies positively influence the vocabulary learning experience of struggling EFL learners, focusing on building motivation, improving retention, and fostering persistence.

1. Goal-setting for clarity and focus

For struggling EFL learners, the task of acquiring new vocabulary can seem overwhelming. Goal-setting, an essential SRL strategy, helps them break down the daunting task of learning hundreds of new words into smaller, manageable segments. By setting short-term, specific goals—such as learning five new words each day—struggling learners can maintain focus and direction, making the process feel less overwhelming and more achievable.

Su and Cheng (2021) found that struggling EFL learners who applied goal-setting strategies were more likely to stay focused on their vocabulary learning tasks and report improvements in retention. The ability to set and achieve small, daily goals provided learners with a sense of progress, which reinforced their confidence and motivation to continue learning. For struggling learners, this sense of accomplishment is crucial for sustaining effort and overcoming the frustration often associated with vocabulary acquisition.

2. Time management to create consistent practice

Struggling EFL learners often face difficulties in effectively managing their time, leading to inconsistent vocabulary practice. Time management strategies, a key component of SRL, help learners establish regular study routines, ensuring that they dedicate sufficient time to vocabulary learning without feeling overwhelmed. By creating structured learning schedules and breaking down study sessions into shorter, focused intervals, struggling learners can avoid cognitive overload and sustain their efforts over time.

Wang and Lin (2022) demonstrated that struggling EFL learners who applied time management strategies reported higher levels of vocabulary retention and greater persistence, compared to learners who used unstructured study methods. The ability to create a consistent learning routine helped these

learners stay on track, reducing the likelihood of procrastination or disengagement. Time management also allowed them to balance vocabulary learning with other academic responsibilities, making the process more manageable.

3. Managing setbacks and developing resilience

Struggling EFL learners frequently encounter setbacks in vocabulary learning, such as difficulty retaining words or applying them in context. SRL strategies help learners develop resilience by encouraging them to reframe setbacks as learning opportunities. Through self-reflection and self-monitoring, struggling learners can analyse their mistakes, identify why they occurred, and adjust their approach accordingly. This ability to bounce back from setbacks reduces the likelihood of learners giving up after encountering challenges.

A 2022 study by Zhao and Li explored the role of SRL strategies in helping struggling EFL learners develop resilience in vocabulary learning. It reported that learners who engaged in reflective practices were better able to cope with difficulties and were more likely to persist in their studies. Instead of feeling discouraged by mistakes, they viewed setbacks as part of the learning process which allowed them to stay motivated and continue practicing. This resilience is critical for struggling learners, as it fosters a growth mindset and encourages them to persist despite challenges.

4. Reflection for developing effective learning strategies

Reflection is a critical SRL strategy that encourages struggling learners to evaluate their vocabulary learning experiences and adjust their strategies based on what works best for them. They often lack the metacognitive awareness needed to recognize ineffective learning habits. Through regular reflection, these learners can identify which strategies—such as using flashcards, mnemonics, or engaging in spaced repetition—are most effective, allowing them to focus on methods that lead to better outcomes.

Liu and Tsai (2021) examined how reflective practices influenced vocabulary retention in struggling EFL learners and found that those who regularly reflected on their learning experiences were able to develop more effective study strategies. These learners showed significant improvement in vocabulary recall, as reflection allowed them to become more intentional in their approach to learning. For struggling learners, this metacognitive awareness is essential for building confidence and improving learning outcomes.

5. Self-efficacy and building confidence in learning

Self-efficacy, or learners' belief in their ability to succeed, is particularly important for struggling learners who often experience low confidence in their ability to acquire new vocabulary. SRL strategies,

such as goal-setting and self-monitoring, play a critical role in building self-efficacy by providing struggling learners with opportunities to experience success. As learners achieve small goals and track their progress, they begin to believe in their ability to master vocabulary, which enhances motivation and persistence.

Hwang and Liu (2021) noted that struggling EFL learners who used SRL strategies to set goals and monitor progress reported significant increases in self-efficacy. They were more likely to continue practicing difficult vocabulary because they believed that their efforts would lead to success. Building self-efficacy in struggling learners is essential for overcoming the negative mindset that often accompanies vocabulary learning challenges, and SRL strategies provide the tools needed to foster this belief.

Conclusion

SRL strategies provide struggling EFL learners with the tools they need to overcome the challenges of vocabulary acquisition. By fostering goal-setting, self-monitoring, reflection, time management, and self-efficacy, SRL strategies help learners stay motivated, improve retention, and develop resilience in the face of setbacks. Recent research confirms that struggling learners who apply SRL strategies are more likely to experience success in vocabulary learning, as these strategies promote autonomy, confidence, and sustained effort. As SRL strategies continue to be integrated into language education, they will play an essential role in supporting struggling learners in their journey towards language proficiency.

3.3 Digital game-based learning (DGBL) in EFL vocabulary learning

Overview

Game-based learning (DGBL) is commonly defined as a type of gameplay designed with specific learning outcomes in mind, where the primary purpose is to foster meaningful educational experiences through interactive and engaging tasks (Kapp, 2016; Plass et al., 2016). This approach integrates elements of game design—such as rules, challenges, feedback, and rewards—into the learning process, encouraging learners to actively participate and achieve targeted educational goals . DGBL has gained significant traction in the field of education due to its ability to make learning more enjoyable and motivating, especially in subjects where learners may otherwise struggle with engagement (Dehghanzadeh et al., 2021).

Game-based learning has evolved alongside advances in technology, becoming an increasingly popular approach across a range of educational settings (Chotipaktanasook & Reinders, 2024; Plass et al., 2016;

Prensky, 2003). It draws on the foundational principles of constructivism, which emphasize active and participatory learning. In language learning, particularly in EFL contexts, DGBL provides an immersive experience that facilitates repeated exposure to language in varied contexts, thereby more effectively supporting learners in acquiring new language skills.

Vocabulary acquisition is one of the cornerstones of language learning, and it can often be a monotonous and challenging task for EFL learners. DGBL offers a solution, by transforming the traditional method of rote memorization into an interactive and stimulating process. Through games, learners can encounter new vocabulary words in engaging contexts, practice their usage, and receive immediate feedback, which has been shown to enhance retention (Nation, 2001). The game elements, such as levels, badges, and points, provide extrinsic motivation, while the immersive scenarios promote intrinsic motivation by giving learners a sense of achievement and progress.

Several studies have demonstrated the potential of DGBL to enhance vocabulary learning outcomes in EFL settings (Chotipaktanasook & Reinders, 2024; Dehghanzadeh et al., 2021). For example, researchers have found that using game-based apps for vocabulary learning can lead to improved engagement and motivation among learners (Johnson & Mayer, 2010). This is particularly important for vocabulary learning, as the gamified environment encourages learners to persist in their efforts even when faced with challenging tasks (Reinhardt & Thorne, 2020). The use of adaptive learning algorithms in some game-based apps allows for personalized learning experiences, catering to individual learners' proficiency levels and learning speeds. These features, combined with the immediate feedback provided by the game, create an environment that supports effective vocabulary acquisition.

Game-based learning apps have gained significant traction in recent years, especially in the field of language learning (Dixon et al., 2022; Hung et al., 2018; Ongoro & Fanjiang, 2023). These apps are designed to combine educational content with game mechanics to engage learners and facilitate vocabulary acquisition in more dynamic and interactive ways. For EFL learners, mastering vocabulary is often a challenging yet crucial part of language proficiency. As noted previously in this discussion, game-based apps provide learners with a flexible and enjoyable tool to overcome these challenges, allowing them to practice vocabulary at their own pace while maintaining a high level of motivation. This section reviews recent research on the effectiveness of game-based apps for EFL vocabulary learning, with a focus on the key findings that support their impact.

3.3.1 Digital game-based learning's influence on EFL vocabulary learning outcomes

DGBL has become increasingly influential in enhancing vocabulary acquisition for learners of EFL in the past decade. The interactive nature of DGBL offers a dynamic alternative to traditional vocabulary learning methods by embedding language instruction in engaging and immersive contexts (Li et al.,

2019; Reinhardt & Thorne, 2020; Yang & Song, 2024). Through gameplay, learners not only encounter new vocabulary but also actively engage with it in ways that promote deeper understanding and retention (Nation, 2013). This review will examine how various factors—such as game type, challenges or mechanisms, and sensory elements—contribute to the enhancement of EFL learners' vocabulary learning outcomes.

1. Game type and vocabulary performance

DGBL apps can be broadly categorized into drill-based and task-based games. Each game type offers distinct advantages for vocabulary learning outcomes. Drill-based games focus on repetition and memorization, allowing learners to practice vocabulary through structured exercises. Task-based games, on the other hand, incorporate vocabulary into meaningful tasks or problem-solving activities, making learning more contextualized and interactive.

According to Tsai and Tsai (2018) both drill and task-based games significantly enhance vocabulary learning outcomes when learners have access to the full sophisticated version of the apps. Their meta-analysis demonstrated that learners using these games showed improved vocabulary retention, comprehension, and application, regardless of the game type. Drill-based games, through repetition, help reinforce word meanings and forms, while task-based games engage learners in applying vocabulary in real-world scenarios, deepening their understanding.

Mahayanti et al. (2024) also found that structured games, whether drill or task-based, which progressively increase in difficulty, provide learners with steady progress and continuous reinforcement of vocabulary knowledge. They also found that the structured nature of these games, combined with clear goals and achievement tracking, allows learners to experience mastery, which is essential for long-term vocabulary retention. And they claimed that both types of games, when fully utilized, create immersive and focused learning environments that cater to different learning styles, thereby improving overall vocabulary performance.

Digital game-based vocabulary learning apps can be broadly categorized into drill-based and task-based games (Yang & Song, 2024). Each game type offers distinct advantages for vocabulary learning outcomes. Drill-based games focus on repetition and memorization, allowing learners to practice vocabulary through structured exercises. Task-based games, on the other hand, incorporate vocabulary into meaningful tasks or problem-solving activities, making learning more contextualized and interactive.

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2. Challenge, game mechanism, and vocabulary learning

Striking a balance between cognitive challenge and success is of great importance for DGBL vocabulary apps in optimizing vocabulary learning performance (Yang et al., 2020). The concept of optimal cognitive challenge is crucial, as it directly influences learners' cognitive engagement, which is a key factor in vocabulary acquisition. The concept of optimal challenge is grounded in Vygotsky's Zone of Proximal Development (ZPD) and Csikszentmihalyi's Flow Theory, both of which emphasize the importance of matching tasks to learners' current abilities while pushing them just beyond their comfort zone to promote engagement and growth (Li et al., 2019). According to Vygotsky's ZPD, learners achieve the best outcomes when tasks are slightly beyond their independent ability but achievable with guidance or support. In DGBL, structured levels of increasing difficulty allow learners to gradually build vocabulary knowledge by taking on tasks that challenge them without causing frustration. Csikszentmihalyi's Flow Theory further supports the need for optimal challenge. Flow occurs when learners are fully immersed in an activity that provides the right balance between challenge and skill. When learners are in a state of flow, they are highly engaged, motivated, and capable of sustaining focus, all of which enhance learning outcomes.

Zhang et al. (2023) found that when cognitive challenges are too low, learners' engagement is minimal, which limits vocabulary learning performance. Without sufficient challenge, learners are unlikely to fully activate the cognitive processes required for effective vocabulary retention. However, the study also revealed that overly difficult challenges can trigger negative emotions such as frustration, and lead to a low sense of perceived competence. These factors were shown to have a detrimental effect on learners' overall vocabulary learning performance, as feelings of inadequacy can decrease motivation and persistence. In the context of DGBL, learners are more likely to enter a state of flow when the

challenges presented are just difficult enough to push them, but not so difficult that they become frustrated.

The importance of finding a balance between challenge and success is further supported by Mahayanti et al. (2024), who emphasized that the best learning outcomes occur when learners are consistently presented with tasks that are challenging but still achievable. When learners experience incremental successes while being pushed cognitively, they are more likely to stay motivated and engaged, leading to improved vocabulary performance. This balance ensures that learners feel competent while still being pushed to extend their abilities, which is essential for long-term retention and language proficiency.

3. Sensory engagement and vocabulary performance

The sensory elements of DGBL such as visuals, sound effects, and animations, significantly contribute to learners' engagement and vocabulary learning outcomes (Reinhardt & Thorne, 2020). Digital games that effectively combine sensory experiences help activate multiple cognitive pathways, allowing learners to more effectively process and retain vocabulary Lin & Lin, 2019.

Chen et al. (2019b) highlighted the importance of multisensory engagement in digital learning environments. The use of images, animations, and sound effects in vocabulary learning games increases learners' ability to encode and retrieve vocabulary by providing additional sensory cues. These sensory elements stimulate the brain and help learners associate words with sounds and visuals, enhancing both short-term recall and long-term retention.

Furthermore, Li (2021) observed that learners who used DGBL apps that offered both written and auditory materials demonstrated significant improvements in vocabulary performance. The simultaneous engagement of auditory and visual sensory channels helped learners internalize vocabulary more effectively. This multisensory approach was especially beneficial when paired with interactive mechanisms such as repetition and active recall, both of which are facilitated by game elements like flashcards, quizzes, and matching games.

Mahayanti et al. (2024) also pointed out that the immediate feedback provided through sound effects and animations, such as celebrating success with visual rewards or sound cues, contributed to a positive learning environment. This sensory stimulation enhances learners' motivation to continue engaging with the content, leading to improved vocabulary performance over time.

However, some recent research suggests that an overabundance of sensory elements can have a detrimental effect on learning outcomes. While multisensory engagement can enhance motivation and cognitive engagement, too much sensory input can overwhelm learners and distract them from the core

learning objectives. Chen et al. (2019b) found that when sensory elements such as animations, music, and visuals were carefully balanced with content, they enhanced vocabulary retention by providing multiple modes of learning. But, if the sensory load becomes too heavy, it can divert learners' attention from vocabulary tasks and impair their ability to absorb the material. This finding aligns with a study (Li et al., 2019). that emphasized the need for balance between content and sensory elements. It indicated that excessive sensory input can overload working memory, reducing the effectiveness of vocabulary learning and overall learning outcomes. In contrast, when sensory elements are used sparingly and in support of the learning content, they help reinforce word meanings and improve learners' vocabulary performance.

Conclusion

DGBL apps may significantly enhance EFL learners' vocabulary learning performance and outcomes by incorporating structured game types, optimal challenges, and balanced sensory elements. Research demonstrates that both drill and task-based games, when fully utilized, improve vocabulary retention. The balance of challenge, as supported by Vygotsky's ZPD and Flow Theory, ensures learners remain engaged while progressing through increasingly difficult tasks. In addition, a measured use of sensory elements—aligned with the core learning content—further supports vocabulary retention without overwhelming learners. These components create an immersive and effective learning environment, fostering both short-term gains and long-term vocabulary retention.

3.3.2 DGBL and EFL learners' vocabulary learning self-efficacy

Self-efficacy is defined by Bandura (1997) as an individual's belief in their ability to achieve specific goals despite difficulties. Some research suggested that language learners with high self-efficacy were more likely to engage in tasks, persist through challenges, and achieve better learning outcomes (An et al., 2020; Genç et al., 2016; Soleimani et al., 2022). Some recent literature reviews (Acquah & Katz, 2020; Ongoro & Fanjiang, 2023; Vnucko & Klimova, 2023) found that DGBL with its dynamic and engaging environment, demonstrated significant potential for enhancing learners' self-efficacy by fostering a sense of control, providing immediate feedback, and promoting incremental success. This section explores how DGBL influences self-efficacy in EFL vocabulary learning and reviews recent research that underscores its positive impact. Many studies examining the influence of DGBL on self-efficacy utilize Keller (1987) model of motivation which focuses on four key components: attention, relevance, confidence, and satisfaction. The "C" in this model, confidence, is particularly relevant when discussing self-efficacy, as it relates directly to learners' belief in their own abilities to complete vocabulary learning tasks (R. Zhang et al., 2024).

1. Personalized learning paths and autonomy

Digital game-based learning environments often provide personalized learning paths that allow learners to choose topics, set learning goals, and adjust the pace of their learning. This sense of autonomy is crucial for fostering self-efficacy, as learners feel more in control of their own progress. According to Self-Determination Theory (SDT) (Deci & Ryan, 2000), autonomy is one of the key psychological needs that enhance intrinsic motivation and self-efficacy. When learners are empowered to make choices about their learning, they are more motivated to engage with the material and are more likely to persist through challenges.

Mahayanti et al. (2024) found that DGBL apps offering personalized learning paths enhanced learners' self-efficacy by allowing them to control their learning environment. This sense of control, paired with the ability to see immediate progress, helped learners build confidence in their ability to succeed. Furthermore, choosing between different learning modes (e.g., written, auditory, or visual) catered to individual preferences, allowing learners to engage with vocabulary tasks in ways that were most effective for them, thereby reinforcing self-efficacy.

2. Mastery experience and self-efficacy

Bandura (1997) emphasizes that mastery experiences, or the successful completion of tasks, are the most direct source of self-efficacy. In digital game-based learning environments, mastery is often facilitated by structured, level-based learning that allows learners to progress through increasingly challenging tasks. The sense of achievement that learners gain when successfully completing a task boosts their confidence in handling future challenges.

A recent study by Mahayanti et al. (2024) found that DGBL enhances self-efficacy by offering repeated opportunities for success. The progressive difficulty of tasks, coupled with clear goals and immediate positive feedback, allowed learners to consolidate their mastery experiences. The study showed that learners' self-efficacy improved significantly as they advanced through the game, successfully completing challenges that gradually increased in complexity. This balance of challenge and success plays a critical role in maintaining motivation and fostering a belief in learners' ability to succeed.

3. Feedback and achievement recognition

Immediate feedback is another crucial element of DGBL that supports self-efficacy. In traditional vocabulary learning feedback is often delayed, but DGBL apps provide instant feedback through sound effects, visual cues, or scores, helping learners quickly identify errors and make corrections. This rapid feedback loop reinforces learners' efforts, providing them with a sense of progress and accomplishment, which boosts their self-efficacy.

Li (2021) explored the role of feedback in DGBL and found that learners' self-efficacy was significantly enhanced when achievement records, such as scores or badges, were visible within the app. These visible markers of success allowed learners to track progress and gain confidence in their ability to achieve learning goals. Furthermore, the combination of achievement records with specific goals helped them maintain focus, which contributed to a deeper sense of accomplishment and strengthened belief in their ability to master vocabulary.

Mahayanti et al. (2024) noted that when the feedback was positive and immediate—delivered through engaging sound effects or visual cues—it played a crucial role in enhancing young learners' self-efficacy. This real-time reinforcement provided learners with the confidence needed to persist through more challenging tasks.

4. Goal-setting and achievement records and self-efficacy development

Goal-setting is another critical component of SRL strategies that contributes to self-efficacy in DGBL. When learners can set clear, attainable goals within the app, they experience a sense of control and direction, which enhances motivation and confidence. Li (2021) found that learners who paired achievement records with specific, challenging, but attainable goals reported higher levels of self-efficacy compared to those who did not have structured goals. These goals gave learners a clear sense of purpose and reinforced belief that their efforts were leading to meaningful progress.

Similarly, the study by Meccawy et al. (2023) highlighted the importance of goal-setting combined with reward mechanisms. It demonstrated that learners who were rewarded for achieving specific goals within the app showed greater self-efficacy as they experienced a direct correlation between their efforts, goal achievement, and the rewards they earned. This positive reinforcement loop further encouraged learners to pursue more challenging vocabulary tasks, thus strengthening their self-belief.

5. The role of rewards and competition

In addition to personalized learning and goal-setting, DGBL apps often incorporate reward systems and competitive elements that further enhance self-efficacy. Studies have shown that including rewards such as points, badges, and certificates can significantly boost learners' confidence by providing tangible recognition of their progress. Zhang et al. (2023) examined the effects of rewards in DGBL and found that learners' self-efficacy was enhanced when they were rewarded for achieving specific vocabulary milestones. These rewards reinforced the learners' belief that their efforts were meaningful and directly related to their success.

However, research also suggests that competition and rewards must be carefully balanced. Yang et al. (2020) investigated the effects of cognitive complexity-based competition in a game environment and found that more complex competitive structures did not necessarily enhance motivation or self-efficacy compared to simpler approaches. This highlights the importance of ensuring that competitive elements do not overshadow learning objectives or overwhelm learners. A well-balanced system of rewards and challenges fosters a positive learning environment where learners feel competent and motivated to continue progressing.

6. Content integration, and optimal challenges

Immediate feedback is another vital feature of DGBL apps that contributes to self-efficacy development. The ability to receive instant feedback on performance allows learners to quickly adjust their strategies and celebrate small wins, which fosters a sense of achievement and progress. Chen and Hsu (2022) and Shamiri and Farvardin (2016) observed that when the feedback was positive and immediate—delivered through engaging sound effects or visual cues—it played a crucial role in enhancing young learners' self-efficacy. This real-time reinforcement provided learners with the confidence needed to persist through more challenging tasks. The study also emphasized the importance of carefully integrating game content, levels, and challenges to ensure learners experienced continuous progress and success. When the digital vocabulary learning app's content was carefully scaffolded to match learners' skill levels, it created an environment where success was achievable but required effort. This balance of challenge and success was crucial for self-efficacy development, as learners felt they could meet the challenges presented to them without becoming overwhelmed.

Zhang et al. (2023) reinforced this notion by demonstrating that optimal challenges—tasks that are neither too easy nor too difficult—paired with appropriate feedback and rewards significantly enhanced EFL learners' self-efficacy. Learners who experienced success with these optimally challenging tasks were more likely to develop a sense of mastery, further boosting their self-confidence and motivation to continue learning.

7. Optimal challenge and continuous success

One of the key elements for DGBL apps to assist learners achieve effective learning is to provide them with optimal challenges—tasks that are neither too easy nor too difficult. The concept of optimal challenge aligns with the ZPD proposed by Vygotsky (1978), which suggests that learning is most effective when tasks are just beyond a learner's current capabilities but still achievable with the right support. When learners engage with tasks that are optimally challenging, they are more likely to experience continuous success, which is crucial for building self-efficacy.

Zhang et al. (2023) highlighted the importance of optimal challenges in DGBL environments. They found that when learners were presented with tasks that progressively increased in difficulty, they experienced a sense of mastery as they successfully completed each level. This experience of continuous success, achieved through overcoming increasingly difficult tasks, reinforces learners' belief in their ability to handle new and more complex vocabulary challenges. As they repeatedly succeed in mastering vocabulary at these optimal levels of challenge, self-efficacy is strengthened, encouraging them to persist in their learning journey.

Furthermore, the ability of DGBL apps to dynamically adjust the difficulty of tasks based on learners' performance plays a crucial role in maintaining this balance of challenge and success. When learners are consistently presented with tasks that are within their capabilities yet still require effort, they are less likely to feel frustrated or overwhelmed. This balance ensures they remain engaged and motivated, as each success reinforces self-efficacy and prepares them for the next challenge.

Mahayanti et al.'s (2024) research concur with this finding, demonstrating that continuous success in completing optimally challenging tasks leads to steady improvement in learners' self-efficacy. The design of app adopted in their research, which gradually increases the complexity of tasks while providing consistent feedback and rewards, ensures that learners feel a sense of accomplishment without facing insurmountable obstacles. This balance between challenge and success is essential for fostering long-term engagement and motivation in EFL vocabulary learning.

Conclusion

DGBL apps can potentially enhance EFL learners' self-efficacy by offering mastery experiences and enhancing positive emotions with immediate feedback, rewards, and optimal challenges. Such apps create structured environments where learners experience continuous success, building confidence through progressively challenging tasks. The integration of achievement records and goal-setting further reinforces learners' belief in their ability to succeed.

Moreover, when personalized learning paths and feedback mechanisms are included, learners gain autonomy and control over their vocabulary learning, further enhancing self-efficacy. Mahayanti et al. (2024) and Li (2021) emphasize that the careful integration of content and game elements is of great importance in creating a motivating and supportive learning environment that fosters learner self-efficacy.

3.3.3 Digital game-based learning enhances EFL vocabulary learning motivation

Motivation is a critical factor in second language acquisition, particularly in vocabulary learning, which requires sustained effort and engagement over time. DGBL has been recognized for its potential to enhance learners' motivation by transforming the learning process into an enjoyable and rewarding experience. In the context of EFL vocabulary learning, DGBL leverages intrinsic and extrinsic motivational elements to encourage learners to persist in vocabulary acquisition efforts. This section explores how DGBL influences motivation and reviews recent research that supports its effectiveness in enhancing EFL learners' motivation to learn vocabulary.

1. Motivation enhancement through game elements

The primary appeal of DGBL apps lies in their ability to integrate gaming elements that engage learners and maintain their motivation (Chotipaktanasook & Reinders, 2024; Peterson, 2016). Features such as levels, points, badges, and leader-boards introduce a competitive and rewarding structure that appeals to learners' intrinsic motivation, encouraging them to keep progressing (Reinhardt & Thorne, 2020). This gamified structure makes vocabulary learning feel less like a chore and more like a game, reducing learners' anxiety and increasing their willingness to participate in vocabulary tasks.

One of the most powerful aspects of DGBL is its ability to foster intrinsic motivation by making learning enjoyable. As previously noted, intrinsic motivation refers to the internal desire to engage in an activity for its own sake, driven by interest, enjoyment, or satisfaction (Ryan & Deci, 2000). DGBL incorporates game elements such as narratives, challenges, and interactive gameplay which captivate learners' attention and keep them engaged in vocabulary learning tasks. By turning vocabulary acquisition into an enjoyable process, DGBL promotes sustained engagement, as learners are more likely to continue practicing when they find the activity intrinsically rewarding.

Recent studies identified the positive impact of DGBL on intrinsic motivation. For example, Abdullah Alhebshi & Gamlo, 2022) found that EFL learners using game-based platforms for vocabulary learning reported higher levels of intrinsic motivation compared to those using traditional methods. The immersive game environment which allowed learners to have more favourable emotions contributed to their enjoyment and willingness to engage with learning tasks. Similarly, Jin (2021) demonstrated that DGBL significantly increased learners' intrinsic motivation to learn new vocabulary, as the interactive and playful nature of the games made learning feel less like a chore and more like a rewarding experience.

However, including game elements does not necessarily guarantee an increase in motivation. An meta-analysis by Tsai and Tsai (2018) found that while game elements can enhance engagement, their

inclusion alone is not always effective in boosting motivation. The analysis indicated that certain game elements might become overwhelming or distracting for learners if not balanced appropriately with learning objectives. In some cases, learners may focus more on playing the game than on achieving their learning goals, which can diminish the educational value of the game-based learning experience.

To further explore this issue, Li et al. (2019) examined the influence of various contextual factors, including game elements, on vocabulary learning motivation. The study revealed that the balance between gaming and learning was crucial for enhancing motivation; while game elements such as competition and rewards were found to be motivating, excessive focus on the gaming aspects could detract from the educational content. Learners who were too focused on the gaming experience reported lower engagement with the actual vocabulary learning tasks. Li et al. (2019) concluded that game-based learning apps should endeavour to strike a balance between the enjoyment of gaming and educational objectives, ensuring that the gaming elements support rather than overshadow the learning process.

This highlights the need for thoughtful integration of game elements into vocabulary learning apps. When well-balanced, game elements can enhance motivation by making the learning process more enjoyable and rewarding. However, as was noted previously, educators and app developers should be cautious about creating environments where the game aspect dominates at the expense of learning outcomes.

2. Immediate feedback and motivation

Another key feature of digital game-based apps is the provision of immediate feedback (Yang & Song, 2024). In traditional vocabulary learning methods, feedback is often delayed, which can lead to frustration or disengagement. Game-based apps, however, offer real-time feedback on learners' performance, allowing them to quickly identify and correct mistakes. This immediate reinforcement of learning is crucial for maintaining learners' motivation, as it helps them remain aware of their progress and feel rewarded for their efforts.

Chen et al. (2019b) noted that EFL learners who used a digital game-based vocabulary learning app reported higher levels of motivation due to the app’s immediate feedback system. Learners observed that being able to see their scores and progress immediately after completing tasks kept them engaged and motivated to improve their performance. The study also found that learners were more likely to continue practicing vocabulary in the app because of the consistent, real-time feedback, which reinforced their sense of achievement.

3. Autonomy and personalized learning and motivation enhancement

Digital game-based learning apps often provide learners with autonomy over their learning process, allowing them to set their own goals, choose which vocabulary topics on which to focus, and determine the pace at which they learn. This sense of control is crucial for fostering intrinsic motivation, as learners feel empowered to take ownership of their learning journey. Moreover, many apps adapt to learners' individual needs by providing personalized content and challenges, making the learning experience more relevant and engaging.

From the perspective of SDT (Deci & Ryan, 2000), autonomy is one of the three basic psychological needs that must be satisfied to enhance intrinsic motivation. When learners have autonomy, they feel a sense of volition and control over their learning process, which fosters deeper engagement and sustained motivation. According to SDT, individuals are more motivated when they perceive their actions as self-directed, rather than externally controlled. By allowing learners to make choices in the vocabulary topics they want to study or set their own goals, game-based learning apps support this need for autonomy, which in turn enhances their intrinsic motivation to learn.

A study by Wang et al. (2020) explored the impact of a personalized game-based vocabulary app on EFL learners' motivation. It found that learners who had the ability to customize their learning experience—such as selecting vocabulary topics aligned with their interests or adjusting the difficulty of tasks—reported higher motivation levels than those using traditional methods. The app's adaptability to individual learners' progress and preferences allowed them to feel more connected to the learning process, which increased their motivation to persist in vocabulary acquisition.

The ability to tailor the learning experience to suit individual preferences and learning needs satisfies learners' need for autonomy, as outlined in SDT. When learners feel that they are in control of their own learning, their intrinsic motivation increases, leading to greater engagement and more effective learning outcomes. This suggests that digital game-based apps that prioritize learner autonomy and personalization can significantly enhance EFL learners' motivation and overall learning experience.

4. Social interaction, competition, and motivation enhancement

Many digital game-based vocabulary learning apps incorporate elements of social interaction and competition, which can significantly enhance learners' motivation. Features such as multiplayer modes, leader-boards, and peer challenges allow learners to interact with others while engaging in vocabulary tasks. These social dynamics not only foster a sense of community but also introduce elements of competition, which can drive learners to improve their performance and remain engaged in learning.

From the perspective of SDT (Deci & Ryan, 2000), social interaction and competition can enhance motivation by satisfying two fundamental psychological needs—relatedness and competence.

Relatedness refers to the need to feel connected to others, while competence reflects the desire to feel capable and effective in completing tasks. When learners participate in social interactions and friendly competition these needs are met, which boosts their intrinsic motivation.

Social interaction within game-based learning environments fosters relatedness by enabling learners to collaborate, share progress, and support one another. This sense of belonging strengthens learners' motivation to participate in vocabulary learning, as they feel part of a larger community working towards similar goals. Zhang and Zou (2022b) confirmed that learners who engaged in social aspects of vocabulary learning apps, such as multiplayer challenges or peer competitions, reported higher levels of motivation, which highlighted that learners were motivated by the opportunity to compete and interact with others and made the learning process more enjoyable and meaningful.

At the same time, competition within these apps satisfies learners' need for competence by providing them with clear performance benchmarks, such as leader-boards or scoring systems. Learners are motivated to improve their standing or outperform their peers, which leads to increased effort and engagement in vocabulary tasks. When learners see themselves succeeding in competition, their sense of competence is reinforced, which further enhances intrinsic motivation. SDT posits that when individuals feel competent and effective in their actions, they are more likely to sustain motivation and continue engaging in the activity.

The combination of relatedness and competence through social interaction and competition aligns with SDT's framework for fostering intrinsic motivation. DGBL apps that incorporate these elements not only make vocabulary learning more engaging but also create a motivational environment that supports long-term persistence and success.

However, it is important to recognize that competition itself does not always enhance motivation. Yang et al. (2020) study on the effects of a cognitive complexity-based competition game on EFL students' English vocabulary learning found that these students did not demonstrate better learning motivation compared to those using a conventional situational English vocabulary gaming approach. This suggests that while competition can drive motivation, the type of competition and its alignment with learners' cognitive needs are crucial. Overly complex or cognitively demanding competitive structures may not necessarily increase motivation, and they could even detract from engagement if not balanced properly.

These findings highlight the nuanced role that competition plays in vocabulary learning. While competition can enhance motivation by fostering competence and relatedness, it must be appropriately structured to avoid overwhelming learners or shifting focus away from the learning objectives. Research suggests that digital game-based apps should aim to strike a balance between challenge and cognitive load to ensure that competition serves as a motivating rather than demotivating factor.

5. Motivation for long-term vocabulary learning

While digital game-based apps are effective in boosting short-term motivation, research also indicates their potential for fostering long-term vocabulary learning motivation. The combination of rewards, feedback, and autonomy encourages learners to develop sustained engagement with the app, promoting continuous vocabulary practice. Over time, this engagement can lead to improved vocabulary retention and a deeper sense of accomplishment, which further enhances learners' long-term motivation.

A multi-case study by Muslim and Mahbub (2023) explored the long-term effects of a digital game-based vocabulary learning app on EFL learners' motivation. The findings revealed that learners who used the app over an extended period demonstrated higher levels of intrinsic motivation, as the game elements and personalized learning paths kept them engaged in the learning process. The study concluded that digital game-based apps not only boost short-term motivation but also have the potential to promote long-term commitment to vocabulary learning, making them a valuable tool for language learners.

Conclusion

Digital game-based vocabulary learning apps significantly enhance EFL learners' motivation by integrating game elements, providing immediate feedback, fostering autonomy, and promoting social interaction and competition. Game elements like rewards and leader-boards engage learners but, as Tsai and Tsai (2018) and Li et al. (2019) found, a balance between gaming and learning is essential to maintain focus on educational goals.

Immediate feedback reinforces motivation by enabling learners to track their progress while autonomy, supported by SDT, boosts intrinsic motivation by giving learners control over their learning experience. Social interaction and competition can also enhance motivation by fulfilling learners' needs for relatedness and competence but, as Yang et al. (2020) showed, overly complex competitive tasks may reduce engagement.

In conclusion, digital game-based apps offer valuable opportunities to motivate EFL learners, but their effectiveness depends on thoughtfully balancing game elements, feedback, and social dynamics to promote both short-term engagement and long-term vocabulary retention.

3.3.4 Game-based learning's influence on struggling EFL learners

Struggling learners, particularly in the context of EFL vocabulary acquisition, often face numerous challenges that can hinder their progress such as low motivation, difficulty retaining vocabulary, and a lack of confidence. DGBL has emerged as a promising solution to address the specific needs of these learners by offering a more engaging, supportive, and flexible learning environment. For struggling learners, DGBL provides opportunities to practice vocabulary in a low-pressure setting, receive immediate feedback, and benefit from personalized learning pathways that adapt to their abilities. This section reviews recent research on how DGBL influences struggling EFL learners and highlights the unique advantages it offers to support their vocabulary acquisition.

1. Reducing learning anxiety

One of the key obstacles for struggling EFL learners is anxiety, particularly in vocabulary learning. Many learners feel overwhelmed by the volume of new words they must acquire and may fear making mistakes, which can reduce their willingness to engage in learning activities. DGBL addresses this challenge by creating a low-stakes, playful environment where mistakes are part of the learning process and learners are encouraged to try again without fear of judgment (Dehghanzadeh et al., 2021; Reinhardt & Thorne, 2020). This helps reduce anxiety and fosters a more positive attitude towards vocabulary learning.

Horwitz and Young (2020) found that struggling EFL learners using a game-based vocabulary app reported significantly lower levels of anxiety compared to those using traditional classroom methods. The game-based environment allowed them to practice new vocabulary in a supportive, self-paced setting, which helped alleviate the pressure often associated with language learning. As a result, learners were more willing to engage with vocabulary tasks, leading to improved learning outcomes.

2. Promoting incremental success and persistence

Struggling learners often need more time and support to achieve vocabulary mastery, and DGBL's structure, which breaks down tasks into manageable segments, is particularly effective in promoting incremental success. The small wins and constant feedback offered by DGBL platforms give struggling learners a sense of accomplishment, reinforcing their motivation to persist with learning. By gamifying the learning process, DGBL enables these learners to experience success more frequently, which can gradually build their confidence and willingness to continue working on vocabulary tasks.

Recent research supports this notion. For example, Su and Cheng (2019) noted that struggling EFL learners who used a game-based vocabulary learning app experienced higher levels of persistence in

their studies compared to those using traditional learning methods. The study highlighted that the app's use of short-term goals, such as completing vocabulary levels or earning rewards, helped learners stay motivated and persist through more challenging tasks. The immediate feedback and sense of progress were particularly beneficial for learners who typically struggled to stay engaged in vocabulary learning.

3. Personalized learning and adaptivity

Another advantage of DGBL for struggling learners is its ability to adapt to individual learner needs. Many game-based apps employ adaptive learning algorithms that adjust the difficulty level of vocabulary tasks based on the learner's performance. This personalized approach ensures that struggling learners are not overwhelmed by tasks that are too difficult, while also providing enough challenge to encourage progress. This adaptive feature allows learners to focus on their specific weaknesses and pace learning according to their needs, which can lead to more effective vocabulary acquisition.

Chang and Hwang (2021) investigated the impact of adaptive DGBL on struggling EFL learners' vocabulary retention and observed that learners using an adaptive game-based app showed significant improvement in vocabulary mastery compared to a control group. The adaptive nature of the app allowed learners to revisit difficult vocabulary, ensuring that they could focus on areas that required more attention. This personalized feedback and pacing helped struggling learners make steady progress, reducing frustration and promoting a more positive learning experience.

4. Boosting self-efficacy and confidence

Struggling learners often lack confidence in their language abilities, which can negatively impact their willingness to participate in learning activities. DGBL helps address this issue by promoting self-efficacy—learners' belief in their ability to succeed in specific tasks. Through consistent positive reinforcement, game-based platforms provide learners with clear evidence of their progress, helping them build a sense of competence over time, which can have a ripple effect, encouraging struggling learners to take more risks in language use and engage more fully in vocabulary learning.

Tsai and Lee (2022) examined the influence of DGBL on self-efficacy in struggling EFL learners and noted that learners who used a game-based app for vocabulary learning showed significant improvements in their self-confidence compared to those in a traditional learning environment. The game's use of immediate feedback, progress tracking, and rewards contributed to learners' belief in their ability to master new vocabulary, which in turn motivated them to invest more effort in the learning process.

5. Game-based learning environment as a motivational tool

Struggling learners often require external motivation to persist with vocabulary learning tasks. Game-based apps incorporate gamification elements, such as points, badges, and leader-boards, to provide external motivation and encourage learners to keep working toward their goals. For struggling learners, these tangible rewards can serve as a powerful motivator, offering clear, achievable milestones that help them stay engaged and focused on the learning process. Gamification also helps create a sense of progress, even when learners are facing difficult vocabulary tasks, making the learning experience more enjoyable and less daunting.

Hung (2017) supported the motivational impact of gamification on struggling learners, reporting that struggling EFL learners who used a gamified vocabulary learning app demonstrated higher levels of engagement and motivation compared to learners who used non-gamified resources. The combination of rewards, achievements, and progress tracking helped struggling learners overcome feelings of discouragement and motivated them to continue practicing vocabulary, even when they encountered challenges.

Conclusion

Game-based learning offers a range of benefits for struggling EFL learners, including reducing anxiety, promoting incremental success, providing personalized learning, boosting self-efficacy, and offering external motivation through gamification. The flexibility and adaptivity of GBL create a supportive environment where struggling learners can develop vocabulary skills at their own pace, build confidence, and persist in language acquisition efforts. As research on GBL continues to grow, these tools will hold significant potential to address the unique needs of struggling EFL learners and help them overcome the challenges associated with vocabulary learning.

Chapter 4 Methodology

Chapter 4 presents the action research methodology for this thesis and covers the research design, data collection, data analysis, and ethics of the research. The research design elaborates the procedures followed by each spiral action research cycle, as well as the purpose and overall design of all four cycles. Participant selection also explains the enrolment of participants. Data collection deals with the instruments employed and the schedule of data collection for the four cycles. The procedures and methods for data analysis and interpretation as well as data authentication are the focus of data analysis. The final section of the chapter addresses ethical issues of the research.

4.1 Introduction

This research was conducted between late 2020 and the end of 2022, a period marked by significant global disruption caused by the COVID-19 pandemic. During this time education, particularly at the tertiary level, almost entirely shifted online. Surveys indicate that many students experienced difficulties in completing their studies and were concerned about their academic performance (Cao et al., 2020; Gritsenko et al., 2021; Li et al., 2022; Mahdy et al., 2020). In response, institutions, universities, and colleges provided psychological, technological, and learning support to assist learners throughout this challenging period (Maican et al., 2021; Gritsenko et al., 2021; Li et al., 2022).

Aligned with this education context, the research explores whether MGBVL apps, combined with SRL strategies, can support university learners with poor EFL performance in their out-of-class vocabulary learning. To investigate and improve their learning practices, an action research method was employed. Action research is particularly suited for this purpose as it seeks to bring about transformative change through the simultaneous processes of taking action and conducting research (Elliot, 1991; McNiff, 2013). It enables the researcher to closely observe and critically analyze the participants' learning journey, identifying potential benefits that could be generalized to other learners in similar situations (Cohen et al., 2017; Elliot, 1991; Elliott, 1978).

4.2 Why action research

The action research method was chosen for this study as it aligns closely with the research goals of addressing real-world challenges in EFL vocabulary learning, implementing iterative interventions, and collaboratively improving learning outcomes. The method is particularly suitable for exploring SRL strategies using a game-based vocabulary learning app, Kaixincichang, during the unique context of the COVID-19 lockdown.

1. **Addressing practical problems in EFL vocabulary learning**

   Action research is well-suited to addressing practical issues within educational contexts. This study sought to tackle the challenges of low motivation, poor persistence, and inconsistent vocabulary learning among Chinese university students during the lockdown. By engaging directly with participants and implementing interventions, action research enabled a problem-focused approach to improving learning experiences.

2. **Iterative and cyclical nature**

   The cyclical structure of action research—comprising planning, acting, observing, and reflecting—allowed for ongoing adjustments to interventions. This iterative process was critical for scaffolding SRL strategies for participants, gradually enhancing their ability to independently manage their vocabulary learning. Each cycle provided an opportunity to refine strategies based on participants' feedback and learning behaviour, ensuring the interventions were responsive and effective.

3. **Collaborative engagement with participants**

   Action research emphasizes collaboration between researchers and participants. In this study, participants were actively involved in setting goals, reflecting on their progress, and sharing their learning experiences. This participatory approach fostered a sense of ownership over their learning journey and provided valuable insights into how SRL strategies and game-based learning elements could be adapted to meet their needs.

4. **Suitability for context-specific challenges**

   During the COVID-19 lockdown, many traditional educational approaches were disrupted, and learners faced unique challenges such as isolation and reduced motivation. Action research's flexible and context-sensitive design made it an ideal method for exploring innovative solutions, such as integrating SRL strategies with Kaixincichang's game-based features, to support learners in this unprecedented situation.

5. **Generating practical and theoretical insights**

   Beyond addressing immediate learning challenges, action research facilitated the development of practical recommendations for integrating SRL strategies into game-based learning contexts. The findings also contribute to the theoretical understanding of how SRL and game-based learning intersect to support EFL learners, particularly in challenging learning environments.

By employing the action research method, this study not only addressed participants' immediate learning needs but also generated insights that can inform future research and practice in EFL vocabulary learning.

4.3 The researcher's role, participant enrolment and the choice of vocabulary learning app

4.3.1 The researcher's role

In this research, I assumed multiple roles each with specific responsibilities, as outlined below:

1. **Project designer during the design and preparation stage**

   In the design and preparation stage, I was primarily responsible for the project's development, working under the guidance of two supervisors. My responsibilities included, but were not limited to, creating the project plan, selecting appropriate GBLL apps, preparing data collection instruments, considering ethical implications, and enrolling participants.

2. **Facilitator, listener, and observer during the implementation stage**

   The project was organized into weekly units where I guided participants in creating plans at beginning of each week. Each morning I sent reminders and encouraging messages to our online chat group to keep participants engaged. As a facilitator, I was available to assist with their EFL learning and provide support for any personal or academic challenges they faced. As an observer, I closely monitored their EFL learning journey, experiences with the GBLL apps, reactions to weekly tasks, and the impact of their living and study conditions, especially those influenced by the COVID-19 pandemic.

3. **Synthesizer and reporter during the data analysis and results presentation stage**

   In this stage, I took on the primary role of synthesizing the data and presenting the findings in my PhD thesis. It involved analyzing the collected data, identifying key trends and insights, and comprehensively reporting the results, all with guidance from my two supervisors.

4.3.2 Participant enrolment

1. Selection and sampling

Given the constraints imposed by the COVID-19 pandemic, the researcher remained within her community which was not near any universities or colleges. As a result, a nonprobability sampling approach was adopted to target and enrol potential participants. The researcher contacted former students, friends, and others who could connect with college students. Due to social restriction policies during the pandemic, these contacts were also limited in their activity areas, leading to online recruitment of all participants.

Both convenience and snowball sampling were utilized for recruitment (Creswell, 2002; Schmuck, 2006). Participants were encouraged to invite their friends, classmates, and family members, provided they were college students. To ensure a diverse range of participants, the researcher considered factors such as age, major, location, English proficiency, and university when selecting participants from the pool of potential candidates.

2. Recruitment process

Participants were approached and enrolled online due to the pandemic-related restrictions. The researcher informed potential participants about the study through various channels, including direct outreach and referrals from existing contacts. Once they expressed interest, participants were provided with detailed information about the study's purpose, procedures, and significance. Informed consent was obtained electronically, and participants were assured of their rights, including privacy, confidentiality, and the voluntary nature of their participation.

Participant recruitment was conducted across four rounds, involving 28 potential candidates. Among them, three individuals were known to the researcher prior to the study—two were former students and one was a relative's acquaintance—while the remaining 24 were unknown to the researcher. Ten participants agreed to take part, and seven from the first and third rounds remained engaged during the main phases of the research. Following discussions with the supervisor, five participants from the third round were selected to report their learning journeys, as they had completed the entire study as a team.

3. Ethical considerations

This research adhered to the ethical guidelines of the Human Research Ethics Committee of Victoria University, ensuring that the rights of all participants were respected throughout the study. Conducting the research online introduced additional ethical considerations, which were addressed as follows:

1) Fundamental ethical issues

The research shared many fundamental ethical concerns with face-to-face studies, including:

a. **Anonymity and pseudonymity:** Participants' identities were protected through the use of self-selected pseudonyms across all online platforms used in the research, such as WeChat, Tencent Meeting, and Kaixincichang.
b. **Risks and benefits:** The risks and benefits to participants and the broader social good were carefully weighed, and their financial compensation was considered.
c. **Cross-cultural issues:** The researcher was mindful of cross-cultural considerations, ensuring that participants' rights and cultural contexts were respected.

2) Online research-specific ethical issues

To address the unique ethical challenges of online research, the following steps were implemented:

a. **Informed consent:** Participants were informed about the study's procedures, purposes, significance, and their role, benefits, and responsibilities. They were also informed about their rights, including privacy, confidentiality, and data security (please see Appendix C).
b. **Electronic signatures:** Consent forms were signed using electronic signatures via PDF, and pseudonyms were accepted to maintain anonymity.
c. **Privacy measures:** Participants were allowed to use virtual backgrounds or turn off their video in online meetings, especially since some shared dorm rooms during lockdowns.
d. **Confidentiality of recordings:** All participants were advised that they could not record during group meetings or interviews without permission to further protect the privacy of other participants. However, while they were not recording using the online meeting software, it was not possible to discern if they were recording using their mobile phones.

