Self-directed language learning using mobile technology in higher education

Lai, Y.

Summary

In today's interconnected global landscape, the ability to communicate in multiple languages is not only advantageous but often essential. Language skills open doors to a plethora of opportunities, spanning career growth, effective collaboration, knowledge sharing, and cultural enrichment. Traditionally, language learning has been confined to the walls of classrooms, following structured curricula and guided by instructors. However, the landscape of language education is rapidly evolving, propelled by advancements in technology and shifting pedagogical paradigms. One of the most prominent trends in contemporary language learning is the emergence of self-directed learning (SDL) facilitated by mobile technology beyond the classroom environment. SDL, as elucidated by Knowles (1975) emphasizes the active role of learners in taking charge of their educational journey. While SDL shares similarities with self-regulated learning (SRL), particularly in terms of active engagement and goal-directed behavior, it differs in the level of control learners exert, especially at the onset of the learning process (Loyens & Rikers, 2008). Self-directed learners initiate learning tasks independently, while self-regulated learners might not necessarily do so. Mobile technology in this study refers to portable electronic devices such as smartphones, tablets, and laptops, as well as the software and applications designed to be used on them. With the ubiquity of these technologies, learners now have unprecedented access to a wealth of language-learning resources at their fingertips. From language learning apps and online courses to podcasts and social media platforms, the possibilities for self-directed language learning are virtually limitless. For example, mobile technology enables it through its accessibility, offering resources like apps and online courses accessible anytime, anywhere. Its interactivity, including quizzes and games, fosters engagement and skill reinforcement. Personalization tailors learning experiences based on individual goals and proficiency levels. Synchronization across devices ensures seamless learning progression, while social features facilitate interaction with peers and native speakers. In essence, mobile technology empowers learners by providing diverse, interactive, and personalized language learning experiences, regardless of time or location.

In higher education, the incorporation of foreign language learning into the core curriculum of specific disciplines continues to be constrained. Additionally, in some regions, students face a lack of adequate exposure to foreign languages in classroom settings, impeding their language

acquisition journey (Richards, 2015; Trinder, 2017; Tsou et al., 2006). To bridge this gap, many students are embracing self-directed language learning via mobile technology (SDLLMT) to augment their language skills beyond formal instruction. SDLLMT enables individuals to take control of their language learning journey independently, determining what and how to learn (Merriam & Bierema, 2013). This is facilitated through the utilization of mobile applications such as italki, Babbel, Duolingo, HelloTalk, Tandem, YouTube, and Google Translate to craft personalized learning environments. While students may receive assistance from teachers or peers, the process predominantly hinges on the learners' initiative and self-direction (Lai et al., 2022). This approach allows learners to customize their learning experiences based on their unique needs and preferences, fostering a more adaptable and efficacious language acquisition process outside the confines of traditional classrooms. Moreover, self-directed learning outside of the classroom promotes autonomy and self-motivation among learners. By providing them with the freedom to set their own learning goals, manage their progress, and take responsibility for their learning outcomes, this approach fosters a sense of ownership and agency. Empowered learners are more likely to stay engaged, persevere through challenges, and ultimately achieve greater proficiency in the target language.

Research indicates that self-directed language learning with technology outside the classroom correlates with positive affective outcomes and language proficiency gains (Lai et al., 2015; Sundqvist & Wikström, 2015). However, students exhibit diverse patterns in their self-directed technology usage (Lai & Gu, 2011), highlighting the need to understand university students' specific self-directed English language learning behaviors with technology. Understanding these behaviors can assist educators and researchers in identifying potential avenues for supporting and enhancing students' use of technology for self-directed language learning.

This dissertation aims to contribute to our understanding of self-directed language learning using mobile technology in higher education, focusing on the learning experience and learning effectiveness of university students' self-directed language learning behaviors with technology. Four studies were designed to understand (1) the learning strategies that students used in their self-directed learning process; (2) self-directed learners' learning experience when they prepared for IELTS, (3) the determinants that influenced students' behavioral intention and actual use of mobile technology in their self-directed learning; and (4) the factors affecting learning engagement,

learning satisfaction and learning persistence in the context of self-directed language learning using mobile technology. The findings of this dissertation aim to inform pedagogical practices, shape educational policies, and inspire future innovations in language education.

Chapter 2 presents a systematic scoping review aiming at providing an overview of empirical research concerning learning strategies that self-directed learners use with the support of mobile technology in language learning. The central research question in this study was what cognitive strategies, metacognitive strategies, affective strategies, and social strategies students use during their self-directed language learning using mobile technology. To address this question, we adopted the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) extension for Scoping Reviews (Tricco, Lillie, Zarin et al., 2018) as our guiding framework. Utilizing these guidelines, we systematically reviewed 20 relevant studies, extracting key information such as author names, publication years, participants' proficiency levels, and learning activities described in each study. From each selected study, we extracted information on learning activities outlined in both the results and conclusion sections. These activities were then coded and categorized as cognitive, metacognitive, affective, or social strategies based on O'Malley's classification scheme. This systematic approach allowed us to comprehensively analyze the various strategies employed by self-directed learners utilizing mobile technology for language learning.