These measures ensured that the research was conducted ethically, and that participants' rights were upheld

4. Participant demographics

The participants in this research were five Chinese-speaking university students, consisting of one male and four females, who failed the CET-6 exam in 2021. Their demographic information is summarized in the table below:

Participant ID	Age	Gender	CET-6 score	Year of University	Major
1	23	Male	Intermediate	Senior	Surgery
2	23	Female	Intermediate	Senior	Medicine
3	22	Female	Low Intermediate	Third Year	Medical Examination
4	21	Female	High Intermediate	Third Year	Medical Imageology
5	21	Female	Low Intermediate	Third Year	Nursing

Table 2 Participant demographics

The participants were enrolled in a university in the north of China and came from different parts of the country. All spoke Mandarin as their first language and joined the four cycles, and four of them completed CET-6 required vocabulary learning in four weeks.

5. Participant involvement

Participants were expected to engage in a 4-week CET-6 vocabulary learning program using the *Kaixincichang* app. Their involvement included learning CET-6 words with the app and recording their learning journey. Specifically, they were asked to:

1) Analyze their learning tasks and set both monthly and weekly goals using a form provided (see Appendix A).
2) Develop plans to achieve these goals.
3) Using *Kaixincichang* to learn CET-6 required words.
4) Maintain a daily learning diary documenting time spent, attitude, mastery rate, and strategies used (see Appendix B).
5) Submit weekly app logs from *Kaixincichang*, detailing their vocabulary learning progress.
6) Attend weekly group meetings online to share their learning experience and challenges.

Participants' involvement was structured to encourage self-regulation and reflection on their learning processes, with weekly meetings serving as a platform for sharing experiences and addressing challenges.

4.3.3 Rationale for choosing Kaixincichang

Kaixincichang, a widely popular game-based vocabulary learning app among Chinese EFL learners (Yan, 2021), was selected for this research due to its potential to address key challenges faced by university students during the COVID-19 lockdown (Chen & Zhang, 2022; Pham et al., 2022).

1. Popularity among Chinese EFL learners

As one of the most commonly used vocabulary learning apps in China, Kaixincichang has garnered a significant user base among EFL learners (Yan, 2021). Its widespread recognition and accessibility ensured that participants would find the app familiar and user-friendly, minimizing the learning curve and maximizing its adoption.

2. Game-based learning features for engagement and persistence

Kaixincichang incorporates game-based elements such as level progression, varied drills, and competitive features like PK mode, which have been shown to have great potential in enhancing learner motivation and engagement (Gamlo, 2019; Krouska et al., 2022; Zhonggen, 2019). During the

lockdown, many Chinese university students reported feeling bored or demotivated to study EFL due to the isolating and monotonous conditions (G. Chen et al., 2020; Chen & Zhang, 2022; Qiao et al., 2021). The app's interactive and game-based design provided a dynamic learning environment, which had potential to encourage sustained effort and persistence, even in challenging circumstances like COVID-19 lockdown (Krouska et al., 2022).

4.3.4 Kaixincichang's features and functionality

The introduction and training of Kaixincichang were carried out at the beginning of each cycle, where I provided participants with a comprehensive overview of the app's features and functionality as well as guided attempts to use it.

4.3.4.1 Key features

1. **Vocabulary lists:** Kaixincichang offers dozens of vocabulary lists to satisfy various learning needs. Participants were guided through lists specifically focusing on CET-6 words in Cycle 1. These lists include a broad range of words that cover various domains of the English language such as academic terms, advanced vocabulary, idiomatic expressions, and specialized terminology. The words are selected based on their frequency of use in academic and professional settings, as well as their relevance to the content typically covered in the CET-6. The list is generally categorized into several tiers (see Figure 4.4-1), based on the following criteria:

1) Frequency of usage:

Words that appear frequently in academic texts and publications are prioritized. These include words that are commonly used in research articles, textbooks, and lectures, which are vital for understanding complex English materials.

2) Difficulty level:

The words range from intermediate to advanced levels, ensuring that students are exposed to a variety of vocabulary that challenges their understanding and usage. This includes multi-syllabic words, phrasal verbs, idioms, and words with nuanced meanings.

3) Relevance to CET-6 exam sections:

The vocabulary list is tailored to align with the different sections of the CET-6 exam such as listening, reading, writing, and translation. Each section requires a distinct set of vocabulary skills:

a. **Listening section:** Focuses on words and phrases that are often used in spoken English, including colloquialisms and conversational expressions.
b. **Reading section:** Includes advanced vocabulary that appears in academic texts, requiring students to understand the meaning, context, and nuanced usage of each word.
c. **Writing section:** Emphasizes words that help in constructing coherent, well-structured, and sophisticated essays.
d. **Translation section:** Contains vocabulary that bridges the gap between English and Chinese, including terms that are challenging to translate due to cultural or contextual differences.

Figure 4.3-1 Vocabulary books

2. **Structured learning process:**

Kaixincichang is a game-based language learning app designed to facilitate vocabulary acquisition through a structured learning process, with various engaging and interactive modes that are

specifically tailored to different learning preferences and enhance retention through active participation and self-regulation. This was first introduced in Cycle 1 and highlighted in Cycle 2. Below is an overview of the key learning modes it offers:

1) Level passing mode: word flashcards

The Flashcards mode is a foundational learning mode within Kaixincichang, designed to support initial vocabulary acquisition and reinforcement. It presents new words alongside their definition, example sentences, and pronunciation guides (please see Figure 4.3-2).

Features:

a. **Word-phrase pairing:** Displays words with their meaning and usage in context, helping learners grasp both their denotative and connotative meaning.
b. **Visual and auditory cues:** Includes images and audio pronunciations to cater for visual and auditory learners, enhancing the multisensory learning experience.
c. **Spaced repetition:** Utilizes a spaced repetition algorithm to present words at increasing intervals based on the learner's familiarity, thus optimizing memory retention.

Figure 4.3-3 Word flashcard

2) Level passing mode: listening and speaking practice

This mode focuses on improving learners' listening and speaking skills, which are crucial for mastering new vocabulary pronunciation and achieving fluency in English (please see Figure 4.3-4).

Features

a. **Audio clips and dictation:** Provides audio clips of words to enhance listening comprehension and pronunciation skills. Dictation exercises require learners to write down what they hear, reinforcing spelling and listening accuracy.

Figure 4.3-5 Level passing mode: listening and speaking

3) Review and revision mode

The review and revision mode is designed to help learners consolidate their knowledge and ensure long-term retention of vocabulary (please see Figure 4.3-6).

Features:

a. **Personalized word lists:** Compile words that learners struggle with or have not yet mastered, allowing for targeted revision.
b. **Cumulative quizzes:** These review previously learned words, reinforcing long-term retention.
c. **Daily and weekly reviews:** Encourage regular revision by prompting learners to review words daily and weekly, integrating spaced repetition principles.

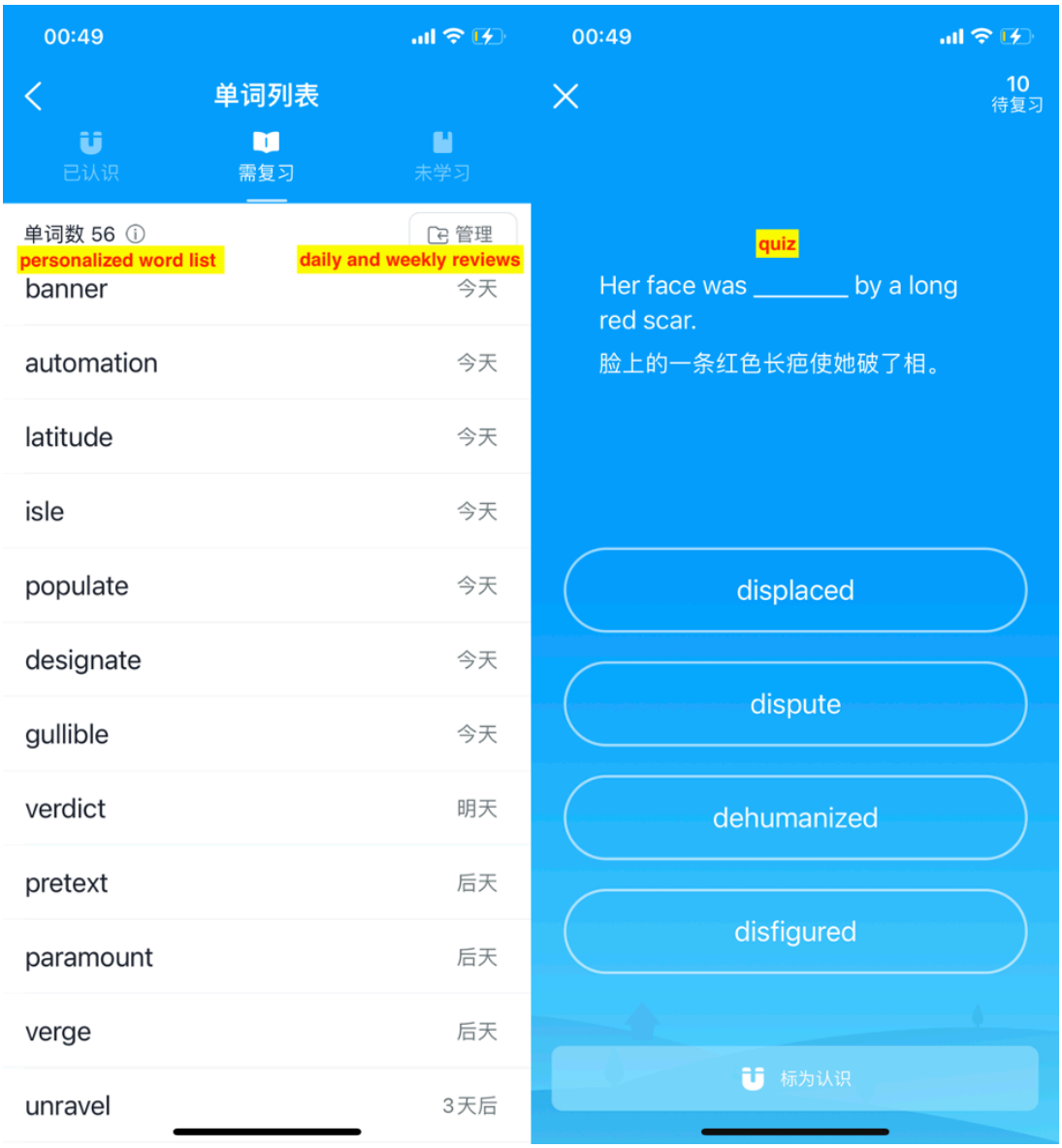

Figure 4.3-7 Review and revision mode

4) Quizzes and tests mode

The quizzes and tests mode is designed to assess learners' vocabulary knowledge through a series of interactive exercises that test recall and recognition, which is also a means of ensuring vocabulary retention (please see Figure 4.3-8).

Features:

a. **Multiple choice questions:** Test word meanings, synonyms, antonyms, and usage in sentences.
b. **Fill-in-the-blank exercises:** Encourage learners to recall words and apply them correctly in context.

c. **Timed challenges:** Add a layer of gamification by setting time limits on questions to enhance quick thinking and decision-making.

d. **Progress feedback:** Provides immediate feedback on answers, reinforcing correct responses and clarifying misunderstandings.

Figure 4.3-9 Quiz and test mode

5) Player versus play competition (PK) mode

PK mode allows users to engage in vocabulary competitions with other learners, either in real-time or asynchronously. This feature adds a competitive and social element to the learning process, making it more engaging and motivating for learners (please see Figure 4.3-10).

Features:

a. **Real-time challenges:** In PK mode, learners can challenge a friend or random user to a vocabulary duel. Both participants are presented with the same set of vocabulary

questions, and they compete to answer correctly and quickly. The faster and more accurate a player is, the higher their score.

b. **Asynchronous play:** Users can also participate in asynchronous PK challenges where they complete their challenge at their own pace and the results are later compared to those of their opponent. This mode is convenient for learners in different time zones or with varying schedules.

c. **Variety of Question Types:** The PK challenges include multiple-choice questions, fill-in-the-blanks, word matching, and even pronunciation checks which test different aspects of vocabulary knowledge and usage.

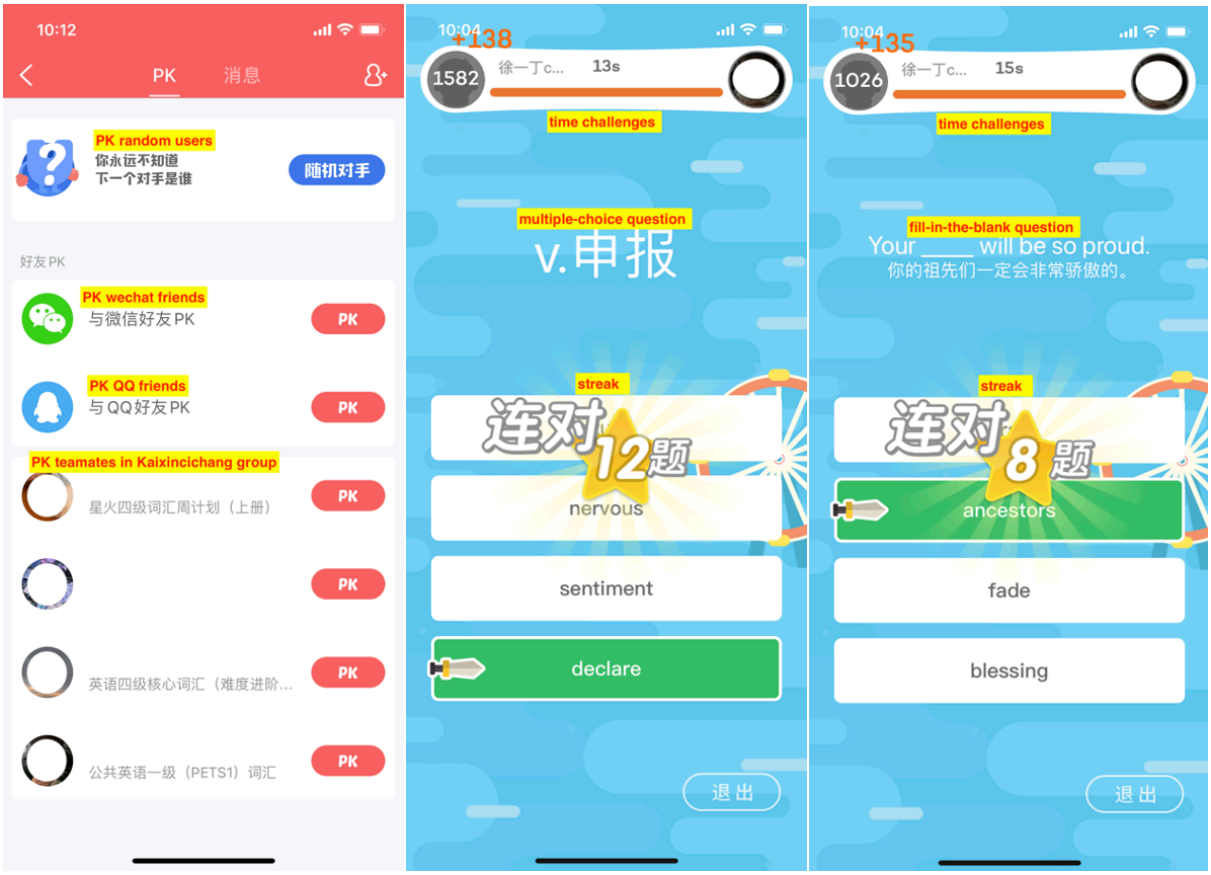

Figure 4.3-11 PK mode

Features

a. **Competitive ranking:** After each match, players are ranked based on their performance. They can see their position on a leader board, which fosters a sense of competition and encourages continued participation to improve rankings.

b. **Rewards and incentives:** Winners of PK matches often receive rewards such as points, badges, or virtual currency that can be used within the app. These incentives serve as motivation for learners to engage more frequently with the vocabulary challenges.

c. **Instant feedback:** Players receive instant feedback on their answers, allowing them to learn from their mistakes and immediately understand the correct usage or meaning of the words.

3. Progress tracking:

Kaixincichang offers a robust progress tracking feature that enables learners to monitor their vocabulary learning and self-assess their development, which was highlighted in Cycle 3. It is designed to support SRL by providing learners with detailed insights into their performance, helping them to set and adjust their learning goals, and fostering a sense of accountability and motivation.

1) Learning achievement dashboard:

The learning achievement dashboard provides an immediate overview of the learner's progress (please see Figure 4.3-12). It displays key metrics such as the number of words learned, daily streaks, and total study time. This comprehensive overview helps learners quickly assess their progress and stay motivated.

Figure 4.3-13 Learning achievement dashboard

2) Word mastery levels:

Kaixincichang categorizes vocabulary words into different mastery levels based on the learner's performance in quizzes, tests, and practice sessions. Words are marked as “new,” “learning,” “reviewing,” or “mastered,” allowing learners to see which words require more attention and practice (please see Figure 4.3-14). This system of categorization helps them focus on areas that need improvement.

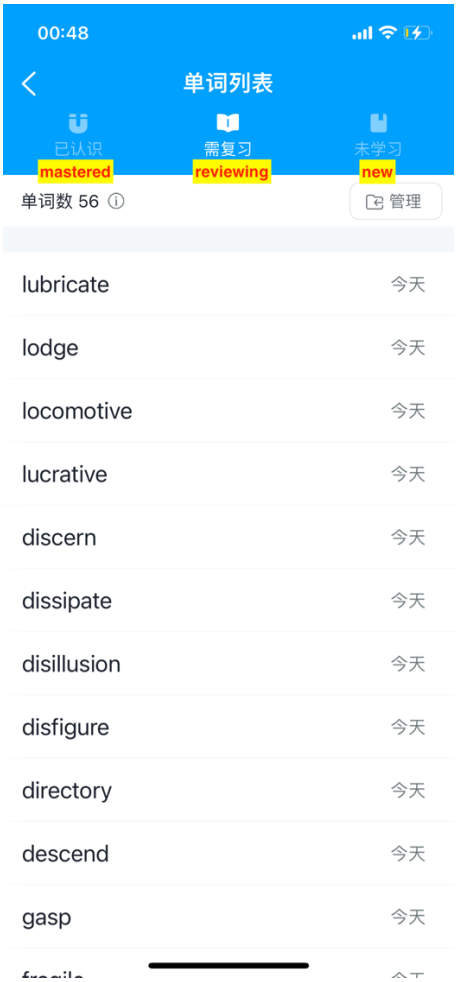

Figure 4.3-15 Word mastery level

3) App log: study history and trends:

The app maintains a detailed log of the learner’s study history, including the dates and times of study sessions, the duration of each session, and the specific activities completed (please see Figure 4.3-16). This information is presented in a visual format, which helps learners identify patterns and trends in their study habits.

Figure 4.3-17 App log: study history and trends

4) Performance Feedback:

Immediate and detailed feedback is provided after each learning, review or PK session (see Figure 4.3-7). It includes not only the correct answers but also explanations and additional context for the words when you click on them. This allows learners to understand their mistakes and to learn more effectively from them.

Figure 4.3-18 Performance feedback

4.4 Action research model and the research construction

4.4.1 The model of action research

This research adopts Kemmis and McTaggart (1988)'s model, which follows a cyclical pattern, consisting of these four stages: planning, acting, observing, and reflecting (please see Figure 4.4-1).

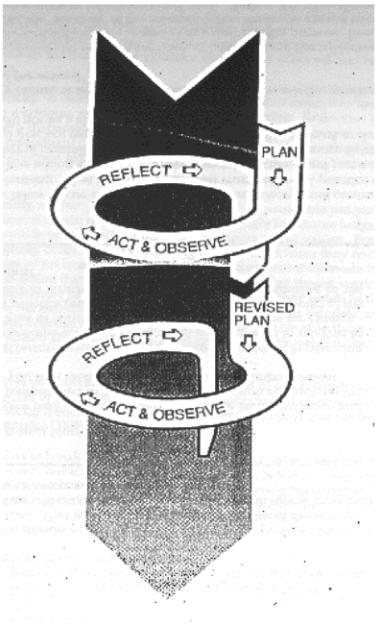

Figure 4.4-2 Kemmis and McTaggart's model

1) **Planning**: In this initial phase, educators identify a specific problem or area of concern within their teaching practice. They then develop a plan of action aimed at addressing the issue, drawing upon relevant theories, pedagogical strategies, and available resources. The planning stage is crucial as it lays the groundwork for the subsequent phases of the research cycle.

2) **Acting**: The acting phase involves the implementation of the planned intervention in the classroom or learning environment. This could include introducing new teaching methods, materials, or technologies, or modifying existing practices to better meet the needs of learners. The emphasis in this stage is on taking deliberate, informed actions that are intended to bring about positive change.

3) **Observing**: During the observing phase, educators collect data on the effects of the intervention which can be gathered through various means, such as classroom observations, student feedback, assessments, and reflective journals. The goal is to systematically monitor the impact of the actions taken, allowing for an evidence-based evaluation of their effectiveness.

4) **Reflecting**: Reflection is a critical component of the action research cycle. In this phase, educators analyze the data collected during the observation stage, considering both the successes and challenges encountered. Reflection allows educators to gain deeper insights into their teaching practices and the learning experiences of their students. Based on these reflections, the cycle may begin again, with revised plans and actions informed by the insights gained from the previous cycle.

4.4.2 Construction of the research project

The study explored participants' self-regulated EFL vocabulary learning journey using the GBVL app Kaixincichang to examine how SRL strategies and game factors influenced their learning of CET-6 required words. The research has four cycles, with each cycle following the adapted structure (please see Figure 4.5-2)

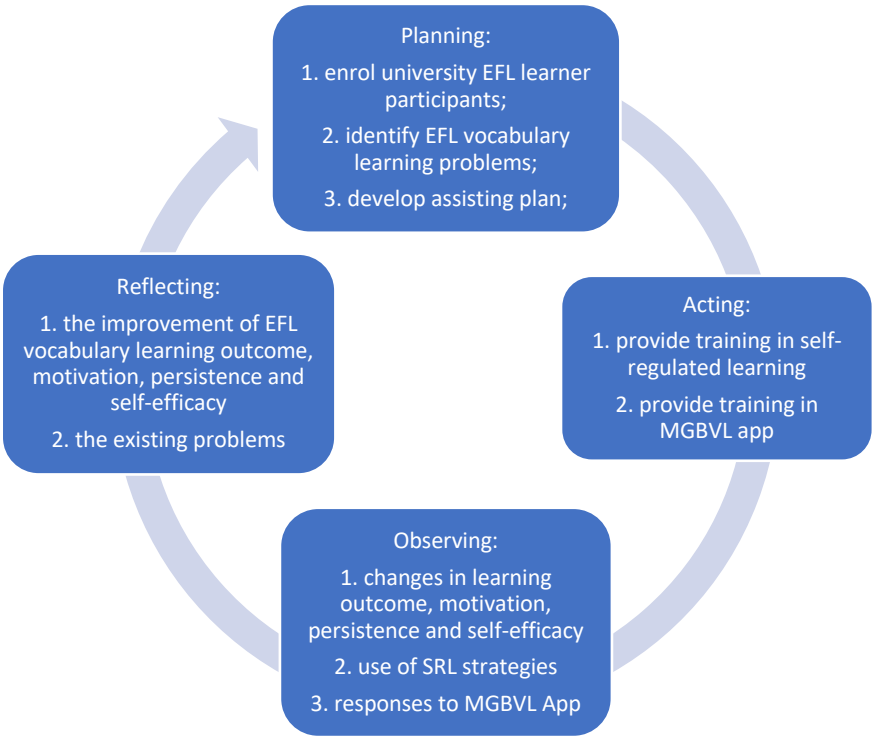

Figure 4.4-3 Model for the research

Participants were scaffolded during the first three cycles with SRL strategies based on Zimmerman and Moylan's (2009) SRL cyclical model. In the final cycle, participants engaged in independent learning without researcher intervention. More detailed design for each cycle is presented in Figure 4.4-3 below.

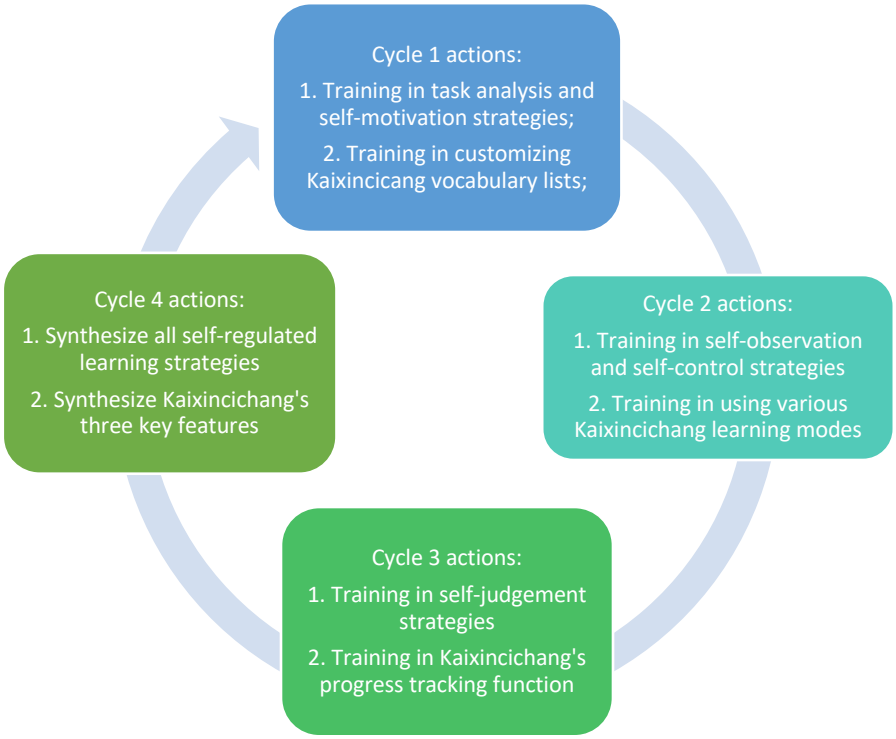

Figure 4.4-4 Four cycles of the research

1. **Cycle 1: addressing vocabulary problems in motivation and strategic planning with forethought phase strategies and Kaixincichang's level-based mechanism**

   1) Plan:

   a) Identify participants' problems in their motivation of CET-6 word learning, examining their self-efficacy, outcome expectations, task value and so on.

   b) Identify participants' problems in analysing CET-6 words learning task, exploring their goal setting and strategic planning.

   c) Enhance participants' confidence and boost their motivation with small success gained from first attempts with Kaixincichang.

   d) Assist participants with task analysis using Kaixincichang's level-based mechanism to make specific, measurable, achievable, relevant, time bound, engaging and rewarding (SMARTER) goals (Les MacLeod, 2012).

   2) Action:

   a) Introduce participants to Zimmerman and Moylan's (2009) SRL forethought phase strategies, focusing on task analysis, breaking down the CET-6 words list into manageable parts to improve clarity and self-motivation strategies, sharing mastery experiences, discussing task values, setting goals and discussing outcome expectations.

   b) Utilize Kaixincichang's level-based mechanism to scaffold goal setting. Participants set practical weekly goals (for example completing specific levels or learning a target number of words) aligned with the app's structure.

c) Encourage participants to record their commitments and utilized strategies in learning diaries to monitor their learning journey.

d) Provide tailored guidance and encouragement for those with further questions and concerns about task analysis.

3) Reflection:

Group and individual reflections were explored, and feedback was gathered to identify areas for further scaffolding and adjustments in goal setting for the next cycle.

a) Participants' experiences with task analysis and how breaking tasks into smaller, clearer goals impacted their learning journey.

b) Participants' experiences of Kaixincichang's structured learning process and how level-based mechanisms and rewards influenced their learning journey.

2. Cycle 2: addressing problems in goal commitment with performance strategies and Kaixincichang's level passing mode

1) Plan:

a) Identity participants' problems in their goal commitment of Cycle 1, focusing on self-control and self-monitoring.

b) Identify participants' problems in following Kaixincichang's structured learning process and spaced review for new words learning and retention in Cycle 1.

c) Draw on Zimmerman and Moylan's (2009) SRL performance phase strategies to address their challenges; for example, using time management to manage tight schedules.

d) Utilize Kaixincichang's level-passing mode to enhance participants' engagement and persistence; for example, making full use of varied drills to enhance cognitive engagement of new words learning.

2) Action:

a) Emphasizing key points of making SMARTER goals and strategic plans.

b) Introduce participants to Zimmerman and Moylan's (2009) SRL performance phase strategies focusing on self-monitor and self-control strategies to ensure the progress and quality of their vocabulary learning in Cycle 2.

c) Further training on effective use of Kaixincichang's varied drills and spaced review to support their new words learning and retention.

d) Encourage participants to keep a record of their progress level and commitment strategies in the process.

e) The researcher provided encouragement and celebrated small milestones to reinforce positive behaviour.

3) Reflection:

Group and individual reflections were explored, and feedback was gathered to identify areas for further scaffolding and adjustment in goal commitment for the next cycle.

a) How self-control strategies helped participants stay committed to their plans.
b) The effectiveness of self-monitoring and immediate feedback in identifying progress and areas needing improvement.
c) How Kaixincichang's varied drills and level passing mode influenced their commitment to their plans.

3. Cycle 3: addressing problems in maintaining vocabulary growth and knowledge quality with self-evaluation, self-reaction strategies and player versus player challenge (PK)

1) Plan:

a) Identify participants' problems in their knowledge quality maintenance in Cycle 2, examining their self-evaluation and self-reaction.
b) Identify participants' problems in their vocabulary growth in Cycle 2, examining varied drills and spaced review of Kaixincichang.
c) Draw on Zimmerman and Moylan's (2009) SRL self-reflection strategies to prompt participants to evaluate their vocabulary growth and knowledge quality to promote consistent and better performance in the future.
d) Further training on Kaixincichang's PK feature, where participants compete with peers in vocabulary tasks to enhance engagement and foster motivation for consistent practice.

2) Act:

a) Emphasizing key points of self-control and self-monitoring strategies for consistent commitment.
b) Introduce participants to Zimmerman and Moylan's (2009) SRL self-evaluation strategies focusing on assessing their learning outcomes against their goals and identifying strengths and weaknesses and retention of vocabulary meaning, pronunciation, and usage.
c) Further training on integrating the PK feature where participants compete with peers in varied vocabulary tasks as developmental evaluation to identify their strengths and weaknesses of vocabulary knowledge retention.
d) Introduce participants to Zimmerman and Moylan's (2009) SRL self-reaction strategies, focusing on self-satisfaction and making adaptive decisions to improve performance in subsequent tasks.
e) The researcher facilitated discussions on self-reaction strategies, helping participants identity their strengths and develop plans to address areas of weakness.

3) Reflect:

Group and individual reflections were explored, and feedback was gathered to identify areas for further scaffolding and adjustment in goal commitment for the next cycle.

a) How self-evaluation influenced participants' awareness of their knowledge quality and persistence.

b) The role of self-reaction in helping participants adjust strategies and sustain engagement.
c) The impact of the PK feature on participants' motivation and learning outcomes, including improvements in retention and application.

4. Phase 4: Independent self-regulated vocabulary learning with Kaixincichang

This phase marked the final week of participants joining the research project, during which they independently applied the SRL strategies they had developed while continuing to engage with the MGBVL app Kaixincichang. App logs and weekly meetings were conducted as usual to conclude the project. One month later, a follow-up was conducted to assess the transferability and sustainability of SRL strategies without external support.

1) Purpose:

a) To evaluate the transferability and sustainability of SRL strategies participants had developed during the previous three cycles.
b) To observe participants' ability to independently manage their vocabulary learning using Kaixincichang.

2) Implementation：

a) Participants engaged with Kaixincichang autonomously, managing their learning goals, monitoring progress, and evaluating outcomes without guidance from the researcher.
b) Kaixincichang's game-based features (such as level progression, varied drills, PK mode) continued to serve as tools for motivation and engagement.
c) One month later, participants were contacted to gather insights into their independent vocabulary learning experiences with Kaixincichang after the study.

This phase concluded the study by observing participants' SRL behaviour in a fully independent context and evaluating their ability to sustain vocabulary learning practices with Kaixincichang after the scaffolding was removed. The one-month follow-up provided additional insights into the long-term transferability and sustainability of SRL strategies and the role of Kaixincichang in supporting autonomous learning.

4.5 Data collection and analysis

4.5.1 Overview

Data collection is crucial for answering the research questions and ensuring the reliability and quality of this study. To ensure a comprehensive understanding of the participants and their learning contexts, data were collected using multiple methods and sources, allowing for data triangulation to validate the findings (Cohen et al., 2017; McNiff, 2013, 2017).

Guided by action research principles and informed by previous studies, this research employed three primary data collection instruments: questionnaires, documents (such as software logs and learning diaries), and individual and cycle interviews (Cohen et al., 2017; Creswell, 2012; Efron & Ravid, 2019). Due to COVID-19 restrictions, all data were collected remotely using stable online tools suggested by Lobe et al. (2020).

The selection of data collection instruments was based on "what I should see" about the participants' vocabulary learning journey; for example, the learning outcome and "what I should know" about their learning experience; for example, their motivation (Burns, 2009, p. 56).

1. **Observation tools:** Due to COVID-19 lockdowns, direct observation of participants was not feasible. As a result, alternative data collection methods such as software logs and learning diaries were employed to effectively capture participants' learning processes and perceptions (Burns, 2009; Lobe et al., 2020; McNiff, 2017). What were used to "see" what actually happened during the participants' vocabulary learning activities were screenshots of Kaixincichang app logs, and the researcher's field notes (Burns, 2009, p. 74).
2. **Non-observation tools:** The instruments employed to provide insights into how participants "think, believe, and perceive" were learning diaries and group interviews (Burns, 2009, p. 74).

The following table summarizes the research questions and the corresponding data collection methods employed:

Research Questions	Data Collection Methods
How do game elements promote vocabulary learning outcomes?	Group interviews, software logs, learning diaries, and researcher field notes.
How do SRL strategies promote vocabulary learning outcomes?	Group interviews, software logs, learning diaries, and researcher field notes.
How do game elements enhance vocabulary learning motivation?	Group interviews, learning diaries, and researcher field notes.
How do SRL strategies enhance vocabulary learning persistence?	Group interviews, software logs, learning diaries, and researcher field notes.

How do game elements enhance vocabulary learning persistence?	Group interviews, software logs, learning diaries, and researcher field notes.
How do SRL strategies enhance vocabulary learning self-efficacy?	Group interviews, learning diaries, and researcher field notes.
How do game elements enhance vocabulary learning self-efficacy?	Group interviews, learning diaries, and researcher field notes.

It should be noted that pre- and post-tests were not independently administered to measure vocabulary gains. All participants had recently failed the CET-6 exam prior to the study and were scheduled to take the next CET-6 exam immediately following the one-month follow-up phase of the research. These two official CET-6 exams can therefore serve as pre- and post-test benchmarks for participants' vocabulary development.

Data collection was conducted systematically, critically, and reflectively, following specific principles for observation and non-observation methods (Burns, 2009):

1. **Implementation of Principles for Observational Methods:**

Although direct observation of participants was not feasible due to COVID-19 lockdowns, the principles of observation were adapted to the virtual context:

1) **Comprehensive observation:** Screenshots of every day learning dashboards, learning history and researcher field notes were collected to gain a full understanding of the participants' learning engagement with Kaixincichang.
2) **Open-minded approach:** The data collection did not focus on specific expected outcomes; rather, it aimed to capture a wide range of participant behaviour and interactions with the app to identify unexpected patterns or insights.
3) **Focused and objective Observation:** The researcher maintained an objective stance, carefully reviewing screenshots and field notes to ensure accurate interpretations without personal bias.
4) **Meticulous recording:** Field notes were taken during each online session to systematically document observations, ensuring that all relevant data were captured and retained for analysis.

2. **Implementation of Principles for Non-Observational Methods:**

When using non-observational methods such as interviews and questionnaires, the following principles were carefully implemented:

1) **Clear Communication:** Before each interview, participants were briefed on the purpose of the interview, the importance of their input, and how their responses would be used in the research. This ensured transparency and helped participants feel comfortable about sharing their thoughts.
2) **Active Listening and Sensitivity:** During interviews, the researcher actively listened without interrupting, providing a supportive environment that encouraged participants to speak freely about their vocabulary learning experiences and perceptions.
3) **Probing and Clarification:** Probing strategies were employed to delve deeper into participants' responses, clarifying any ambiguities and encouraging detailed answers. This approach helped to capture rich, nuanced data on participants' experiences with Kaixincichang.
4) **Reinforcement and Feedback:** The researcher provided positive reinforcement and feedback during interviews, acknowledging participants' contributions to encourage openness and honesty.

4.5.2 Questionnaire

Questionnaires are a quick and efficient way of gathering responses to a series of questions and are particularly useful when working with large samples (Cohen et al., 2017). They are a popular and important tool in educational research for collecting data on participants' attitudes, behaviour and experiences (Cohen et al., 2017; Creswell, 2012). However, in action research, especially when conducted with small groups, the use of questionnaires needs to be carefully justified and applied (McNiff, 2013). In this research, conducted in cycles with small participant groups, questionnaires were employed selectively to collect specific types of data that aligned with the research objectives.

1. Purpose and Design of Questionnaires

Three questionnaires were utilized in this study, each serving a distinct purpose. They were:

1) **Participant Demographics Questionnaire**: The first questionnaire was designed to gather basic demographic information from the participants such as name, gender, age, major, year of study, university, and their most recent CET-6 score. This information was used to create a comprehensive participant profile and ensure a diverse sample. The questionnaire was formatted as an online form and distributed at the beginning of the research. Its primary function was to establish a baseline understanding of participant demographics, which was crucial for analyzing the effectiveness of the SRL strategies and the use of the Kaixincichang app.
2) **Vocabulary learning goals questionnaire**: The second questionnaire (see Appendix A) aimed to collect data on participants' vocabulary learning goals. It was adapted from the Learning Goals Worksheet published by the Department of Education in the state of Victoria (Victoria, 2022) with input from my supervisors to ensure its relevance to the research context. It was distributed online at the end of each week and asked participants to outline their weekly,

monthly, and quarterly vocabulary learning goals, as well as the strategies they planned to use to achieve them. The purpose of this questionnaire was to encourage participants to actively engage in goal setting, a key component of SRL, and to provide data on their evolving learning objectives.

3) **Learning diary questionnaire**: The third questionnaire served as a learning diary, also adapted from the Learning Goals Worksheet by the Department of Education of Victoria (Victoria, 2022). It was designed to be completed daily or weekly by participants, recording their vocabulary learning achievements, the percentage of their daily learning plan completed, their self-evaluation of vocabulary mastery, and the strategies they employed during the learning process. This tool not only facilitated participant self-reflection but also provided rich, qualitative data on their learning experiences and the effectiveness of the strategies introduced in the study.

2. Implementation and Administration

All three questionnaires were administered online, consistent with the "socially distant" research approach necessitated by the COVID-19 pandemic (Lobe et al., 2020). The online distribution ensured ease of access for all participants and allowed the efficient collection of data across different locations. Participants were provided with clear instructions on how to complete each questionnaire. Their consent was obtained beforehand, as discussed later in this chapter, ensuring ethical compliance and the voluntary nature of participation.

3. Justification for Using Questionnaires

Given the small sample size typical of action research, the use of questionnaires in this study was carefully considered and justified. According to McNiff (2013), questionnaires can be an effective tool in action research with small participant groups when necessary, to complement other data collection methods. In this study, the questionnaires were used not only to gather baseline demographic information but also to support the continuous monitoring of participants' goal setting and self-reflection practices. The data obtained from these questionnaires provided valuable insights into the participants' progress and the impact of the learning interventions.

4.5.3 Interviews

Interviews play a central role in qualitative research, emphasizing human interaction and fostering meaningful, authentic dialogue between the researcher and participants (Fontana & Frey, 2005; Kvale, 1996). In educational research, interviews are widely used to explore participants' experiences and

perceptions, particularly in game-based learning environments, aligning with the social constructionist epistemology of this study (Cohen et al., 2017; Creswell, 2020; Lobe et al., 2020; Xu, 2020).

In this action research study, interviews served as a critical tool for tracing participants' actions and capturing their descriptions and perceptions of their learning experiences in game-based learning environments (Cohen et al., 2017; Ebbutt, 1985; Efron & Ravid, 2019). Two types of interviews were employed: informal conversational interviews and guided interviews, following Patton's (1980) categorization.

1. Purpose of the interviews

The primary purpose of the interviews was to gain in-depth insights into participants' learning experiences, their interactions with the game-based learning environment (Kaixincichang), and their perceptions of SRL strategies. They provided qualitative data that complemented the quantitative data collected through questionnaires and software logs, offering a comprehensive understanding of the research questions.

2. Types of Interviews Conducted

1) **Informal conversational interviews**: Informal conversational interviews were conducted spontaneously in natural contexts, often during task follow-ups or discussions in the online WeChat chat group. This approach allowed questions to emerge organically from the context, enhancing the relevance and salience of the conversation (Patton, 1980, p. 206). These interviews had no predetermined questions, enabling a fluid dialogue where both participants and the researcher could raise topics of immediate interest or concern.
2) **Guided interviews**: Guided interviews were more structured with predetermined topics or issues outlined beforehand, though the sequence and form of questions remained flexible (Cohen et al., 2017, p. 510; Patton, 1980, p. 206). These interviews were conducted after participants used the game-based learning environment and again at the end of the project. The immediate post-usage interviews aimed to capture participants' observations and perceptions while their experiences were still fresh, thereby enhancing the validity of their responses (Cohen et al., 2017; Creswell, 2012, 2020). The end-of-project interviews sought to gain an overall understanding and evaluation of their EFL learning experiences and the effectiveness of the game-based environment.

Both individual and group interviews were used in the guided interview format. Individual interviews provided a private setting for more personal reflections, particularly with quieter participants. In contrast, group interviews were conducted with participants from the same active online chat groups,

leveraging group dynamics to elicit richer data. Group interviews were especially valuable when participants were cooperative and had similar experiences, as they could build on each other's responses (Creswell, 2020, p. 218).

3. Development of interview questions

The interview questions were developed based on prior research on language learning in game-based learning environments (Chen et al., 2020; Görgen et al., 2020; Haerazi & Irawan, 2020; Hwang et al., 2015; Kasim & Raisha, 2017; Komala & Rifai, 2021; Lai & Wen, 2012; Liu, 2009; Murotova et al., 2020; Thorne, 2008). They focused on participants' EFL vocabulary learning experiences, their use of Kaixincichang, and their evaluation of their learning outcomes. A sample question was:

- "Can you please describe your vocabulary learning experience over the past week?"

These questions were designed to be open-ended to encourage detailed, reflective responses from participants.

4. Interview process

All interviews were conducted online using Tencent Meeting, a videoconferencing software, due to COVID-19 restrictions. The interviews conducted immediately after using a specific game-based learning environment occurred once or twice per environment and lasted approximately 15 minutes. The end-of-project interviews were also conducted once or twice, depending on the group dynamics and specific needs of each group.

To ensure participants fully understood the questions and could express themselves freely, accurately, and precisely, all interviews were conducted in Mandarin, their first language. The transcripts were then translated and back-translated by professional translators to maintain the validity of the data.

5. Data analysis of interview responses

The interview data were analyzed using thematic analysis, a method that identifies key themes and patterns related to the research questions. Transcripts were thoroughly reviewed, and responses were coded to extract significant themes related to participants' experiences with the GBVL app and their SRL strategies. The process followed the procedures proposed by Braun and Clarke (2021). The qualitative findings were integrated with quantitative data from questionnaires and software logs to provide a holistic understanding of the participants' learning processes and outcomes.

4.5.4 App logs

In this research, logs from the Kaixincichang app were utilized as a key data source to objectively track participants' daily vocabulary learning progress, time spent on learning activities, and overall learning outcomes. These logs served as a type of private document, providing a detailed and unbiased record of their engagement and performance in EFL tasks within the game-based learning environment (McNiff, 2013, 2017).

1. Purpose of collecting logs

The primary purpose of collecting logs from Kaixincichang was to obtain objective, quantitative data on participants' learning behaviour and outcomes. They helped to measure participants' engagement levels, consistency in vocabulary learning, and progress over time. By analyzing this data, the research aimed to evaluate the effectiveness of the game-based learning environment and the SRL strategies employed by participants.

2. Description of the logs

The logs collected from Kaixincichang included several key metrics:

- **Daily Progress on Vocabulary Learning:** The number of new words learned, reviewed, or mastered each day, providing insights into participants' daily learning activities and vocabulary acquisition rates.
- **Time Spent on Learning Activities:** The total amount of time participants dedicated to vocabulary learning each day, reflecting their commitment and engagement with the app.
- **Overall Learning Outcomes:** Cumulative data on the total number of words learned, mastery levels achieved, and the completion of various learning tasks and challenges within the app.

These metrics provided a comprehensive overview of each participant's learning journey, allowing for an objective assessment of their progress and engagement.

3. Data Collection Process

Logs from Kaixincichang were collected weekly to ensure consistent and systematic tracking of participants' learning activities. The app's built-in reporting features generated detailed reports for each participant, summarizing their performance across different tasks and the amount of learning achieved during the week. These weekly reports were then compiled and analyzed to identify trends, patterns, and variations in participants' engagement and learning outcomes.

4. Integration with other data sources

The data obtained from Kaixincichang logs were integrated with other data sources, such as learning diaries, and interviews, to provide a comprehensive understanding of participants' experiences and learning processes. This triangulation of data sources enhanced the validity of the research findings by corroborating self-reported data with objective, app-generated metrics.

5. Ethical considerations

Given that the logs from Kaixincichang contained sensitive information about participants' learning behaviour and performance, strict ethical guidelines were followed to ensure data confidentiality and privacy. Participants were fully informed about the nature of the data being collected, its purpose, and how it would be used in the research. All logs were securely stored, as discussed later in the chapter, and any identifying information was anonymized to protect participants' identities.

4.5.5 Researcher field notes

Researcher's field notes, considered private documents, were an essential data collection method in this study. They were used to track the researcher's evolving actions and perceptions regarding situations and participants across different research cycles (McNiff, 2013). Field notes are vital records in qualitative research; they include summaries, observations, jottings, and reflections that capture the research context and critical aspects of the action research process (Cohen et al., 2017; McNiff, 2013; Mulhall, 2003).

1. Purpose of field notes

The primary purpose of collecting researcher field notes was to document their observations and reflections throughout the study. These notes provided insights into the dynamic nature of the research environment and the participants' experiences, allowing for a deeper understanding of the contextual factors influencing the study. They also served as a reflective tool for the researcher, capturing their thoughts on the development, evaluation, and refinement of the research actions and strategies over time.

2. Content of field notes

The field notes included:

1) **Online observations:** Given the "socially distant" method necessitated by COVID-19 restrictions, field notes were based on the researcher's observations of participants' online

behaviour and interactions. For example, notes on how the local COVID-19 lockdown situation affected participants were recorded to understand the external factors influencing their engagement and learning journeys.

2) **Researcher reflections:** The notes also contained narratives detailing the researcher's actions, decisions, and reflections. These reflections provided a critical perspective on the development of the research, highlighting changes in the researcher's approach and understanding as the study progressed.

3. Role of field notes in action research

In action research, field notes are crucial for documenting the cyclical process of action, observation, evaluation, and reflection. They help the researcher maintain a detailed account of the context and changes within the study, ensuring that the research remains grounded in the participants' lived experiences. The field notes in this study captured the iterative nature of the research process, demonstrating how the researcher adapted their actions based on ongoing observations and reflections (McNiff, 2017).

4. Integration with other data sources

The insights derived from the researcher's field notes were integrated with other data sources such as participant interviews, questionnaires, and app logs from Kaixincichang to provide a comprehensive understanding of the research outcomes. This integration helped triangulate findings, enhancing the validity and reliability of the research by corroborating observational data with self-reported and app-generated data.

5. Ethical considerations

Since field notes often contain sensitive observations and reflections, ethical considerations were carefully addressed to ensure confidentiality and respect for participants' privacy. The researcher was mindful of maintaining objectivity and avoiding bias in their notes, and all personal identifiers were anonymized to protect participant identity.

4.5.6 Data analysis

The data analysis for this research was designed to provide a comprehensive understanding of the participants' learning journey, focusing on changes in their vocabulary learning outcomes, motivation, and self-efficacy over time. Given the diverse background and learning experiences of the five participants who engaged in this action research over four cycles, the analysis aimed to capture both the collective trends and the unique trajectories of each learner.

1. Approach to data analysis

A mixed methods approach was employed to analyze the data, integrating both quantitative and qualitative techniques to achieve a holistic understanding of the research questions (Creswell, 2020; Sharma & Giannakos, 2020). This enabled the exploration of both measurable changes in learning outcomes and nuanced shifts in participants' motivation and self-efficacy, as well as capturing the distinct learning experiences of each participant.

2. Types of data analysed

The analysis focused on multiple types of data collected over the course of the study, including:

1) **Quantitative data**: Data collected from questionnaires, app usage logs from Kaixincichang, and weekly reports provided quantitative measures of participants' engagement, vocabulary learning progress, and overall learning outcomes. These data were analysed to identify trends, patterns, and changes in learning behaviour over the four cycles and the follow-up periods (one month and two months later).
2) **Qualitative data**: Data from semi-structured interviews, learning diaries, and researcher field notes provided qualitative insights into participants' experiences, perceptions, and self-reflections. These data were analysed thematically to identify changes in motivation and self-efficacy, as well as to explore the individual learning journeys of each participant.

3. Quantitative data analysis

Quantitative data were analysed using descriptive statistics and trend analysis to assess changes in learning outcomes over time. Measures such as vocabulary retention rates, time spent on learning activities, and app engagement levels were calculated to identify patterns of sustained learning or decline. Comparative analysis was also conducted to examine changes in participants' motivation and self-efficacy scores across different time points.

4. Qualitative data analysis

Qualitative data were analysed using thematic and longitudinal analysis to capture the evolving nature of participants' motivation and self-efficacy throughout the study. Thematic analysis was employed to code the data and identify key themes related to learning experiences, while a longitudinal approach was used to track these themes over the four cycles and follow-up periods. This dual approach allowed for a deeper understanding of both group-level trends and individual participant journeys.

5. Individual learning journeys

Recognizing that each participant was a unique learner with a distinct background, motivation, and challenges, the analysis also focused on their individual learning journey. A case study approach was used to provide a detailed narrative of each participant's progress, highlighting how their vocabulary learning outcomes, motivation, and self-efficacy evolved throughout the research (Creswell, 2020). This approach supported personalized analysis which helped to contextualize the broader findings, offering insights into the diverse ways in which different learners engage with game-based learning environments and SRL strategies.

6. Integration of data

To ensure a comprehensive analysis, the quantitative and qualitative findings were integrated through data triangulation. This process involved comparing trends in quantitative data with themes identified in qualitative data, allowing for a richer interpretation of the results and providing a more nuanced understanding of the factors influencing participants' learning outcomes, motivation, and self-efficacy.

7. Ethical considerations

Throughout the data analysis process, ethical considerations were prioritized to maintain confidentiality and respect for participants' privacy. All data were anonymized, securely stored, and handled in accordance with ethical guidelines to ensure the integrity of the research.

8. Conclusion

The mixed methods approach to data analysis provided a thorough exploration of the participants' learning journeys, capturing both quantitative changes in learning outcomes and qualitative shifts in motivation and self-efficacy. By focusing on both collective trends and individual experiences, the analysis offers valuable insights into the effectiveness of game-based learning environments and SRL strategies in fostering sustainable vocabulary learning among diverse learners.

4.6 Ethical considerations

This action research was conducted with human participants and adhered strictly to the ethical framework established by the Human Research Ethics Committee of Victoria University. The research was designed to respect and protect the rights of all participants, ensuring ethical integrity throughout the study.

As a "socially distant" study conducted entirely online, this research shared many fundamental ethical considerations with face-to-face studies, albeit with some notable differences. The common ethical concerns included ensuring anonymity and pseudonymity, assessing risks and benefits to participants,

balancing risks and benefits for the social good, considering subject compensation, ensuring justice, and addressing cross-cultural issues (Anderson & Corneli, 2017; Ess & af Segerstad, 2019; Lobe et al., 2020). However, conducting the study online introduced unique challenges in obtaining informed consent, protecting participant privacy, and ensuring data confidentiality and security (Lobe et al., 2020).

1. Fundamental Ethical Steps

The following steps were implemented to ensure that ethical standards were met, consistent with those required in face-to-face research (Ess & af Segerstad, 2019; Lobe et al., 2020):

1) **Informing Participants**: Participants were thoroughly informed about the research procedures, purpose, and significance of the study. This included detailed explanations of the research goals, the methods involved, and the expected duration of their participation.
2) **Clarifying Roles and Responsibilities**: Participants were made aware of their roles within the research, the potential benefits they might receive, and their responsibilities. This was crucial in ensuring that participants fully understood what was expected of them and what they could gain from their involvement.
3) **Ensuring Awareness of Rights**: Participants were clearly informed of their rights, including the right to withdraw from the study at any time without any penalty. Their right to ask questions and receive comprehensive answers was also emphasized.
4) **Guaranteeing Privacy and Confidentiality**: The privacy of participants' involvement was guaranteed, and measures were taken to ensure the confidentiality and security of their data. This involved clarifying how data would be stored, used, and who would have access to it.

2. Additional Ethical Considerations for Online Research

Given the online nature of the study, the following additional ethical considerations were implemented to address the unique challenges of remote research (Anderson & Corneli, 2017; Ess & af Segerstad, 2019; Lobe et al., 2020):

1) **Electronic Consent**: Informed consent was obtained electronically, with participants signing consent forms via PDF using electronic signatures. This approach ensured that they could provide informed consent conveniently, despite the physical distancing measures in place.
2) **Anonymity through Pseudonyms**: To maintain anonymity, participants were allowed to use pseudonyms when signing consent forms and throughout the research. This helped to further protect their identities, especially in online settings where digital traces could potentially compromise confidentiality.

3) **Use of Pseudonyms Across Platforms**: Pseudonyms were consistently used across all online platforms employed in the research, including WeChat, Tencent Meeting, Kaixincichang. This approach ensured uniformity in protecting participants' identities across different digital environments.
4) **Privacy in Digital Spaces**: Recognizing that some participants might be sharing living spaces, such as dorm rooms, during lockdowns the research allowed them to use virtual backgrounds or turn off their video during online meetings or interviews. This measure ensured that participants could maintain their privacy while participating in the study.
5) **Restrictions on Recordings**: To further protect participant privacy, no recordings of participants were permitted during group meetings or group interviews. This policy ensured that they felt comfortable sharing their experiences without concerns about being recorded.

3. Data Security and Management

The confidentiality and security of all collected data were paramount. Digital data, including interview transcripts, questionnaire responses, and app usage logs, were securely stored on encrypted, password-protected devices and cloud storage services. Access to this data was restricted to the researcher and supervisors directly involved in the study, ensuring that participant information remained confidential and secure at all times.

4. Conclusion

By adhering to these ethical considerations, the research was able to maintain a high standard of ethical integrity, ensuring that participants' rights, privacy, and well-being were fully respected throughout the study. These measures not only protected the participants but also enhanced the credibility and validity of the research findings.

Chapter 5 Cycle 1: Actions and Findings at the Beginning

This chapter examines the impact of SRL strategies and the GBVL)app Kaixincichang during the first cycle of action research. Cycle 1 focused on scaffolding five university students with task analysis and self-motivation strategies while familiarizing them with Kaixincichang's structured learning features as they began learning the required words for the CET-6, which they had recently failed.

The chapter begins with a brief overview of the participants and their vocabulary learning challenges. It then details the actions taken in Cycle 1 and analyses participants' responses in four key areas: vocabulary growth, motivation, persistence, and self-efficacy, providing insights into how SRL strategies and the GBVL app influenced their initial learning experience.

5.1 Introduction

1. Context

Cycle 1 commenced in March 2022, at which time all participants resided and studied on their respective campuses. Two weeks into the project, participants transitioned to taking all lessons online from their dormitories. This shift aligned with the emergence of new COVID-19 cases and was consistent with the emergency response plan that had been articulated at the start of the semester (China, 2022; Commission, 2022, p. 303). The following photo shows a student studying online in his dorm (Wang (2022).

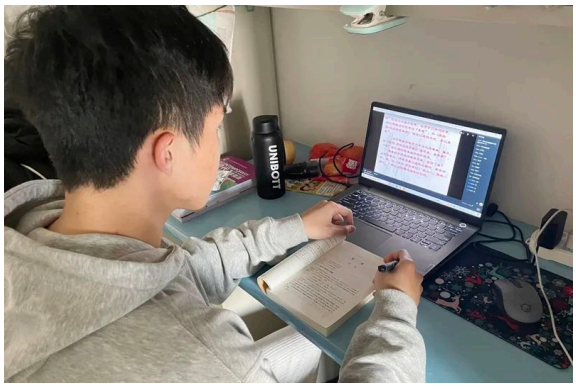

Figure 5.1-1 Picture of Learning at a Dorm

2. Participants' brief

This research had five participants from the same university located in the northern part of China, with mixed genders, different level of EFL proficiency and different majors. Further details are listed in Table 5.1-1 below. They had all just failed the CET-6 and believed their limited vocabulary range contributed to their poor result. They planned to pass the next test which was in four months' time.

Table 5.1-1 Participant Demographic Information

Participant ID	Name	Age	Gender	English proficiency (before)	Year of university	Major
1	Alex	23	Male	Intermediate	Senior	Medicine
2	Fay	23	Female	Intermediate	Senior	Medicine
3	Daisy	22	Female	Low intermediate	Third year	Laboratory Medicine
4	Dawn	21	Female	High intermediate	Third year	Medical Imageology
5	Elizabeth	21	Female	Low intermediate	Third year	Nursing

Note: this table includes the following information.

1) Participant ID: a unique identifier for each of the participants in this research.
2) Name: the pseudonym for this research to set up their identity.
3) Age: the age of each participant when they joined the program.
4) Gender: the gender of each student.
5) English proficiency (before): each participant's English proficiency level before joining the program.
6) Year at university: each participant's year at university when he or she joined the program.
7) Major: the major of each participant.

3. CET-6 Vocabulary Problem Specification and Cause Identification

Problem specification

To identify participants' CET-6 vocabulary challenges, an interview was conducted once they had agreed to participate in the research. The findings revealed two common issues: a limited EFL vocabulary and low vocabulary depth. Vocabulary size refers to the number of words learners can recognize and attach meaning to, while vocabulary depth involves the quality of knowledge about words including forms, contextual use, and connections with other words (Milton, 2009, p. 71).

Regarding receptive knowledge for CET-6 reading and listening, participants reported difficulties such as “阅读里面很多次我不认识” (“many words I don’t know in reading”) and “听力里面也有很多（词）不认识” (“many (words) I didn’t recognize by listening.”) This indicated inadequate vocabulary breadth and poor vocabulary depth, affecting their ability to recognize words aurally or in context.

For productive knowledge in CET-6 translation, participants commonly struggled with translating words into English and spelling them correctly. For example, Participant 2 admitted, “I don’t even know how to translate “第二大道” (“the second avenue”) into English.” Similar issues were observed in CET-6 writing, with participants stating that they lacked the vocabulary to express ideas or struggled with spelling. These challenges highlighted insufficient vocabulary size and poor vocabulary quality.

Cause identification

1) **Limited vocabulary input**: Some participants reported insufficient CET-6-focused vocabulary input in their prior learning. Participant 3 shared, “我们平常记单词不多，英语老师也不检查” (“We don’t memorize many words in daily study, and our English teacher doesn’t check vocabulary”). Participant 4 noted, “我主要是从错题里面学习单词” (“I mainly learn vocabulary from the mistakes I make in practice questions”).
   Limited input indicated a lack of structured exposure to CET-6 vocabulary. This gap restricted learners' ability to build both vocabulary breadth and depth.

2) **Poor persistence**: Interrupted learning and a lack of persistence were recurring themes. Fay explained, “我从来没有学完过六级单词” (“I never finished learning the (required) vocabulary”,) while Alex mentioned inconsistent use of a vocabulary learning app stating “我背的时断时续的吧” (“My memorization was quite on-and-off”). Both participants failed to maintain a strategic approach, resulting in limited progress.
   The lack of persistence highlighted the need for motivational support and structured learning plans. Without consistent practice, vocabulary learning becomes fragmented, reducing the long-term retention and application of new words.

3) **Poor review practices**: Inadequate review of learned words emerged as a significant reason for their poor retention of vocabulary knowledge. Fay admitted, “我复习的不及时，所以单词记得不太好” (“My review was not timely, so I didn’t retain the words well”). Dawn also mentioned failing to consolidate vocabulary through effective review methods, saying “我记了单词但是没有常复习，所以效果不好” (“I memorized words but didn’t review them often, so it didn’t work well.”)

The absence of timely and repeated reviews reflected ineffective learning strategies. Regular review is critical for reinforcing memory, especially for advanced vocabulary, and its absence can result in rapid forgetting and poor retrieval in practical contexts.

4) **Poor context understanding**: Some participants struggled to understand words in context. Elizabeth explained "有的词感觉记住了感觉把意思放进去很别扭" ("For some words, I feel I've memorized them, but they seem awkward when placed in context.") Fay and Dawn also noted "有时候记住的意思不是句子里（单词的）意思" ("Sometimes the meaning I remember isn't the meaning the word has in the sentence.")

   The inability to apply vocabulary in context suggested a lack of exposure to diversified and authentic language use. Without contextual practice, learners may struggle to integrate words into meaningful communication, reducing the practical utility of their vocabulary.

5) **Lack of oral practice**: All participants reported seldom reading words out loud, preferring to memorize them by writing or silent reading. Alex noted "我很少读出单词，就写写或者默读" ("I rarely read words out loud; I just write them down or read silently,") and Daisy also noted "背单词的时候我基本上不会读出来" ("When memorizing words, I basically never say them out loud.") This lack of oral practice may have limited their ability to internalize word pronunciation and usage.

   The lack of oral practice limited learners' ability to develop accurate pronunciation and auditory recognition. This gap can hinder their listening and speaking skills, making it difficult to fully internalize vocabulary for effective use.

6) **Low motivation and passive attitude**: A lack of motivation was evident in some participants. Daisy admitted "我不喜欢背单词，也没怎么学六级词汇" ("I don't like memorizing words and haven't really studied CET-6 vocabulary.") Dawn stated "每天学了一些但是没多大兴趣" ("I studied some words daily but wasn't very interested.")

   Thus, low motivation and passive attitudes were significant barriers to sustained vocabulary learning. This suggested the need for interventions that make learning more engaging and rewarding, such as integrating gamified or interactive elements to boost intrinsic and extrinsic motivation.

The participants faced six main challenges in learning CET-6 vocabulary: limited input, poor persistence, inadequate review practices, and difficulties with context understanding, lack of oral practice, and low motivation. These issues highlighted the need for structured and engaging strategies

to address gaps in vocabulary learning breadth, depth, and application. The following sections present an analysis of Cycle one, focusing on the actions taken and participants' responses during this phase.

5.2 Cycle One: scaffolding forethought phase

Cycle 1 aimed to introduce participants to the Kaixincichang app and scaffold their understanding and application of the forethought phase of SRL strategies, based on the Zimmerman and Moylan (2009) model. This phase focused on motivating and then equipping them with tools and strategies for effective planning and goal setting in vocabulary learning.

5.2.1 Actions: energize and equip participants

Cycle 1 incorporated both self-motivation and task analysis (goal-setting and planning) strategies and guided participants though Kaixincichang to analyze CET-6 words learning task.

1) **Training on the Kaixincichang app**: Participants attended an online session via Tencent Meeting where they were introduced to the Kaixincichang app. The training included:
    - **Navigation and features**: A walkthrough of the app's key features, such as vocabulary drills, progress tracking, and gamified elements like rewards for task completion.
    - **Practice session**: Participants were guided through a mock learning session to explore how to effectively use spelling exercises, meaning-matching tasks, and sentence usage features.
    - **Q&A support**: Time was allocated for participants to ask questions and resolve any technical issues with the app.
2) **Enhancing self-motivation:** To build self-efficacy and intrinsic motivation, the following activities were conducted:
    - **Mastery experience**: Participants were encouraged to share one of their successful experiences of vocabulary learning.
    - **Relevance discussion**: Participants discussed the importance of CET-6 vocabulary for academic success and future opportunities, helping them to see the value in their efforts.
    - **Positive reinforcement**: Regular feedback and encouragement were provided via WeChat during the week to sustain participants' motivation.
3) **Scaffolding goal-setting and planning**: Participants were trained in creating SMART (Specific, Measurable, Achievable, Relevant, Time-bound) goals informed by Les MacLeod (2012) for their vocabulary learning. These included:

- **Weekly objective setting**: Examples of setting achievable weekly goals, such as learning 50 words and reviewing them daily.
- **Daily planning**: Practical guidance on allocating specific times for vocabulary practice and prioritizing challenging words.
- **Progress tracking**: Participants were encouraged to monitor their progress using the app's dashboard, thus fostering accountability.

4) **Monitoring and support**: Throughout the week participants received:

- **Daily reminders**: Notifications sent via group chat to encourage consistent practice and remind participants of their goals.
- **Progress check-ins**: Facilitators checked in with each participant to address any challenges, such as technical difficulties or dips in motivation.

5.2.2 Journey exploration: vocabulary growth, motivation, persistence, self-efficacy

The following bar chart provides an overview of all participants' vocabulary growth in Cycle 1. Nearly all of them fell short of their planned number of words, except for Fay who had made the most modest plan. Alex made the most ambitious plan and achieved the most.

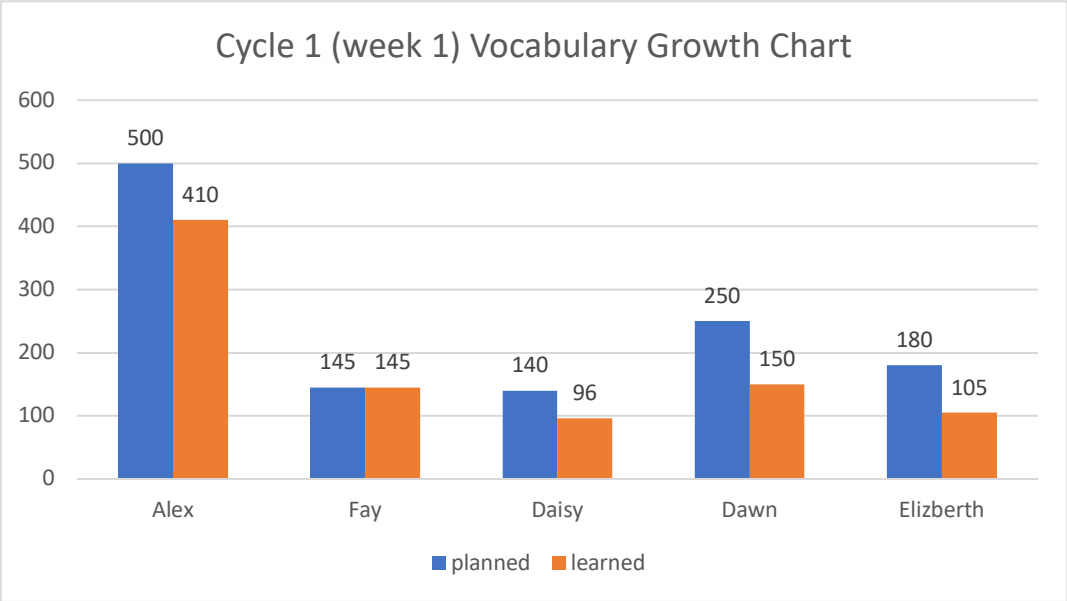

Figure 5.2-1 Cycle 1 Vocabulary Growth Chart

The next section presents a detailed analysis of each participant's learning journey during Cycle 1, focusing on four key aspects: vocabulary growth, motivation, persistence, and self-efficacy, using data from learning diaries, app logs, weekly interviews and researcher's field notes. By analysing individual

participants, this section provides a holistic understanding of how the actions and strategies implemented in this cycle influenced their learning outcomes and experiences.

Key aspects of analysis:

1) **Vocabulary growth**: Examines the weekly progress participants made in learning CET-6 vocabulary, including the increase in vocabulary size and the quality of vocabulary knowledge acquired (Li, 2021).

2) **Motivation**: Evaluates changes in participants' intrinsic and extrinsic motivation in vocabulary learning (Li, 2021; Wu, 2018).

3) **Persistence**: Explores participants' determination and time spent to complete the learning process and achieve their weekly learning objectives in using the Kaixincichang app (DiCerbo, 2014; Israel-Fishelson & Hershkovitz, 2019).

4) **Self-efficacy**: Analyses participants' confidence in their ability to succeed in next week's vocabulary learning which they had planned (Li, 2021; Mahayanti et al., 2024).

5.2.2.1 Alex's journey: Ambitious and fruitful

Alex demonstrated an ambitious and hardworking approach during Cycle 1. Despite achieving the highest vocabulary growth in the group, his progress showed significant fluctuations. These variations were attributed to challenges in effectively managing his time and energy, which hindered consistent adherence to his learning plan. This analysis will explore how his ambition translated into tangible outcomes with the help of Kaixincichang, while highlighting areas where time and energy management impacted his persistence and self-efficacy.

1. Alex's Vocabulary Growth: Effective Drilling from Kaixincichang and Strategic Planning

Alex achieved the most significant vocabulary growth among all participants in Cycle 1, a result of his ambitious planning and effective use of the Kaixincichang app. He reflected "找到适合背单词的方式，效率和数量上都有提高. 制定每天计划加开心词场" ("I found a suitable way to memorize words, and both efficiency and quantity improved. That is, setting up a daily plan and the use of Kaixincichang").

1) The level-passing mode supports efficient focus on unknown words

A key feature Alex found particularly helpful was the app's 闯关模式 (level-passing mode), which filtered unknown words from the word list. As Alex explained, "它(闯关模式)能够先把认识的和不认识的分开" ("Its (level-passing mode) can first separate the words I know

from the ones I don't."). This allowed him to focus his time and energy on unfamiliar vocabulary, making his learning more efficient.

2) Structured practice for knowledge depth

The app's diverse drills further supported Alex's progress. He described how the exercises were sequenced: "它通常是先让记意思然后是拼写，然后是意思运用。拼写有的记不太牢固，但是意思差不多都能记住" ("It usually starts with memorizing meanings, then spelling, and finally usage. I wasn't fully secure in spelling, but I could remember most of the meanings."). This step-by-step approach helped Alex build both vocabulary size and depth, even though spelling remained a minor challenge.

This indicates that Kaixincichang's design effectively supports vocabulary size increase and the development of vocabulary knowledge through gamified and structured learning design.

2. Alex's Motivation: Empowered by Long-Term Achievement Goal

Alex demonstrated a high level of motivation to learn CET-6 vocabulary, which he described in his diary as "积极主动的" ("proactive and self-driven"). His motivation appeared to align with integrated regulation, the most autonomous form of extrinsic motivation which reflects a deep internalization of the value of the task, where external goals are fully integrated with personal beliefs and needs.

1) Clear goal orientation catalysed his motivation

Alex's motivation stemmed from recognizing the relevance of CET-6 vocabulary for his postgraduate entrance exam, linking vocabulary learning to his long-term academic aspirations. He noted, "我要（今）年底考研，英语单词肯定是基础" ("I am planning to take the postgraduate entrance exam at the end of the year, and English vocabulary is definitely the foundation."). This understanding provided him with a clear purpose, linking vocabulary acquisition to his ambition of pursuing postgraduate education.

2) Motivation further boosted by responsiveness to external stimuli

The announcement of increasing exam cut-off scores acted as another catalyst, intensifying Alex's intrinsic drive to invest more effort in vocabulary learning. Midweek, he noted, "这周（2022年）考研国家线公布，所有学科分数线大涨，本专业英语线达到53（百分制）" ("This week, the 2022 national postgraduate entrance exam cutoff scores were announced, and all disciplines saw a significant increase. The English score for my major reached 53 (on a 100-point scale)."). This realization reinforced his determination, as he wrote "下定决心要在英语上多下功夫。加油。" ("I've decided to work harder on English. Keep it up.").

In summary, Alex's motivation during Cycle 1 was both proactive and purpose-driven, shaped by a strong alignment of personal and academic goals, and further energized by external academic pressures.

3. Alex's Persistence: Strong Determination with Fluctuations in Commitments

Alex's persistence in Cycle 1 was marked by fluctuations in the time he spent learning CET-6 vocabulary using Kaixincichang. The data shows notable variations, with peaks on Days 3, 4, and 6 (1.5 hours each) and declines on Days 2 (0.4 hours) and 5 (0.7 hours) (see Figure 5.2-2). These fluctuations reflect both external disruptions and Alex's difficulties in effectively regulating his learning.

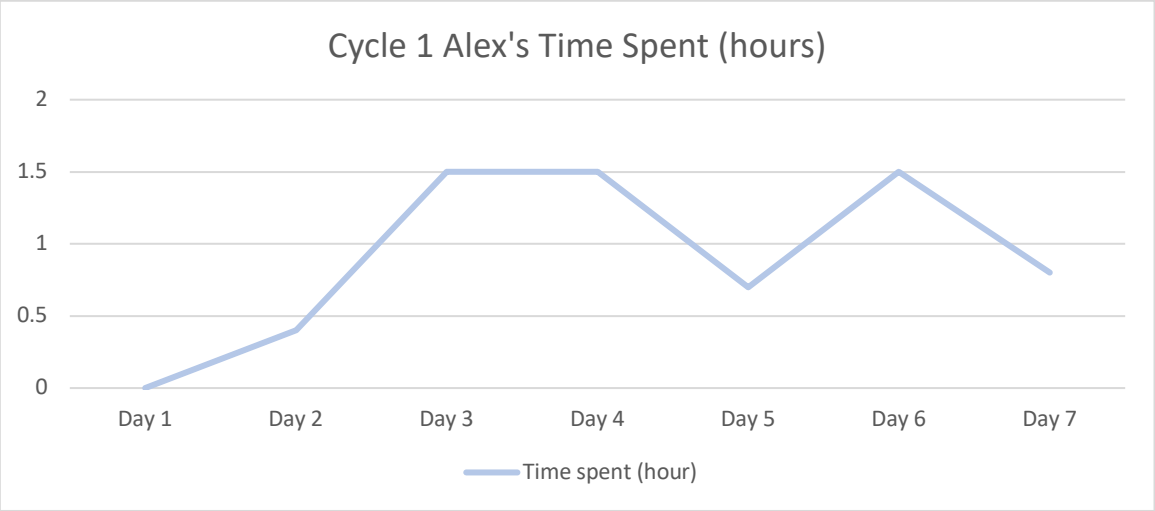

Figure 5.2-2 Cycle 1 Alex's time spent on Kaixincichang

1) Fluctuating commitment due to external factors and challenges with self-regulation

While external disruptions contributed to variability, Alex's inability to effectively manage his time and energy also played a role in the inconsistent time spent on learning. On Day 2, he recorded a significant drop in learning time, which he attributed to external activities: "今天有一些活动影响学习的连贯性，不能完整的实现今日目标" ("Today, some activities disrupted the continuity of my study, and I couldn't fully achieve today's goal.").

A similar decline occurred on Day 5, which Alex explained was due to administrative disruptions: "学校全员核酸统计信息，占用一部分时间" ("School-wide nucleic acid test data collection took up part of my time."). These external factors further highlighted Alex's challenges in managing his time and adapting his learning schedule.

2) Proactive mindset and determination

Despite these fluctuations, Alex demonstrated a strong commitment to improvement, as reflected in diary entries where he acknowledged setbacks and set goals for better performance.

For example, Day 2's learning diary noted: "明天要改善，集中时间完成目标" ("Tomorrow, I will improve and focus my time to complete my goals.").

In summary, while Alex exhibited determination to persist through challenges. His fluctuating commitment also underscored gaps in his ability to effectively regulate his learning process, particularly in time management and maintaining consistency.

4. Alex's Self-Efficacy: Mastery Experience Fuelled Satisfaction and Confidence

Alex demonstrated strong self-efficacy after completing Cycle 1, evident in his confidence to sustain and improve his learning. He wrote in his diary "下周将继续保持并突破" ("Next week, I will continue maintaining and achieving breakthroughs.") This confidence stemmed from his mastery experiences and his satisfaction with the progress he achieved, even though he fell short of fully meeting his initial weekly objective.

1) Mastery experience from the level-based mechanism

Alex perceived that he was succeeding in learning vocabulary efficiently. The level-based mechanism provided concrete evidence of his capabilities, reinforcing belief in his ability to excel. He attributed much of this to Kaixincichang's features which allowed him to clearly track his successful learning. He explained: "拼写有的记不太牢固，但是意思差不多都能记住" (" I wasn't fully secure in spelling, but I could remember most of the meanings"). This structured approach enabled him to recognize his progress in vocabulary acquisition.

For words for which he struggled to learn spelling or meanings, Alex appreciated how the app identified these gaps for targeted review: "过滤出来，然后再进行复习" ("It filters out the failed words, and then I can review them again"). This process reinforced his confidence by ensuring that even challenging words could be addressed systematically.

2) Mastery experience from PK (player versus play competition), a positive feedback loop

Alex's measurable success in achieving high accuracy in PK challenges reinforced belief in his ability to excel. Engaging in 随机 PK (random PK challenges) further bolstered his self-efficacy. He noted "增加了随机 PK，正确率很高" ("I participated in random PK challenges, and my accuracy was very high"). This feature provided real-time feedback on his progress and reinforced his sense of achievement. It also boosted his self-efficacy by demonstrating that he outperformed another learner, offering him tangible evidence of his success.

In summary, Alex's strong self-efficacy during Cycle 1 was driven by mastery experiences, positive social comparisons, and the app's ability to provide measurable and actionable feedback. These factors enabled him to maintain a positive outlook and confidence in achieving future goals.

5. Summary of Alex's Journey and Implications

Alex was an ambitious and hardworking learner who demonstrated significant vocabulary growth, strong motivation, fluctuating persistence, and robust self-efficacy during Cycle 1. His success was driven by awareness of the value of goals, strategic planning and effective use of the Kaixincichang app. It provided structured and gamified learning opportunities, enabling him to recognize progress and systematically address challenges. However, his fluctuating persistence revealed difficulty in stable commitment, especially in time and energy management, which occasionally hindered his ability to meet his learning objectives. Despite these challenges, Alex remained confident in his ability to improve, showcasing resilience and a strong growth mindset.

5.2.2.2 Fay's journey: Struggling but Stable

Fay approached Cycle 1 with a modest plan, setting the most modest weekly goal of all the participants (please see *Figure 5.2-1 Cycle 1 Vocabulary Growth Chart*). Despite her lower motivation and confidence compared to Alex, she was the only participant who successfully achieved her goal. Her progress was less ambitious but steady, reflecting her ability to maintain consistency throughout the week. Fay's learning journey provides insights into how a simpler, achievable plan can support learners with lower motivation and self-efficacy, enabling them to build momentum progressively.

1. Fay's Vocabulary Growth: Struggling

Fay's vocabulary growth in Cycle 1 was modest, reflecting her struggles with both learning and reviewing new words. She described the learning and reviewing process as "花费很长时间" (time consuming).

1) Learning challenges from the level passing mode:

The structured and gamified approach of Kaixincichang, particularly its level-passing mode, did not align with Fay's learning pace, resulting in slower vocabulary acquisition. Fay further explained her difficulties with the app's level-passing mode: "可能就(学习)效率不太高，一关词多了(从五个增加到十个)，就有一部分词要来回几遍才能通关" ("Perhaps my learning efficiency isn't high; when there are more words in one level (increase from five to ten), some words require several attempts before I can pass the level"). This suggests that the app's challenge setting, while motivating for Alex, posed difficulty for Fay due to the cognitive load of managing a large number of words per level.

2) Ineffectiveness of Spaced Review:

The app's spaced review feature, designed to reinforce learning over time, did not significantly ease her struggles with retaining vocabulary, indicating a potential mismatch between her cognitive processing style and the app's review design. Fay admitted that "复习的时候也要花费很长时间" ("Reviewing also takes a very long time"), "因为有些词复习的时候有点忘了" ("Because I had forgotten some words during the review process"). This suggests that Kaixincichang's spaced review mechanism was less effective for Fay, as she struggled to consolidate and retain vocabulary despite the app's systematic support.

In summary, while Fay managed to increase vocabulary size and maintain the quality of her vocabulary knowledge, her experience suggested a need to adapt word learning and spaced review strategies to better suit individual learning preferences and cognitive styles.

2. Fay's Motivation: Empowered by Proximal Goal

Fay's motivation aligned with introjected regulation, a type of extrinsic motivation where individuals engage in tasks due to an internalized sense of obligation rather than intrinsic interest or fully integrated goals (Ryan & Deci, 2017, p. 185). She recognized the importance of learning CET-6 vocabulary, and her motivation was primarily driven by a sense of necessity for achieving her proximal goal: "我目前我就是想过六级" ("My current goal is simply to pass CET-6"). She also acknowledged the value of vocabulary learning, stating, "我觉得是有用的" ("I think it is useful").

However, Fay's prior experiences of failure seemed to weaken and blur her perception of vocabulary learning as a useful strategy for passing CET-6. She reflected, "之前备考六级也背过一些单词，但是感觉提升不明显" ("I previously prepared for CET-6 and memorized some words, but the improvement didn't feel significant"). This diminished perception of efficacy was likely to have contributed to her moderate motivation and hesitation about investing substantial effort. In addition, she expressed uncertainty about how much vocabulary she needed to learn to see results: "六级单词很多，不知道背多少才会能提升正确率" ("There are so many CET-6 words; I don't know how many I need to memorize to improve my accuracy").

In summary, Fay's motivation in Cycle 1 was primarily introjected regulation, driven by a sense of obligation and short-term academic goals. Her experience highlighted the need to counterbalance the demotivating effects of past failures and uncertainty with clear benchmarks and opportunities for small, consistent successes to build confidence and foster a more autonomous motivational outlook.

3. Fay's Persistence: Supported by Reminders

Fay demonstrated the best persistence among all participants during Cycle 1, consistently dedicating time to vocabulary learning with Kaixincichang. Starting on Day 2, after the training session, Fay spent between 1 and 1.8 hours daily on vocabulary learning, steadily increasing her efforts midweek (Day 4 to Day 6) before returning to her baseline of 1 hour on Day 7. Her ability to maintain consistent study habits allowed her to achieve her weekly objective, which was modest but realistic for her capabilities.

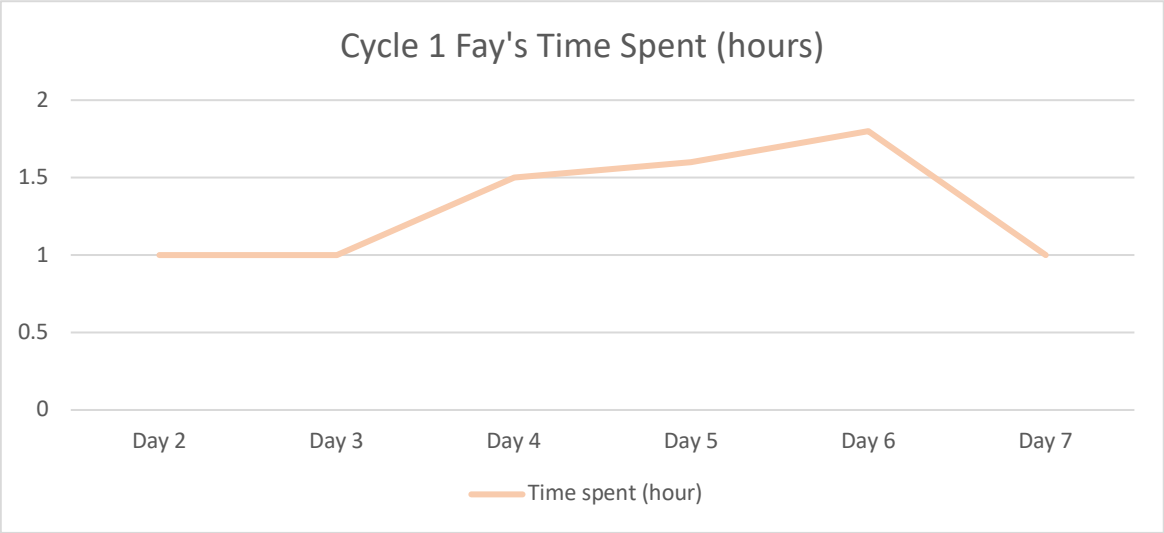

Figure 5.2-3 Cycle 1 Fay's time spent on Kaixincichang

1) External prompts promoted persistence:

The researcher's reminders played a crucial role in reinforcing Fay's commitment, acting as an external motivator to ensure she stayed on track. Fay attributed her persistence partly to these reminders. She noted: "晚上的时候，差不多你（研究者）就发提醒了，马上我就应该开始完成今天剩余的单词任务" ("In the evening, when you (the researcher) sent a reminder, I would immediately feel like I should start completing the remaining word tasks for the day"). These reminders served as external prompts, helping her stay on track with her daily learning.

2) Increased challenge of passing one level and perception of time pressure diminished determination

Fay also perceived the increased challenge of passing levels in Kaixincichang as time-consuming. She remarked on the shift in difficulty: "有时候满课的话,可能抽不出太多时间来弄全部（过一关）" ("Sometimes, when I have a full day of classes, I can't find enough time to complete everything (to pass a level)"). The increase in challenge from five to ten words per level amplified the time pressure she felt, particularly given her tight academic schedule. She admitted that this additional workload occasionally diminished her determination to persist: 然后第二天就没那么想（继续学习单词）" ("Then the next day, I didn't feel as motivated to continue learning words").

In summary, Fay's persistence was her strongest attribute during Cycle 1, bolstered by external reminders and her understanding of the importance of commitment. However, her experience highlighted the need for adaptive strategies to manage increased challenges and tight schedules, ensuring tasks remained achievable and motivating.

4. Fay's Self-Efficacy: Weakened by Perceptions and Concerns

Fay demonstrated modest self-efficacy in her ability to complete her Cycle 2 vocabulary learning, stating: "尽量完成吧" ("I'll try my best to complete it."). This reflects a cautious approach, signalling her uncertainty about fully meeting her next cycle objective.

1) Weak mastery experience form cycle 1

Reflecting on her experience in Cycle 1, she acknowledged that the objective she set was slightly ambitious: "根据我这周的情况来说，我感觉我定的这个目标感觉有点儿太多了，我会减少一些" ("Based on how things went this week, I feel the goal I set was a bit too much. I will reduce it a little"). This suggests that while she achieved her Cycle 1 objective, she did not perceive it as a particularly successful mastery experience. Instead, the effort required to meet her goal left her feeling that it was overly ambitious.

2) Awareness of challenges of time management

Her cautious optimism reflected her awareness of potential challenges, particularly related to time management. She explained: "计划执行的情况就是也跟排课有关" ("Whether I can follow through with the plan depends on my class schedule"). Her concern about time availability highlighted a potential obstacle: "如果抽不出太多时间" ("If I can't find enough time"), then "(学习单词)就没有那么有效率" ("(learning vocabulary) won't be as efficient").

Fay's experience underscored the critical role of perceived mastery experiences in building self-efficacy. It also highlighted the importance of equipping learners with strategies to manage task challenges and external time pressures, ensuring their goals remain achievable and their confidence is reinforced.

5. Summary of Fay's Journey and Implications

Fay approached Cycle 1 with modest goals, successfully achieving her weekly objective through steady persistence despite being less motivated and confident. Her necessity-driven motivation (introjected regulation) was influenced by prior failures that weakened her perception of vocabulary learning's effectiveness. While consistent external reminders supported her persistence, the time-consuming nature of tasks and her tight academic schedule created challenges. Fay's modest self-efficacy for Cycle 2 reflected her struggles with perceiving her Cycle 1 success as a meaningful mastery experience.

5.2.2.3 Daisy's journey: Modest but Stable

Daisy approached Cycle 1 with a modest objective, setting the lowest target among all participants and achieving the least vocabulary growth. Her motivation was externally regulated, driven by external expectations of her mother rather than intrinsic or integrated goals, reflecting a low-autonomy type of motivation. Despite her limited progress, Daisy displayed consistent persistence at a low level and maintained an optimistic, pressure-free attitude toward her learning. However, her low self-efficacy indicated a lack of confidence in her ability to succeed. Let's examine her learning journey.

1. **Daisy's Vocabulary Growth: Learning Strategies Work in Tandem with Kaixincichang Structured Learning Process**

Daisy achieved 96 words in Cycle 1, the least of all participants, aligning with her modest objective. Despite limited progress, she emphasized the importance of applying strategies to enhance Kaixincichang's structured process. She used "结合语境记单词" ("Learning words in context") to improve retention and understanding, and "用心记" ("Memorize with focus") to stay engaged. She also mentioned the value of writing words down: "有的时候得写一写，在背单词时候,才会记得比较清楚，只跟着(开心词场)的话记不住" ("Sometimes I have to write them down while memorizing; otherwise, I can't remember them clearly just by following (Kaixincichang)."). These strategies enabled her to pass levels more efficiently, though her overall growth remained limited.

2. **Daisy's Motivation: Her Mother's Expectation**

Daisy's motivation during Cycle 1 was externally regulated, driven by external expectations rather than intrinsic interest or integrated goals. She reported that "我妈妈想让我过六级。她会监督我背单词" ("My mom wants me to pass CET-6. She supervises me to memorize words."). This reliance on external encouragement and accountability highlighted her low autonomy in vocabulary learning.

Her motivation was not rooted in personal goals or a deep appreciation for the learning process but was instead shaped by pressure and oversight from her mother. While this external regulation provided a reason for her to engage in vocabulary learning, it limited the development of more autonomous forms of motivation such as identifying personal value in learning.

3. **Daisy's Persistence: Peer Monitor and Parental Encouragement**

Daisy demonstrated consistent but low persistence in Cycle 1, with daily time spent on vocabulary learning ranging from 0.33 to 0.8 hours. Her engagement peaked on Days 4 and 5, at 0.8 hours each, and was lower on other days, including a minimal effort of 0.33 hours on Day 7 (see Figure 5.2-4 below). Despite her limited time investment, Daisy maintained a steady routine throughout the week, aligned with her modest learning objectives.

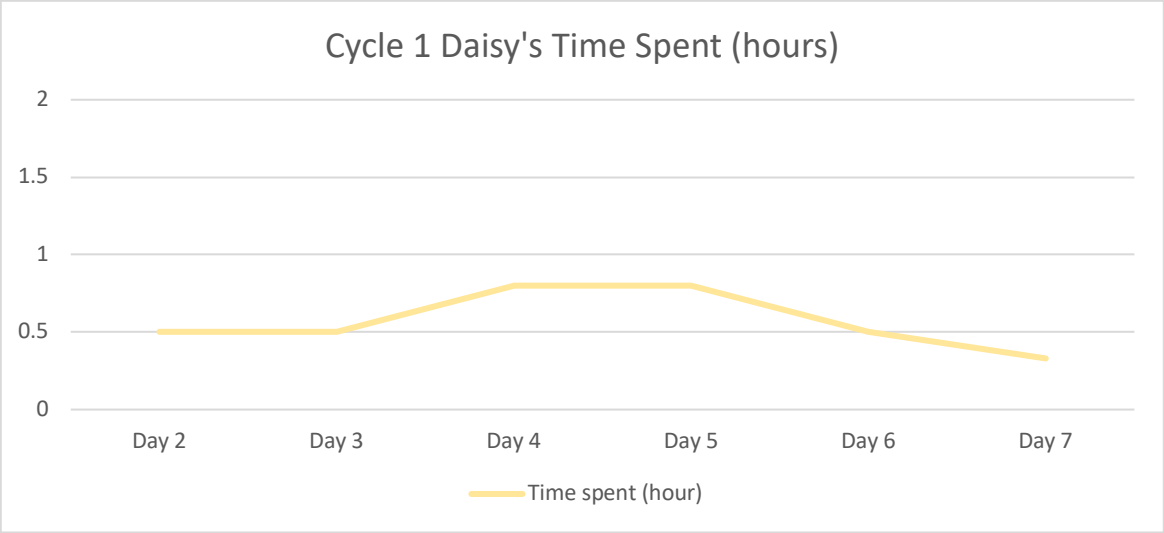

Figure 5.2-4 Cycle 1 Daisy's time spent on Kaixincichang

1) Peer monitor

Daisy's persistence was supported by both social accountability and her mother's encouragement. She mentioned that "每天和朋友相互打卡监督(背单词)" ("Every day, my friends and I checked in with each other to supervise our vocabulary memorization reliance"). This system of peer accountability helped her stay on track, reflecting her dependence on external motivators.

2) Parental support

Moreover, her mother's flexible approach to monitoring, "妈妈对量没有要求，坚持背就行" ("My mom didn't require a specific amount; as long as I kept memorizing, it was fine"), provided her with a pressure-free environment that reinforced her persistence without overwhelming her.

In summary, Daisy's persistence during Cycle 1 was low but stable, driven by external motivators, including social accountability and parental support.

4. Daisy's Mixed Self-Efficacy: Effective Word Learning and Failed to Achieve Objectives

Daisy exhibited mixed self-efficacy during Cycle 1. While she expressed confidence in continuing with vocabulary learning using Kaixincichang: "下周会继续" ("I will continue next week"), she was not confident in achieving her goal for Cycle 2. Her lack of confidence was shaped by her Cycle 1 experiences, which included both mastery moments and challenges.

Daisy gained some mastery experiences through the effective use of Kaixincichang, as discussed in her vocabulary growth analysis. However, her overall experience was overshadowed by her failure to fully achieve her Cycle 1 goal. She admitted that "计划的话，有的计划确实没有完成。实施过程当中看不下去，就停了" ("Some parts of my plan weren't completed. During the implementation process, I

couldn't stay focused and stopped"). This suggests that her struggle with focus and persistence undermined her perception of success, leading to a weaker sense of mastery.

5. Summary of Daisy's Learning Journey and Implications

Daisy's vocabulary growth in Cycle 1 was supported by both the structured process of Kaixincichang and her personal learning strategies, such as learning in context and writing words down. However, her motivation remained externally regulated and was not boosted by task analysis. Her consistent, low-level persistence was primarily driven by social monitoring and support from her mother and friends. While her ambitious goal setting negatively impacted her self-efficacy for achieving objectives, her self-efficacy for effective vocabulary learning was maintained, supported by her use of practical strategies.

5.2.2.4 Dawn's journey: Fluctuating

Dawn demonstrated the least persistence among all participants in Cycle 1, engaging with vocabulary learning for only three days. Her limited engagement was influenced by her emotional state, as she was feeling depressed about the lockdown. This external stressor possibly compounded her difficulties in sustaining learning effort and motivation. Dawn's journey offers insights into the impact of external circumstances on learner persistence and highlights areas for targeted support.

1. Dawn's Vocabulary Growth: Empowered by Learning Strategies

Despite engaging in vocabulary learning for only three days, Dawn achieved 150 words, demonstrating notable efficiency. Her progress was supported by use of cognitive and metacognitive learning strategies within Kaixincichang's structured process.

1) Cognitive strategy for challenging words

Like Daisy, Dawn employed context understanding as a key and useful cognitive strategy. However, what distinguished Dawn's approach was her application of this strategy specifically to "专业词汇或者抽象词汇" ("specialized or abstract vocabulary"). She found this particularly effective for promoting cognitive engagement, which deepened her understanding and retention of these challenging words.

2) Metacognitive strategy for retention

Another strategy Dawn emphasized was "及时复习" ("timely review"), which she believed was essential for reinforcing her learning and consolidating knowledge. This approach aligned with Kaixincichang's spaced review mechanism and was likely to have contributed to her efficient progress, despite limited persistence.

In summary, Dawn's vocabulary growth during Cycle 1 was efficient and strategically focused. Her experience highlighted the value of personalized applications of contextual learning and timely review for addressing challenging vocabulary within a structured learning framework.

2. Dawn's Motivation: Empowered by Recognition of Task Value but Discouraged by Task Demands

Dawn's motivation during Cycle 1 reflected both recognition of the importance of vocabulary learning and the discouraging effect of perceived task demands. It aligns with introjected regulation, where the task is performed out of a sense of obligation rather than intrinsic interest or personal enjoyment.

However, motivation was undermined by her perception of the effort required to achieve her goal. She remarked, "但是量太大了，有点抵触，还没调整好状态吧" ("But the volume is too large, I feel resistant and haven't adjusted my mindset yet"). This resistance reflected the tension between her perceived obligation to succeed and the overwhelming demands of the task.

In addition, Dawn noted the game sensation of levels of certain vocabulary books added to her discouragement: "我看到开心词场一个最短的六级词表都有几十关，视觉压力就好大" ("When I saw even the shortest CET-6 word list in Kaixincichang had dozens of levels, the visual pressure was overwhelming"). This suggested that the visual presentation of the task amplified her resistance and demotivation by enhancing her stress.

3. Dawn's Persistence: Strategic Planning Promoted Persistence but Interrupted by External Stressors

Dawn had a strong start and sharp decline in Cycle 1's learning (see Figure 5.2-5). Her persistence during Cycle 1 was the lowest of all participants, with learning limited to three days.

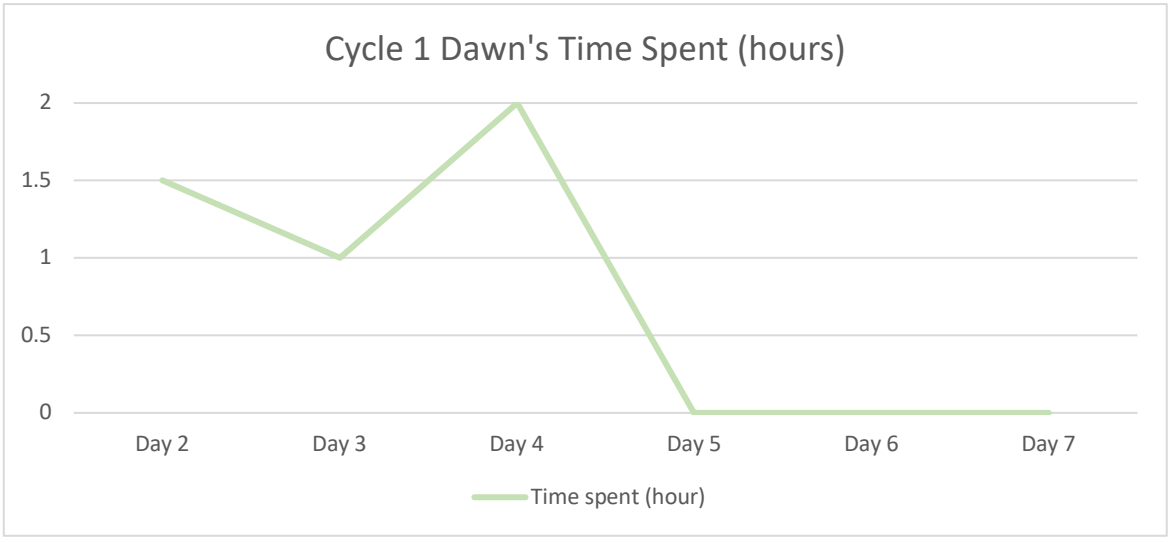

Figure 5.2-5 Cycle 1 Dawn's time spent on Kaixincichang

1) Strategic planning as a driver:

Her clear goals at the start of the week enhanced Dawn's determination, enabling her to engage meaningfully with vocabulary learning during the first three days. She attributed her strong start to the influence of strategic planning: "制定的计划有影响。就是迫使自己达到这个目标" ("The plan I set had an impact. It forced me to achieve the objective"). This suggested that her initial determination was strengthened by clear goal setting, which provided her with a sense of direction and purpose at the beginning of the week.

2) Impact of external stressors:

Tight scheduling, fatigue, and negative emotions disrupted her ability to maintain consistency. Dawn explained this disengagement in her diary: "周五我一天的课，因为疫情封校在宿舍上网课，心情有点浮躁，不想学习单词" ("I had a full day of classes on Friday, and because of the lockdown, I was stuck in the dorm attending online classes. I felt irritable and didn't want to study vocabulary"). The lockdown and the tight schedule of online classes contributed to her emotional distress, disrupting her vocabulary learning routine and motivation with online vocabulary learning.

In summary, Dawn's strong start was driven by her strategic planning, but persistence was disrupted by tight scheduling, fatigue, and emotional challenges. Supporting learners like Dawn with adaptive strategies and emotional resilience tools can help them sustain their engagement across cycles.

4. Dawn's Self-Efficacy: Modest due to External and Internal Challenges

Dawn exhibited moderate self-efficacy for achieving her next cycle's goal, reflecting a cautious outlook shaped by her concerns about external and emotional factors. Her confidence was influenced by the challenges she faced in maintaining persistence during Cycle 1.

1) Concerns of managing tight schedule:

Like Fay, Dawn expressed concerns about time management over her tight schedule**.** This revealed her perceived lack of control over balancing her university schedule and after class vocabulary learning.

2) Emotional vulnerability: Acknowledgment of the role of her emotional state highlighted the influence of external stressors and personal resilience on her self-efficacy. Moreover, Dawn highlighted the impact of her emotional states on the ability to meet her objectives. She remarked: "是否能完成计划，我感觉跟我个人的（心情）状态关系比较大" ("Whether I can complete my plan, I feel it's closely related to my (emotional) state."). This reflected her awareness of how negative emotions, such as those experienced during the lockdown, could undermine her focus and motivation.

Both concerns—her tight schedule and emotional state—were closely linked to her experience of failing to maintain stable persistence during Cycle 1. Despite strategic planning and a strong start, the external pressures and emotional challenges she faced disrupted her learning routine, weakening her confidence in sustaining future efforts.

5. Summary of Dawn's Learning Journey and Implications

Dawn's learning journey in Cycle 1 was marked by significant challenges notwithstanding a strong start. She achieved 150 words in three days, demonstrating efficient learning supported by strategies such as learning vocabulary in context and timely review. However, her persistence dropped sharply after Day 4 due to a tight schedule, fatigue, and negative emotions caused by the lockdown. Her motivation, embedded in introjected regulation, was undermined by the overwhelming number of CET-6 words and visual pressure from Kaixincichang's design. Her self-efficacy for future cycles was moderate, shaped by concerns about her ability to manage her schedule and emotional state. Dawn's learning experience highlighted the interplay between strategic planning, external stressors, and emotional well-being.

5.2.2.5 Elizabeth's journey: Fruitful

Elizabeth achieved 105 words in Cycle 1, maintaining fluctuating persistence over five days. While she did not join the group interview and provided limited information in her learning diary, her app logs revealed her progress. She expressed satisfaction with Kaixincichang, perceiving it as a useful tool for vocabulary learning. Her journey underlined the role of app-based tools in supporting learners, even with minimal engagement in additional interventions.

1. Elizabeth's Vocabulary Growth

Elizabeth set an ambitious goal of learning 180 words in Cycle 1 but achieved 105, reaching approximately 58% of her target. While she fell short of her objective, her progress demonstrated steady effort, supported by use of Kaixincichang. She said that she was "满意的" ("satisfied") with the app, which probably contributed to her ability to achieve this level of growth. Her perception of the app as effective may have sustained her engagement and motivation, even as she faced challenges in meeting her goal.

2. Elizabeth's Motivation (Inferred)

Elizabeth's motivation appeared to have been influenced by a mix of factors:

1) **Goal-setting**: Her initial goal of 180 words reflected ambition and a desire to achieve a significant outcome.

2) **Effective tool as external stimuli**: Her satisfaction with Kaixincichang, which she perceived as "useful," possibly drove her effort by providing a practical tool to support her learning.

3) **Moderation of Effort**: Despite falling short of her goal, her steady engagement suggested that she valued the learning process but may have lacked the intrinsic drive or external accountability to push herself further.

3. Elizabeth's Persistence

Elizabeth's persistence spanned five days, with fluctuating daily time spent on vocabulary learning as shown in the line chart Figure 5.2-6.

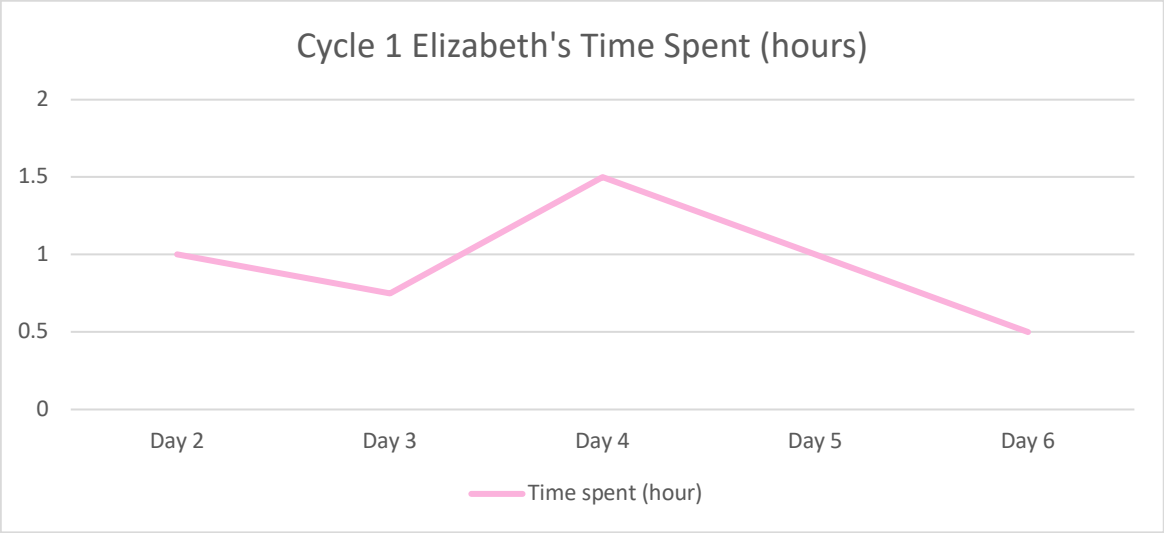

Figure 5.2-6 Cycle 1 Elizabeth's time spent on Kaixincichang

This pattern demonstrated moderate commitment, with a peak on Day 4 and notable engagement on Days 2 and 5. However, her fluctuation in time spent, combined with no learning recorded on Days 1 and 7, suggested challenges in maintaining a consistent routine. Her satisfaction with Kaixincichang appeared to have supported her persistence, enabling her to stay engaged across most of the week.

4. Elizabeth's Self-Efficacy

Elizabeth's failure to meet her ambitious goal may have had implications for her self-efficacy, but due to limited data, this aspect cannot be fully analyzed. Her satisfaction with Kaixincichang suggested she saw value in her learning process, which may have mitigated the negative impact of falling short of her target. However, future cycles could provide clearer insights into how this experience influenced her confidence.

5. Summary

Elizabeth set an ambitious goal of 180 words but achieved 105 during Cycle 1. Her learning was supported by moderate persistence over five days and her positive perception of Kaixincichang. While she showed steady effort, fluctuations in her persistence and inability to reach her target indicated areas where additional support could help enhance her engagement and outcomes.

5.2.3 Implications from Cycle 1 and Recommendations for the Next Cycle

Implications from cycle 1

1. **Task analysis and goal setting**: Task analysis emerged as a double-edged sword, working differently based on learners' motivational and emotional profiles:

    1) For motivated learners like Alex and Fay, task analysis served as a valuable tool to clarify objectives and facilitate strategic planning. When these learners broke down their ambitious goals into manageable steps, they were able to sustain their motivation and gradually transform ambition into measurable progress. However, supporting them with ongoing feedback about task completion could further enhance their intrinsic satisfaction and SRL.

    2) For low-motivation learners like Daisy, overly ambitious goal setting tended to undermine their persistence. Setting high expectations without considering their motivation and persistence levels might reinforce feelings of inadequacy, leading to disengagement. For such learners, a scaffolding approach with achievable sub-goals could provide a sense of accomplishment, progressively building their motivation.

    3) For emotional learners like Dawn, task analysis highlighted the demands of vocabulary learning and exacerbated their pressure, resulting in negative emotions, diminished motivation, and disrupted persistence. Dawn's case underscored the need for task simplification and chunking to create more manageable learning experiences and reduce the emotional burden of perceived task magnitude.

2. **Need for Self-Control Strategies**: Tight university schedules emerged as a common barrier, with most participants struggling to balance their academic obligations and vocabulary learning. Many lacked the following effective self-control strategies for time management and task prioritization:

    1) Providing learners with structured tools such as digital reminders, time-blocking schedules, or study trackers which could help them allocate sufficient time for vocabulary learning.

    2) Offering training on prioritization techniques such as focusing on high-frequency or specialized words which could make their study sessions more efficient.

3) Supporting learners in building habit formation such as scheduling learning during consistent time slots which could reduce reliance on fluctuating external motivators like reminders.

3. **Game Factors and Challenge Levels：** Kaixincichang's game elements, particularly its level-based progression and increasing challenge, elicited mixed responses based on learners' confidence levels:

   1) For **confident learners** like Alex, these features complemented their self-efficacy and provided opportunities to test and validate their progress without imposing undue pressure. The rising difficulty functioned as a motivational tool, aligning with their competitive drive.
   2) For **less confident learners** like Fay and Dawn, the increasing difficulty presented a barrier to sustained engagement. These learners felt discouraged when their efforts did not align with the increased task demands. Similarly, the app's visual display of all required levels for one vocabulary book created a psychological barrier for Dawn, amplifying a sense of being overwhelmed and resistance. Reframing these game elements—such as hiding future levels until learners complete their current task or offering adjustable difficulty—could alleviate such challenges.

4. **Structured Learning Design and Cognitive Engagement**: Kaixincichang's structured design received positive feedback from most participants, who found its drills and quizzes embedded in a level-based mechanism effective for learning. However, the following refinements could optimize its impact:

   1) Reducing the number of words per level could help learners focus and lessen cognitive overload, especially for those with limited persistence or confidence.
   2) Encouraging active cognitive learning strategies, such as context-based learning, could increase vocabulary retention and understanding. For example, Dawn's application of contextual learning for specialized or abstract words demonstrated how this strategy promotes cognitive engagement and enhances the depth of knowledge. Explicitly integrating such strategies into the app's design could support learners in applying them consistently.

5. **Emotional and Structural Support**: External circumstances, such as the lockdown, negatively impacted learners like Dawn who faced emotional strain that diminished their persistence and motivation. The following emotional support strategies are critical:

1) Introducing features to foster positive emotions, such as personalized feedback, celebration of progress, or social encouragement from peers, could alleviate emotional burdens.
2) Structural supports, such as breaking tasks into smaller milestones and simplifying the presentation of required tasks, could further reduce perceived pressure and enhance engagement.

Recommendations for the Next Cycle

1. **Tailor Task Analysis and Goals**: Adjust goals based on learners' motivation and emotional needs, ensuring ambitious learners are supported to achieve their objectives while less motivated or emotional learners are not overwhelmed.
2. **Support Self-Control Development**: Provide targeted support for time management and task strategies to help learners balance their academic schedules and vocabulary learning commitments.
3. **Adaptive Game Challenges**: Introduce adjustable challenge levels or incremental difficulty to accommodate varying confidence levels among learners.
4. **Simplify Task Presentation**: Reassess how tasks and goals are visually presented to reduce perceived pressure, particularly for emotional learners.
5. **Promote Cognitive Strategies**: Encourage learners to use strategies like context-based learning to improve their vocabulary acquisition and boost engagement.

Chapter 6 Cycle 2: Actions and Findings at the Middle

This chapter examines the implementation and outcome of Cycle 2 which was conducted based on the findings and implications from Cycle 1. Building on the foundational support provided in the first cycle, Cycle 2 focused on the performance phase of SRL strategies (Zimmerman & Moylan, 2009). It emphasized strategies such as time management and concentrated on helping participants sustain their efforts and address challenges identified in the previous cycle. This cycle also aimed to deepen participants' understanding of the MGBVL app, Kaixincichang**,** enabling them to better manage their learning and more effectively acquire words.

The chapter begins with a brief review of participants' progress and challenges from Cycle 1. It then details the actions taken in Cycle 2 and analyses their responses in four key areas: vocabulary growth**,** motivation**,** persistence, and self-efficacy. By examining how participants applied refined SRL strategies and engaged further with Kaixincichang, this chapter provides insights into their evolving learning behaviour and progress towards their CET-6 vocabulary goals.

6.1 Brief review of participants' progress and challenges from Cycle 1

In Cycle 1, participants demonstrated varied progress and responses to the implementation of task analysis and self-motivation strategies, as well as their initial use of the MGBVL app, Kaixincichang.

1. **Progress in vocabulary growth**: Participants achieved different levels of vocabulary growth based on their individual motivation and persistence:
    1) Alex realised the highest number of words due to his ambitious goal-setting and strategic planning.
    2) Fay set a modest goal and successfully achieved it, showing steady but slow progress.
    3) Daisy and Elizabeth accomplished limited growth but benefited from cognitive strategies and app-based support.
    4) Dawn achieved notable efficiency during her short engagement but struggled with maintaining persistence.
2. **Motivation**: Motivation levels varied across the participants:
    1) Alex and Fay displayed strong motivation, driven by their personal goals and external factors.
    2) Daisy and Dawn showed external regulation and emotional influences that limited their engagement.

Challenges such as overly ambitious goals (Daisy), emotional strain from external factors (Dawn), and prior experience of failure (Fay) affected motivation for some participants.

3. **Persistence**: Participants' persistence reflected their ability to manage schedules and emotional resilience:
    1) Alex and Fay maintained relatively consistent persistence, with some fluctuations.
    2) Daisy and Elizabeth exhibited moderate consistency but faced challenges in sustaining daily engagement.
    3) Dawn struggled with persistence, disengaging completely after three days due to emotional strain and a tight schedule.
4. **Self-Efficacy**: Self-efficacy for completing future goals varied widely:
    1) Alex demonstrated high self-efficacy due to his mastery experiences.
    2) Fay had modest confidence, influenced by her sense of achievement.
    3) Daisy and Dawn experienced low self-efficacy due to challenges in persistence and emotional strain.
    4) Elizabeth provided limited data on self-efficacy but appeared satisfied with her progress.

Key challenges

1. Tight schedules and competing academic demands limited participants' ability to consistently engage.
2. Emotional challenges, such as stress from the lockdown, negatively impacted persistence and motivation.
3. Overly ambitious task demands and a lack of SRL strategies affected the progress of less motivated learners.

6.2 Actions conducted in Cycle 2

Building on the findings and challenges identified in Cycle 1, the actions in Cycle 2 aimed to address participants' diverse needs by introducing strategies from the performance phase of the SRL model (Zimmerman & Moylan, 2009). These actions focused on enhancing participants' ability to manage their learning process, sustain effort, and engage effectively with the game-based vocabulary learning (GBVL) app, Kaixincichang.

1. **Scaffolding self-control strategies**

To support participants in maintaining focus and managing their learning time, the following self-control strategies were introduced:

1) **Time management**: Participants were guided to organise their vocabulary learning sessions based on their academic schedules, breaking vocabulary books into smaller, manageable chunks to reduce being overwhelmed.

2) **Attention control**: Tips like environmental structuring were provided to help participants minimize distractions during learning, such as using quiet environments and turning off non-essential notifications.

3) **Emotional regulation**: Participants were encouraged to use techniques like help-seeking and interest incentives to manage stress or frustration during challenging learning moments.

2. Optimizing use of Kaixincichang

Participants were further familiarized with Kaixincichang's features to enhance their engagement and learning efficiency:

1) **Breaking levels into chunks**: Participants were guided to divide each level into smaller chunks, allowing for manageable study sessions and reducing feelings of being overwhelmed.

2) **Spaced review**: They were shown how to effectively manage and utilize the app's built-in review mechanism to reinforce previously learned words.

3) **Cognitive learning strategies**: Contextual learning was emphasized, helping participants deepen their understanding of vocabulary meaning and usage.

3. Addressing task challenges

Recognizing the varying impact of task analysis and game-based challenges, the following adjustments were made:

1) **Simplifying task demands**: Participants were encouraged to set realistic weekly goals based on their performance in Cycle 1, ensuring these goals aligned with their confidence and schedules.

2) **Reframing challenges**: Participants were guided to view task difficulty as an opportunity to learn and grow, shifting their mindset from pressure to motivation.

4. Providing encouragement and celebrating successes

Instead of sending reminders, the researcher provided participants with encouragement and congratulations for every small success they achieved. This positive reinforcement aimed to sustain motivation and build a sense of accomplishment throughout the cycle.

5. Promoting peer interaction

Participants were encouraged to share their progress and strategies in a group chat, fostering a sense of community, reducing emotional pressure, and enhancing accountability.

6.3 Cycle 2 journey exploration: vocabulary growth, motivation, persistence and self-efficacy

The following bar chart (Figure 6.3-1) provides an overview of participants' vocabulary growth in Cycle 1. Compared to Cycle 1, half of them improved vocabulary growth. Most achieved their goal for Cycle 2, except for Alex even though he learnt more words than other participants. Let's move to the details of their learning journeys in Cycle 2.

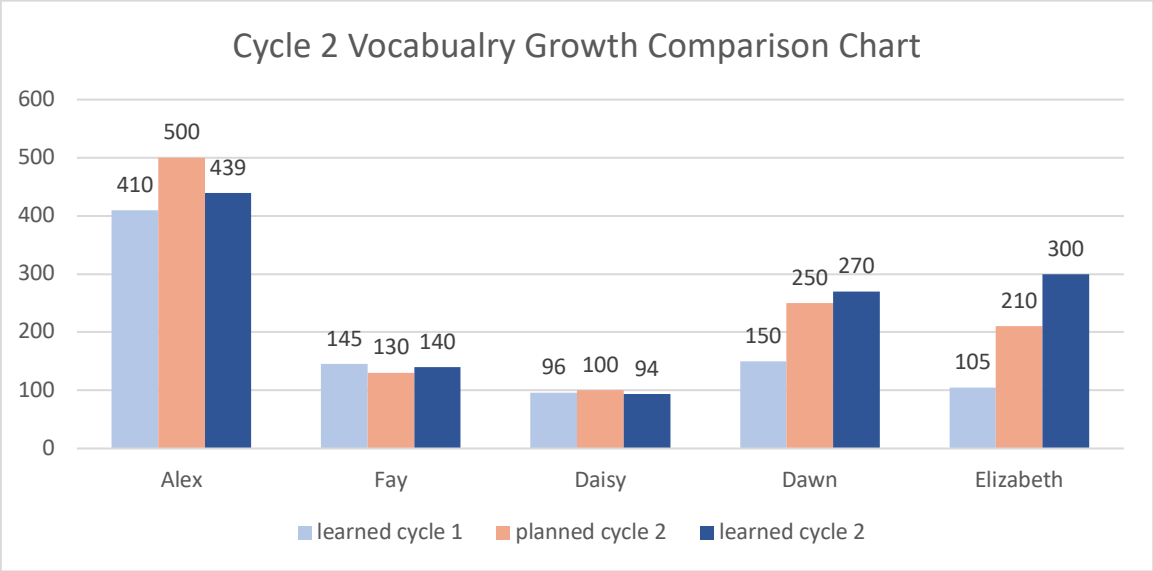

Figure 6.3-1 Cycle 2 Vocabulary growth comparison chart

6.3.1 Alex's journey: ambitious and stable

1. Alex's vocabulary growth: consistent learning time and proactive review

Alex achieved increased vocabulary growth in a more stable way during Cycle 2 compared to Cycle 1 (see Figure 6.3.2). This improvement reflected his enhanced self-regulation and ability to refine learning strategies.

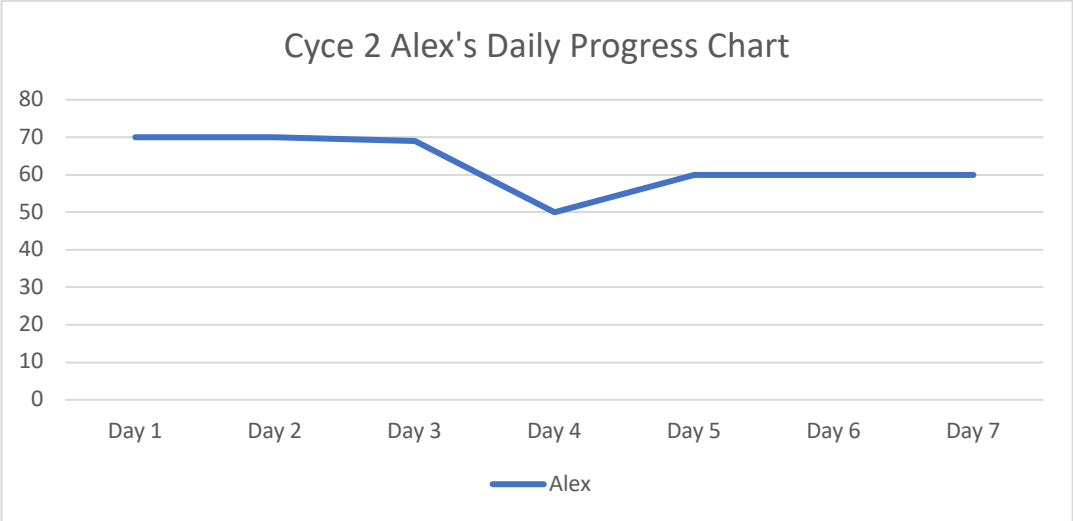

Figure 6.3-2 Cycle 2 Alex's daily progress chart

He attributed this progress to better time management, stating: "(我)尽量保证每日英语学习时间固定" ("I try to ensure a fixed schedule for my daily English words learning"). By maintaining a fixed schedule, he was able to engage consistently with the learning process, reducing the fluctuations observed in the previous cycle. As well, Alex identified a need to strengthen his review process to further improve the quality of his vocabulary retention. He observed, **"**现在（每天）学的词多，但软件给得复习词数量较少，复习不够, 要再多遍复习**"** ("Now I learn more words every day, but the app provides fewer review words; the reviews are not enough, and I need to review more times"). This insight highlighted growing awareness of the importance of spaced review and his proactive adjustment to ensure better retention of newly learned words.

2. Alex's vocabulary motivation: further enhanced by fruitful learning

Alex's motivation in Cycle 2 remained highly autonomous and was exam-oriented. However, in addition to this external motivation, his improved learning strategies and consistent engagement with Kaixincichang were likely to have contributed to the development of task-oriented intrinsic motivation. His satisfaction with progress was reflected in his comment that "整体英语学习进度感觉还可以" ("Overall, the progress in my English learning feels okay"). This suggested that his sense of accomplishment and mastery during the cycle served to further reinforce motivation.

3. Alex's vocabulary persistence: enhanced by teamwork and time management

Alex maintained consistent engagement throughout the cycle, with daily time spent ranging from 1 to 1.3 hours (see Figure 6.3-3).

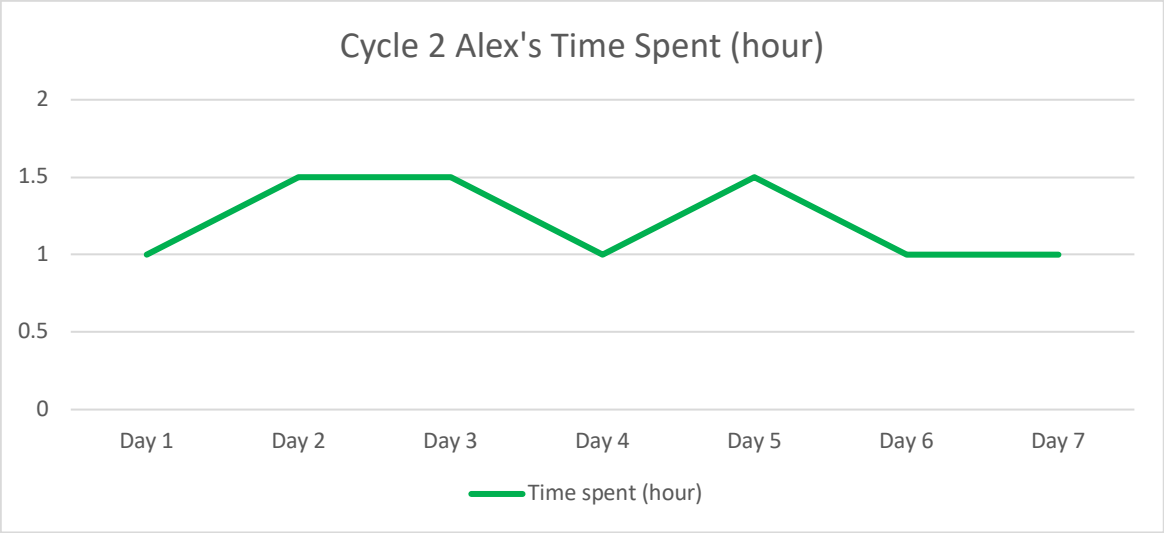

Figure 6.3-3 Cycle 2 Alex's time spent on Kaixincichang

This consistent engagement reflected Alex's improved time management and determination to maintain steady progress throughout the cycle. He attributed this consistency in part to the sense of accountability fostered by being part of the research group, noting that: "咱们一起学习的伙伴督促" ("Our fellow learning partners encouraged me"). Thus, external encouragement complemented his intrinsic drive, creating a supportive environment that helped sustain his efforts.

4. Alex's vocabulary self-efficacy: enhanced by teamwork and time management

Alex demonstrated strong self-efficacy for continuing his progress into Cycle 3, asserting: "下周会继续保持" ("I will maintain my efforts next week"). Establishing and adhering to a fixed learning routine in Cycle 2 gave him a sense of control over the process, further boosting his confidence.

5. Summary of Alex's learning journey in Cycle 2

Alex's Cycle 2 journey reflected significant growth in his SRL abilities. His time management and task strategies contributed to steady vocabulary growth, while engagement with Kaixincichang reinforced his learning process. Alex's consistent persistence, driven by a combination of external motivation (exam preparation) and peer accountability, demonstrated his capacity to maintain focus across the week. His robust self-efficacy, grounded in mastery experiences and improved strategies, positioned him well for continued progress in Cycle 3.

6.3.2 Fay's journey: more confident and more stable

1. Fay's Vocabulary Growth: Extremely Stable and Assisted with Time Management and Task Strategy

Fay achieved extremely stable progress in Cycle 2, learning 20 words per day for seven consecutive days. This consistency reflected her ability to strategically plan and sustain her efforts throughout the

week. Fay demonstrated clear self-regulation in her approach to task execution, aligning her strategies with learning goals.

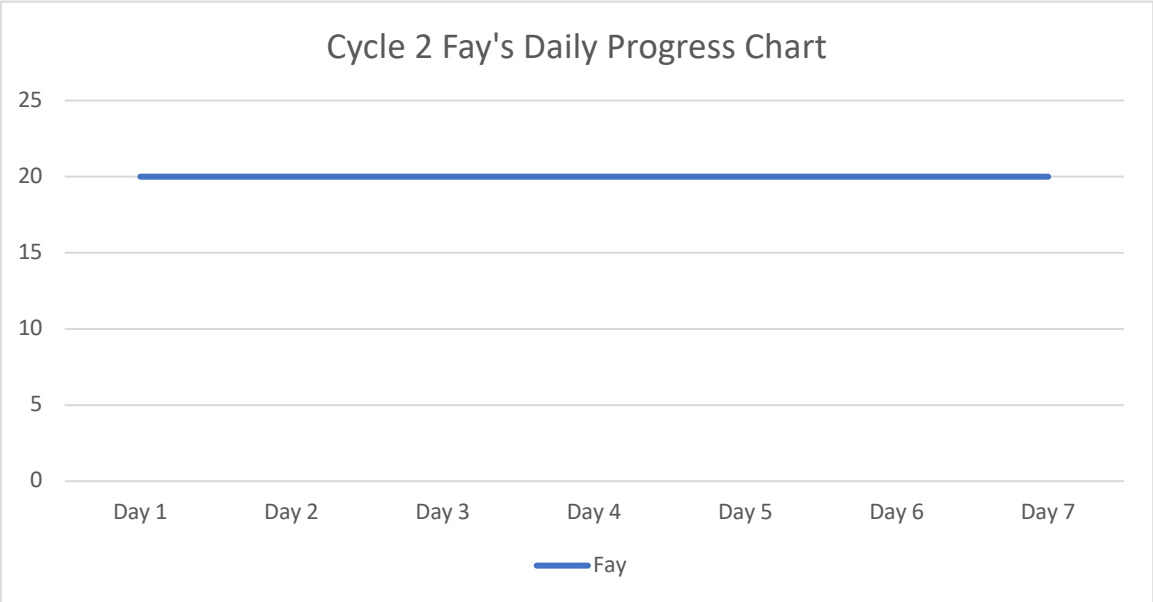

Figure 6.3-4 Cycle Fay's daily progress chart

1) Strategic planning and time management

Fay established a fixed daily study schedule, stating, "大部分都是六七点到七八点的样子" (Translation: "Most of the time, it was between 6 or 7 a.m. to 7 or 8 a.m."). By allocating a specific time each day for vocabulary learning, she ensured stability and routine in her engagement with the task.

2) Task strategy

To strengthen word retention, Fay developed an effective strategy based on the Ebbinghaus forgetting curve. She explained: "在 pad 上我就弄了一张艾宾浩斯遗忘曲线的那个表，然后一边跟着开心词场学，我就把它们写在这张表上，根据背诵日期会再看他几遍。" ("On my tablet, I created a chart based on the Ebbinghaus forgetting curve. While learning with Kaixincichang, I wrote the words on the chart and reviewed them a few times based on the memorization dates"). This task strategy actively promoted spaced review, allowing her to systematically revisit newly learned words. Her engagement with both the app and her supplementary strategy demonstrated thoughtful planning to ensure deeper vocabulary retention and learning quality.

2. Fay's motivation: enhanced by mastery experience

Fay's motivation in Cycle 2 showed notable improvement compared to Cycle 1. While her primary drive remained the proximal goal of passing CET-6, her growing confidence and sense of accomplishment contributed to increased task-oriented motivation.

Fay expressed a positive emotional connection to her learning process when she shared in English through WeChat: "I feel more and more comfortable learning with Kaixincichang. I have successfully completed the task (two levels a day)". This message highlighted:

1) **Increased comfort and engagement**:

   Fay's experience of stability and achievement in Cycle 2 made the learning process feel more manageable and rewarding, reducing the frustration she previously faced.

2) **Task completion and achievement sensation as motivation**:

   Successfully achieving her daily vocabulary objectives fostered a sense of accomplishment, which was evident with Kaixincichang's achievement celebrations. Both were likely to have reinforced her motivation to persist and consistently engage.

The structured success she experienced through her fixed study routine and review strategy not only improved persistence but also shifted her perception of the task. Fay began to see vocabulary learning as less of a burden and more as a process she could effectively manage, which reflected progress toward a more autonomous type.

3. **Fay's persistence: enhanced by improved time and task management and visible achievement**

Fay demonstrated exceptionally stable persistence in Cycle 2, learning 20 words per day for seven consecutive days. This consistency marked significant progress compared to Cycle 1 and reflected her improved ability to effectively manage time and tasks. Fay also noted the positive impact of stable persistence on her progress, noting that: "词汇量肯定是比之前好很多，每天更愿意坚持背单词" ("My vocabulary size has definitely improved a lot compared to before, and I am more willing to persist in learning words every day"), which highlighted how this growing sense of achievement further motivated her to stay consistent, reinforcing a positive cycle of persistence and progress.

4. **Fay's self-efficacy: enhanced greatly by mastery experience**

Fay's self-efficacy in Cycle 2 demonstrated significant growth, reflecting her increasing confidence in effectively managing her vocabulary learning. This confidence was evident in positive reflections on her progress and determination to continue.

During an interview with the researcher, Fay stated with a happy tone, “我会继续下去的” ("I will keep going"). Moreover, in a WeChat message she commented: “I think my learning is slowly getting on track”, indicating growing satisfaction with her learning and learning management efforts.

Key factors contributing to her enhanced self-efficacy included:

1) **Mastery experiences**:

Fay’s consistent achievement of daily targets, passing two levels with Kaixincihang and stable persistence provided concrete evidence of her capability which reinforced self-belief.

2) **Improved task strategies**:

Her structured review approach using the Ebbinghaus forgetting curve together with Kaixincichang’s spaced review allowed her to effectively engage with the learning material, enhancing confidence in her learning process.

3) **Positive emotional outlook**:

Fay’s satisfaction with her progress and recognition of improvement, reflected in these messages, contributed to motivation and belief in her success.

5. Summary of Fay’s journey in Cycle 2

Fay’s learning journey in Cycle 2 demonstrated significant growth in self-regulation, enabling her to achieve her desired results. By gaining self-control over her learning progress, she established a stable routine and effective strategies, leading to visible achievements which further enhanced motivation**,** persistence, and self-efficacy.

Fay’s journey in Cycle 2 demonstrated how achieving self-control and visible achievements can transform a learner’s experience, enhancing motivation, persistence, and self-efficacy. Her progress underscored the importance of providing structured support and strategies to help learners manage their learning effectively. Her experience also highlighted the importance of celebrating achievements and making them trackable to boost learners’ motivation and self-efficacy.

6.3.3 Daisy’s journey: consistent with Cycle 1

1. Daisy’s vocabulary growth

Daisy set a more realistic goal of learning 100 words and successfully achieved 94 words in Cycle 2, which was like her achievement in Cycle 1 (96 words) (see Figure 6.3-1). While her progress remained modest, it reflected her ability to maintain consistent performance through stable engagement and realistic goal-setting.

2. Daisy’s motivation

Daisy's motivation in Cycle 2 continued to be externally regulated, to satisfy her mother's expectation of passing CET-6. Her modest progress and low level of learning autonomy suggested that she remained driven by external factors rather than intrinsic interest. However, the satisfaction of completing daily tasks and meeting her adjusted goal possibly provided small incentives to her engagement, preventing further decline in motivation.

3. Daisy's persistence

Daisy's persistence in Cycle 2 mirrored her consistency in Cycle 1. Her progress was supported by peer monitoring which served as an external motivator. She explained that: "因为她(我的闺蜜)性格是一个特别自律的，她督促我". ("Because she (my best friend) is very self-disciplined, she supervises me"). This social support system helped Daisy stay on track, reinforcing her steady engagement and ability to follow through with her learning goals. Despite relying heavily on external factors, her commitment remained intact, reflecting the importance of accountability in maintaining persistence for such learners.

4. Daisy's self-efficacy

Daisy's self-efficacy remained unchanged from Cycle 1, as she expressed confidence in her ability to persist, commenting that: "每天学单词这个，觉得能继续坚持 ("Learning words every day feels like something I can continue to stick with"). This confidence stemmed from her ability to maintain steady persistence and meet daily learning tasks, even if her overall progress remained modest. The small mastery experiences gained through achieving manageable goals reinforced belief in her capacity to sustain such efforts.

5. Summary of Daisy's journey in Cycle 2

Daisy's learning journey in Cycle 2 was a continuation of her Cycle 1 performance: modest, consistent, and externally supported. She achieved 94 words, nearly matching her previous result of 96 words, with stable persistence maintained by peer monitoring. Her self-efficacy remained steady, as she believed in her ability to persist with daily vocabulary learning tasks.

Daisy's experience highlighted the role of peer accountability and realistic goal-setting in sustaining persistence for externally motivated learners. While her progress remained modest, the stability of her learning routine and confidence suggested a foundation for future growth with additional support to foster intrinsic motivation.

6.3.4 Dawn's journey: fluctuating but better persistence

Dawn's learning journey in Cycle 2 showed significant improvement compared to Cycle 1. She demonstrated better performance and greatly enhanced vocabulary growth, successfully meeting her

learning goal for this cycle. This progress reflected her ability to overcome some previous challenges, such as emotional strain and inconsistent persistence, while benefiting from refined strategies and better self-regulation. Her achievement in Cycle 2 marked a positive turnaround, providing evidence of her improved engagement and capacity to achieve set goals when supported with effective scaffolding. The following section presents details of her journey.

1. Dawn's Vocabulary Growth: Promoted by Better Self-Control

Dawn's vocabulary growth in Cycle 2 was remarkable, nearly doubling her achievement in Cycle 1. She successfully learned 270 words compared to 150 words in the previous cycle (see Figure 6.3-1). This significant improvement could be attributed to effective use of self-control and cognitive strategies which enhanced her focus, engagement, and retention.

1) Time management:

Dawn divided her learning into structured sessions, explaining: **"**设定学习时间，划分成三个段" (Translation: "I set specific study times, dividing it into three segments"). This strategy allowed her to effectively manage learning time with certain flexibility, ensuring steady engagement throughout the day.

2) Environment structuring:

To minimize distractions and enhance focus, Dawn utilized an environment structuring strategy: "到自习室学习，使用 iPad 背单词，关闭手机" ("I study in the self-study room, use my iPad for learning words, and turn off my phone"). Creating a distraction-free learning environment enabled her to concentrate fully on her tasks.

3) Context learning:

Dawn adopted Daisy's strategy of learning words in context, stating: "我看例句背单词，带入语境理解" ("I learn words by reading example sentences and understanding them in context"). This cognitive strategy improved her understanding of word meanings, improving vocabulary quality.

4) Review practice:

Dawn incorporated regular review into her learning process to reinforce retention, explaining, "过完一关后，（我）会快速的再扫（浏览）一遍所有单词" ("After completing a level, I quickly go through all the words again"). This strategy helped consolidate her newly learned words, preventing forgetting and improving mastery.

Dawn's improved vocabulary growth highlighted the benefit of combining self-control strategies (time management, environment structuring) with cognitive learning strategies (context learning and review). These approaches allowed her to more effectively engage, focus, and retain vocabulary.

2. Dawn's motivation: greatly improved by reflection and personal needs

Dawn's motivation in Cycle 2 was greatly enhanced compared to Cycle 1. A key shift occurred as she began to personally value the importance of learning CET-6 vocabulary for her long-term goals, which she clearly described:

1) "我也想过两年考研，英语肯定需要提升，单词躲不过去" ("I plan to take the postgraduate entrance exam in two years, and I definitely need to improve my English. Vocabulary is unavoidable"). This statement revealed that Dawn's motivation had progressed to a level of identified regulation, where she saw learning vocabulary as essential for achieving academic aspirations. Her future-focused outlook helped her internalize the value of the task.

Moreover, reflecting on her prior performance further strengthened motivation:

2) "上周末总结的时候发现自己学习英语的不足" ("During last weekend's reflection, I realized my weaknesses in learning English"). This self-awareness allowed Dawn to recognize the gaps in her English learning, prompting her to approach Cycle 2 with a stronger sense of purpose and commitment.

Dawn's motivation in Cycle 2 was driven by a clear alignment between her learning goals and future aspirations. This shift from external pressure to personally valuing the task played a significant role in enhancing her engagement and performance. Reflection on weaknesses also acted as a catalyst, motivating her to proactively address these shortcomings.

3. Dawn's persistence: empowered by strategic planning and achievement celebration

Dawn's persistence in Cycle 2 indicated significant improvement compared to Cycle 1, as she successfully persisted for seven consecutive days (please Figure 6.3-5). This marked a notable change from her earlier struggles with emotional strain and disengagement.

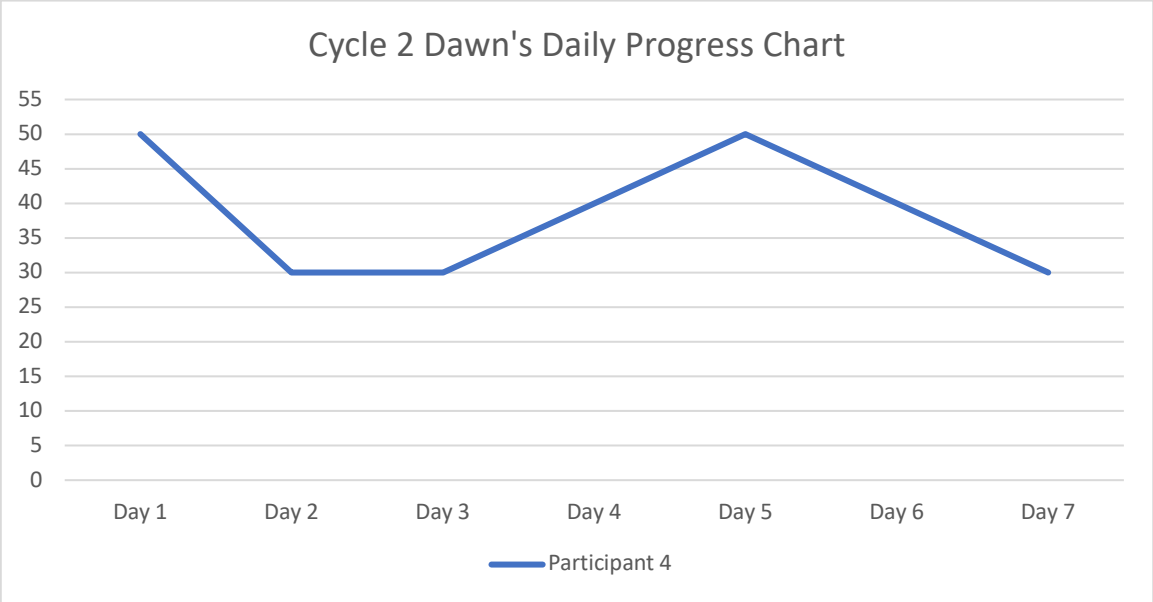

Figure 6.3-5 Cycle 2 Dawn's daily progress chart

Several factors contributed to her enhanced persistence:

1) **Strategic planning**:

Dawn attributed this improved consistency to her structured plan, noting: "因为是有计划在催促我，完成度较高" ("Having a plan pushed me forward, and my completion rate was quite high"). The presence of a clear plan acted as an external guide, helping her stay on track and overcome potential disruption.

2) **Positive feedback from Kaixincichang**:

Dawn celebrated her small successes, particularly when completing levels within the app. She shared how: "收到通关报告的那一刻，心里就感觉挺好的" (Translation: "The moment I received the level-passing report, I felt really good inside"). This instant feedback provided a sense of achievement, reinforcing her determination to continue learning.

3) **Valuing persistence**:

Dawn recognized the importance of persistence for building positive learning habits. She explained: "完成学习计划是一个比较好的学习习惯，是我想养成的习惯" ("Completing my learning plan is a good study habit, and it's one I want to develop"). By aligning persistence with the broader goal of cultivating strong learning habits, she found intrinsic value in staying committed to her tasks.

Dawn's improved persistence in Cycle 2 highlighted the importance of strategic planning, positive reinforcement, and a growing sense of intrinsic value for consistent learning. Her ability to celebrate small achievements and view persistence as a desirable habit demonstrated her evolving self-regulation and commitment to long-term goals.

4. Dawn's self-efficacy: promoted by mastery experience

Dawn's self-efficacy in Cycle 2 showed significant improvement as she developed confidence in her ability to sustain vocabulary learning and achieve goals. Her success in meeting Cycle 2 objective strengthened belief that she could manage the next phase effectively.

She expressed clear confidence about continuing into Cycle 3, asserting:

1) "完成第三轮，没问题" ("Completing the third cycle? No problem"). This confidence was rooted in the development of positive learning habits, as she remarked:

2) "现在形成了英语单词学习习惯" ("I've now formed a habit of learning English words").

Dawn's growing familiarity with Kaixincichang also contributed to self-efficacy, as she noted:

3) "开心词场用的也越来越顺手了" ("I'm getting more and more comfortable using Kaixincichang").

Her mastery experiences—achieving her goal in Cycle 2, maintaining persistence, and effectively using the app—collectively reinforced her confidence. These experiences enabled her to perceive learning as a manageable process rather than a source of stress, fostering a positive outlook towards future learning tasks.

5. Summary of Dawn's journey in Cycle 2

Dawn's learning journey in Cycle 2 demonstrated significant improvement compared to Cycle 1. She achieved remarkable vocabulary growth (270 words, nearly double her Cycle 1 result of 150 words) and successfully met her learning goal. Dawn's progress in Cycle 2 highlighted the transformative role of strategic planning, self-control strategies, and task reinforcement in supporting learners who previously struggled with emotional challenges and persistence. Her improved self-efficacy and motivation provided a strong foundation for continued success in future cycles.

6.3.5 Elizabeth's journey: transforming available time into fruitful learning

Elizabeth demonstrated the greatest improvement in Cycle 2, achieving 300 words, nearly tripling her result from Cycle 1 (105 words) (see Figure 6.3-1). This significant progress was supported by **better persistence** and more consistent engagement throughout the week. She attributed success to improved use of Kaixincichang, which allowed her to learn more efficiently, and more available **time**, as her

schedule was less demanding. Elizabeth also highlighted the motivating role of being part of the research team, which provided external accountability and encouraged her to persist with learning tasks.

1. **Elizabeth's vocabulary growth: supported by effective use of Kaixincichang and independent review**

Elizabeth's vocabulary growth in Cycle 2 was remarkable. This improvement highlighted her ability to adapt learning strategies and make more effective use of Kaixincichang's structured learning process.

1) Supported by structured learning from Kaixincichang:

Elizabeth found the app's design particularly effective for learning new words, as its level-based structure and drills provided a clear pathway to acquiring vocabulary. However, she identified a need for additional review beyond the app's spaced review feature, observing that: "学完后，那些单词可以自己再复习复习的" ("After learning them, those words can be reviewed again on your own"). This comment reflected her growing awareness of the importance of independent review to reinforce retention and improve long-term mastery.

2) Supported by strategic planning and time management:

Furthermore, time management and strategic planning played a key role in her success. She noted: "一般在下午或者晚上，留出时间，单独背单词，然后再复习" ("I usually set aside time in the afternoon or evening to study vocabulary exclusively and then review it"). This disciplined approach to scheduling and reviewing not only enhanced her engagement but also directly contributed to the growth of her vocabulary and the development of higher-quality knowledge.

2. **Elizabeth's motivation: empowered by valuing the objective**

Elizabeth's motivation in Cycle 2 reflected a highly autonomous type, the identified regulation defined by self-determination theory (SDT) (Ryan & Deci, 2017, p. 185). She recognized the importance of vocabulary learning as a foundational skill for improving her overall English proficiency, asserting that: "单词是英语的基础。我之前一直做的不太好" ("Vocabulary is the foundation of English. I haven't been doing very well at it before"). This acknowledgment indicated that she valued the learning objective and understood its relevance to her broader academic and personal goals. Her motivation was driven by belief in the necessity of mastering vocabulary to improve her English skills, rather than external pressures.

3. **Elizabeth's persistence: enhanced by achievement and peer monitoring**

Elizabeth demonstrated better persistence in Cycle 2, successfully engaging with vocabulary learning for all seven days of the week (see Figure 6.3-6). This marked a significant improvement from her

fluctuating engagement in Cycle 1 and highlighted the impact of both mastery experiences and external accountability on her determination.

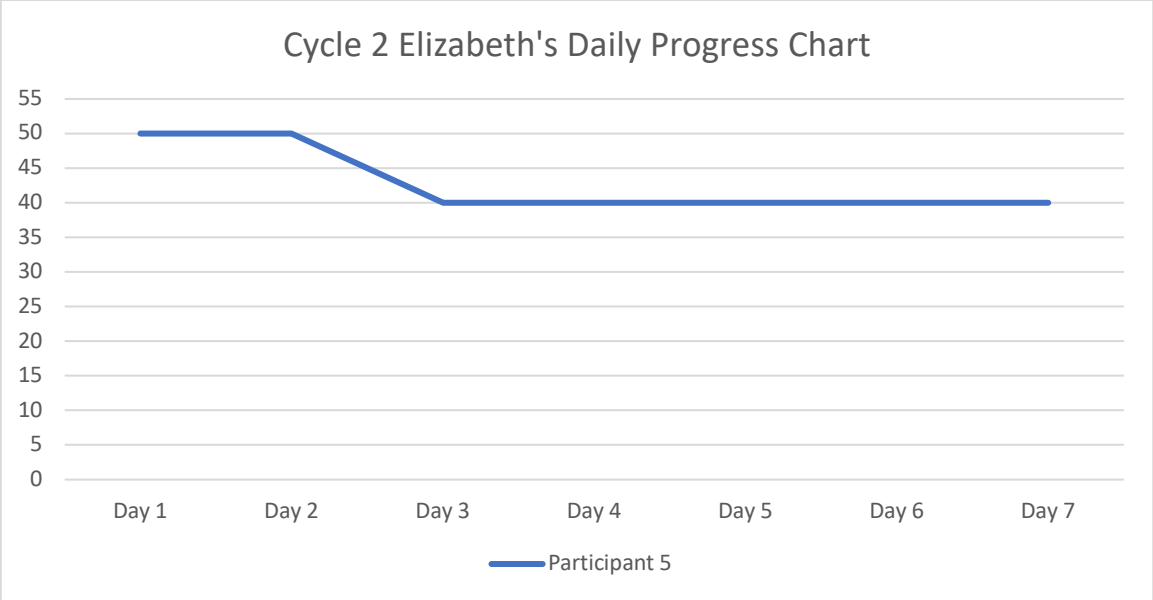

Figure 6.3-6 Cycle 2 Elizabeth's daily progress chart

1) Mastery experience:

Elizabeth's success in Kaixincichang's gamified features, such as the PK mode, reinforced her persistence. She noted, "PK 大部分都赢，坚持背单词还是有效果的" ("I won most of the PK matches; persisting in learning words has been effective"). This tangible success enhanced her confidence and motivated her to maintain consistent effort throughout the week.

2) Peer Monitoring:

Being part of the research team also contributed significantly to Elizabeth's persistence. She acknowledged the influence of external accountability in her learning diary, writing: "加入学习小组，有监督作用" ("Joining the study group has a supervisory effect"). The sense of being monitored and supported by peers provided her with additional motivation to stay on track.

4. Elizabeth's self-efficacy: enhanced by mastery experience but tempered by concerns

Elizabeth's self-efficacy for completing Cycle 3 learning objectives showed a moderate level of confidence, influenced by her success in Cycle 2 and the uncertainties of her changing schedule for the following week. She expressed belief in sustaining her learning habits, noting that: "学习习惯坚持下去，基本可以" ("If I keep up my learning habits, I should be able to manage it"). This indicated that

her self-efficacy was strengthened by mastery experiences in Cycle 2, as she successfully achieved her learning goal of 300 words and maintained steady persistence. However, her confidence was tempered by practical concerns about her schedule for the next cycle, which introduced an element of uncertainty and potential disruption.

6.4 Implications from Cycle 2 and recommendations for Cycle 3

Implications from Cycle 2

The findings from Cycle 2 provided in-depth insights into the interplay between SRL strategies and game-based features in influencing learners' vocabulary growth, motivation, persistence, and self-efficacy.

1. **Game factors boosted learner persistence and self-efficacy**:

    1) Achievement celebration and progress tracking:

    Celebratory elements, such as level-passing reports, provided emotional reinforcement that positively influenced the persistence and self-efficacy of less confident learners such as Fay and emotional learners like Dawn. These features gave learners a sense of accomplishment, helping them associate progress with personal capability, thus transforming apprehension into motivation.

    2) PK mode as a developmental evaluation:

    PK competitions acted as both an engaging activity and an evaluative tool, offering real-time performance feedback. For learners like Alex and Elizabeth, this gamified feature fuelled intrinsic competition, which enhanced persistence and improved word retention. It also served as a low-stakes, incremental validation of their learning progress, helping to maintain their momentum.

2. **Strategic planning, self-control and levelling work in tandem:**

    1) Strategic planning and levelling:

    The use of strategic planning, such as breaking levels into smaller, manageable chunks and scheduling dedicated learning times, allowed learners like Fay and Dawn to independently regulate their learning. This approach was particularly effective in ensuring consistency for learners who previously struggled with emotional or motivational barriers.

    2) Time management and levelling:

    Consistent time management ensured that learners like Elizabeth could better align their efforts with their goals. By dedicating specific blocks of time to level chunks of vocabulary learning

and review, participants maximized their efficiency, reduced their sense of being overwhelmed, and achieved improved outcomes. This combination of strategies not only fostered better persistence but also enhanced confidence in their ability to succeed.

3. **Cognitive strategies plus structured learning process for deeper learning:**

   1) **Context learning**:

   Learners who employed contextual learning strategies, such as understanding words through example sentences or situating them in meaningful contexts, demonstrated higher levels of vocabulary retention and a deeper understanding of word usage. This strategy was particularly effective for complex or abstract vocabulary, as noted by learners like Dawn.

   2) **Independent review plus spaced review**:

   While Kaixincichang's spaced review mechanisms provided a solid foundation for learning, participants like Elizabeth identified the importance of independent review to further strengthen retention. The ability to supplement structured learning with proactive review strategies reflected a growing awareness of metacognitive regulation.

4. **Social and Peer Accountability:**

   Being part of the research team provided a supportive and motivational framework for participants, particularly for learners like Elizabeth and Daisy. Peer monitoring not only reinforced persistence but also helped learners perceive their progress as part of a shared journey, reducing feelings of isolation and encouraging consistent engagement.

Recommendations for Cycle 3

Building on these insights, the following recommendations are proposed for Cycle 3:

1. **Enhance positive feedback mechanisms**:

   Continue emphasizing achievement celebrations and trackable progress to sustain and boost learner persistence and self-efficacy, especially for less confident and emotional learners.

2. **Promote strategic planning**:

   Provide further guidance on time management and task segmentation, enabling learners to create realistic and manageable plans that align with their individual schedules and objectives.

3. **Leverage game elements for evaluation**:

   Encourage the use of PK mode as a motivational tool, integrating it as an optional evaluation mechanism to foster friendly competition and developmental feedback for learners.

4. **Reinforce cognitive strategies**:

   Continue promoting context learning and encourage learners to extend independent review practices, especially for difficult or abstract vocabulary, to maximize the retention of newly acquired knowledge.

5. **Adjust to external constraints**:

   Provide tailored recommendations for learners who face external challenges, such as changing schedules, to help them maintain persistence and self-efficacy despite disruptions.

Chapter 7 Cycle 3: Actions and Findings at the End

Cycle 3 focused on supporting participants in the self-reflection phase of SRL, as outlined by Zimmerman and Moylan (2009). Building on the progress and insights from Cycle 2, this cycle aimed to help learners evaluate improvement in their vocabulary knowledge and learning strategies, monitor progress, and make adjustments to optimize vocabulary acquisition. Participants were encouraged to use self-reflection strategies such as performance evaluation, self-reward, and identifying areas for improvement. The actions taken during this cycle also emphasized enhancing metacognitive awareness by guiding learners to reflect on their learning habits, identify effective approaches, and address challenges encountered in previous cycles. In this chapter, participants' responses are analysed in four key areas—vocabulary growth, motivation, persistence, and self-efficacy—to evaluate how the self-reflection phase influenced their learning journey. This analysis provides insights into how SRL strategies can empower learners to sustain engagement, adapt to challenges, and achieve meaningful progress in their vocabulary learning.

7.1 Brief review of participant progress and challenges from Cycle 2

1. **Participants' Progress**:

Cycle 2 saw notable improvements across all participants, with most achieving their learning goals and demonstrating enhanced persistence. Key progress included:

1) **Alex**: Maintained ambitious goals with stable persistence and improved time management, achieving significant vocabulary growth.
2) **Fay**: Achieved exceptional stability in persistence and made consistent progress, supported by strategic planning and effective review strategies.
3) **Daisy**: Continued with modest but stable performance, achieving her set goal through peer accountability and consistent effort.
4) **Dawn**: Showed a remarkable turnaround with double vocabulary growth, driven by strategic planning, improved motivation, and better persistence.
5) **Elizabeth**: Achieved the largest vocabulary growth, supported by improved use of Kaixincichang, better time management, and peer encouragement.

2. **Cycle 2 Challenges**:

The key challenges identified in Cycle 2 and moving into Cycle 3 include:

1) **Ensuring Knowledge Quality for Alex**:

Alex maintained ambitious goals, learning over 400 words in each of the past two cycles. While his vocabulary growth was impressive, it was essential to ensure that the quality of his vocabulary knowledge—such as retention, understanding of meaning in context, and word usage—kept pace with the quantity of words learned.

2) **Sustaining Progress for Improved Learners**:

Participants like Fay, Dawn, and Elizabeth who made significant improvements in Cycle 2, required support to maintain their momentum. Sustaining motivation, persistence, and confidence in subsequent cycles would be critical to prevent regression.

3) **Motivating Daisy While Sustaining Persistence**:

Daisy demonstrated consistent persistence but continued to struggle with low motivation and modest performance. Finding ways to more effectively engage her and foster intrinsic motivation while preserving her steady persistence was essential.

These challenges informed the goals and strategies of Cycle 3, focusing on self-reflection and adaptive learning adjustments to empower participants and address their unique needs.

7.2 Actions conducted for Cycle 3

Cycle 3 focused on the self-reflection phase of SRL, helping participants evaluate their learning strategies, monitor their progress, and make adjustments to achieve improved outcomes. However, an unexpected challenge arose on the second day of Cycle 3, when all participants faced a strict lockdown and were confined to their dormitories for the remainder of the week. Moreover, Alex, identified as a close contact, was relocated to a separate quarantine facility, adding a layer of emotional and logistical difficulty to his learning journey.

Building on insights from Cycle 2 and challenges imposed by the sudden lockdown, the following actions were implemented:

1. **Addressing the lockdown challenge**

The sudden lockdown introduced challenges such as emotional strain, limited resources, and disrupted routines. Actions to mitigate these challenges included:

1) **Flexible time management**: Participants were encouraged to adjust their study schedules to fit their new circumstances, with sorter, more frequent study sessions to maintain focus.

2) **Emotional support**: Group discussions and encouragement via WeChat provided a sense of connection and peer encouragement, helping to counter isolation and maintain motivation.

3) **Specific support for Alex**:

a. **Prioritizing health**: Alex was encouraged to prioritize his physical and emotional well-being, recognizing that his ability to learn effectively depended on maintaining his health during this challenging time.
b. **Emotional encouragement**: Regular motivational messages were sent to Alex to help him stay connected with the group and maintain a sense of purpose in his learning journey, despite the isolation.
c. **Tailored guidance**: The researcher offered asynchronous communication via WeChat to provide personalized guidance on his learning process. This ensured that Alex could receive support and adjust his strategies as needed, even in isolation.

2. Promoting self-reflection strategies

Participants were guided to use self-reflection strategies to evaluate their learning processes and identify areas for improvement. Key strategies included:

1) Performance evaluation:

a. Participants reflected on their learning goals and assessed their daily achievements in Cycle 2, comparing their planned and actual outcomes.

b. Participants reflected on their CET-6 practice performance on vocabulary knowledge retention and quality. For example, they were encouraged to reflect to what extent they could recognize a new learned word and understand it in the given context.

2) Identifying strengths and weaknesses: Learners were encouraged to pinpoint effective strategies they used and challenges they faced, fostering awareness for adjustments in their future studies.

3) Emphasizing adaptability:

a. Given the lockdown, participants were guided to reflect on how external barriers influenced their learning and how they could adapt their strategies to maintain engagement.

4) Self-reward: Participants were prompted to reward themselves for achieving specific milestones, to strengthen positive reinforcement and motivation.

3. Scaffolding for knowledge quality

With restricted physical movement and increased screen time, participants were guided to focus on strategies that improved vocabulary knowledge quality:

1) Participants were guided to increase their use of learning strategies, such as context learning and systematic review, to enhance retention and deepen understanding.
2) Alex was especially encouraged to implement review-intensive and application-intensive practices to ensure his ambitious learning pace did not compromise retention or mastery of words.

4. **Leveraging game-based features**

Game-based features of Kaixincichang were further utilized to sustain engagement during lockdown:

1) The PK mode was promoted as a fun and competitive evaluation tool to boost persistence and word retention.
2) Achievement celebrations, such as reports for passing a new level, were emphasized to reinforce positive feedback and foster confidence.

7.3 Cycle 3 journey exploration: vocabulary growth, motivation, persistence and self-efficacy

In Cycle 3, participants demonstrated varied vocabulary growth (see Figure 7.3-1), reflecting both their progress and challenges encountered. Alex still achieved the most number of new words, despite experiencing minor declines due to external challenges. Similarly, Dawn also experienced a minor decline in vocabulary growth compared to Cycle 2. Fay and Elizabeth maintained their steady upward trajectories, showing resilience and adaptability despite the lockdown challenges. Daisy's motivational struggles became more pronounced, highlighting a need for targeted support.

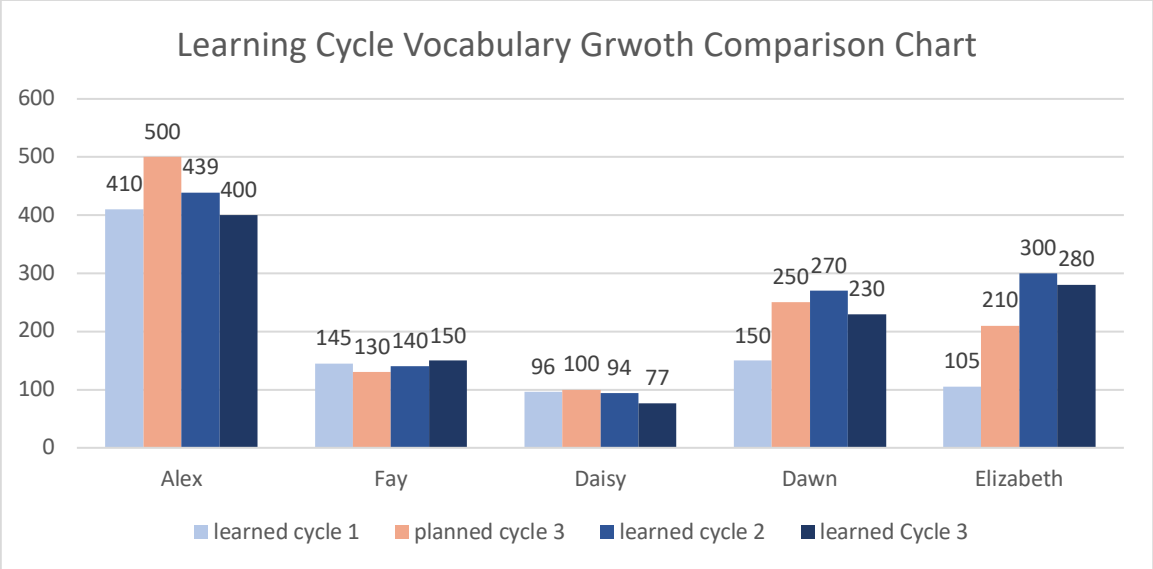

Figure 7.3-1 Learning Cycle vocabulary growth comparison

7.3.1 Alex's journey: strong resilience to external challenge

1. **Alex's vocabulary growth**

In Cycle 3, Alex achieved 400 words, slightly below his ambitious target of 500 but still demonstrating substantial progress despite the challenges of quarantine. His vocabulary growth was supported by effective strategies and Kaixincichang's structured learning features. The new findings in this cycle were:

1) PK mode promotes words retention

The PK mode of Kaixincichang played a significant role in reinforcing word retention. Alex reflected: “PK 时有的（单词）出现误判，应该及时对单词再巩固” ("Some mis-judgments with words occurred during PK, which highlighted the need to reinforce those words promptly"). This gamified feedback mechanism helped him identify weaknesses and provided opportunities for targeted review, improving his retention of challenging words.

2) Structured learning process supports in-depth vocabulary learning

Alex noted that Kaixincichang’s structured learning process contributed to his deeper understanding and application of vocabulary:“阅读中感觉单词比之前好很多，做题的时候就会有意识用上” ("I feel that my vocabulary is much better during reading, and I consciously use it when doing exercises"). This indicates that the app's structured drills and varied activities not only expanded his vocabulary size but also enhanced his ability to apply the learned words in meaningful contexts.

Alex’s vocabulary growth in Cycle 3 underscored the importance of combining time management and structured learning tools to support ambitious learners. It also reflected the effectiveness game-based reinforcement for word retention. Despite falling short of his target, his progress indicated a strong command of strategies and effective use of tools to sustain learning under challenging conditions.

2. Alex’s motivation

In Cycle 3, Alex’s motivation was significantly enhanced, driven by positive self-evaluation and the reinforcing effects of Kaixincichang’s game-based features.

1) PK mode promotes motivation

The competitive nature of the PK mode played a crucial role in stimulating Alex’s intrinsic motivation, as he explained: “PK 机制激发获胜心。然后获胜整体上督促你去认识更多词。” ("The PK mechanism sparks a desire to win. Winning, in turn, encourages you to learn more words overall."). This reflected how gamified elements not only made the learning process enjoyable but also fostered a sense of accomplishment, pushing Alex to engage more deeply with vocabulary learning.

2) Positive self-evaluation promotes motivation

Alex noted that his perception of progress further fuelled his motivation: “现在能明显感觉到进步，就更有动力了。”("I can clearly feel the progress now, which gives me even more motivation"). This indicated that achieving measurable outcomes and recognizing personal improvement enhanced belief in the value of his efforts, reinforcing determination to continue learning.

Alex’s enhanced motivation in Cycle 3 highlighted the effectiveness of combining game-based reinforcement with positive self-evaluation to drive engagement and sustained effort. His journey underscored the importance of providing learners with opportunities to recognize their progress and celebrate achievements as part of their learning experience.

3. Alex’s persistence

Alex demonstrated consistent persistence in Cycle 3, maintaining a steady pace throughout the week, as reflected in his daily progress data (see Figure 7.3-2 below). This steady progression highlighted his ability to sustain focus and adapt to challenges, despite the disruption of quarantine.

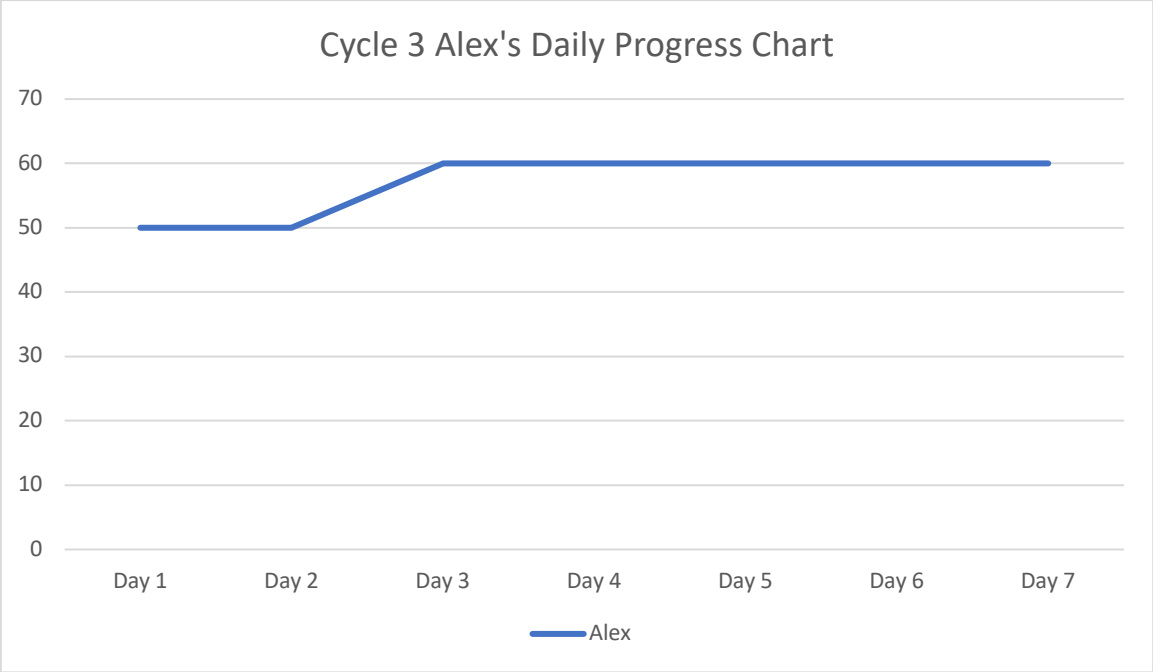

Figure 7.3-2 Alex's daily progress of Cycle 3

1) PK and positive self-evaluation enhance determination

The gamified PK feature and his positive self-evaluation further reinforced his determination to persist. Winning PK challenges motivated him to keep learning, as noted in earlier quotes on motivation. In addition, recognizing his own progress boosted confidence and commitment, sustaining his persistence throughout the cycle.

2) Proximal goal enhanced and self-control supported persistence

Alex's persistence improved significantly after Day 3, as he adapted to the new learning environment in quarantine. He reflected: "新的学习环境比较适应，能够专心投入学习，数量和质量有所提高" ("I've adapted to the new learning environment, and I'm able to focus on studying, with both quantity and quality improving"), and explained how "考试的压力压着自己要尽快适应（新环境），回归正常学习" ("The pressure of the exam pushed me to quickly adapt to the new environment and return to normal learning"). This underscored the importance of proximal goals to ambitious learners, in promoting self-control to adapt to challenging situations to achieve persistence.

Alex's persistence in Cycle 3 underscored the interplay between proximal goals, self-control, and environmental adaptability in maintaining the consistent engagement of an ambitious learner. His experience also demonstrated the effectiveness of positive self-evaluation in promoting persistence. His ability to sustain a stable learning pace, even in challenging conditions, reflected his growth in SRL strategies and determination to achieve his goals.

4. Alex's self-efficacy

Alex exhibited robust self-efficacy at the end of Cycle 3, displaying strong confidence in his ability to independently complete the rest of his CET-6 vocabulary learning.

He expressed a high level of assurance in both the quantity and quality of his learning, commenting that: "接下来独立完成六级单词的学习，没问题。数量上肯定有保证。质量上，我会再加强复习和练习" ("There's no problem in independently completing the rest of the CET-6 vocabulary learning. The quantity is definitely guaranteed, and I'll further enhance quality through review and practice"). This indicates that, on self-reflection, self-efficacy extended beyond his ability to sustain current progress to proactively addressing areas for improvement, particularly in retention and application of vocabulary knowledge.

Alex attributed his confidence to the mastery experiences gained through persistent efforts in past cycles. He reflected: "主要还是过去几周的学习，尤其是这周我都能坚持下来。我感觉可以独立完成后续的学习。" ("It's mainly because of the learning from the past few weeks, especially this week where I managed to persist. I feel I can independently complete the subsequent learning"). His successful engagement with challenging tasks, even under quarantine conditions, reinforced belief in the capacity to regulate his own learning.

Alex's self-efficacy at the end of Cycle 3 highlighted the transformative impact of mastery experiences and strategic reflection. His confidence to independently complete the remaining CET-6

vocabulary learning demonstrated the effectiveness of combining structured support with SRL strategies to foster long-term autonomy.

7.3.2 Fay's journey: motivation eroded by lockdown but boosted self-efficacy after reflection

Fay's learning journey in Cycle 3 was marked by steady progress, achieving 150 words and surpassing her Cycle 2 performance. Despite the challenges of a lockdown environment that eroded her motivation, she maintained consistent persistence through strategic planning, peer support, and encouraging feedback from the researcher. Her proactive use of context learning and review strategies strengthened her vocabulary retention and application. Fay's mastery experiences and self-reflection boosted her confidence, and she expressed robust self-efficacy in completing the rest of the CET-6 vocabulary learning independently before the next exam.

1. Vocabulary growth

1) Improved vocabulary size and depth

Fay's reflection highlighted her notable improvement in vocabulary knowledge, particularly its application in CET-6 practice: "词汇一直是我很大的弱点，现在做题好多了，认识的词增多了不少。" ("Vocabulary has always been a major weakness for me, but now I've improved a lot in practice; I recognize significantly more words"). This sound application indicated improvement in both the size and depth of vocabulary knowledge and in her efforts to learn and review vocabulary, which translated into tangible benefits in applying vocabulary knowledge in context.

2) The importance of Kaixincichang and proactive use of learning strategies

She reiterated the importance of context learning to enhance her retention and comprehension of vocabulary: "要多用开心词场给的例句去理解词的含义" ("You need to use the example sentences provided by Kaixincichang to understand the meaning of words"). She also highlighted the role of additional review in strengthening her learning outcomes: "除了开心词场的复习外，自己也要安排复习就能记得更牢固。" ("Besides the review provided by Kaixincichang, arranging additional review yourself helps make the learning more solid"). This dual approach—leveraging the app's spaced review and incorporating her own review plan—enhanced the quality of her vocabulary knowledge and improved retention.

Fay's vocabulary growth in Cycle 3 underscored the value of combining structured app-based learning with proactive self-regulated strategies such as context learning and independent review. Her success highlighted the importance of active learner engagement in achieving meaningful vocabulary development.

2. Fay's motivation

Fay's motivation in Cycle 3 faced challenges due to the lockdown environment, which negatively impacted her emotional state. However, her continued recognition of the importance of vocabulary learning sustained her overall effort.

1) Erosion of motivation by the environment:

Fay expressed frustration with the impact of the dormitory lockdown environment: "现在都只能在宿舍，就大家一起那种摆烂那种感觉。" ("Now we're all stuck in the dormitory, and it's just that collective feeling of giving up."). This indicated that the lack of structure and negative peer influence in the shared environment eroded her motivation, making it harder for her to maintain focus and engagement.

2) Recognition of vocabulary learning's value helps motivation maintenance:

Despite the discouraging environment, Fay continued to acknowledge the importance of vocabulary learning which acted as a motivator to sustain her efforts. This internalized understanding of its relevance helped her persist in her goals even when faced with emotional and situational barriers.

Fay's motivation in Cycle 3 highlighted the fragility of learner motivation in challenging environments and the importance of reinforcing the value of the learning task. While her recognition of vocabulary learning's significance helped sustain her efforts, addressing emotional and situational barriers was crucial for maintaining motivation in similar contexts.

3. Fay's persistence

Fay demonstrated consistent persistence throughout Cycle 3, achieving her planned daily target of 20–30 words as shown in Figure 7.3-3.

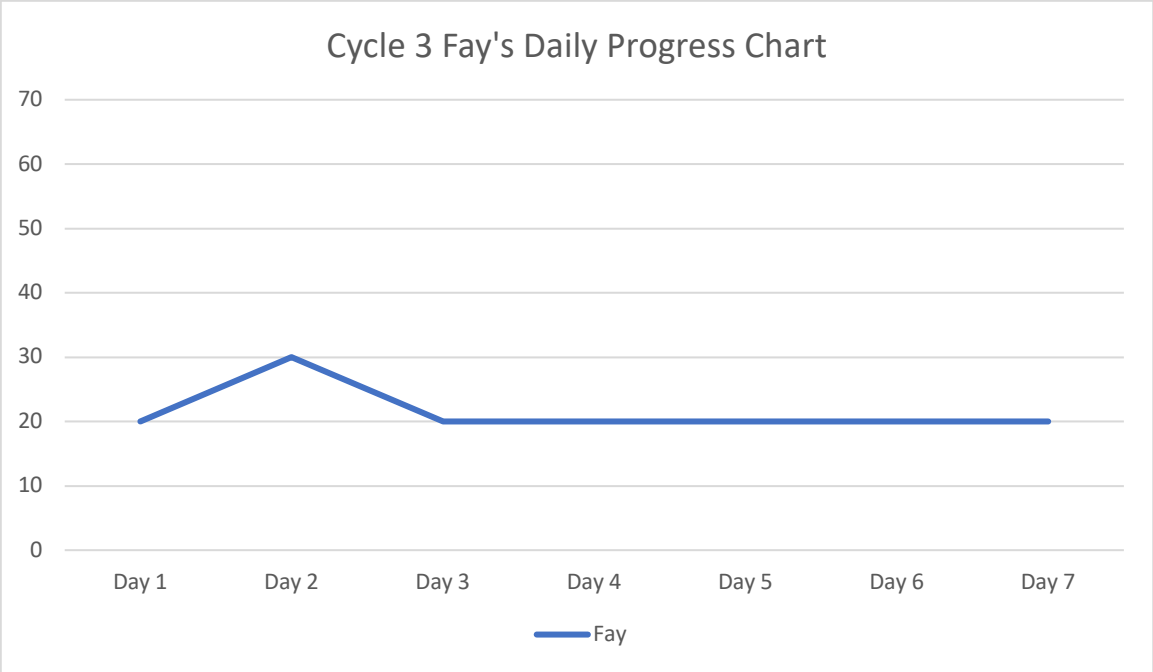

Figure 7.3-3 Cycle 3 Fay's daily progress chart

Despite steady progress, Fay struggled with persistence due to challenges in managing her schedule and emotional state during the lockdown.

1) Struggles with persistence:

Fay reflected on the difficulties she faced, particularly in maintaining her regular study routine: “就是有几个晚上，都是尽力完成任务(目标)，但是那个完成任务的时间，就是晚上有点偏后了（跟上周比）。” ("There were a few nights when I tried my best to complete my tasks (targets), but the completion time was a bit later than last week"). These comments indicate that, although she managed to achieve her daily goals, she required additional persistence, especially as her learning schedule shifted to later in the day.

2) Role of peer accountability:

Fay emphasized the motivating effect of being part of the research team, which helped her sustain persistence: “就是明显能感觉到，参加我们这个活动有督促作用。” (Translation: "It’s obvious that participating in this activity has a supervisory effect"). She also noted the collective encouragement of the group: “想跟大家一起坚持。” (Translation: "I want to persist together with everyone."). This highlighted the importance of social and peer accountability in fostering determination to complete her learning tasks.

3) Impact of Researcher Feedback:

Fay found the researcher's feedback particularly motivating, commenting that: "还有老师你的反馈每次都特别温暖，给我能量。让我觉得很有动力。" ("Your feedback is always so warm and energizing. It gives me motivation"). This underscored the importance of external encouragement in helping learners feel supported and motivated, particularly during challenging times.

Fay's persistence in Cycle 3 highlighted the significance of peer support, external feedback, and collective motivation in overcoming barriers to learning. While she maintained daily targets, her experience underlines the need for strategies to mitigate disruptions in schedules and strengthen emotional resilience to support consistent engagement.

4. Fay's self-efficacy

Fay displayed robust confidence in her ability to independently complete the rest of the CET-6 vocabulary learning before the next CET-6 exam. Her self-efficacy was bolstered by her mastery experiences, positive reflection, and renewed determination.

1) Confidence in completing CET-6 vocabulary:

Fay expressed her belief in successfully finishing the vocabulary learning tasks before the exam: "(我)会顺着这个方向把单词学完。" ("(I) will continue in this direction and finish learning the vocabulary."), which demonstrated her readiness to maintain current progress and achieve her learning goals within a concrete timeframe.

2) Mastery experience through reflection:

Fay attributed this confidence to the growth she observed in herself through the program, noting: "觉得就是对比前几次（备考六级）明显感觉到我们活动我的成长。" ("Compared to my previous attempts at preparing for CET-6, I can clearly feel my growth through this activity."). Positive self-reflection and recognition of progress reinforced belief in her ability to succeed.

3) Enhanced Determination and Renewed Confidence:

Fay linked this renewed determination to her third CET-6 attempt: "然后包括也是第三次(报考六级)也有改头换面信心。" ("It's also my third time taking CET-6, and I have a renewed sense of confidence."). Her determination to excel in the upcoming exam acted as a motivator, further boosting confidence in achieving her vocabulary learning goals.

Fay's self-efficacy in Cycle 3 highlighted the transformative power of mastery experiences, positive reflection, and goal-focused determination in fostering learners' confidence. Her readiness to complete the remaining CET-6 vocabulary before the exam exemplified how structured support and personal growth can drive autonomy and future success.

7.3.3 Daisy's journey: struggling maintenance and low self-efficacy after self-reflection

Daisy's learning journey in Cycle 3 was marked by challenges and a decline in performance compared to previous cycles. She achieved 77 words and maintained persistence for five consecutive days, but her progress was hindered by the lockdown environment and her diminished motivation. Despite these struggles, she showed signs of proactive learning through strategies like active review and creating a personal learning environment, reflecting a degree of autonomy. However, her self-efficacy remained low due to limited mastery experiences and discouraging feedback from PK challenges.

1. Daisy's vocabulary growth

In Cycle 3, Daisy achieved 77 words, reflecting a decline compared to her performance in Cycle 2 (94 words). Despite the challenges posed by her environment, she identified strategies that contributed to her vocabulary knowledge quality.

1) Impact of learning environment:

Daisy noted that the lockdown and dormitory setting negatively affected her efficiency, explaining that: "大家都在宿舍，学习效率会变低，就比较松散。" ("Everyone is in the dormitory, and learning efficiency drops; it becomes more relaxed"). This highlighted how an unstructured and distracting environment hindered her ability to focus and maintain a productive pace.

2) Creating a personal learning environment:

Daisy recognized the importance of crafting her own learning environment to counteract the distractions of the dormitory lockdown by: "营造自身学习环境" ("Creating a personal learning environment"). This strategy was critical in helping maintain focus and complete her planned vocabulary learning, showing proactive effort to adapt to the restricted circumstances.

3) Compensatory time management:

Despite the challenges, Daisy used time management strategies to sustain her progress, explaining how:"（每天学习单词的）量上还好。就是花的时间长了点儿。" ("The amount of vocabulary learned each day was fine; it just took longer"). This indicated that while she was able to maintain a certain amount of learning, it required more effort and time due to the inefficiencies in her learning environment during lockdown.

4) Active Review for Retention:

Daisy emphasized the importance of proactive review in retaining learned vocabulary "主动复习" (Translation: "Active review") which helped consolidate her knowledge and

contributed to the development of her vocabulary quality, even though overall progress was slower than in previous cycles.

Daisy's vocabulary growth in Cycle 3 reflected the dual importance of learning strategies and self-structured learning environments in supporting new word learning and knowledge retention when facing a distracting environment. Despite a slower pace, her reflections reveal critical insights into managing learning under challenging conditions.

2. Daisy's motivation

In Cycle 3, Daisy's motivation declined slightly compared to previous cycles due to the challenges of the dormitory lockdown. However, her proactive use of learning strategies revealed a growing sense of autonomy and resilience, suggesting that she successfully maintained a certain level of motivation, despite the difficult circumstances.

1) Negative impact of the environment:

Daisy described feeling trapped and disengaged due to the prolonged dormitory lockdown: "这周有点儿懈怠，一直待在宿舍有点儿圈得慌，学习状态也不大能调节过来。" (Translation: "I felt a bit slack this week, being stuck in the dormitory made me feel trapped, and I couldn't adjust my learning state"). This reflected how the restrictive environment affected her emotional well-being, making it harder to maintain focus and enthusiasm for learning.

2) Proactive Learning Strategies Reflecting Autonomy:

Daisy demonstrated autonomy in her learning by implementing key strategies, including active review and creating a personal learning environment. These actions reflected her ability to self-regulate and adapt her approach to maintain engagement and improve vocabulary retention, demonstrating an improvement in her autonomy compared to Cycle 1.

Daisy's motivation in Cycle 3, though affected by external challenges, reflected a higher degree of autonomy and resilience compared to Cycle 1. Her proactive use of learning strategies suggests that she successfully maintained a meaningful level of motivation, offering insights into the importance of fostering self-regulated strategies to support learners in difficult situations.

3. Daisy's persistence

Daisy's persistence in Cycle 3 was shorter than in Cycle 2, but it remained stable across five consecutive days. Figure 7.3-4 charts her daily progress data:

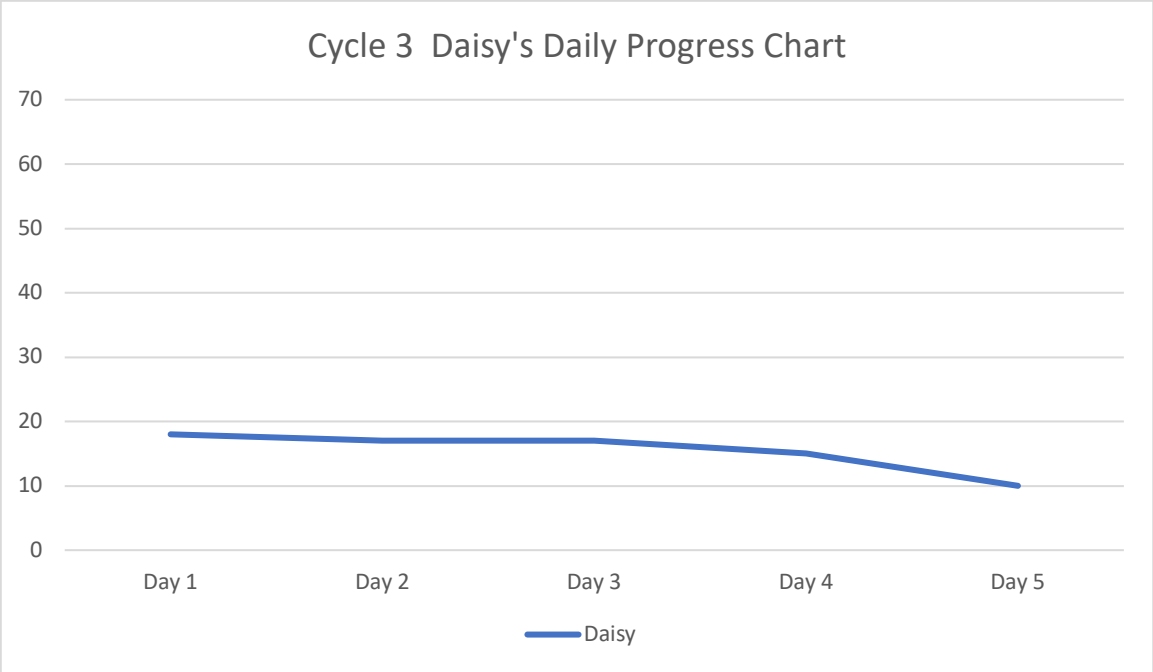

Figure 7.3-4 Cycle 3 Daisy's daily progress chart

Daisy attributed her persistence to a combination of external and internal factors.

1) Increased sources of determination for persistence:

Daisy identified three main drivers that helped her maintain persistence: “有我妈妈（期望）的原因，有小姐妹监督的原因，现在又多了参与这个项目，觉得和大家一起坚持下来感觉挺好的。” ("It’s partly because of my mother’s expectations, partly because of my friend’s supervision, and now also because of participating in this project—I feel good persisting together with everyone"). These factors demonstrated the interplay of social, familial, and community support in sustaining her efforts.

2) Steady but Declining Effort:

While Daisy’s persistence was consistent for the first four days, her effort declined on the fifth day. This shorter persistence compared to Cycle 2 reflected the cumulative effects of environmental challenges, such as the emotional strain of the lockdown.

Daisy’s persistence in Cycle 3 highlighted the importance of external support systems and community-based motivation in sustaining effort. While her shorter persistence reflected the impact of environmental challenges, her ability to consistently engage for five days indicated resilience and the value of structured social and familial encouragement in maintaining learning progress.

4. Daisy’s self-efficacy

Daisy displayed **low self-efficacy** regarding her ability to independently complete the rest of the CET-6 vocabulary learning. Her confidence was undermined by her limited mastery experiences and discouraging feedback from PK results.

1) Limited mastery experience:

Daisy reflected on her repeated struggles with CET-6 preparation, noting: “因为我和我朋友，备考了三次，都没能背完(单词)，高中的时候我们两个水平就一直不太好。” (Translation: "Because my friend and I have prepared for CET-6 three times but never managed to finish learning all the words required, and since high school, our level has not been very good"). This reflection highlighted how past failures continued to influence perception of her capability, contributing to low confidence.

2) Negative PK experiences:

Daisy mentioned feeling disheartened by her performance in PK challenges: “有的是反应慢了，有的是有些词忘了，PK 反正我是都输了。” ("Sometimes I was slow to react, and sometimes I forgot some words. Anyway, I lost all the PKs.") These struggles during PK sessions not only reflected gaps in her vocabulary retention but also reinforced doubts about her ability, further weakening self-efficacy.

Daisy’s self-efficacy in Cycle 3 underscored the importance of providing positive mastery experiences and constructive feedback to help learners rebuild their confidence. Her struggles highlighted the need for personalized strategies to address gaps in knowledge retention and turn challenges into opportunities for growth.

7.3.4 Dawn’s journey

Dawn’s learning journey in Cycle 3 demonstrated significant progress despite the challenges of a restrictive lockdown environment. She achieved 230 words, slightly fewer than in Cycle 2, but maintained persistence for five consecutive days. Her use of context learning and strategic planning contributed to vocabulary growth, while determination and self-reward strategies helped her rebound from setbacks caused by negative emotions. Her motivation, driven by the value of vocabulary learning for passing CET-6, remained steady although her autonomy was affected by external pressures. Dawn’s strong self-efficacy was significantly boosted by the tangible achievement of nearly finishing her vocabulary book, providing her with confidence to complete the remaining CET-6 words independently before the exam.

1. Dawn’s vocabulary growth

In Cycle 3, Dawn achieved 230 words, which was 20 fewer than planned for Cycle 3 (250 words). While her vocabulary growth declined slightly, she continued to emphasize the role of cognitive and self-regulated strategies in maintaining progress amid emotional challenges.

1) Strategic planning to sustain progress:

Despite experiencing emotional challenges, Dawn relied on strategic planning to maintain a minimum daily learning target, noting: “我对这个每天学习的单词量也有一些最低标准，就是一天最低 30 个单词。” ("I set a minimum standard for my daily word learning—at least 30 words a day"). This approach helped counteract the negative impact of her emotional state and ensured consistent engagement with learning tasks, directly supporting the increase in her vocabulary size.

2) Impact of Context Learning:

Dawn reflected on her CET-6 practice performance and highlighted how context learning enhanced her understanding of complex sentences and reduced the barriers posed by unfamiliar words: “当读到一些长难句，单词对理解的阻碍少了。有些能读懂了。” ("When reading some long and difficult sentences, the words were less of an obstacle to understanding. I could understand some of them"). Thus, her ability to connect words with their contextual usage contributed to the quality of her vocabulary knowledge, even as her overall growth slowed.

2. Dawn’s motivation

Like Fay, in Cycle 3 Dawn’s motivation remained primarily driven by her recognition of the importance of vocabulary learning for passing the CET-6 exam. However, her sense of autonomy was diminished by the pressures of a tight schedule and the challenging learning environment.

Dawn’s motivation in Cycle 3 reflected the importance of task value in sustaining effort under challenging conditions. However, her reduced autonomy underscored the need for supportive strategies to help learners navigate external pressures while maintaining control over their learning process.

3. Dawn’s persistence

Dawn maintained five consecutive days of learning in Cycle 3, achieving consistent daily progress despite facing challenges (see Figure 7.3-5). Her persistence was influenced by both negative external factors and her use of self-control strategies to sustain engagement.

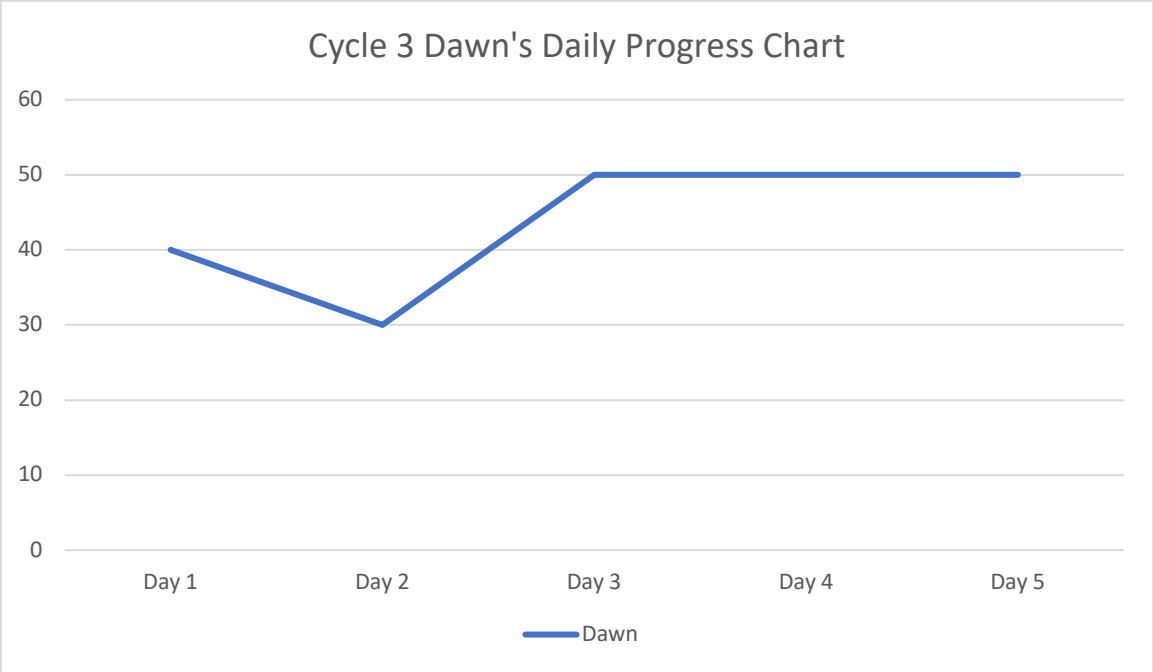

Figure 7.3-5 Cycle 3 Dawn's Daily progress chart

1) Challenges to Persistence:

A significant drop in progress occurred on Day 2, coinciding with the lockdown, which she described as emotionally and logistically disruptive: “疫情封校，烦躁,专业课程又比较多。” ("The lockdown made me irritable, and I also had many professional courses"). This illustrates how her persistence was negatively impacted by the combination of emotional strain and a tight academic schedule.

2) Rebounding Through Positive Reinforcement:

Dawn managed to recover her persistence on Day 3, attributing her renewed determination to perceiving improvements in her vocabulary knowledge: “做题时感到有提升,我想应该就是要坚持下来背单词。” ("I felt improvement while doing practice, and I thought this meant I should persist with vocabulary learning"). This recognition of progress served as a powerful motivator to re-engage with her learning tasks.

3) Use of Self-Consequence Strategies:

Dawn employed a self-reward system to maintain her persistence, sharing that: “完成日计划我就奖励自己。” ("I reward myself after completing my daily plan."). This self-regulated strategy created additional incentives for her to stay consistent.

4) Achievement Celebration from Kaixincichang:

Dawn also mentioned the positive impact of Kaixincichang's achievement celebration features: "每次通关都会收到恭喜，我觉得也有一些成就感。" ("Every time I pass a level, I receive congratulations, which gives me a sense of achievement"). These small celebratory moments reinforced her sense of accomplishment and encouraged her to continue.

Dawn's persistence in Cycle 3 highlighted the interplay between emotional resilience, self-regulated strategies, and positive reinforcement in sustaining engagement. Her ability to recover from setbacks and continue learning underscored the importance of both individual effort and supportive learning tools in promoting consistent progress. Dawn's journey in Cycle 3 also demonstrated improved emotional resilience and recovery skills compared to Cycle 1. This growth highlighted the impact of self-regulated strategies, positive reinforcement, and the gradual development of a learning routine in fostering greater adaptability and persistence over time.

4. Dawn's self-efficacy

Dawn exhibited strong self-efficacy regarding her ability to independently complete the rest of the CET-6 vocabulary before the exam. Her confidence was fuelled by recent progress and the motivational boost experienced as she neared the end of her vocabulary list. Her confidence was deeply rooted in her tangible achievement of nearly finishing the vocabulary book, which served as both a motivational boost and a validation of her efforts.

1) Achievement driving confidence:

Dawn attributed her growing confidence to significant progress, describing how: "现在我的这个词书已经快背完了，更有动力了，下周应该就能全部背完。" ("I'm almost finished with this vocabulary book now, which gives me more motivation. I should be able to finish it all next week"). This sense of accomplishment provided her with a clear mastery experience, which greatly enhanced self-efficacy.

2) Sustained belief in success:

Reflecting on her ability to persist, Dawn expressed strong confidence in completing the remaining vocabulary before the exam**:** "我觉得还是能够一直坚持下去在考前完成单词。" ("I think I can continue persisting and finish the vocabulary before the test"). These achievements validated belief in her learning strategies and reinforced her determination to succeed.

Dawn's self-efficacy in Cycle 3 was significantly enhanced by her achievement of nearly completing the vocabulary book. This mastery experience not only reinforced her confidence but also created a positive momentum towards completing her learning independently, underscoring the role of achievement milestones in fostering learner self-belief and persistence.

7.3.5 Elizabeth's journey

Elizabeth demonstrated consistent progress and stable persistence in Cycle 3, achieving 280 words, which exceeded her planned target of 210. Her success was supported by time management strategies and a relatively relaxed schedule during lockdown, allowing her to allocate dedicated time for learning each evening. Reflection on her CET-6 practice performance enhanced motivation, as she deepened her understanding of the critical role vocabulary plays in improving comprehension and accuracy. While she expressed strong self-efficacy in completing the rest of the CET-6 vocabulary, she also voiced concerns about word retention and the depth of her vocabulary understanding, highlighting the need for proactive review and deeper engagement with word learning.

1. Elizabeth's vocabulary growth

In Cycle 3, Elizabeth achieved 280 words, slightly fewer than her Cycle 2 performance of 300 words, but exceeding her planned target of 210 words. Her progress reflected the effectiveness of time management strategies, though challenges with word retention persisted.

1) Effective Time Management:

Elizabeth emphasized the importance of allocating dedicated time for vocabulary learning, explaining that: "每天晚上会学习单词一个半小时左右。" ("Every evening, I spend about an hour and a half learning words"). This disciplined approach allowed her to maintain a consistent learning pace and surpass her planned goal for the cycle.

2) Struggles with Retention:

Despite her achievements, Elizabeth expressed frustration with retaining earlier-learned vocabulary, noting: "我觉得每天背的单词也不少，但是就感觉记不太住，一周前的就快忘了。" ("I feel like I'm learning a lot of words every day, but it seems like I can't remember them well; words I learned a week ago are almost forgotten"). Hence, while time management supported the quantity of her learning, retention of earlier-learned words remained a challenge, highlighting a need for enhanced review strategies beyond the app's spaced repetition.

Elizabeth's vocabulary growth in Cycle 3 reflected the power of time management in achieving learning goals while highlighting the importance of addressing retention challenges, especially in the middle of a long learning journey, through enhanced review strategies. Her experience demonstrated the need to balance structured app-based learning with personalized, proactive approaches to ensure deeper and more lasting vocabulary knowledge.

2. Elizabeth's motivation

Elizabeth's motivation in Cycle 3 was enhanced through reflection on her recent CET-6 practice performance. This process deepened her understanding of the role vocabulary knowledge played in her English comprehension and task accuracy, driving her to focus more on vocabulary learning.

1) Reflection on CET-6 practice performance enhanced task value recognition:

Reflecting on her recent CET-6 practice results, Elizabeth identified vocabulary knowledge as a critical factor affecting her performance, explaining: "阅读和听力不是很好,感觉可能还是单词这方面的问题，所以可能理解上会有很多偏差。然后就做不对。还是得多背，记熟一些。" ("My reading and listening aren't very good, and I feel it's probably a vocabulary issue. This leads to a lot of misunderstanding, and I end up getting things wrong. I really need to memorize more and get more familiar with the words."). This realization reinforced her motivation to focus on improving vocabulary retention as a way of addressing her comprehension challenges and enhancing her overall English performance.

2) Deeper task value recognition promoted motivation:

Elizabeth's reflection helped her recognize the broader implications of vocabulary learning, linking it not only to CET-6 success but also to her ability to improve in essential English skills like reading and listening. This indicated a progression towards identified regulation, where her motivation stemmed from understanding the value of vocabulary learning for achieving long-term goals.

Elizabeth's motivation in Cycle 3 demonstrated the impact of reflection on practice performance as a tool for fostering task value and deepening commitment to learning goals. Her journey underscored how connecting learning efforts to broader outcomes can sustain motivation and drive progress.

3. Elizabeth's persistence

Elizabeth exhibited **extremely stable persistence** throughout Cycle 3, consistently achieving her daily learning goals, as reflected in Figure 7.3-6 .

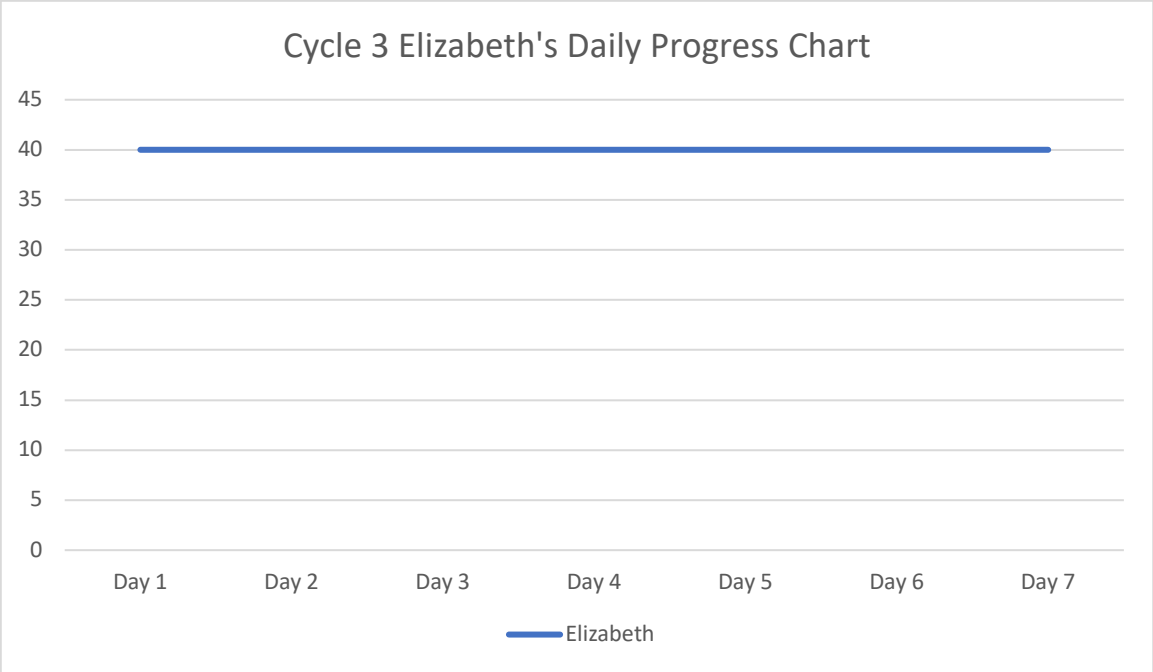

Figure 7.3-6 Cycle 3 Elizabeth's daily progress chart

1) Consistency through time management and goal setting:

Elizabeth attributed her stable persistence to effective time management and clear goal-setting practices, noting: “每天晚上会学习单词一个半小时左右. 都能达到目标。” (Translation: "I spend about an hour and a half learning words every evening and always meet my goals"). This disciplined routine ensured she consistently dedicated sufficient time to vocabulary learning, helping her maintain steady progress.

2) Impact of relaxed schedule:

Unlike other participants who struggled with tight schedules, Elizabeth mentioned that her evenings were relatively free during the lockdown. This flexibility enabled her to commit consistent time to her learning routine, contributing to stable persistence throughout Cycle 3.

Elizabeth’s persistence in Cycle 3 reflected the synergy between time management, goal setting, and a supportive schedule in fostering stable and consistent engagement. Her experience underscored the value of leveraging available time to build productive routines that enhanced persistence and learning outcomes.

4. Elizabeth’s self-efficacy

Elizabeth exhibited strong self-efficacy regarding her ability to complete the rest of the CET-6 vocabulary before the exam. This confidence was rooted in her successful goal achievement in the two earlier cycles, but she also expressed concerns about her vocabulary retention and depth of understanding.

1) **Confidence in Completion**:

Elizabeth was confident in her ability to continue learning and complete the remaining CET-6 vocabulary, emphasising that: “单词会继续记下去的。按照目前的节奏考试之前能背完所有的单词。” ("I will keep memorizing words. At this pace, I can finish all the words before the exam"). Her belief that she could maintain this current learning rhythm reflected the positive impact of past mastery experiences on her self-efficacy.

2) **Concerns About Retention and Depth:**

Despite confidence in completing the vocabulary list, Elizabeth expressed doubts about her ability to retain and fully understand the words, sharing the view that: “感觉单词应该会好一点，但是觉得还是没什么把握看到的六级单词都认识。” ("I think my vocabulary might be better, but I still don’t feel confident that I’ll recognize all CET-6 words I encounter"). This concern stemmed from her reflection on recent practice performance, where she identified gaps in word retention and comprehension.

Elizabeth’s self-efficacy in Cycle 3 reflected the positive impact of mastery experiences on learner confidence, balanced by the insights gained from reflective practice. Her journey underscored the need for strategies that not only support vocabulary completion but also address retention and depth of understanding to fully prepare learners for their goals.

7.3.6 Implications from Cycle 3

1. **Effectiveness of task analysis and self-control strategies**:

Strategic planning, time management, and environmental structuring proved indispensable in Cycle 3, allowing learners to navigate challenges such as lockdown restrictions. These strategies, paired with Kaixincichang’s structured learning process, supported learners across varying motivation levels to achieve meaningful progress. For example, Alex utilized consistent time allocation to maintain stable progress, while Fay and Dawn relied on proactive strategies like breaking tasks into smaller chunks to manage their learning effectively.

2. **Motivation and self-efficacy through achievement:**

1) On the one hand, learners like Alex, Fay, and Dawn, who achieved substantial progress, experienced enhanced motivation and self-efficacy through positive self-evaluation. Their accomplishments fostered a sense of satisfaction, reinforcing their persistence and belief in their ability to continue learning.

2) On the other hand, learners like Daisy, who achieved less but stable progress, struggled to derive self-satisfaction from their efforts. The lack of perceived accomplishment, whether due

to controllable factors like limited engagement or uncontrollable circumstances like the learning environment, hindered their motivation and confidence. This suggests that for such learners, external encouragement and carefully tailored feedback are critical to sustaining their engagement.

3. **Differential Impact of PK Features:**

The PK feature in Kaixincichang had varying effects on learners:

1) For high achievers such as Alex, PK challenges provided opportunities for success, which further boosted motivation and self-efficacy by affirming their competence. Winning PK sessions reinforced their determination to persist and strengthened their retention through competitive reinforcement.

2) Conversely, for learners like Daisy, repeated losses in PK challenges were detrimental, eroding self-efficacy and occasionally undermining their persistence. This highlights the need for adaptive game mechanics that account for learners' differing achievement levels, to ensure competitive elements remain motivating rather than discouraging.

4. **Importance of adapted review strategies:**

Most participants, including Elizabeth, emphasized the need for proactive review strategies to address retention gaps. While Kaixincichang's spaced review system provided a solid foundation, learners often found it insufficient for maintaining long-term retention. Proactive review, tailored to individual needs, can enhance knowledge consolidation and support deeper vocabulary mastery.

5. **Effectiveness of context learning:**

The context learning strategy, widely adopted by participants like Dawn and Fay, emerged as a highly effective approach for fostering in-depth word understanding and durable retention. By embedding vocabulary within meaningful contexts, learners improved their comprehension and practical application of words, positively impacting their general English performance in tasks like reading and listening.

Cycle 3 underscores the importance of integrating structured game-based learning with personalized, adaptive strategies to address diverse learner needs. While features such as PK can serve as powerful motivators for high achievers, they require careful calibration to prevent negative impact on less confident learners. Furthermore, proactive review and context-based learning strategies are essential complements to app-driven learning, ensuring both retention and quality of knowledge. Providing tailored support and feedback remains critical for learners who struggle to find intrinsic satisfaction, as it helps to sustain their motivation and build self-efficacy in challenging circumstances.

Chapter 8 Phase 4: Independent Self-Regulated Vocabulary Learning with Kaixincichang

Phase 4 marked the culmination of the participants' vocabulary learning journey, as they transitioned to independent application of SRL strategies while using Kaixincichang. This phase was designed to evaluate their ability to sustain effective learning habits, manage challenges, and achieve vocabulary learning goals without external guidance. Over the course of one week, participants independently planned and executed their vocabulary learning, drawing on the task analysis, self-control, and cognitive strategies they had developed in the earlier cycles. The emphasis was on observing how they applied SRL principles—such as strategic planning, time management, and adaptive review—in a self-directed context. One month after Phase 4, a follow-up session was conducted to assess the long-term sustainability of their learning habits, the retention of CET-6 vocabulary, and any shifts in motivation, persistence, and self-efficacy. It also explored the participants' reflections on their independent learning experience and the role of Kaixincichang in supporting vocabulary growth. Phase 4 offers critical insights into the participants' readiness for independent learning, the effectiveness of SRL strategies in promoting autonomous language learning, and the long-term impact of the game-based learning app on their vocabulary development.

8.1 Final week of intervention

8.1.1 Alex's journey: sustained autonomous and self-regulated learning with Kaixincichang

Alex demonstrated outstanding progress in Phase 4, achieving his highest vocabulary growth of 680 words through Kaixincichang's level-based mechanism, which supported his fast, effective, and independent review. His ability to competently and independently apply SRL strategies, such as time management, task analysis, and reflection, enabled him to optimize his learning process and sustain high performance. His success in mastering both the breadth and depth of vocabulary knowledge further reinforced his motivation, persistence, and self-efficacy, highlighting his readiness for independent and effective vocabulary learning with Kaixincichang.

1. **Alex's vocabulary growth**

In the final week of the intervention, Alex demonstrated outstanding vocabulary growth, achieving 680 words, the highest among all cycles and surpassing his usual weekly objective of 500 words for the first time (see Figure 8.1-1). This marked a significant milestone in his learning journey, reflecting both the consolidation of earlier learning and his effective use of self-regulation strategies.

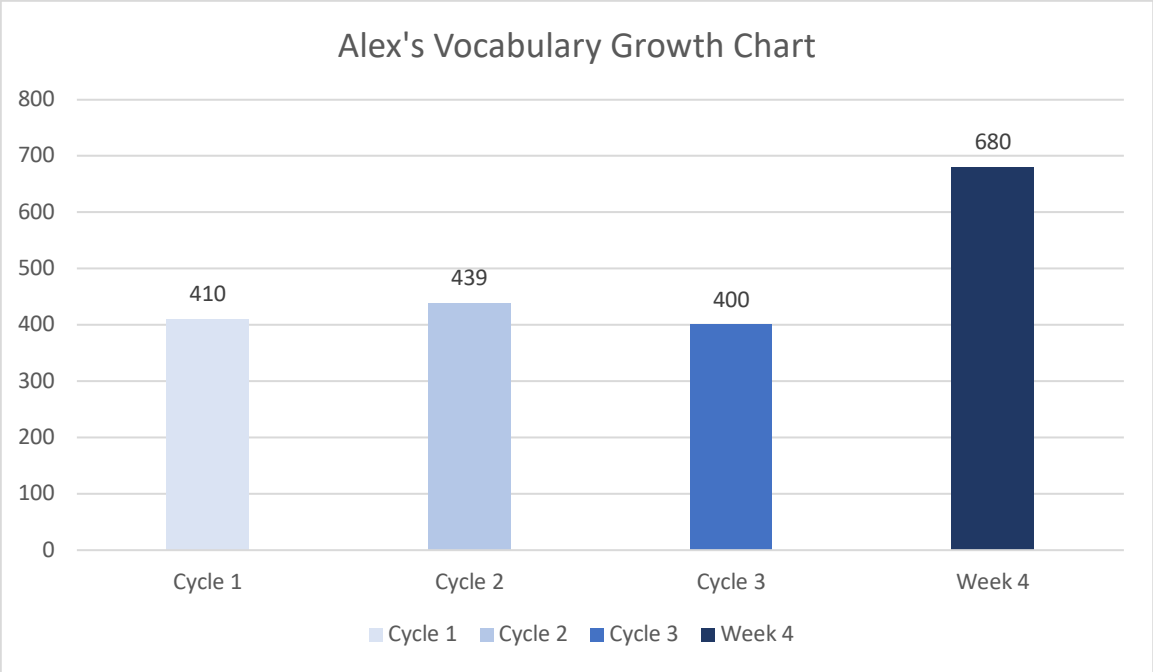

Figure 8.1-1 Alex's vocabulary growth

1) Efficiency through review and familiarity

Alex attributed his remarkable progress to the shift in focus from learning new words to reviewing previously learned ones, which facilitated quicker learning: **“**新单词已经背完了，这周主要是复习前面的，认识的多所以就过地很快。” ("I’ve finished learning the new words, so this week was mainly about reviewing the earlier ones. Since I already knew many, levels were passed much faster"). This highlights how a review-focused approach can significantly boost learning efficiency and how Kaixincichang effectively supported fast paced reviewing.

2) Independent use of self-regulation strategies

Alex emphasized his improved ability to independently regulate his learning process, noting: “现在能够合理分配自己的时间，把握好学习节奏（安排），所以效率就不错。” ("I’m now able to allocate my time reasonably and maintain a good learning rhythm, so the efficiency is quite high."). He also reflected on how self-analysis and optimization of strategies contributed to his success: “分析自身对于学习结果的影响因素，还会反思如何优化，找到适合的技巧方法。” ("I analyse the factors influencing my learning outcomes, reflect on how to optimize them, and find the techniques that suit me"). These insights demonstrated Alex’s mastery and independent use of self-reflection, time management, and task analysis, which enabled him to effectively adapt his learning strategies and achieve substantial progress.

2. Alex’s motivation

Alex's motivation for vocabulary learning in the final week was further boosted by positive outcome expectations, which reinforced his commitment and engagement.

1) Enhanced motivation through outcome expectations

Alex's belief in the tangible benefits of completing his vocabulary review significantly heightened his motivation. He reflected: "觉得自己复习完这一轮, 单词的掌握肯定会更好，就很有动力。" ("I feel that after completing this round of vocabulary review, my mastery will definitely improve, which makes me very motivated"). This demonstrated how the anticipation of achieving a higher level of mastery served as a powerful internal driver, reinforcing his determination to persist with learning.

Alex's enhanced motivation during the final week of intervention reflected the critical role of positive outcome expectations in driving engagement. By linking his efforts to tangible improvements in mastery, he maintained a strong sense of purpose and direction in his vocabulary learning journey.

3. Alex's persistence

Alex demonstrated exceptional persistence in the final week of intervention, consistently achieving high daily progress and reaching 680 words in a week. The following data shows his steady engagement.

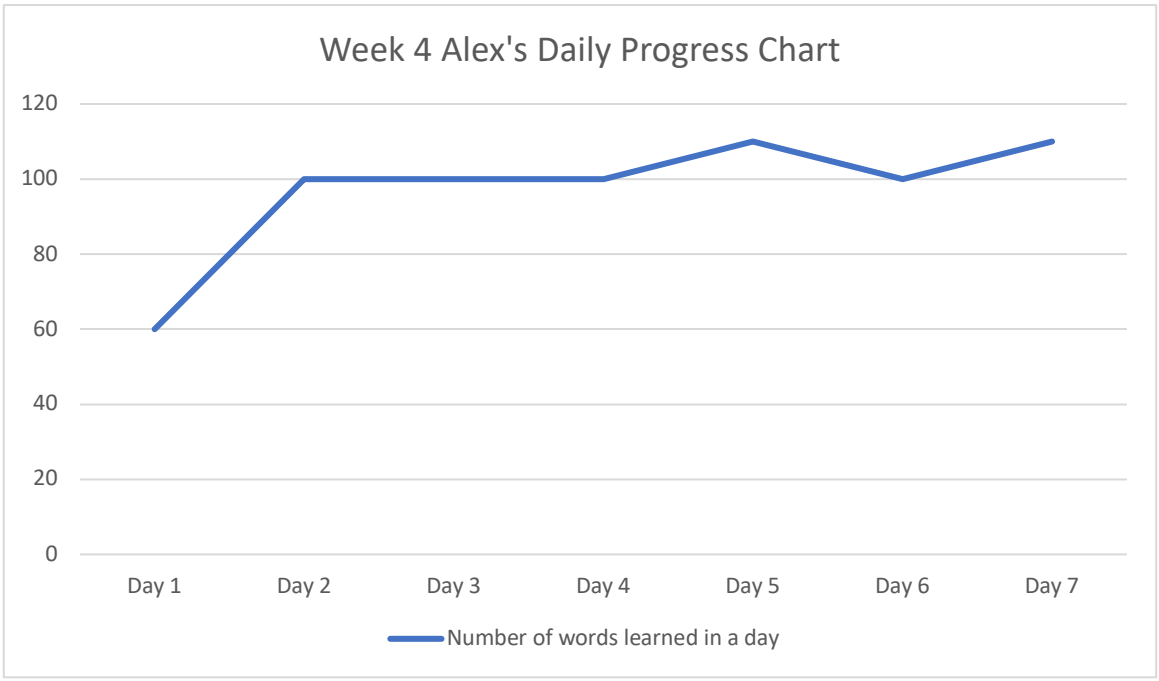

Figure 8.1-2 Week 4: Alex's daily progress chart

1) Key turning point on Day 2

A significant increase in progress occurred on Day 2, when Alex shifted his focus to reviewing previously learned words. This transition allowed him to process familiar content more efficiently, contributing to sustained progress throughout the week.

2) Independent self-evaluation on persistence:

Alex utilized PK (player versus player competition) and CET-6 practice to self-evaluate his vocabulary learning achievement. His repeated winning of PKs and improved performance in CET-6 practice provided him with clear evidence of the benefits of consistent vocabulary learning, further boosting his determination. He noted: “能切实感受到每天学习单词的习惯养成后,自己单词量的显著变化，而且在做题中检验自己,感受到了直接的变化，认识的单词明显增多，正确率也明显上升。” ("I can clearly feel the significant changes in my vocabulary size after developing the habit of daily vocabulary learning. Testing myself in practice exercises revealed noticeable improvements—my vocabulary recognition increased significantly, and my accuracy rate rose markedly"). This direct feedback from practice tests strengthened his sense of achievement and determination to sustain his learning efforts.

3) Mastery of self-regulation strategies

Alex attributed this persistence to his ability to independently manage learning and effectively achieve his objectives: “（我）找到了合适的技巧方法，能管理自己学习，达到学习的目标。” ("I’ve found the right techniques and methods, which help me manage my learning and achieve my goals"). This demonstrated his increasing competence in applying self-regulation strategies, such as time management, task analysis, and reflection to sustain persistence.

Alex’s persistence in Cycle 4 showcased the importance of integrating self-regulation strategies with task-appropriate learning techniques and opportunities for measurable feedback. His success underscored the value of fostering both autonomy and achievement in supporting learners’ long-term engagement and progress.

4. Alex’s self-efficacy

Alex exhibited strong self-efficacy in independently meeting the vocabulary requirements for CET-6 in both size (the number of correctly recognized words) and depth (the richness of his vocabulary knowledge). This confidence was grounded in his mastery experiences, self-evaluation, and effective use of self-regulation strategies.

1) Confidence in achieving CET-6 vocabulary requirements

Alex expressed robust confidence in reaching CET-6’s vocabulary demands before the exam: “我觉得考试之前应该能达到六级单词要求。” ("I think I’ll be able to meet the CET-6 vocabulary

requirements before the exam"), reflecting his belief he could sustain independent learning and meet the test's expectations in both vocabulary size and depth.

Alex highlighted the role of PK and CET-6 practice in influencing his self-efficacy. He noted that PK provided immediate validation of progress and improved performance in CET-6 practice strengthened belief in his capabilities. Alex attributed part of this confidence to his ability to independently and effectively manage learning through self-regulation.

Alex's self-efficacy in satisfying CET-6's vocabulary requirements was bolstered by his mastery experiences, practical self-assessment, and effective use of self-regulation strategies. His confidence reflected the culmination of his learning journey, demonstrating the critical role of autonomous learning practices and feedback-driven mastery in fostering learners' belief in their abilities to meet challenging goals.

8.1.2 Fay's journey: consistent with previous performance

1. Fay's vocabulary growth

Fay achieved 140 words during the final week of the intervention, maintaining a consistent level of vocabulary growth comparable to her performance in previous cycles (see Figure 8.2-1).

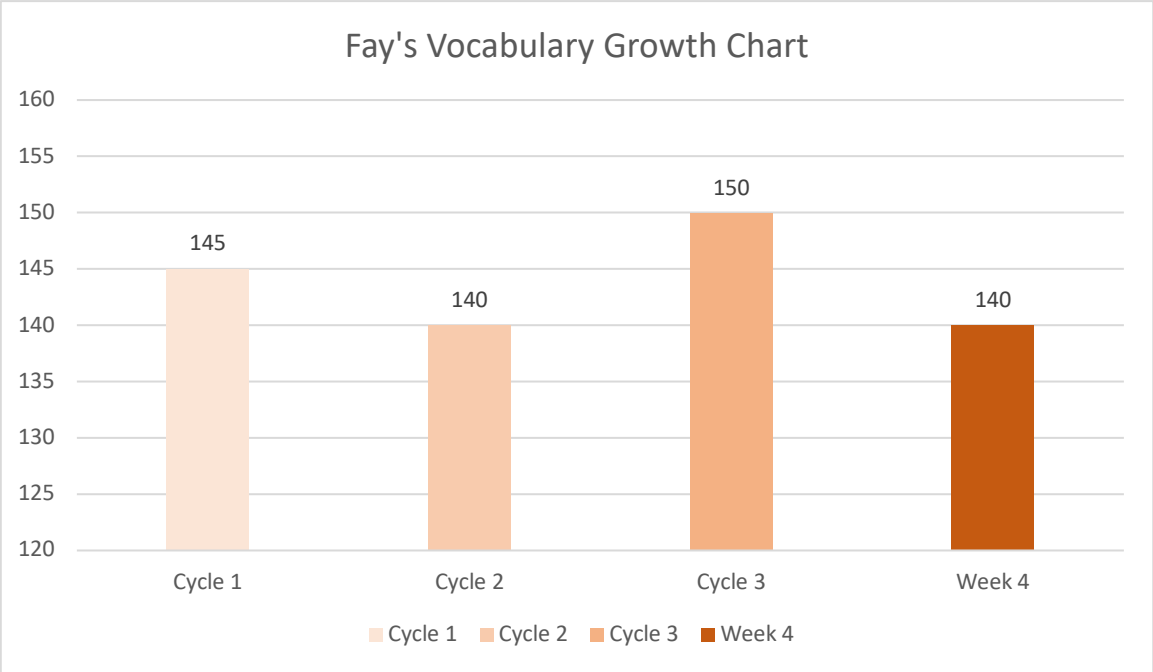

Figure 8.1-3 Fay's vocabulary growth chart

1) PK promoted knowledge quality via self-evaluation processes

Fay actively utilized PK sessions as a diagnostic tool to assess her vocabulary knowledge quality and fluency: "PK 很便于对自己的一个检查，自己的反应速度能看出词汇的熟练度。"

("PK is very convenient for checking myself; it shows my reaction speed and vocabulary fluency"). This reflective process allowed her to identify weaknesses in vocabulary retention and target areas for improvement.

2) Adaptive actions promoted knowledge quality

Fay's adaptive review strategy—adding incorrect words from PK sessions to her personal review list—further enhanced retention: "我都会把错误的词再加到复习列表里。" (Translation: "I always add the words I got wrong to my review list"). This targeted approach ensured that she focused on consolidating difficult words, contributing to a deeper understanding of vocabulary and improving her retention.

Fay's vocabulary growth in Week 4 reflected her ability to combine structured support from Kaixincichang with reflective and adaptive learning strategies. Her active engagement with PK sessions and targeted review actions contributed to consistent progress and improved vocabulary quality, paving the way for sustained independent learning.

2. Fay's motivation

Fay's motivation during the final week of the intervention remained consistent with earlier cycles, primarily driven by recognition of the importance of vocabulary learning for passing CET-6 and her gradual progress in mastering new words. This highlighted the importance of aligning immediate learning objectives with broader achievements.

3. Fay's persistence

Fay's persistence in Week 4 was remarkably stable, as evidenced by her consistent progress of 20 words per day for seven consecutive days.

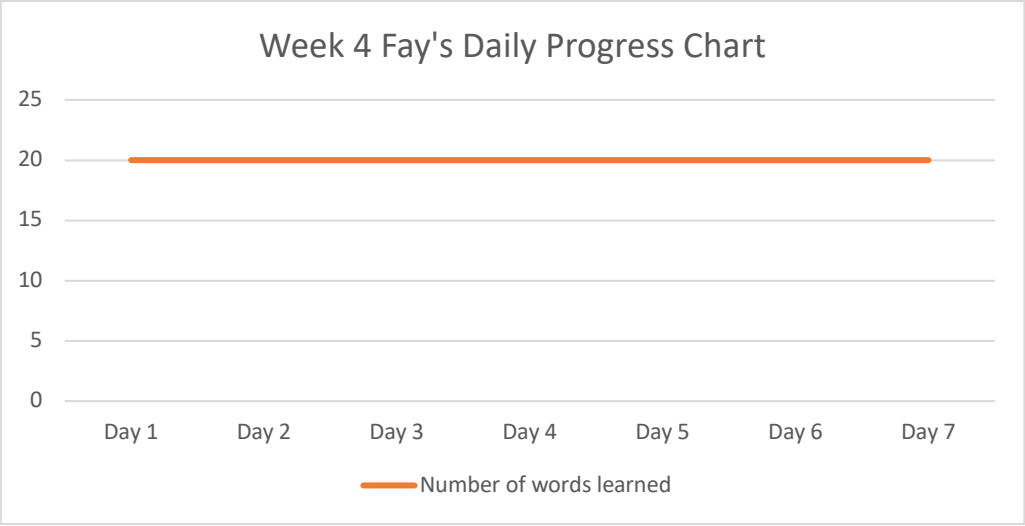

Figure 8.1-4 week 4 Fay's daily progress chart

1) Perceived value of persistence from self-evaluation

Fay recognized the positive impact of independent daily persistence on her overall English proficiency through self-evaluation, which motivated her to sustain her efforts: “(每天坚持背单词)对我现在英语水平的提升有一个促进作用。” ("It (learning words everyday) has positively contributed to improving my current English proficiency").

2) Goal setting

Fay planned to maintain this level of persistence beyond the intervention, highlighting her improved determination and commitment to setting weekly goals and adhering to them: “后续的话，我还是每周做一个计划坚持下去。” ("In the near future, I will continue to set weekly plans and stick to them"). This indicated that goal setting could fuel her persistence.

3) Kaixincichang’s level-based mechanism support

Fay highlighted the role of Kaixincichang’s level-based design in enhancing her persistence: “一关一关的设计也会让我清楚自己的进度，也会激发我坚持下去的动力。” ("The level-based design helps me see my progress clearly, which also motivates me to keep going"). This structured approach provided her with a clear sense of achievement and momentum, reinforcing her determination.

Fay’s persistence in Week 4 reflected the culmination of habit formation, motivational impact of structured progress tracking, and effective goal setting. These factors, supported by Kaixincichang’s level-based design, enabled her to maintain a stable and productive learning routine, paving the way for continued independent success.

4. Fay’s self-efficacy

Fay demonstrated strong confidence in independently satisfying the CET-6 vocabulary requirements. Her self-efficacy was influenced by her recent progress, mastery experiences, and reflection on past failures:

1) Confident in completing CET-6 vocabulary

Fay expressed confidence in learning all the required CET-6 words before the exam: “我觉得我在考试之前很大概率，应该能学完所有六级词汇。” ("I think there’s a high probability I’ll finish learning all the CET-6 words before the exam"). This confidence was driven by consistent progress during the intervention and habits developed, such as structured daily learning and adaptive review strategies.

2) Confident in passing CET-6:

Fay also felt optimistic about passing CET-6, citing noticeable improvements in her reading performance: “现在阅读部分正确率好了很多。我感觉这次应该能过。” ("Now the accuracy in the reading section has improved a lot. I feel I can pass this time."). Her improved reading performance, supported by growing vocabulary, reinforced belief in achieving her immediate goal.

3) Hesitation about achieving a high score:

Despite her confidence in passing, Fay expressed uncertainty about achieving a high score due to her history of repeated failures: “因为之前都失败了，这次虽然有提升，但是对于提升很高我还是没把握。” ("Because I failed before, even though I’ve improved this time, I’m still not confident about achieving a significantly higher score"). This reflected how prior experiences still tempered her overall self-efficacy, particularly in aiming for ambitious outcomes.

Fay’s self-efficacy in Week 4 indicated a balance between optimism and caution. While recent progress strengthened belief in her ability to meet CET-6 vocabulary demands and pass the exam, her confidence in achieving higher scores remained constrained by past failures. This highlighted the importance of fostering continued mastery experiences and addressing the lingering effects of prior setbacks to further enhance self-efficacy.

5. Summary

During the final week of the intervention, Fay demonstrated consistent progress, achieving 140 words and maintaining remarkably stable persistence, with 20 words learned each day. Her performance was supported by the level-based design and spaced review features of Kaixincichang, which provided clear progress tracking and achievement celebrations, motivating her to stay on track. Fay also actively used self-regulation strategies, such as task planning and adaptive review, to enhance word retention and knowledge quality.

Although her motivation remained externally regulated, Fay’s steady achievements bolstered her confidence in completing CET-6 vocabulary learning. She reflected positively on her progress and acknowledged the value of habit formation, which she planned to sustain post-intervention.

Fay’s Week 4 journey showcased that she was able to conduct independent and fruitful vocabulary learning with Kaixincichang.

8.1.3 Daisy journey: fluctuating persistence with great improvement

1. Daisy’s vocabulary growth

In Week 4, Daisy demonstrated remarkable improvement in her vocabulary growth, making significant progress compared to earlier cycles (see Figure 8.3-1). Her success was supported by a combination of effective self-regulation strategies and the game-based structure of Kaixincichang.

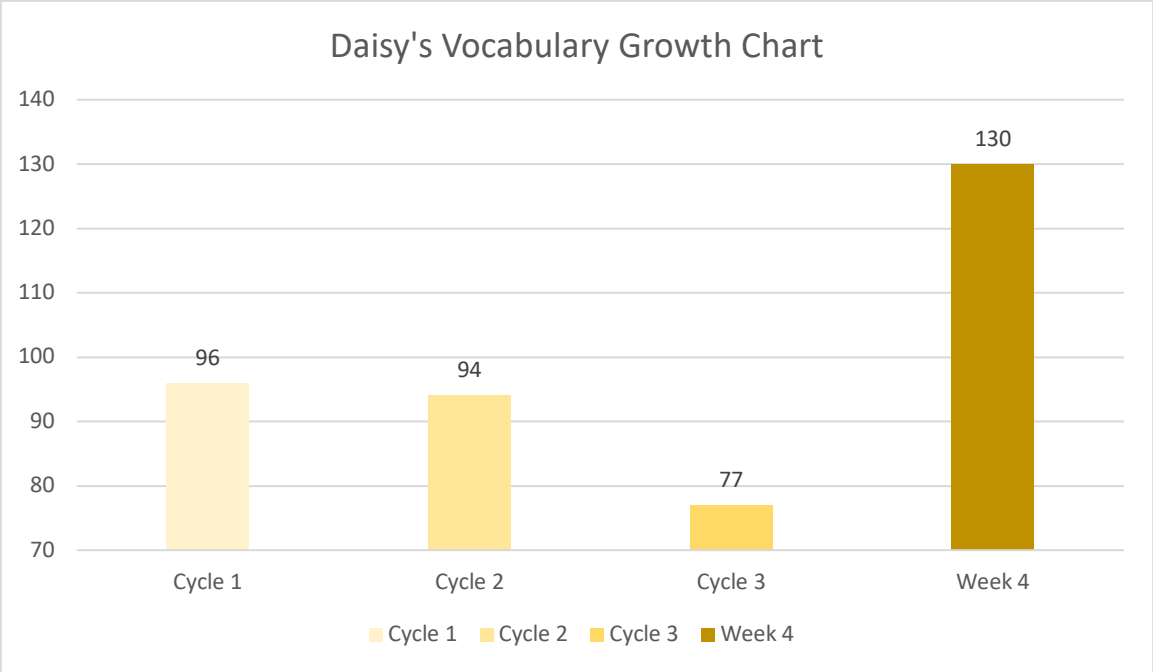

Figure 8.1-5 Week 4 Daisy's vocabulary growth

1) Improved time management:

Daisy attributed progress to her ability to allocate dedicated time for vocabulary learning: “在有意提升（学习新单词的）量，每天中午可以保证过两关（20 词）哪天下午或者晚上有时间会再过一关或者两关。” ("I intentionally increased the amount (of new words learned). Every afternoon, I could ensure passing two levels (20 words), and on days with more time in the evening, I’d pass another one or two levels"). This reflected improved time management, which enabled her to engage in consistent and productive learning sessions.

2) Structured progress with Kaixincichang

The app’s level-based design provided a clear and manageable structure for Daisy to follow, helping her sustain improved progress. The focus on small, achievable tasks each day allowed her to build momentum and maintain focus.

3) Enhanced word retention through proactive review with review mode

Daisy’s use of proactive review strategies, combined with Kaixincichang’s review mode, significantly enhanced her vocabulary knowledge quality: “质量也在提升，单独再过一遍那个（开心词场的）复习列表。” ("The quality is also improving. I would independently go through Kaixincichang’s review list again"). This targeted approach ensured that she consolidated previously learned words, improving both retention and understanding.

Daisy's significant improvement in vocabulary growth during Week 4 reflected her ability to integrate game-structured tools with proactive self-regulation strategies. Her achievements highlighted the importance of effective time management, tailored review practices and proper tools in promoting both the quantity and quality of vocabulary learning.

2. Daisy's motivation

During Week 4, Daisy's motivation shifted towards more autonomy, driven by realization of the value of vocabulary learning for improving her overall English performance and CET-6 preparation.

1) Improved Performance as a Motivational Boost:

Daisy noted that her improved performance in CET-6 practice significantly enhanced her motivation: "感觉在变好，做题会感觉顺一点,动力更大了一些。" ("I feel it's getting better; doing practice questions feels smoother, and my motivation has increased"). The direct impact of vocabulary growth on test performance provided a sense of achievement, strengthening her drive to continue learning.

Realization of task value:

Through improved performance, Daisy recognized the value of vocabulary learning in supporting reading comprehension: "单词背过的在阅读里能够体现出来，就是看见了能认识。" ("The words I've learned are reflected in reading; I can recognize them when I see them"). This realization reinforced the importance of these efforts, helping her appreciate how vocabulary learning contributes to tangible academic outcomes.

As Daisy began to connect her learning efforts with their practical benefits, motivation became more self-determined. This newfound understanding of the task value played a critical role in sustaining her engagement and commitment.

Daisy's motivation in Week 4 was significantly enhanced by improved performance and realization of the task value of vocabulary learning. This recognition of its practical importance helped her transition to a more autonomous motivational outlook, reinforcing engagement and persistence in vocabulary acquisition.

3. Daisy's persistence

Daisy's persistence in Week 4 showed fluctuating but significant improvement, reflecting enhanced determination and more effective use of time management strategies (please see Figure 8.3-2). This pattern indicated that while Daisy's daily word count fluctuated, her overall persistence was enhanced compared to earlier cycles, culminating in achieving a higher level of engagement by the end of the week.

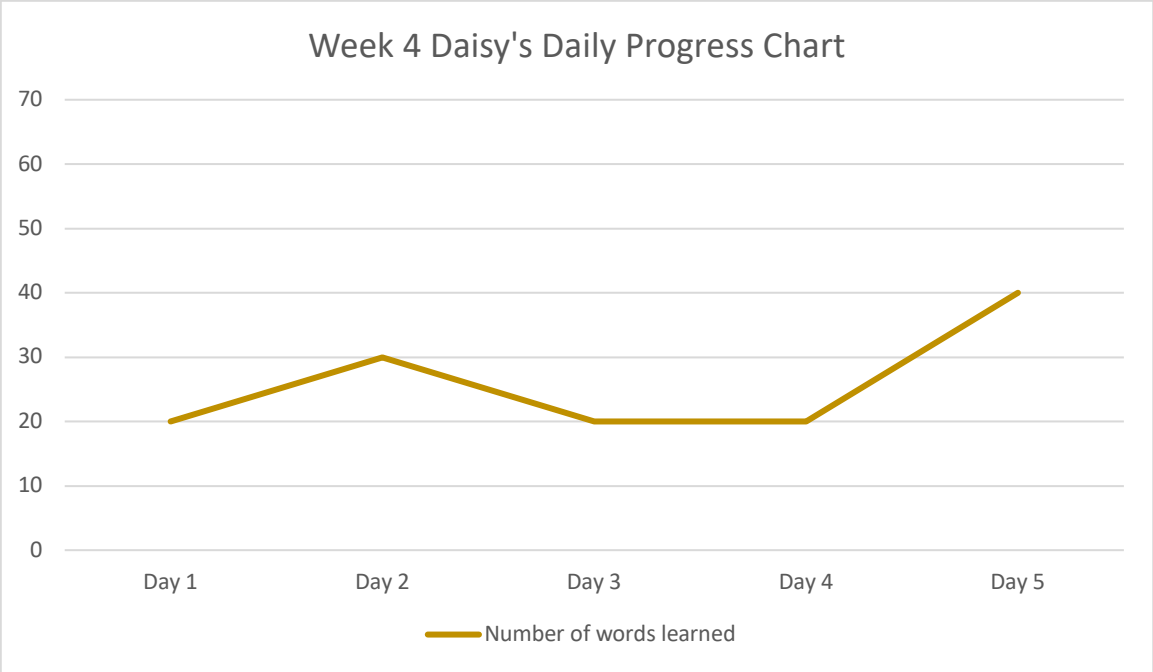

Figure 8.1-6 Week 4 Daisy's daily progress chart

1) Realization of the value of consistent vocabulary learning

Daisy attributed her determination to persist, to recognition of the benefits of consistent vocabulary learning: “感觉有潜移默化地看见坚持背单词的成效。” ("I feel I’ve gradually seen the results of consistently learning vocabulary"). This positive feedback loop encouraged her to sustain efforts despite daily fluctuations.

2) Role of time management

As noted in her vocabulary growth analysis, Daisy’s improved time management allowed her to dedicate more time to vocabulary learning, contributing to enhanced persistence. Allocating specific periods for learning helped her maintain a steady rhythm throughout the week.

Daisy’s persistence in Week 4 highlighted the importance of recognizing task value and employing effective time management strategies. These factors allowed her to overcome challenges and sustain a steady effort, ultimately contributing to improved vocabulary growth.

4. Daisy’s self-efficacy

Daisy’s self-efficacy in Week 4 demonstrated moderate confidence in maintaining her vocabulary learning habits but uncertainty about meeting the full CET-6 vocabulary requirements.

1) Confidence in sustained persistence

Daisy expressed a strong belief in her ability to persevere in vocabulary learning until the CET-6 exam: “会更加努力坚持下去。” ("I will work harder to persist and keep learning."). This

confidence reflected a strengthened commitment to consistent learning, supported by her progress in Week 4.

2) Uncertainty about completing CET-6 vocabulary:

Despite improved persistence, Daisy was unsure about completing the full CET-6 word list before the exam: “我会尽力多背一些，但是我（英语）水平一直不太好，考试之前不一定能背完。” (Translation: "I will try my best to learn more words, but my (English) proficiency has never been great, so I might not finish before the exam"). This uncertainty stemmed from her self-perception of limited English proficiency and the demanding vocabulary requirement.

Daisy’s self-efficacy during Week 4 highlighted determination to persist in vocabulary learning while also acknowledging her limitations in completing the CET-6 word list. This mixed confidence reflected the progress she had made and the challenges she still faced, emphasizing the importance of setting realistic goals and celebrating incremental achievements.

5. Summary

In Week 4, Daisy demonstrated significant progress in her vocabulary learning, achieving a higher word count compared to earlier weeks through improved time management and proactive use of Kaixincichang’s review mode. Enhanced focus on word retention and structured review strategies contributed to both the quality and quantity of her vocabulary knowledge.

Daisy’s motivation increased, driven by realization of the task value and the impact of vocabulary learning on her overall CET-6 preparation. While persistence fluctuated, she maintained consistent efforts across the week, supported by improved planning and determination to persist until the CET-6 exam. However, her self-efficacy showed mixed confidence—she believed in sustaining learning habits but remained uncertain about completing the entire CET-6 word list due to her perceived language proficiency.

Daisy’s journey highlighted the critical role of structured tools, task value recognition, and time management in fostering progress and persistence, while also emphasizing the need for realistic goal setting to build stronger self-efficacy.

8.1.4 Dawn’s journey: flexible self-regulation and ambitious review

1. Dawn’s vocabulary growth

Dawn achieved 300 words in five days during Week 4, marking her highest performance across the intervention (see Figure 8.4-1). Her improvement can be attributed to familiarity with the previously learned words and flexible use of time management strategies: "我基本每天分几部分复习，比如说上午是早饭前复习 2 关，中午 10 点有半小时大课间可以复习一关或者两关。" ("I divide my

review into several parts each day. For example, I review two levels before breakfast in the morning, and around 10 a.m., during a 30-minute break, I can review one or two levels"). This flexibility allowed her to make efficient use of time and maintain focus, supporting her ability to effectively consolidate vocabulary knowledge.

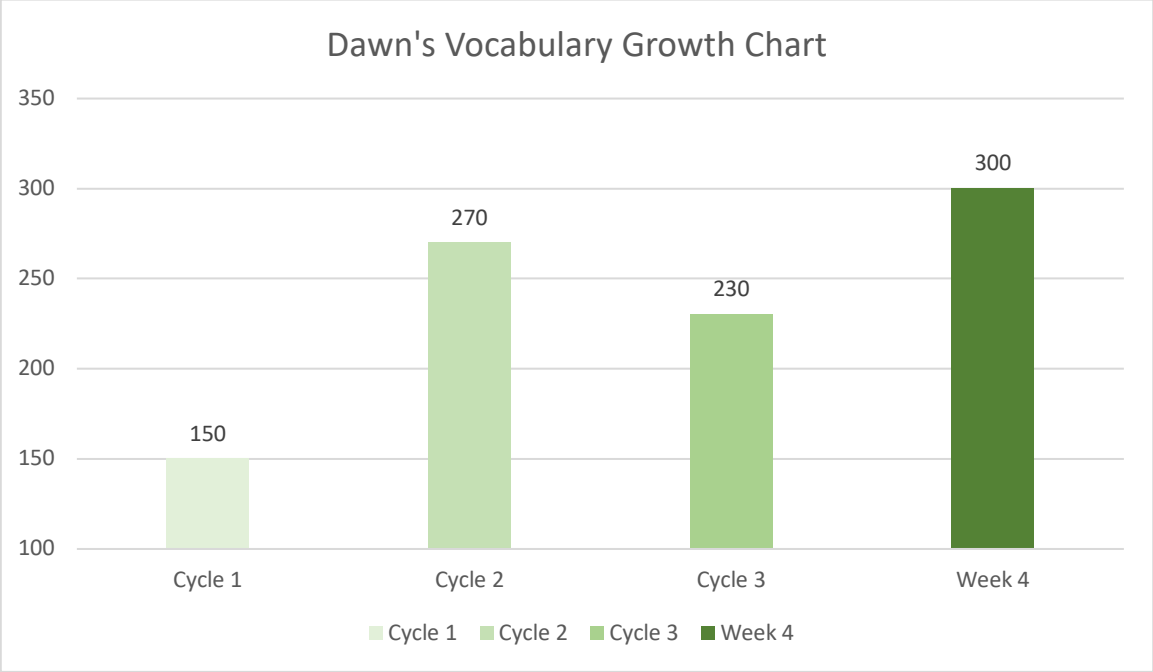

Figure 8.1-7 Dawn's vocabulary growth chart

2. Dawn’s motivation

Dawn’s motivation during Week 4 demonstrated a higher level of autonomy, driven by her proximal goal of completing a comprehensive review. She explained: "我想尽快地再过（复习）一遍（单词），一方面是为了巩固前面学的单词。另一方面看看自己的掌握情况。" ("I want to quickly review the words again, partly to consolidate the words I’ve learned and partly to assess my level of mastery"). This proactive approach reflected her growing intrinsic motivation to enhance vocabulary knowledge, as she recognized the practical value of reviewing and evaluating learning.

3. Dawn’s persistence

Dawn’s persistence was significantly enhanced, with stable progress over five consecutive days of review. The line chart below (Figure 8.4-2) illustrates her learning journey.

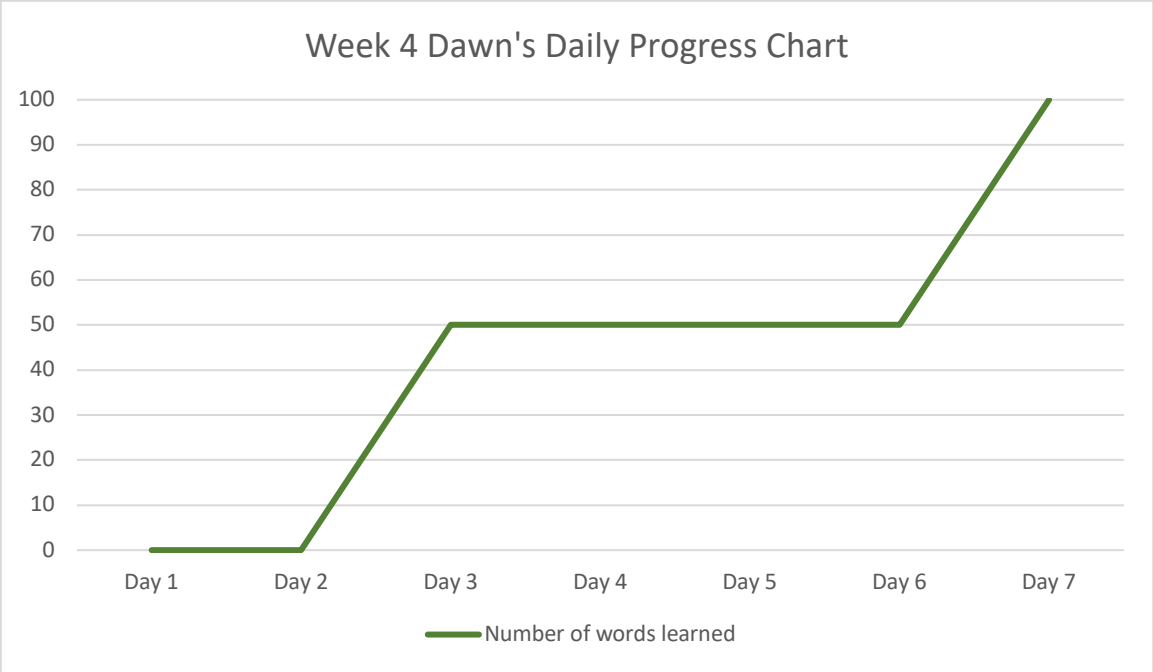

Figure 8.1-8 Week 4 Dawn's daily progress chart

This persistence was fuelled by efficient time management and autonomous motivation to consolidate her learning. The increase on Day 7 highlighted her dedication to completing the week's review.

4. Dawn's self-efficacy

Dawn's self-efficacy in satisfying the CET-6 vocabulary requirement was greatly boosted by self-evaluation during her review, following Kaixincichang's review mode: "我觉得我现在就达到了六级单词的要求了。我复习的时候过的很快，前面学的词基本都没忘。" ("I feel I've already met the CET-6 vocabulary requirements. My review progressed quickly, and I hardly forgot the words I learned earlier"). Such confidence was rooted in her ability to effectively retain and recall previously learned words, showcasing the impact of her mastery experience and the efficiency of level-based review processes.

5. Summary

Dawn's Week 4 journey highlighted the effective integration of self-regulation strategies and Kaixincichang's review mode in driving her vocabulary learning progress. By applying strategic planning together with time management, she maximized her review efficiency, turning a demanding schedule into productive learning sessions. Her motivation shifted towards greater autonomy, driven by recognition of the task's value and the goal of consolidating learning and assessing mastery.

Kaixincichang's structured review process supported her retention and provided positive self-evaluation opportunities, boosting her self-efficacy. This week marked her highest vocabulary growth,

reflecting a transition towards independent learning and showcasing how SRL strategies and game-based tools can foster long-term learning habits.

8.1.5 Elizabeth's journey: improved progress

1. Elizabeth's vocabulary growth

Elizabeth achieved 364 words in Week 4, the highest among all cycles. This exceptional progress was the result of consistent application of SRL strategies combined with Kaixincichang's level-based mechanism. She demonstrated a well-structured approach, setting daily goals and using flexible time management to meet them: "自己制定计划，基本上每天都能完成，如果有事耽误，会在晚些时候空出时间补上。" ("I set my own plans, and I can usually complete them every day. If something delays me, I'll find time later to make up for it").

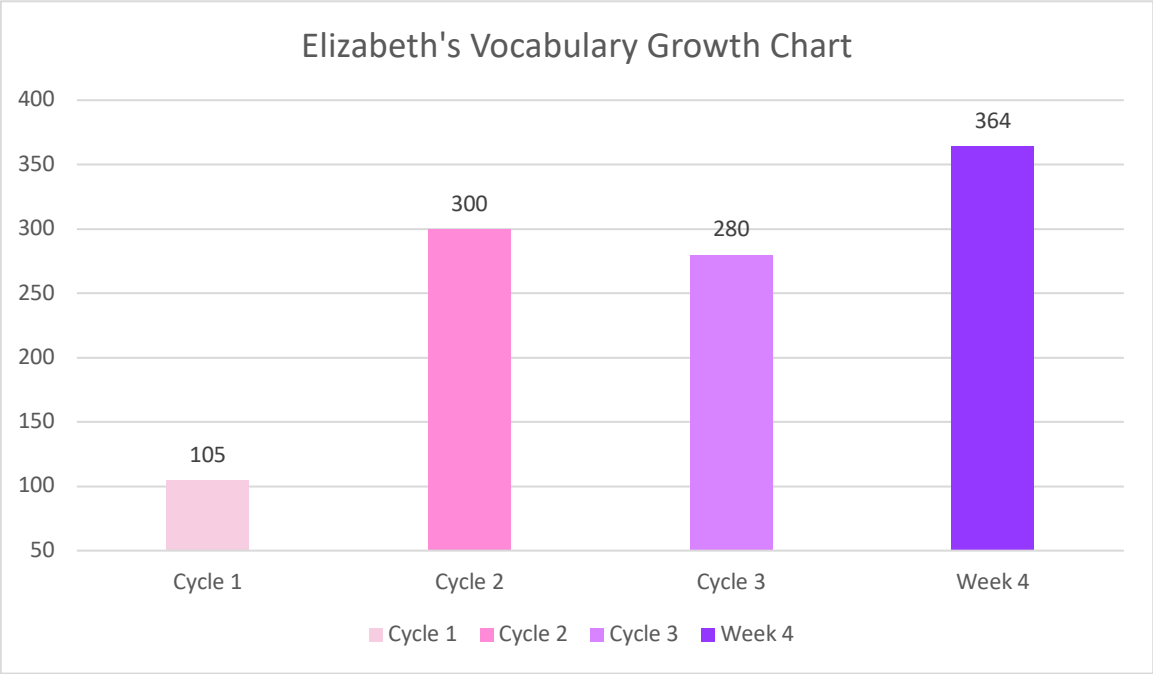

Figure 8.1-9 Elizabeth vocabulary growth chart

This structured routine allowed her to maintain focus and productivity even when faced with disruptions, highlighting an ability to autonomously regulate her learning. Furthermore, her proactive review of previously learned words ensured the retention of earlier vocabulary, adding depth to her knowledge base.

2. Elizabeth's motivation

Elizabeth's motivation reached a more autonomous level, underpinned by her recognition of the task value and optimistic outcome expectations: "掌握更多单词一定是有用的。" ("Mastering more words is definitely useful"). "感觉坚持下去肯定是会有进步的，就算不能成功也会有很多进步的，

所以我一定会继续努力哒。" ("I feel that if I keep going, I will definitely make progress. Even if I don't succeed, I'll still improve a lot, so I will definitely keep working hard"). Her motivation was no longer driven only by external expectations but by an internalized understanding of how improved vocabulary knowledge could enhance broader language abilities. This shift demonstrated the success of SRL strategies and Kaixincichang in fostering a deeper and more sustainable commitment to learning.

3. Elizabeth's persistence

Elizabeth's persistence was stable and higher than in previous cycles, as shown in this line chart:

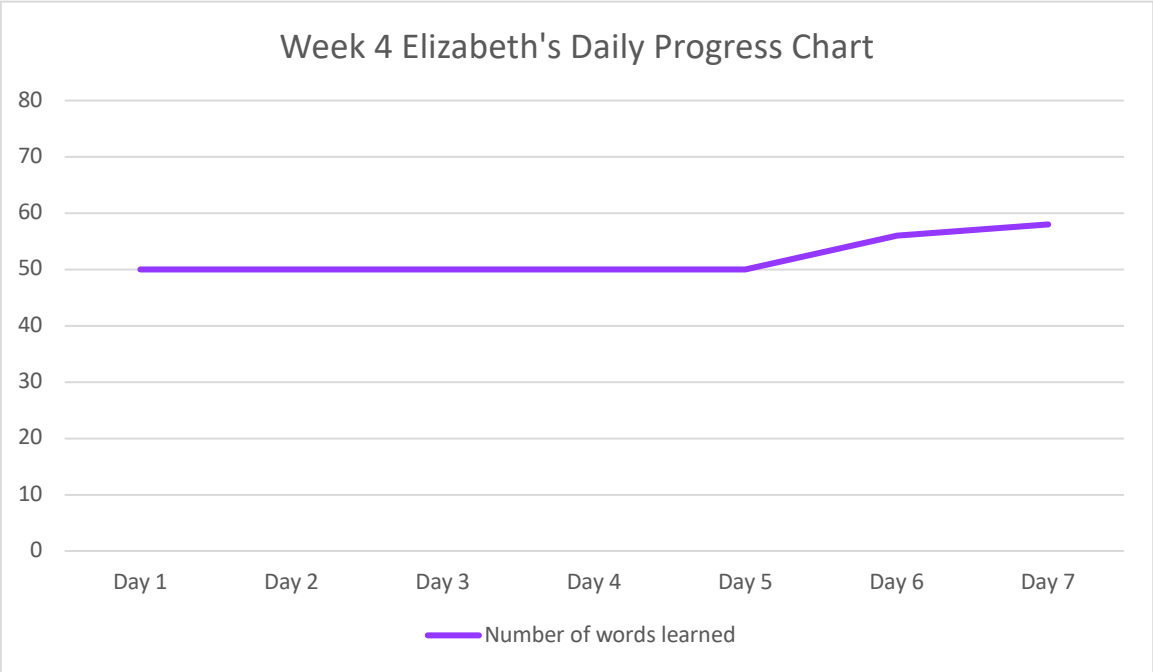

Figure 8.1-10 Week 4 Elizabeth's daily progress chart

Her ability to sustain such consistent progress highlighted the role of time management strategies in helping her allocate and optimize learning time, as indicated in the analysis of vocabulary growth. Her determination to persist was also enhanced by belief in the cumulative value of her efforts. Moreover, the trackable achievement also played a role in boosting her determination to persist by engendering a feeling of achievement "看到自己过那么多关，就挺有成就感，也更有动力坚持背下去。" ("Seeing myself complete so many levels gives me a sense of achievement and more motivation to keep going")."

4. Elizabeth's self-efficacy

Elizabeth's self-efficacy in meeting CET-6 vocabulary requirements remained moderate, shaped by her earlier failures and comparison with peers: "主要还是因为现在做题的准确率啦,不高，我觉得还是单词导致的理解问题，还有就是因为本身英语一直就不太好。" ("Mainly because my accuracy in

practice isn't high. I feel it's still a vocabulary issue. Besides, my English has never been great"). "我看到人家有好多四级成绩很高的，六级也背很长时间单词，也说记得不好，有很多词在句子里不太理解，所以怕自己可能也会不太行。" ("I see many people who scored high on CET-4 but still find CET-6 difficult after memorizing words for a long time. They say they can't understand many words in sentences, so I worry I might not do well either").

While the sense of achievement from trackable progress added to her confidence: "会增加一些信心 " ("It gives me a bit more confidence"), it was not sufficient to dispel her doubts: "但是感觉差距还是很大。" ("But I still feel there's a big gap"). Earlier failure experiences and vicarious observations of peers struggling with similar challenges seemed to inhibit her ability to fully embrace progress and believe in her readiness for CET-6.

Despite these concerns, the ability to consistently achieve her goals and increasing vocabulary size reflected the potential for further enhancement of her confidence through continued success and reinforcement.

5. Summary

Elizabeth's final week underscored the powerful role of SRL strategies and Kaixincichang's game-structured design in supporting effective learning and measurable progress, which enhanced both persistence and motivation. The trackable progress provided by the app served as a tangible source of determination, enabling her to maintain consistency and achieve her best performance. However, her self-efficacy remained moderate, highlighting the complex interplay between past failures, vicarious experience, and the need for sustained positive reinforcement.

8.1.6 Implications

1. Alerts for regular review

Alerts were instrumental in maintaining word retention, particularly for ambitious learners like Alex who made significant progress while managing tight schedules. These reminders provided structure to their independent learning, ensuring timely engagement with previously learned vocabulary and reinforcing retention. The consistent nudge to revisit material helped mitigate the cognitive burden of manually planning and scheduling reviews.

Embedding alert systems into learning tools fosters a routine of regular review, enabling learners to sustain their vocabulary retention independently and efficiently over time.

2. Self-evaluation as a motivational boost

Self-evaluation stood out as a crucial motivational strategy, especially for learners like Fay and Daisy who struggled with performance or lacked intrinsic motivation. By reflecting on their progress, learners

not only recognized the tangible value of vocabulary learning but also developed a more optimistic outlook on their ability to achieve long-term goals. This clarity in task value, coupled with raised task expectations, transformed their perception of the learning process from burdensome to rewarding.

Encouraging self-evaluation at significant milestones can reinforce task value, boost intrinsic motivation, and help learners appreciate the broader benefits of their efforts, fostering sustained engagement and commitment.

3. Trackable progress for sustained persistence

Kaixincichang's trackable progress system played a pivotal role in maintaining persistence, especially for learners engaged in the extensive journey of EFL vocabulary acquisition. For learners like Fay and Elizabeth, completing levels and observing their cumulative progress provided a tangible sense of accomplishment, which reinforced their determination to continue learning. This was particularly important in overcoming the monotony and challenges associated with long-term learning tasks.

Designing learning tools with mechanisms for clear progress tracking, such as level completions, enables learners to see measurable results, enhancing their sense of achievement and encouraging stable, sustained persistence.

4. Level-based mechanisms for independent learning

Kaixincichang's level-based mechanism, which segments learning into manageable 10-word units, proved effective in fostering independent learning. This structured approach allowed learners to set achievable daily goals and maintain focus, even in the face of competing responsibilities. For learners like Daisy, who benefited from the predictability of input, and Alex, who thrived on goal setting and reflection, the level-based design supported consistent progress.

Implementing level-based designs in learning tools provides learners with a stable and structured framework, reducing the likelihood of them being overwhelmed and enabling SRL, even in challenging circumstances.

5. Conclusion

The final week of intervention underscored the importance of structured tools and strategies in supporting learners' vocabulary growth, motivation, persistence, and retention. Alerts ensured independent regular reviews, self-evaluation boosted intrinsic motivation, trackable progress reinforced persistence, and level-based mechanisms facilitated independent learning. Together, these features offer a roadmap for designing effective and sustainable learning interventions that cater for diverse learner needs and promote long-term success.

8.2 One-month follow-up

8.2.1 Alex's journey

At the one-month follow-up, Alex demonstrated remarkable persistence and adaptability in independently managing his vocabulary learning while expanding his focus to new objectives. His journey highlighted the critical role of Kaixincichang in sustaining autonomous learning behaviour and the long-term transferability of SRL strategies in managing vocabulary learning without external scaffolding.

1. **Sustained use of Kaixincichang**:

Kaixincichang continued to serve as an essential tool in supporting Alex's independent learning behaviour:

1) Reminders promoted spaced review for CET-6 vocabulary

The app's spaced review reminders played a key role in sustaining Alex's regular review habits. He described how the alerts kept him on track: "每隔一天收到提醒，就会复习出现在复习列表中的单词。" ("Every other day, I'd receive a reminder and review the words in the review list"). This feature ensured the consolidation of earlier learning and promoted effective retention.

2) PK challenges for self-evaluation

Alex periodically participated in PK sessions to assess his accuracy and fluency, using the competitive environment as a self-diagnostic mechanism: "通过 PK 游戏检验自己的熟练度和准确性。" ("I evaluate my proficiency and accuracy through PK challenges"). These sessions provided feedback that further guided his self-reflection and adjustments.

3) A new vocabulary book for postgraduate exam:

Expanding his focus, Alex initiated another vocabulary book tailored for the postgraduate entrance exam using Kaixincichang. This dual usage underscores the app's versatility in supporting learners across different objectives and its role in fostering sustainable learning behaviour.

Alex's sustained engagement with Kaixincichang demonstrated the app's ability to support autonomous learning behaviour via its game mechanism. By providing structured yet flexible tools such as spaced review and gamified elements (PK and reminders) it not only reinforced his retention and self-assessment but also worked in tandem with the SRL strategies cultivated during the intervention to support him to achieve long-term fruitful vocabulary learning.

2. **Transferability of SRL strategies**

Alex demonstrated the transferability of SRL strategies cultivated during the intervention to independent learning scenarios:

1) Task analysis and time management

He effectively balanced reviewing CET-6 vocabulary with studying for the postgraduate exam, using task analysis and time management strategies to organize his learning process: “能够合理安排时间，对任务做出适当的分析后分配精力。” ("I can reasonably manage my time and allocate my efforts after conducting an appropriate analysis of tasks").

2) Self-reflection and adaptive decision-making

Weekly CET-6 practice tests became an integral part of his learning routine, allowing Alex to assess performance and make strategic adjustments to his learning methods: “每周做一次六级练习，之后总结表现，根据结果做出调整。” (Translation: "I do CET-6 practice once a week, then summarize my performance and make adjustments based on the results"). This iterative process highlights the durability of self-reflection strategies in guiding long-term learning.

SRL strategy transferability was a cornerstone of Alex's continued success in the one-month follow-up, showcasing the durability and adaptability of the self-regulation skills cultivated during the intervention. His ability to apply these strategies across multiple contexts highlighted their long-term utility in independent learning.

Alex’s one-month follow-up demonstrated how Kaixincichang, in conjunction with SRL strategies, effectively sustained autonomous learning behaviour and supported the long-term transferability of self-regulation skills. By integrating app-based features with independently developed strategies, Alex could maintain his vocabulary learning progress while preparing for new challenges. However, his reflections also indicate the potential for extending similar digital support to other areas of language learning, such as reading and translation.

8.2.2 Fay’s journey: continuous improvement with challenges

1. Vocabulary growth

Fay’s vocabulary learning during the one-month follow-up shifted from Kaixincichang to focusing more on CET-6 practice and learning new words encountered during exercises. However, this transition led to a slower vocabulary growth rate compared to the intervention period:

1) Reduction in vocabulary growth

Fay acknowledged that her vocabulary growth was slower post-intervention: “唯一有差别的就是背单词, 数量不是很多。” ("The only difference is vocabulary learning; the number of words is

not very high"). This reflected the challenge of maintaining her earlier pace without the structured support of Kaixincichang.

2) Challenges in strategic planning without level-based mechanism

Fay found it difficult to effectively plan for vocabulary learning due to the unstructured nature of her new vocabulary sources: “做题的时候遇到的新单词量是不确定的，不像开心词场一样固定的一关十个。” ("The number of new words encountered during practice is uncertain, unlike Kaixincichang, where each level has ten fixed words"). Without a clear structure, Fay struggled to allocate time efficiently, which disrupted the consistency she had developed during the intervention: “再加上做题，所以不太好规划时间背单词，就没有之前那样固定。” ("Combined with doing exercises, it’s hard to plan time for vocabulary learning, so it’s not as fixed as before").

3) Decline in retention without spaced review:

Fay also observed a decline in word retention, attributing it partly to the irregularity of her review schedule: “复习巩固的效果可能也有所下降。” ("The effect of review and consolidation may have also declined"). She explained the difficulty of independently maintaining a systematic review process: “复习的时间和频率也不是那么有规律了,主要可能是效率低一些吧，因为不可能像开心词场一样根据各个词汇的不同情况出一个词表定时复习。” ("The time and frequency of review are not as regular, and the efficiency might be lower because it’s not possible to create a word list and schedule reviews like Kaixincichang does").

Fay’s experience during the one-month follow-up illustrated the challenges of transitioning to independent vocabulary learning without the structured support of a platform like Kaixincichang. Her slower progress and reduced retention emphasized the importance of structure, strategic planning, and systematic review in sustaining vocabulary growth, as well as the effectiveness of level-based design and spaced review. These challenges suggest that tools to assist strategic planning and word retention may be necessary to support learners in self-regulated vocabulary learning post-intervention.

2. Fay’s motivation

During the one-month follow-up, Fay’s motivation appeared to be negatively impacted by the challenges she faced in maintaining consistent progress and the lack of structured reinforcement that had been present during the intervention.

1) Erosion of autonomy

While Fay did not explicitly discuss motivation, her reflections on the difficulties of independent learning suggested that her autonomy in vocabulary learning was diminished. The irregularity in

planning and reviewing may have reduced her sense of control over the learning process, contributing to a decline in intrinsic motivation.

2) Lack of achievement celebration:

Fay's reduced motivation may also be linked to the absence of celebratory feedback that she had previously experienced with Kaixincichang. The app's progress tracking and achievement celebrations had played a significant role in boosting her motivation during the intervention. Without such reinforcement, she lacked tangible milestones to sustain a sense of accomplishment, potentially eroding her drive to maintain consistent effort.

Fay's motivation during the one-month follow-up reflected the challenge of transitioning to independent learning without the scaffolding provided by structured tools like Kaixincichang. The erosion of autonomy and lack of achievement celebration contributed to a decline in her intrinsic motivation, though external goals continued to provide a baseline level of drive. This highlights the importance of maintaining motivational reinforcement mechanisms in the absence of external scaffolding.

3. Fay's persistence

Fay's persistence in learning new words and reviewing previously learned ones declined during the one-month independent learning phase. However, the follow-up activity seemed to play a role in reinforcing her determination through self-reflection.

1) Decline in persistence

Fay admitted that her persistence in learning and reviewing vocabulary was affected post-intervention: "唯一有差别的就是背单词, 数量不是很多。" ("The only difference is vocabulary learning; the number of words is not very high"). This decline was influenced by her struggles with planning and maintaining regular review schedules in the absence of a structured platform like Kaixincichang.

Fay also acknowledged the difficulty of sustaining regular review without Kaixincichang's support: "复习的时间和频率也不是那么有规律了。" ("The time and frequency of review are not as regular"). Thus, lack of systematic review contributed to reduced engagement and persistence.

2) Follow-up activity enhanced persistence by promoting self-reflection:

Despite challenges, the one-month follow-up activity seemed to reignite Fay's commitment to persistence through self-reflection. She realized the importance of consistency in vocabulary learning and expressed a strong determination to continue: "我现在就大的感觉就是一定要坚持下去。" ("My biggest realization now is that I must keep going"). This reflection highlighted the

role of follow-up activities in promoting a renewed focus on persistence, even after a period of decline.

Fay's persistence during the one-month follow-up declined compared to the intervention period due to the lack of structured support and regular review mechanisms. However, the follow-up activity served as a pivotal moment for self-reflection, reigniting her determination to persist in vocabulary learning. This highlights the value of incorporating reflective practices to sustain persistence in independent learning phases.

4. Fay's self-efficacy

While Fay did not make explicit statements regarding her self-efficacy in meeting the full CET-6 vocabulary requirements, her confidence appeared to be enhanced by the noticeable improvement in reading practice, which she attributed to growing vocabulary knowledge.

She reflected positively on her progress in reading, emphasizing the significant improvement she had achieved compared to earlier stages: "阅读很不错，比起之前有很大进步。整体上反正就是在一步一步慢慢地小进步。" (Translation: "Reading is quite good, with significant progress compared to before. Overall, it's just step-by-step, slow improvements"). This satisfaction with her reading ability demonstrated enhanced confidence in effectively using vocabulary in comprehension tasks, indirectly reinforcing her self-efficacy.

5. Summary

Fay's one-month follow-up revealed both challenges and progress in independent vocabulary learning. While her vocabulary growth and persistence declined compared to the intervention, she maintained commitment to CET-6 preparation, focusing more on learning new words from practice exercises. The lack of structure in her new vocabulary sources made strategic planning and regular review difficult, impacting on learning efficiency and retention. This underscores the importance of Kaixincichang's level-based design and spaced review in supporting independent and effective vocabulary learning.

Fay's motivation was sustained by her further recognition of the essential role of vocabulary knowledge in CET-6 performance. And her confidence was sustained by positive evaluation of improvements in reading practice, which she attributed to enhanced vocabulary knowledge. Although she did not mention self-efficacy in meeting CET-6 vocabulary requirements, her reading progress and gradual improvements strengthened her confidence in passing the exam. This journey underscores the importance of structured support and reflective practices in maintaining vocabulary growth, persistence, motivation, and self-efficacy during independent learning phases.

8.2.3 Daisy's journey

1. Vocabulary growth and persistence

Daisy's vocabulary growth showed further improvement during the one-month follow-up, as she managed to consistently learn three to four levels each day**:** "单词（学习）没有间断过，现在基本上每天过三关到四关。" ("I haven't stopped learning vocabulary. Now I basically pass three to four levels daily"). Her stable and improved persistence highlighted her commitment to vocabulary learning despite her university schedule becoming tighter with upcoming final examinations.

1) Effective use of time management

Daisy managed her schedule by focusing learning efforts in the afternoon or evening: "突然期末了，总感觉时间好紧。所以现在就就集中在下午或者晚上背单词。" ("The finals are approaching, and I always feel like time is tight. So now I focus on learning vocabulary in the afternoon or evening"). This demonstrated her consistent use of time management strategies to sustain progress under challenging circumstances.

2. Motivation

Daisy's continued engagement with Kaixincichang and her steady progress suggested a shift towards greater autonomous motivation. Her ability to prioritize vocabulary learning during a busy schedule, reflected intrinsic recognition of its importance for her overall CET-6 preparation.

3. Self-efficacy

Although Daisy did not explicitly express confidence in completing all CET-6 words, her stable progress and consistent persistence reflect enhanced self-efficacy in passing CET-6. Her gradual achievements with vocabulary learning likely contributed to growing belief in her ability to meet exam goals.

Daisy's one-month follow-up reflected her continued progress and ability to independently manage vocabulary learning through effective use of Kaixincichang and self-regulation strategies. Her enhanced persistence and autonomous motivation underscored both her growth as a self-regulated learner and the support of Kaixincichang's level-based mechanism and structured learning, even amid external challenges like a demanding university schedule.

8.2.4 Dawn's journey

1. Vocabulary growth

In the one-month follow-up, Dawn effectively focused on reviewing weak words from her first vocabulary book using Kaixincichang. These words, flagged every time she failed to pass a level, appeared regularly in her review list based on an Ebbinghaus forgetting curve. This targeted review strategy strengthened her retention of challenging vocabulary, consolidating earlier learning.

Simultaneously, Dawn started a new vocabulary book focused on CET-6 listening words using Kaixincichang. She found the process efficient and manageable, noting that many words in this list were familiar, allowing her to pass levels faster. Her vocabulary growth remained stable at around 300 words per week, reflecting a balance between review and expansion of her vocabulary.

2. Motivation

Dawn's motivation to continue CET-6 vocabulary learning was enhanced by the level-based mechanism and feeling of achievement: "现在学起来更快，因为很多词都认识了。" ("Now I learn faster because I recognize many of the words"). This sense of progress and efficiency in learning the new vocabulary book strengthened intrinsic motivation, fuelled by the growing confidence that she was nearing the end of her vocabulary learning journey.

3. Persistence

Dawn's persistence during the follow-up period was fluctuating but high, comparable to her consistency in Week 4. She remained committed to her learning schedule, driven by the level-based process of Kaixincichang and a growing sense of achievement. The efficient pace at which she progressed through the new vocabulary book possibly reinforced her determination to continue.

4. Self-Efficacy

Dawn's self-efficacy in satisfying CET-6 vocabulary requirements was significantly boosted by improved CET-6 practice performance and perceived mastery of vocabulary. She explained that learning the new vocabulary book with Kaixincichang helped boost her confidence: "感觉现在对单词的掌握更好了，做题正确率也在提升。" ("I feel my mastery of vocabulary has improved, and my accuracy in practice is also increasing"). Her ability to handle reviewing weak words and independently learning new vocabulary reflected the successful transfer of self-regulation strategies learned during the intervention.

5. Summary

Dawn's one-month follow-up highlighted the effective integration of SRL strategies and Kaixincichang in supporting independent vocabulary learning. The use of targeted reviews for weak words and autonomy to expand learning with another CET-6 vocabulary list demonstrated her mastery of task analysis, self-control and reflective practices.

Kaixincichang's structured review mode and progress tracking facilitated Dawn's vocabulary retention and provided a tangible sense of progress, enhancing her motivation and self-efficacy. The transferability of SRL strategies learned during the intervention enabled her to sustain persistence and

maintain confidence in meeting CET-6 vocabulary requirements, showcasing the combined power of strategic learning and digital support in fostering autonomous, long-term learning.

8.2.5 Elizabeth's journey

1. Elizabeth's vocabulary growth

Elizabeth maintained consistent vocabulary growth, achieving around 350 words per week in the month following the intervention. This marked an improvement compared to the earlier intervention weeks, demonstrating an ability to independently sustain and even enhance her learning pace. Her progress reflected the transferability of the SRL strategies scaffolded during the intervention and the effectiveness of Kaixincichang in supporting independent and fruitful vocabulary learning.

2. Elizabeth's motivation

Elizabeth's motivation was further enhanced by recognizing the tangible benefits of vocabulary learning from her CET-6 practice: "这次做的这套真题准确率有提高,感觉能更好的理解，感觉坚持背单词还是有效果的." ("The accuracy of my answers in this set of practice tests improved. I feel I understand better, and I think sticking to vocabulary learning has been effective"). This improvement in CET-6 practice performance reinforced her perception of the task value. And Kaixincichang's trackable progress and achievement mechanisms also reinforced Elizabeth's motivation by providing tangible and immediate feedback on her learning progress.

3. Elizabeth's persistence

Elizabeth's persistence remained stable. In the month following the intervention she persisted for seven days every week and passed five levels or more daily, even under the pressure of a tight schedule: "最近因为有期末考试和一些其他的工作，学英语的时间并不多，不过还是坚持了每天背单词。" ("Recently, because of final exams and other tasks, I didn't have much time to study English, but I still managed to stick to daily vocabulary learning"). Her flexible time management strategy allowed her to allocate limited time efficiently and the ten words in a level, ensuring steady progress despite competing responsibilities. This reflected her growing ability to independently regulate her learning. Kaixincichang's design also supported Elizabeth's persistence. The small learning units of 10 words per level made it feasible to maintain her learning routine even during a tight schedule.

4. Elizabeth's self-efficacy

Elizabeth's self-efficacy in satisfying CET-6 vocabulary requirements remained moderate, shaped by ongoing challenges with word retention: "总是有些单词背了记不住，很容易就忘了。" ("There are always some words that I can't remember after memorizing them, and they are easily forgotten").

Her concerns about retention revealed the persistent need for tailored review strategies and confidence-building interventions to further enhance belief in her ability to achieve full mastery of the required vocabulary.

5. Summary

Elizabeth's journey highlights the effectiveness of combining SRL strategies with Kaixincichang's structured support to foster sustained and independent vocabulary learning. Her progress underscores the role of small, manageable learning units, flexible scheduling, and consistent review in enabling learners to thrive, even under external pressures. However, addressing individual retention concerns remains crucial for further enhancing self-efficacy and long-term success.

8.2.6 Implications

1. Setting proximal and practical goals to maintain motivation and persistence

The one-month follow-up demonstrated the importance of proximal and practical goal-setting in sustaining learners' motivation and persistence, particularly for those like Dawn and Fay who previously struggled to complete long learning journeys. Proximal goals provided clarity and immediate targets, enabling learners to stay engaged and focused on incremental progress rather than feeling overwhelmed by the larger objective. Interventions should incorporate goal-setting strategies that emphasize manageable, near-term objectives to keep learners motivated and persistent, particularly during challenging phases of long-term learning.

2. Game-structured learning tools and strategic planning for sustained learning

Game-based learning tools like Kaixincichang, when combined with effective strategic planning, were instrumental in supporting continuous and effective learning for all types of learners. The structured design of these tools allowed learners to integrate strategic planning, such as dividing tasks into smaller levels and effectively scheduling time, which promoted consistency and progress. Game-based tools should be designed to align with SRL strategies, enabling learners to combine the benefits of gamification with personalized planning for sustained engagement and achievement.

3. Time management and level-based mechanisms for persistence through tight schedules

The combination of effective time management and small, level-based tasks allowed learners to persist even during tight schedules. Kaixincichang's 10-word levels helped learners maintain focus and manage their time efficiently, as demonstrated with Elizabeth, who balanced her schedule while achieving stable progress. Learning tools should incorporate level-based mechanisms with small, manageable tasks to facilitate consistent progress and support learners facing time constraints.

4. Learning-outcome focused self-evaluation for motivation and persistence

Self-evaluation, particularly when centred on learning outcomes, played a crucial role in boosting motivation and persistence for learners like Fay, Daisy, and Elizabeth who previously struggled with low motivation or self-efficacy. Reflecting on tangible progress helped these learners recognize the value of their efforts, encouraging them to stay committed to their goals. Encouraging regular self-evaluation focused on measurable outcomes can enhance learners' motivation and persistence, particularly for those with a history of low motivation or self-efficacy.

5. **Trackable achievements and progress celebration for boosting self-efficacy**

Celebrating progress and showcasing trackable achievements helped maintain motivation, persistence, and self-efficacy, especially for learners with low confidence or motivation. Features such as Kaixincichang's level completions and review success reports provided learners with positive reinforcement, which was particularly effective for learners like Fay and Daisy. Learning tools should incorporate features that allow learners to track their progress and celebrate achievements, reinforcing motivation and confidence throughout the learning journey.

6. **Alerts for supporting persistence throughout long learning journeys**

Alerts were highlighted as a critical feature for maintaining persistence across all learner types, particularly during different phases of a long learning journey. These reminders ensured learners consistently revisited their study materials, even when external motivation or structure was lacking. Timely alerts should be an integral part of learning tools to support regular engagement and help learners stay on track during extensive learning processes.

Conclusion

The one-month follow-up demonstrated that combining SRL strategies like goal-setting and time management with game-based learning tools with supportive features such as alerts and progress tracking creates a robust framework for sustaining motivation, persistence, and self-efficacy. These strategies are especially impactful for learners with diverse profiles and challenges, ensuring independent, continuous progress and long-term success.

Chapter 9 Discussion and Conclusion

This chapter synthesizes the findings of the study, discusses their implications, and provides recommendations for both educational practice and future research. Conducted during the unprecedented challenges of the COVID-19 pandemic, this research explored how SRL strategies and a MGBVL)

app, Kaixincichang, supported university EFL learners in achieving sustainable and effective vocabulary learning outcomes. The study adopted an action research methodology, progressing through iterative cycles to address learners' challenges in motivation, persistence, and self-efficacy, which were heightened by the disruption to traditional learning environments.

The chapter begins by summarizing the key findings related to vocabulary growth, motivation, persistence, and self-efficacy, highlighting patterns and themes across the intervention and follow-up phases. It then provides a detailed discussion, linking the findings to existing theories and literature while uncovering unique insights from this study. Finally, the chapter concludes with practical recommendations for educators and developers, reflections on the study's limitations, and directions for future research, emphasizing the study's contribution to improving vocabulary learning in challenging circumstances.

9.1 Self-regulated vocabulary learning outcome using GBVL app

9.1.1 Discussion

1. **Strategic vocabulary learning scaffolding and word retention**

Kaixincichang effectively integrates morphological analysis during word presentation and phonological analysis in its follow-up word consolidation processes. This structured scaffolding plays a crucial role in supporting word retention by enhancing the depth of information processing. Morphological analysis, which involves breaking down words into their roots, prefixes, and suffixes, helps learners establish meaningful connections between word forms and meanings. Similarly, phonological analysis reinforces auditory and visual associations, promoting a multisensory learning experience that fosters long-term memory consolidation.

This multisensory experience aligns with the dual coding theory, which posits that encoding information through multiple sensory modalities (e.g., visual and auditory) strengthens memory by creating richer memory traces. This approach facilitates easier information retrieval. The findings also align with recent research (Kanellopoulou et al., 2019; W. Li et al., 2022) which highlights the role of dual coding in enhancing vocabulary retention and retrieval. Moreover, a recent experimental study by Teng and Zhang (2023) explored three types of input conditions: (1) Definition + Word information +

Video, (2) Definition + Word information, and (3) Definition only. Their findings underscore the importance of audio input for activating phonological short-term memory, which was found to play a significant role in vocabulary learning and retention. The phonological components embedded in Kaixincichang's structured learning system align with these insights, providing audio-visual reinforcement that benefits learners across diverse contexts.

Earlier research (e.g., Calvo-Ferrer, 2017; Huang & Huang, 2015) emphasized the importance of embedding strategic cognitive scaffolding for vocabulary learning, such as rehearsal, into digital vocabulary learning game designs (Zou et al., 2019). Rehearsal helps learners reinforce new words through repetition and active recall, promoting deeper engagement with the vocabulary. Kaixincichang's structured learning process, with its strategic scaffolding of vocabulary learning strategies, aligns with these findings, demonstrating how game-based tools can effectively support long-term retention and improve vocabulary learning outcomes.

2. The role of SRL strategies in vocabulary learning and retention

The proactive use of SRL strategies, particularly metacognitive strategies such as self-monitoring and self-control, emerged as pivotal in supporting both vocabulary learning and retention. These strategies promoted the use of memory techniques tailored to individual needs, such as word structure encoding (Alex), contextual encoding (Dawn), and visual repetition (Fay). By enabling learners to track and regulate their learning progress following the structured processes provided by the MGBVL app, SRL strategies fostered a more deliberate and reflective approach to vocabulary acquisition.

Recent research corroborates these findings. R. Zhang et al. (2024) explored the interplay between SRL strategies and vocabulary learning within a digital game-based environment. Both parameter analysis and interview data revealed that SRL strategies enhanced the internalization of vocabulary knowledge by mediating the use of effective cognitive learning methods. Similarly, Boroughani et al. (2023) demonstrated that scaffolding mobile app-based vocabulary learning with SRL strategies facilitated the development of metacognitive awareness, which supported better performance compared to using cognitive strategies alone.

Chen et al. (2024) conducted an experimental study that validated the effectiveness of integrating SRL strategies with mobile vocabulary learning apps. Their findings highlighted how the incorporation of SRL strategies improved learning achievement by enabling learners to plan, monitor, and reflect on their vocabulary learning processes.

The intersection of SRL strategies and mobile or game-based vocabulary learning has garnered increasing attention from language researchers, given its potential to enhance learning outcomes. However, more research is needed to examine the underlying mechanisms of how SRL strategies

interact with game-based vocabulary learning tools. This exploration is crucial for optimizing the design of educational technologies and providing context-specific solutions for diverse learner profiles.

3. **The role of adaptive and spaced review in vocabulary retention**

The findings of this study highlight the critical role of adaptive review, alongside generic spaced review, in supporting vocabulary retention, particularly for learners making rapid progress. For instance, Alex, who averaged over 70 words per day, and Dawn, who sometimes learned over 40 words daily, both benefited significantly from incorporating personalized review strategies alongside Kaixincichang's built-in spaced review. Similarly, Elizabeth, who faced retention challenges when her daily learning progress exceeded 40 words during Cycle 3, observed marked improvement in retention when she began conducting personalized reviews in addition to the app's structured review in Week 4. These findings highlight the importance of adaptive scheduling of spaced reviews tailored to a learner's progress. Without such adjustments, learners who rapidly expand their vocabulary risk retention failures, as their cognitive load exceeds the capacity supported by generic spaced repetition models.

This aligns with the findings of Lindsey et al. (2014) which demonstrated that personalized adaptive spaced review improved long-term knowledge retention in Spanish foreign-language learning, using a flash-card tutoring system. Similarly, Zaidi et al. (2020) explored the use of adaptive spaced repetition for language learning and found it particularly effective for retaining complex words. Kharwal et al. (2021) proposed a framework integrating repetition, adaptive learning, and game elements to enhance language learning; however, the framework's effectiveness remains underexplored.

Despite the promising potential, research on adaptive spaced review is still limited. The growing evidence suggests that adaptive approaches, responsive to individual learning progress**,** are essential for ensuring sustainable and effective vocabulary retention, particularly for learners who consistently make significant progress in short timeframe. This calls for further exploration of adaptive learning systems that incorporate personalized review schedules into digital game-based vocabulary learning tools.

9.1.2 Conclusion: vocabulary growth achieved by structured learning and review

All participants demonstrated significant improvement in vocabulary learning, encompassing both the acquisition of new words and their long-term retention. These findings underlined the effectiveness of integrating Kaixincichang and SRL strategies in addressing the challenges of EFL vocabulary learning during the pandemic, directly supporting the study's aim to enhance learners' vocabulary acquisition and retention through the integration of a MGBVL app and SRL strategies.

1. **New words learning**

Kaixincichang's structured learning process and immediate feedback mechanisms facilitated efficient new word acquisition and supported their integration into long-term memory. The structured learning sequence began with a comprehensive word entry overview, followed by varied word consolidation activities including spelling, pronunciation, meaning, and contextual usage. Immediate feedback during word retrieval and adaptive consolidation for errors ensured that learning gaps were addressed promptly, enabling steady progress even for participants with initially low self-regulation, such as Daisy.

Participants' effective use of metacognitive-monitoring during Kaixincichang's structured learning process further enhanced new word learning. By tracking their progress, participants proactively employed tailored strategies to consolidate word knowledge. For example, Dawn employed contextual encoding, integrating words into meaningful contexts, which improved retrieval and application during reading tasks. The tailored strategies emphasize the importance of coupling SRL strategies with a game-based learning framework to accommodate individual learning needs and styles.

2. Long term retention

Kaixincichang's spaced repetition system played a pivotal role in ensuring successful long-term retention and retrieval. The app's adaptive review mechanism, tailored to each learner's performance, presented an individualized spaced review list that reinforced previously learned words.

Participants who made significant daily progress, such as Alex and Dawn, leveraged the spaced review list for proactive review, allowing them to monitor their retention metacognitively and adapt their review strategies accordingly. This consistent review process ensured sustained retention of a large volume of newly acquired vocabulary. For instance, Alex regularly reviewed and consolidated his expansive vocabulary set, while Dawn's methodical review aligned with her contextual learning approach, ensuring effective retrieval.

9.1.3 Implications

This research provides valuable insights into the integration of SRL strategies with MGBVL tools, particularly in fostering new word learning and long-term retention among university EFL learners. The findings have significant implications for EFL teachers, learners, MGBVL app developers, and future research.

1. Implications for EFL teachers

EFL teachers can play a critical role in guiding students towards effective vocabulary learning strategies. One key implication is the importance of scaffolding strategic word learning by explicitly training students in metacognitive strategies such as self-monitoring and self-control. These strategies allow learners to track their progress and adopt tailored approaches for word consolidation, such as word structure encoding (Alex), visual repetition (Fay), or contextual encoding (Dawn). By

integrating structured vocabulary learning strategies into classroom activities, teachers can ensure that students are better equipped to store words in long-term memory. In addition, teachers should encourage adaptive review practices to ensure that students effectively retain newly acquired words. Some learners may struggle with self-directed review, making it essential for educators to introduce them to structured review lists and spaced repetition tools. These practices are especially crucial for learners with high daily learning loads, such as Alex and Dawn, who benefited from combining systematic review with personalized adaptive review.

Finally, EFL teachers should promote multi-sensory learning approaches that integrate visual, auditory, and textual stimuli, aligning with dual-coding theory, which suggests that multisensory input enhances long-term memory consolidation. Encouraging students to engage with digital tools that provide phonological, semantic, and contextual reinforcement can significantly improve vocabulary retention and application.

2. Implications for university EFL learners

For learners, developing metacognitive awareness is crucial for monitoring progress and adjusting learning strategies accordingly. Individuals who struggle with retention should engage in proactive review using structured review lists, such as those provided by Kaixincichang, or create personalized flashcards to reinforce difficult words. Learners must also balance learning load and review intensity, tailoring their review strategies based on their daily vocabulary intake.

While fast learners like Alex and Dawn proactively reviewed Kaixincichang's spaced review list almost daily, Daisy found that the app's built-in review system was sufficient for her slower learning pace. These differences highlight the need for learners to identify and adopt review strategies suited to their individual progress. Furthermore, leveraging contextual learning strategies—as demonstrated by Fay and Dawn—can enhance word retrieval and application, particularly in reading and comprehension tasks.

3. Implications for MGBVL app developers

To further support effective vocabulary learning, developers of MGBVL apps like Kaixincichang should consider enhancing adaptive review mechanisms by incorporating personalized spaced repetition algorithms that dynamically adjust, based on individual learning speed and accuracy. This would ensure that learners receive timely and targeted review sessions, which would prevent forgetting and enhance retention.

Embedding learning strategy prompts within the app could also improve learner engagement. For instance, interactive hints or guided strategy recommendations could prompt users to adopt structure encoding, contextual learning, or self-testing strategies, thereby fostering better vocabulary retention. Customizable learning loads should also be offered to prevent low self-efficacy

learners from feeling overwhelmed by large vocabulary lists. Allowing users to adjust the number of words per level would provide a more flexible and confidence-building learning experience.

4. Implications for future research

Given the growing interest in digital game-based language learning, future research should further explore strategy-specific impacts on vocabulary retention. Understanding which vocabulary learning strategies—such as structure encoding, visual repetition, or contextual learning—yield the best long-term retention could provide better guidance for EFL learners. As well, research should examine how adaptive learning pathways influence retention and retrieval efficiency. Investigating the effectiveness of personalized spaced repetition in comparison to fixed-interval review systems would help educators and developers design more efficient learning models.

Moreover, future studies could explore the individual and combined effects of SRL strategies and MGBVL. While this study examined their synergy, it did not include a control or comparison group to isolate the contributions of each. Comparative designs could clarify whether SRL training alone, game features alone, or their combination leads to the most sustained learning gains.

Finally, exploring the integration of MGBVL with AI-driven tutoring systems could provide real-time feedback and tailored learning recommendations, enhancing learners' long-term vocabulary acquisition and retention.

9.2 Self-regulated vocabulary learning motivation using GBVL app

9.2.1 Discussion

1. The role of SRL strategies in influencing motivation

Integrating SRL strategies with mobile vocabulary learning or MGBVL apps has been shown to enhance learners' motivation, and aligns with the findings of multiple recent studies (Boroughani et al., 2023; Chen et al., 2024; Chen et al., 2019; Choi et al., 2018; Teng, 2023; Yang, Song, et al., 2023). These studies consistently highlight the general positive impact of SRL strategies on university learners' motivation across diverse contexts, genders, and cognitive styles.

For instance, Chen et al. (2024) and Chen et al. (2019) demonstrated that SRL strategies can effectively boost motivation, irrespective of learners' cognitive or demographic differences. Similarly, R. Zhang et al. (2024) utilized multiple linear regression analysis to reveal that frequent use of SRL strategies significantly enhances learners' satisfaction with their vocabulary learning progress. This current study further emphasizes the importance of self-evaluation as a mechanism for reinforcing motivation when learners have consistently applied SRL strategies over time, as observed in Cycle 3.

While these earlier studies focused on the broad influence of SRL strategies over short learning periods, the current research builds on this by examining the impact of specific SRL strategies on motivation across an extended cyclical learning journey.

1) Task analysis and self-motivation strategies

Goal-setting, particularly proximal goal-setting, emerged as a pivotal factor for motivation which was especially effective for learners with prior failure in English proficiency tests. This finding aligns with goal-setting theory (Cook & Artino Jr, 2016; Elliott & Dweck, 1988) and the proximal goal theory (Bandura, 1988), which emphasize the motivational benefits of short-term, mastery-oriented goals.

Moreover, the correlation between goal-setting types and motivation in EFL learning has been supported by Han and Lu (2018), who found that avoidance motives positively correlate with short-term and mastery goals. Similarly, Li and Li (2024) demonstrated that short-term mastery goals predict positive emotions, which are closely linked to heightened motivation. These findings highlight the value of clear, manageable short-term goals in fostering motivation, particularly in learners with lower self-efficacy.

2) The role of self-efficacy in motivation

The relationship between self-efficacy and motivation emerged as a nuanced dynamic. Learners with low self-efficacy often experienced diminished motivation, a finding supported by Schunk (1995) and Chowdhury and Shahabuddin (2007), who identified a positive correlation between self-efficacy and intrinsic/extrinsic motivation. According to expectancy-value theory (Wigfield & Eccles, 2000), self-efficacy shapes learners' expectations of success, which in turn influences their motivation.

A recent study by Zhan et al. (2020) further explored this interaction within the context of EFL learning, revealing that the relationship between self-efficacy and learning motivation is both activity and strategy-specific. This underscores the need for future research to more extensively explore how self-efficacy interacts with motivation in different SRL contexts and strategies.

3) The role of self-evaluation on motivation

Self-evaluation emerged as a pivotal SRL strategy in promoting participants' extrinsic motivation. By reflecting on their learning progress and aligning it with future goals, such as passing CET-6 or preparing for master’s entrance exams, participants could recognize the utility value of their vocabulary learning. This realization significantly boosted their motivation to persist. These findings align with Wigfield and Eccles (2000) expectancy-value theory, which highlights the role of utility value in shaping learners’ motivation.

Fukuda (2024) supports this view, demonstrating that EFL learning motivation is closely tied to perceived task value, which varies across learning scenarios. Similarly, recent research in gamified EFL vocabulary learning reinforces this relationship. A quasi-experimental study by Fithriani (2021) revealed that learners' perceptions of the usefulness of gamified learning tools significantly enhanced their motivation. Furthermore, an experimental survey by Chen and Zhao (2022a) on a gamified vocabulary learning app found that perceived utility value played a crucial role in motivating learners. These studies collectively emphasize the importance of self-evaluation in helping learners connect their efforts with tangible outcomes, thereby fostering sustained motivation.

In summary, the findings confirm that SRL strategies, particularly task analysis self-motivation and self-evaluation strategies, can effectively enhance motivation in MGBVL contexts. However, the interaction between self-efficacy and motivation warrants further exploration to develop more targeted interventions that support learners with varying confidence levels and motivational needs.

2. The influence of game factors on learning motivation

1) Game factors supporting task analysis and strategic planning

Kaixincichang employs a level-based mechanism that organizes vocabulary books into manageable levels, initially with five words per level and increasing to 10 words per level in later stages. All levels are presented on the menu page, supporting task analysis and enabling learners to plan strategically. This structured approach aligns with findings in motivational research that emphasize the importance of clear, manageable goals to sustain motivation.

However, the comprehensive presentation of all levels, especially for extensive vocabulary books such as the 96-level CET-6 book, had a dual impact. While it offered a clear roadmap for task completion, it also caused a sense of being overwhelmed and stressed among low self-efficacy learners like Dawn. Such negative emotions diminished their motivation, as these learners perceived the task to be insurmountable. This finding aligns with Pekrun (1992) assertion that task-related negative emotions can undermine extrinsic motivation. Similarly, Sari and Ningsih (2022) found that learning materials inducing anxiety in language learners can reduce motivation, while Namaziandost and Rezai (2024) highlighted that regulating such emotions can lead to improved academic motivation. Moreover, the findings echo Alamer and Almulhim (2021) research which revealed that negative emotions negatively correlate with feelings of competence and relatedness, fundamental needs for sustaining self-determination motivation.

2) Game factors enhancing motivation through positive emotions

Nevertheless, Kaixincichang's progress in tracking and achievement celebrations fostered a sense of accomplishment among learners like Fay, Dawn, and Elizabeth. These features promoted task enjoyment and self-efficacy, subsequently enhancing intrinsic motivation, reflecting Pekrun (1992) assumption that task enjoyment induces positive intrinsic motivation (p.366).

These findings are further corroborated by Bagunaid et al. (2022), who noted that presenting progress in a game format significantly enhanced learners' motivation. Similarly, Pesare et al. (2016), in a literature review on game-based learning, confirmed that publishing and celebrating achievements can visibly boost motivation. Moreover, field research by Avrahami et al. (2020) demonstrated that celebrating daily successes can significantly enhance learners' motivation, though the field still lacks comprehensive research into this area.

In addition to progress tracking and achievement celebrations, Kaixincichang also features a competitive game element known as PK, where users compete against others learning the same vocabulary book. This competitive mechanism was found to have a dual effect on learners' motivation. For competent learners like Alex, PK enhanced motivation by providing opportunities to demonstrate mastery and experience success. However, for less proficient learners such as Daisy, repeated failures in PK challenges led to anxiety and diminished motivation. This finding aligns with the results of a meta-analysis by C.-H. Chen et al. (2020), which reported that failure experiences in educational games can negatively affect learners' emotions and motivation. Similarly, Yang et al. (2020) observed that cognitively demanding vocabulary games may increase learner anxiety through frequent failures. Wang and Huang (2023) further emphasized that excessive difficulty in game-based learning environments can evoke negative emotional responses, particularly among lower-performing students. These insights suggest that while competitive elements can foster motivation for some, they may hinder engagement for others, highlighting the need for adaptive competition mechanisms that cater to diverse learner profiles.

The findings emphasize the dual impact of game factors: they can simultaneously support structured planning and, when not tailored to learners' confidence levels, induce anxiety that undermines motivation. However, features like progress tracking and celebration can mitigate this by fostering positive emotions and intrinsic motivation. Future research should focus on refining game-based learning tools to balance clarity and challenge, addressing the emotional needs of learners to sustain motivation across different proficiency levels.

9.2.2 Conclusion: vocabulary learning motivation was boosted by game factors and SRL task analysis strategies

1. Fluctuations in motivation

Motivation fluctuated across the cycles, shaped by both external and intrinsic factors:

1) **External factors:** Lockdown-induced learning environments posed challenges that negatively impacted motivation. Dawn, for instance, struggled with a bad mood due to the restrictive and isolating environment, which hindered her motivation.
2) **Intrinsic factors:** Outcome expectations, task value realization, and positive self-evaluation were critical motivators. Learners like Fay and Dawn experienced motivation surges as they recognized the practical benefits of their efforts and perceived tangible progress in their vocabulary learning.

2. Key findings and contributions

1) Game-based factors promote motivation: achievement celebrations

Features like progress tracking and achievement celebrations in Kaixincichang significantly enhanced motivation. These elements offered learners, especially those like Fay and Dawn, a sense of accomplishment and recognition which helped them persist despite external challenges.

2) SRL autonomy supportive strategies enhance motivation

These autonomy-supportive strategies were pivotal in fostering extrinsic motivation. Learners who engaged in realistic planning and goal-setting, such as Alex and Elizabeth, were better able to maintain consistent efforts and sustain their learning journeys.

Motivation was further boosted when participants engaged in self-evaluation upon achieving progress. This process allowed learners to recognize the task's value in a practical and personal way, reinforcing belief in the importance of their learning efforts.

These findings highlight the importance of addressing both external and intrinsic factors in designing motivational interventions, particularly during challenging periods like the pandemic. Combining game-based features with strategic planning, goal-setting, and self-evaluation creates a robust framework for sustaining motivation across diverse learner profiles.

9.2.3 Implications

1. Implications for teachers

EFL teachers play a critical role in enhancing learners' motivation through thoughtful integration of game-based tools and SRL strategies. Teachers should guide learners in breaking down overwhelming vocabulary tasks into manageable units through goal-setting and task analysis, which can alleviate feelings of anxiety and enhance motivation. Teachers can also incorporate self-reflection activities into the learning process, enabling students to evaluate progress and recognize their achievements, which are known to foster intrinsic motivation. Emotional support is also essential, particularly for learners

with low self-efficacy, as it helps counter negative emotions associated with large-scale vocabulary tasks and sustains engagement over time.

2. Implications for EFL learners

For EFL learners, adopting SRL strategies is essential for maintaining motivation throughout their vocabulary learning journey. Setting proximal goals and engaging in self-reflection allows learners to track their progress and celebrate small wins, fostering a sense of accomplishment and reinforcing their intrinsic motivation. Learners should actively utilize metacognitive strategies, such as self-monitoring and personalized review, to ensure their efforts align with learning objectives. Furthermore, learners need to recognize the motivational benefits of game-based tools while remaining vigilant about potential challenges, such as feelings of being overwhelmed by large tasks, and adapt their strategies to effectively sustain motivation.

3. Implications for MGBVL app developers

Developers of MGBVL apps have a unique opportunity to design tools that enhance motivation while addressing learner challenges. Progress visualization and achievement celebrations are key features that should be incorporated to reinforce learners' sense of accomplishment and drive continued engagement. Personalized adaptive review mechanisms are equally important, as they enable learners to address individual needs and sustain motivation by ensuring long-term retention. Developers should also focus on emotion-sensitive design elements, such as customizable vocabulary lists and smaller learning units, to reduce anxiety and enhance feelings of competence. In addition, embedding SRL support within the app, such as goal-setting prompts and reflective tools, can empower learners to manage their learning independently and foster intrinsic motivation.

4. Implications for future research

Future research should examine the motivational dynamics of game-based vocabulary learning and its integration with SRL strategies. Studies exploring how game features, such as progress tracking and achievement celebrations, influence learners' intrinsic and extrinsic motivation can provide valuable insights for app design and classroom practice. Longitudinal studies are also needed to examine how these motivational strategies influence vocabulary learning over extended periods, particularly in diverse learner populations. Finally, investigating the customization of game-based learning paths and its impact on motivation could open new avenues for personalized and effective language learning experiences.

By addressing these areas, teachers, learners, and developers can create a more supportive and motivational learning environment, while at the same time researchers can contribute to a deeper understanding of the motivational mechanisms underlying effective vocabulary acquisition.

9.3 Self-regulated vocabulary learning persistence using GBVL app

9.3.1 Discussion

1. SRL strategies' influence on learning persistence

1) The influence of self-control strategies

Self-control strategies, particularly environment structuring and time management, played a pivotal role in promoting learning persistence during the pandemic lockdown. The challenges of unconducive learning environments, such as home or dorm settings, and tight university schedules, made it difficult for learners to maintain focus and commitment (Goudeau et al., 2021; Qiao et al., 2021; Yu, 2022). By using environment structuring strategies, participants created spaces conducive to learning, which led to immediate improvement in their ability to concentrate and work effectively (Zimmerman & Moylan, 2009, p. 303). Time management strategies helped learners plan their schedules, optimize time slots, and align daily objectives with their weekly goals, allowing them to overcome scheduling conflicts and maintain a steady learning routine. This finding aligns with Peterson and Seligman's (2004) assertion that persistence often relies on self-control to override natural tendencies to quit when tasks become challenging (p. 234).

These findings also echo Lassoued et al. (2020) research which emphasized the importance of creating effective learning environments to overcome pandemic-imposed challenges and sustain quality learning. Similarly, Octavia et al. (2022) and Mutlu and Yıldırım (2019) highlighted the role of structured environments in maintaining focus and ensuring academic success. The role of time management during tight schedules was further validated by Kulusaklı (2022) and Karacan et al. (2022), who found that effective time management was critical for achieving EFL academic success in distance education contexts during the pandemic.

2) The influence of positive self-evaluation

Positive self-evaluation emerged as another key factor in sustaining persistence. By reflecting on their progress and recognizing achievements with Kaixincichang, participants experienced enhanced self-esteem and renewed determination which concurs with Peterson and Seligman's (2004, p. 231) observation that persistence is driven by the expectation that efforts will be rewarded with the desired outcome. Participants' ability to see the value of their learning efforts reinforced their persistence, a finding supported by Ghasemi and Dowlatabadi (2018) who demonstrated a positive relationship between task value recognition and persistence. Similarly, Xie et al. (2024) observed that learners were more likely to persist when they perceived the value of what they were learning, even when faced with prior failures or discouraging circumstances. Fukuda (2024) also highlighted that task value can maintain learners' commitment across diverse learning contexts, further validating this study's findings.

In summary, the effective use of SRL strategies, including environment structuring, time management, and positive self-evaluation, provided learners with the tools to overcome external obstacles and internal challenges. These strategies helped sustain persistence during a period marked by significant disruption, showcasing their critical role in fostering resilience and commitment in vocabulary learning.

2. Game factors influence on learning persistence

The role of game factors in fostering persistence was evident in this study, particularly through features like progress tracking and achievement celebrations. As discussed in the context of motivation, mechanisms such as streaks and level completions enhanced participants' sense of accomplishment, which in turn supported their persistence. This finding aligns with the Expectation Confirmation Model (Bhattacherjee, 2001; Dai et al., 2020) which emphasizes the importance of perceived enjoyment in driving the continued use of technology for learning. By providing learners with a sense of achievement, these game elements boosted their self-esteem, further reinforcing persistence, which aligns with Peterson and Seligman's (2004) assertion that individuals are more likely to persevere in tasks that protect or enhance their self-esteem. Huang and Liu (2024) also found that EFL learners' enjoyment derived from task accomplishments which played a critical role in their sustained engagement. Similarly, earlier research by Li et al. (2019) demonstrated a positive relationship between enjoyment and accomplishment in MGBVL contexts, further validating this study's findings.

Another significant factor influencing persistence was the perceived usefulness of Kaixincichang for vocabulary learning. Participants found the app's features to be highly beneficial, enhancing their learning experience in the following ways:

1) **Alignment with learning needs**: Kaixincichang's content was directly relevant to participants' EFL learning requirements, such as preparing for CET-6, which heightened its perceived usefulness.
2) **Structured learning and review process**: The app provided a systematic approach, beginning with a comprehensive overview of each word entry and followed by various word retrieval practices. In addition, the spaced review system with immediate feedback supported long-term retention and created a meaningful learning experience.
3) **Level-based progress tracking**: The app's level-based mechanism offered participants a clear visualization of their progress, which reinforced their sense of achievement and motivated them to persist.

These findings echo earlier studies on gamified EFL learning technologies. Dai et al. (2020) and Luo (2022) emphasized the importance of structured and engaging learning processes in driving learners' continued use of technology. Similarly, Rodríguez Mejía and Troya Fuentes (2024) found that game-based vocabulary learning apps were perceived as useful because of their engaging processes and effective support for word retention. Luo et al. (2023) further validated this, demonstrating that game-

based EFL learning tools like whiteboards were valued by preservice teachers for promoting engagement and enhancing knowledge retention.

The growing interest in the interplay between game-based learning and persistence has led to the development of modified constructs (Chen & Zhao, 2022b; Dai et al., 2020; Luo, 2022) and scales (Dai et al., 2020; Zainuddin et al., 2024). However, further research is needed to validate these frameworks across diverse learner groups, backgrounds, and learning styles. Exploring the nuanced mechanisms through which self-esteem and perceived usefulness influence persistence could provide valuable insights for future educational interventions.

While features like progress tracking and achievement celebrations enhanced learners' motivation and supported persistence, not all game design elements had a uniformly positive effect. One such factor was the increase in challenge embedded in Kaixincichang's level progression. After participants passed the first ten levels, the number of words required to complete each subsequent level doubled. All participants—except Alex—reported that this sudden escalation in task difficulty negatively impacted their persistence. This finding aligns with Israel-Fishelson and Hershkovitz (2019), who observed that unexpected increases in difficulty can lead to reduced engagement. Similarly, Porter et al. (2020) found that learners demonstrated greater persistence when tasks were less cognitively demanding. DUMDUMAYA and RODRIGO (2018) also emphasized that perceived task difficulty is a significant predictor of persistence in digital learning environments. These findings suggest that while challenge is essential for engagement, unmodulated increases in difficulty may discourage learners, particularly those with lower initial motivation or self-efficacy. Game-based learning systems may therefore benefit from incorporating adaptive challenge mechanisms to sustain persistence across diverse learner profiles.

9.3.2 Conclusion: persistence was enhanced and maintained by level-based mechanisms and self-control strategies

1. Persistence improvement over time

Persistence, defined as the goal directed continuance of vocabulary learning with Kaixincichang despite obstacles, was modified from Dai et al., 2020; Peterson & Seligman, 2004, p. 229). It improved progressively for all participants during the intervention and was sustained throughout the follow-up month without direct researcher support. The results demonstrated variations in persistence based on participants' initial motivation levels.

Highly motivated learners, Alex and Fay, showed early and consistent improvement in persistence, driven by intrinsic motivation, effective use of Kaixincichang's game-based features, and self-regulation strategies. Fast progress and positive self-evaluation further reinforced their persistence.

Moderately motivated learners, Dawn and Elizabeth, experienced gradual improvement. Strategic planning, self-reflection, and growing adaptation to Kaixincichang's structured processes enabled steady growth in persistence over time.

The least motivated learner, Daisy, initially struggled but demonstrated significant progress in the final week of intervention. Her persistence was further sustained during independent learning and the follow-up month, supported by her eventual mastery of self-control and effective engagement with the app.

Key findings and contributions

1) Game-based factors enhance persistence

Achievement celebrations and progress tracking embedded in level-based mechanisms in Kaixincichang played a critical role in fostering persistence. These features promoted positive emotions, enhanced self-esteem, and motivated learners to continue their efforts even during challenging periods.

2) Self-regulation strategies help override natural tendency to quit

The development and application of self-control and self-reflection strategies were pivotal in sustaining persistence:

a) **Self-control:** Enabled learners to override their natural tendency to quit when faced with challenging learning environments, such as those imposed by the pandemic lockdown.
b) **Self-reflection:** Helped learners maintain faith in their efforts by recognizing progress and identifying areas for improvement. Persistence was further supported by the learners' belief in their ability to achieve goals, reinforced through strategic planning, periodic self-evaluation, and recognition of progress toward satisfying CET-6 vocabulary requirements.

3) Sustained efforts without observation

Importantly, learners maintained their persistence during the follow-up month, despite the absence of direct observation or intervention by the researcher. This demonstrates the lasting impact of the intervention in fostering independent learning behaviour.

These findings highlight the combined impact of game-based tools, self-regulation strategies, and internal motivational factors in fostering sustained persistence, even beyond the period of structured intervention.

9.3.3 Implications

1. Implications for EFL teachers

EFL teachers play a pivotal role in fostering persistence among learners, particularly during challenging learning scenarios. Teachers should design structured, manageable learning tasks that allow learners to set and achieve realistic short-term goals, gradually building their confidence and motivation. Introducing self-regulation strategies, such as environment structuring and time management, can empower students to navigate challenges like unconducive learning environments or tight academic schedules. Teachers should also encourage self-reflective practices, helping learners to evaluate their progress, recognize their achievements, and identify areas for improvement. Such practices not only support persistence but also enhance learners' sense of agency and control over their learning journey.

2. Implications for EFL learners

For EFL learners, persistence is a critical factor in achieving long-term vocabulary retention and language proficiency. Learners should actively adopt self-regulation strategies, including self-monitoring and time management, to sustain their learning efforts. Proactive self-monitoring can help them track progress and adapt their strategies, while time management ensures they can consistently allocate sufficient time to learning amid competing responsibilities. Learners should also embrace adaptive review strategies to address gaps in retention, especially when managing large volumes of new vocabulary. Recognizing the value of consistent progress and celebrating small achievements can boost intrinsic motivation, reduce feelings of discouragement, and strengthen determination to persist in their studies.

3. Implications for MGBVL app developers

Developers of MGBVL apps have a unique opportunity to design tools that inherently support persistence through engaging and effective features. Key considerations include:

1) **Structured and manageable learning processes**: Providing level-based mechanisms and clear progress tracking can help learners manage their goals effectively and maintain a sense of accomplishment as they progress through the app.
2) **Achievement celebrations and positive reinforcement**: Incorporating features such as rewards, streaks, badges, and congratulatory messages can enhance learners' self-esteem and motivation, particularly for those who benefit from visible progress and recognition.
3) **Immediate and constructive feedback**: Providing feedback on failed retrievals or incorrect answers encourages immediate corrective actions, reinforcing the learning process and fostering a sense of improvement and mastery.
4) **Customization and flexibility**: Offering customizable learning paths and options to adjust difficulty levels or learning modes can cater for diverse learners, ensuring that the app remains engaging and supportive for all users.

MGBVL app developers should also conduct usability studies to ensure these features are user-friendly and address the needs of learners with different levels of motivation, proficiency, and self-regulation skills. By integrating features that explicitly support persistence, developers can create tools that not only enhance vocabulary learning outcomes but also foster sustainable and self-directed learning habits.

4. Implications for future research

The findings highlight the value of applying case study research to this particular context, future research should explore how persistence develops over extended learning periods and in diverse contexts, such as different cultural settings, age groups, and proficiency levels. Longitudinal studies that track learners over multiple months or academic terms can provide valuable insights into the sustainability of persistence and the factors that influence its fluctuation.

Moreover, the interaction between persistence, self-regulation strategies, and game-based features warrants further investigation. For example, research could explore how specific combinations of SRL strategies—such as time management and self-monitoring—interact with game-based elements like progress tracking and achievement celebrations to enhance persistence. This would help identify the most effective strategies and features for different learner profiles.

Another promising avenue for research lies in examining the long-term impact of adaptive review mechanisms. While this study highlights the importance of personalized review schedules in supporting vocabulary retention and persistence, further experimental research is required to determine the optimal design of adaptive review systems. Questions such as how often reviews should be spaced, how they should adapt to individual progress, and their effectiveness across different types of vocabulary (e.g., technical vs. general words) should be explored.

Moreover, the role of emotional factors in persistence—such as the influence of positive emotions from achievement celebrations and the mitigation of negative emotions caused by challenges—remains underexplored. Future studies could investigate how emotional states interact with cognitive and motivational factors to sustain persistence in vocabulary learning and other EFL contexts.

Finally, the integration of cutting-edge technologies, such as artificial intelligence and machine learning, in MGBVL tools could be a rich area of exploration. These technologies have the potential to provide highly personalized learning experiences, adaptive feedback, and predictive analytics to support learners' persistence. Research could examine how these innovations can be effectively utilized while maintaining user engagement and minimizing cognitive overload.

By addressing these areas, future research can contribute to a deeper understanding of persistence in EFL learning and inform the development of more effective teaching practices and technological tools, ultimately improving learning outcomes for diverse groups of learners.

9.4 Self-regulated vocabulary learning self-efficacy using GBVL app

9.4.1 Discussion

1. Self-evaluation's influence on self-efficacy

SRL strategies, particularly self-evaluation, played a pivotal role in enhancing participants' self-efficacy. Through cyclical and formative self-assessment, learners were able to identify their progress and recognize improvements. This process provided them with assurance that they were on the path to success, ultimately boosting their self-efficacy. This finding aligns with Bandura's (1994) assertion that when learners are convinced of their capability to succeed, their self-efficacy is strengthened.

It also resonates with Takarroucht (2022) research which demonstrated that self-assessment boosted EFL learners' self-efficacy by fostering clear self-awareness of their progress. Similarly, earlier studies highlight the role of formative self-assessment in enhancing self-efficacy. For instance, Yoshie (2018) found that implementing a structured self-evaluation worksheet significantly enhanced self-efficacy among primary school EFL learners, particularly those with intermediate proficiency levels. These studies underline the importance of creating mechanisms that allow learners to constructively reflect on their learning journey.

However, there remains a gap in understanding how self-evaluation can be systematically designed and implemented to optimize its impact on self-efficacy. Few studies have explored effective approaches to self-evaluation, especially in the context of long-term EFL learning supported by SRL strategies.

2. Game factors' influence on self-efficacy

Game elements such as immediate feedback, level-passing rewards, and streaks provided participants with tangible evidence of progress, significantly enhancing their self-efficacy. These elements align with Bandura's (1994) assertion that successful learning experiences contribute to robust self-efficacy beliefs. Participants in this study frequently reported feeling more confident in their ability to meet learning challenges when their progress was visibly celebrated through game mechanisms, echoing Meccawy et al. (2023) finding that level-up rewards and immediate feedback greatly boosted self-efficacy among intermediate-level students facing the challenges of pandemic-induced disruptions. Similarly, surveys of EFL learners across various levels have consistently highlighted the positive impact of game-based features on their self-efficacy, emphasising the motivational benefits of visible progress and recognition.

However, competitive elements like PK (player-versus-player challenges) exhibited a dual impact on learners' self-efficacy, depending on their initial confidence levels. For high self-efficacy learners, PK enhanced their sense of accomplishment and further improved their confidence. Conversely, learners with low self-efficacy often found the uniform challenge level of PK discouraging, as frequent failures

eroded belief in their capabilities. This observation aligns with findings from Yang et al. (2020) who noted that overly challenging tasks can diminish learners' confidence and hinder motivation. Similarly, Zou et al. (2021) found that self-efficacy was bolstered when learners completed game-based EFL tasks independently, suggesting that individualized challenges are critical for fostering confidence.

These findings demonstrate the nuanced role of game-based competition in shaping self-efficacy. While competition can motivate high self-efficacy learners it may require careful design, such as adaptive difficulty levels, to prevent a negative impact on less confident learners. Currently, there is limited research which explores the complex interplay between competitive elements in game-based learning and EFL learners' self-efficacy, pointing to a need for further investigation of how to optimize these mechanisms for diverse learner profiles.

9.4.2 Implications

1. Implications for EFL teachers

EFL teachers can play a pivotal role in fostering learners' self-efficacy by integrating tools and strategies that provide consistent mastery experiences. Encouraging students to use game-based vocabulary learning tools like Kaixincichang can provide tangible evidence of progress, such as level passing and streaks, which reinforce confidence in their learning capabilities. Teachers should also promote self-evaluation practices, guiding learners to reflect on their progress and recognize their achievements, as this formative feedback has been shown to significantly enhance self-efficacy. In addition, educators can design classroom activities that scaffold learners' use of SRL strategies, such as strategic planning and self-monitoring, to build their confidence in independently managing learning.

2. Implications for EFL learners

EFL learners can enhance their self-efficacy by adopting SRL strategies such as setting proximal goals, practicing self-monitoring, and conducting regular self-evaluation. These strategies help learners recognize their progress and develop a stronger belief in their abilities. Utilizing MGBVL apps with features like immediate feedback and progress tracking can further strengthen self-efficacy by providing tangible proof of their learning achievements. Learners should also seek to balance competitive activities such as PK challenges with reflective practices, ensuring that they derive motivation from successes while constructively addressing challenges.

3. Implications for MGBVL app developers

Developers of MGBVL apps should prioritize features that promote learners' self-efficacy. For example, incorporating adaptive feedback and personalized review schedules can help learners of varying confidence levels experience consistent mastery. Celebratory elements such as streaks, level completions, and badges should be designed to visibly recognize achievements, thereby enhancing

motivation and confidence. Developers should also consider implementing customizable competition levels in features like PK to accommodate learners with different self-efficacy levels, minimizing the risk of discouragement. Moreover, embedding prompts for self-evaluation within the app can encourage reflective practices that further support self-efficacy growth.

4. Implications for future research

Future research should more extensively explore the interplay between SRL strategies and game-based learning in enhancing EFL learners' self-efficacy. Specifically, investigations could focus on:

1) The mechanisms through which self-evaluation practices influence self-efficacy across different proficiency levels and cultural contexts.
2) The complex effect of competitive game elements like PK on learners with varying self-efficacy levels, exploring adaptive competition designs.
3) The role of adaptive spaced review in fostering mastery experiences and supporting long-term retention among diverse learner profiles.
4) Longitudinal studies examining how the integration of SRL strategies with game-based tools influences learners' self-efficacy over extended periods.
5) Developing and validating frameworks that measure the nuanced contributions of game factors and SRL strategies to self-efficacy growth, providing actionable insights for educators and developers.

These implications collectively underscore the importance of a multi-faceted approach to enhancing self-efficacy in EFL vocabulary learning, leveraging SRL strategies, game-based tools, and targeted interventions.

9.4.3 Summary of findings and contribution

1. Summary of findings

Participants demonstrated significant improvement in self-efficacy throughout the study, influenced by three primary factors: mastery experiences, social persuasion, and the interplay of SRL strategies with MGBVL features. While competitive game elements like PK enhanced self-efficacy for some, they occasionally challenged those with low initial confidence.

1) Mastery experiences

Mastery experiences emerged as the strongest source of self-efficacy enhancement:

a) **Passing levels:** Passing one level either for new words or spaced word review, is successful retrieval of a group of words' meaning, spelling, pronunciation and contextualized application. Consistently passing levels in both new word learning and word review

provided tangible evidence of progress. These incremental successes reinforced participants' belief in their capabilities.

b) **Achieving weekly goals:** The accomplishment of weekly goals, facilitated by improved strategic planning and time management, strengthened their sense of competence and contributed to a sustained feeling of accomplishment.

c) **Improved CET-6 performance:** Self-reflection through regular CET-6 practice enabled participants to evaluate their progress, recognize areas of achievement, and refine their strategies. This direct assessment further increased their confidence in meeting learning objectives.

2) Social persuasion

Social persuasion played a critical role, particularly for participants with initial low self-efficacy, such as Fay and Dawn. Encouragement from the researcher and peers fostered a supportive environment that motivated these learners to persist. This emotional and motivational boost was especially valuable at the start of the intervention, helping them overcome initial barriers.

3) Challenges with competitive game features

Competitive elements like PK (player versus player word consolidation game) had a dual impact. For participants with moderate or high self-efficacy, such features enhanced their confidence by winning the game and provided an engaging way to test their knowledge. However, for those with lower self-efficacy, repeated failure in PK sessions with different players sometimes undermined their confidence, highlighting the need for balanced and adaptive game mechanisms.

2. Contribution of the research

This research contributes to the growing body of knowledge on the integration of SRL strategies with MGBVL for enhancing self-efficacy in EFL vocabulary learning. It highlights how SRL strategies, such as strategic planning, time management, and self-reflection, can synergize with game-based features like progress tracking, achievement celebrations, and structured learning mechanisms to create mastery experiences. By demonstrating how these integrated approaches provide tangible evidence of progress, foster task satisfaction, and support learners in overcoming challenges, this study advances understanding of how self-efficacy can be systematically developed in EFL learning contexts. Moreover, it sheds light on the nuanced role of social persuasion and the mixed impact of competitive game features, offering insights for designing adaptive and supportive learning environments tailored to diverse learner profiles.

9.5 Limitations of the research

While this study offers valuable insights into the integration of SRL strategies and MGBVL to enhance university students' EFL vocabulary learning during the pandemic, it is not without limitations. These limitations, which span the scope, methodology, and tools employed, provide an important context for interpreting the findings and suggest avenues for future research.

1. **Sample size and generalizability**

   The research was conducted with a limited number of participants, which restricts the generalizability of its findings. While the in-depth qualitative data provided nuanced insights into participants' learning journeys, a larger and more diverse sample could have offered broader perspectives and increased the reliability of the results across different demographic and educational contexts. Expanding the participant pool in future studies could also facilitate subgroup analyses, such as examining the interplay between SRL strategies and game-based elements among learners with varying proficiency levels or learning preferences.

2. **Lack of pre- and post-tests for vocabulary growth**

   This study did not employ standardized pre- and post-tests to quantitatively measure participants' vocabulary growth. Although qualitative evidence from participants' logs, reflections, and interviews illustrates significant progress in vocabulary acquisition and retention, the absence of pre- and post-tests limits the ability to objectively assess the extent of improvement. Future research could incorporate validated vocabulary tests to provide empirical evidence of learning outcomes, thereby strengthening the validity of conclusions about the efficacy of SRL and MGBVL integration.

3. **No standardized motivation questionnaires**

   Motivation was explored through qualitative data, providing rich narratives of participants' motivational fluctuations and the factors influencing them. However, the lack of standardized motivation questionnaires restricted the study from conducting correlational analyses or quantitative validation of SRL strategies and the impact of game factors on motivation. Employing established instruments such as the Language Learning Orientations Scale or the Academic Motivation Scale in future research would allow for a more rigorous examination of the relationship between motivation, SRL, and MGBVL elements.

4. **Limited use of standardized instruments for persistence and self-efficacy**

   Like motivation, persistence and self-efficacy were primarily assessed through qualitative methods. While these methods captured dynamic changes and contextual nuances, the absence of

standardized instruments (e.g., Persistence in Learning Scale or Self-Efficacy Questionnaire) limited the ability to quantify participants' progress and explore statistical relationships. Incorporating these tools in future studies could provide complementary data and enhance the robustness of findings related to learners' persistence and self-efficacy.

5. **Reliance on self-reported data**

   The study relied heavily on self-reported data, including reflective logs, interviews, and participant feedback, which may be subject to biases such as social desirability, selective recall, or overestimation of progress. While triangulation of data sources was employed to mitigate these issues, future research could adopt more objective measures, such as log data from learning apps, observational data, or controlled experiments, to validate self-reported findings.

6. **Context-specific constraints**

   The research was conducted during the pandemic, a period characterized by unique challenges such as lockdowns and online learning environments. While this provided a critical backdrop for exploring SRL and MGBVL in mitigating learning disruption, the findings may be context-specific and not fully generalizable to non-pandemic situations. Future studies could examine the applicability of these strategies in more conventional learning settings.

7. **Exploration of game features and SRL strategies**

   Although the study sheds light on how SRL strategies and game features contribute to vocabulary learning, motivation, persistence, and self-efficacy, it does not fully explore the complex interplay between these elements. For example, the dual impact of competitive features like PK challenges on learners with varying levels of self-efficacy requires further investigation. Future research could adopt mixed-method approaches to further explore these relationships and identify optimal configurations of game and SRL elements.

9.6 Contributions of the research

This research makes significant contributions to the field of EFL vocabulary learning by illustrating how SRL strategies can be effectively integrated with MGBVL tools to support sustainable learning outcomes in out-of-class contexts. Conducted during a time of disruption, the study demonstrates that structured learning sequences, personalized spaced reviews, and reflective SRL practices—such as goal-setting, time management, and self-evaluation—collectively enabled learners to achieve vocabulary growth, sustain motivation, maintain persistence, and enhance self-efficacy. The findings offer empirical support for the pedagogical value of combining SRL with gamification to scaffold vocabulary learning for university learners, particularly those with initially low self-regulation or confidence.

Methodologically, the use of a three-cycle action research design allowed for iterative improvements and a rich understanding of learners' developmental trajectories across time. The inclusion of a follow-up phase further demonstrated the transferability and sustainability of learned strategies when external scaffolding was removed. The study also contributes to the theoretical understanding of how game elements—such as achievement celebrations, progress tracking, and adaptive challenges—interact with SRL mechanisms to influence cognitive, motivational, and emotional aspects of learning.

Practically, the research provides actionable insights for EFL educators, learners, and MGBVL app developers. It advocates for classroom integration of SRL strategy instruction, learner-centered scaffolding, and the design of emotion-sensitive and adaptive digital tools that support long-term engagement. Taken together, these contributions advance knowledge in language learning, learner autonomy, and educational technology, with implications for both pandemic and post-pandemic educational contexts.

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Appendix A

THE BIG PICTURE

IN 1 YEAR I WILL
IN 6 MONTHS I WILL
IN 3 MONTHS I WILL
IN 1 MONTH I WILL

FOUR WEEK MILESTONES

WEEK 1
WEEK 2
WEEK 3
WEEK 4

THIS WEEK'S MILESTONES DATE:

MONDAY
TUESDAY
WEDNESDAY
THURSDAY
FRIDAY

SATURDAY

SUNDAY

WHAT CAN I DO TO HELP ME ACHIEVE MY GOALS

Goal Setting Work Sheet

Appendix B

Learning Diary/学习记录
ID（化名）: Date（日期）： Time（时间）：

Do you intend to learn English today(你今天想学习英语吗)?
「」Yes(是的) Please make a brief record of your study today.(为今天的学习做一个简要记录吧。)Please answer all the following questions(请转入下文其他问题。)

「」No(没有) Please explain briefly your reasons. (简短解释一下原因吧。)

How do you feel about your learning task today?(在完成今天的学习任务时你感受如何？)
Active(积极的)；jittery(紧张的)；attentive(专注且投入的)；worried(担心的)；

How much time have you spent learning English after class today? （今天你课后学习英语多久） hours(小时) minutes(分钟)

How much of that time have you spent studying English effectively? (其中多少时间是有效学习英语的？) hours(小时) minutes(分钟)

Did you achieve the learning goal you listed before?(你是实现了之前定的学习目标吗？)：

Do you feel satisfied about the design of the content? And why? (你对今天的学习内容呈现满意吗, 为什么)

Did you apply any learning strategies in the process? (你在学习过程中用到什么策略吗？)

Appendix C

CONSENT FORM FOR PARTICIPANTS INVOLVED IN RESEARCH

INFORMATION TO PARTICIPANTS:

We would like to invite you to be a part of a study into self-regulated game-based EAL learning research

This research will study how participants learn EAL in online game-based learning environments with the assistance of self-regulated learning strategies and their perceptions of the experience. The aim is to help EAL learners learn EAL more effectively in a relaxing game-based environment and develop self-regulating learning abilities.

CERTIFICATION BY PARTICIPANT

I, …….

of ……...

certify that I am at least 18 years old* and that I am voluntarily giving my consent to participate in the study: An Analysis of English as an Foreign Language Learning Processes in Online Game-Based Learning Environments assisted by Self-Regulated Learning Strategies being conducted at Victoria University by: ……..

I certify that the objectives of the study, together with any risks and safeguards associated with the procedures listed hereunder to be carried out in the research, have been fully explained to me by:

……..

and that I freely consent to participation involving the procedures mentioned below:

- Participants and researcher meeting every week
- Receiving daily prompts
- Finish at least one task via recommended APPs every working day
- Hand in daily learning report
- Taking a group interview about the learning experience at the end of the research
- Provide original and final EAL marks

I certify that I have had the opportunity to have any questions answered and that I understand that I can withdraw from this study at any time and that this withdrawal will not jeopardise me in any way.

I have been informed that the information I provide will be kept confidential.

Signed:

Date:

Any queries about your participation in this project may be directed to the researcher

PhD. Candidate Meixia XU (meixia.xu@live.vu.edu.au)

If you have any queries or complaints about the way you have been treated, you may contact the Ethics Secretary, Victoria University Human Research Ethics Committee, Office for Research, Victoria University, PO Box 14428, Melbourne, VIC, 8001, email: Researchethics@vu.edu.au or phone (03) 9919 4781 or 4461.