Bloom's revised taxonomy served as the framework to assess cognitive strategies, enabling the measurement of students' thinking levels (Anderson et al., 2001; Crompton et al., 2019). Among the 20 articles reviewed, 16 reported the utilization of cognitive strategies by learners. Notably, more strategies were observed at the *remembering* and *understanding* levels compared to the *applying, analyzing, evaluating*, and *creating* levels. This suggests that language learners predominantly employ low-order learning strategies rather than high-order ones. While these low-level strategies are suitable for short-term learning goals or memorization tasks (Setiyadi, 2001), enhancing overall language performance requires the integration of high-order strategies throughout the learning process (Aharony, 2006; Setiyadi, 2001; Yot-Domínguez & Marcelo, 2017). Consequently, further research is encouraged to explore higher-order strategies in language learning. To categorize metacognitive strategies illustrating how students regulate their learning process, Zimmerman's cyclical self-regulatory phases (2000, 2008) were adopted. 13 out of the 20 reviewed articles were associated with metacognitive strategies in self-directed language learning.

Notably, the *forethought* phase was most frequently addressed, followed by the *performance* phase and the *self-reflection* phase, with only two articles covering all three phases. Three kinds of affective strategies were examined. Social strategies reported include *cooperation* and *questioning for clarification* (O'Malley & Chamot, 1990), and *help-receiving*. 14 out of 20 of the reviewed articles reported social strategies used in the self-directed language learning process. Future studies are encouraged to delve deeper into social and affective strategies, given their association with effective language learning. The findings underscore the need for additional research to explore all self-regulatory stages within the process of self-directed learning facilitated by mobile technology, as well as to examine the influence of both learners and teachers on this process. In response to these identified research gaps, Chapters 3 to 5 have been conducted to address these areas comprehensively.

The goal of **Chapter 3** is to describe the learning experience of language learners in the context of self-directed learning using mobile technology. The research questions included (1) How do language learners initiate their learning in the context of self-directed learning using mobile technology? (2) What do language learners do in the forethought phase, performance phase ,and self-reflection phase in the context of self-directed learning using mobile technology? The netnography approach was employed to analyze how Chinese learners learned English through the process of preparing for IELTS (International English Language Testing System) in the context of self-directed learning using mobile technology. Nine questions were eventually screened. Under these questions, a total of 6182 answers were identified. We only selected the entries with a final grade as this is an indication that students went through all learning stages until the examination. To include the answers that presented learners' learning process or experience about preparing for IELTS in a self-directed way, we further screened the answers based on the following criteria: (1) These answers should be relevant to preparing for IELTS in a self-directed way; (2) They should be written by users instead of educational institutions; (3) They are about sharing learning experiences; and (4) They should not contain advertisements. Finally, 29 posts from an online platform for knowledge exchange were screened as the data. The coding of 29 answers was carried out based on a theory-driven framework.

The findings revealed that the process experienced by these language learners included four phases, namely *learning task initiation, forethought, performance*, and *self-reflection* phases. *Motivation for English learning* and *self-directed learning* were identified in the *learning task*

initiation phase. The *forethought phase* included *goal setting, strategic planning, task value* and *self-efficacy*. Learners set their goals of target scores and small learning goals based on their needs, and make the strategic plans by understanding the test, selecting appropriate materials and making study plans. Some of them considered self-directed learning feasible for IELTS preparation, and they also perceived their self-learning ability through a self-test or by referring to their prior self-learning experience. The *performance phase* consisted of *task strategies, help-seeking, management, interest incentives, self-consequences, self-recording* and *self-monitoring*. Twelve cognitive and four metacognitive strategies were presented. Learners solicited support from teachers, peers, internet, native speakers, and parents, and managed the environment, resources, effort, and time during the learning process. Learners used some methods to motivate themselves and remain persistent. Additionally, they made recordings about their learning process and monitored the production and comprehension in the process. *Self-evaluation* and *self-reaction* were identified in the *self-reflection phase*. Participants evaluated their performance by using their final grades and they made suggestions and concluded the difficult parts and successful self-directed learning requirements when reflecting on the whole learning process.

In **Chapter 4**, we investigated the factors influencing university students' utilization of mobile technology for self-directed language learning outside the classroom. The central research question focused on exploring the interconnections among attitude, subjective norm, self-efficacy, and behavioral intention. Additionally, it aimed to explore how intention, facilitating conditions, and self-regulation skills relate to the utilization of mobile technology in self-directed language learning. Furthermore, the research delved into the potential moderating role of self-regulation skills on intention and actual usage. The theoretical framework employed for this investigation was the Integrative Model of Behavior Prediction (IMBP) proposed by Fishbein and Ajzen (2010). A questionnaire was developed to collect data, including demographic information, self-regulation skills, activities students engaged in when using mobile technology for self-directed English language learning, and factors such as attitude, subjective norm, self-efficacy, facilitating conditions, behavioral intention, and actual behavior. The participants targeted for this study were students from various disciplines in Chinese universities engaged in self-directed English language learning. A total of 676 students participated in the survey, and Structural Equation Modeling (SEM) using Mplus 8.3 (Muthén & Muthén, 2017) was employed for data analysis.

The findings revealed that 37.1 percent of respondents never utilized mobile technology for self-directed language learning, with the majority exhibiting extrinsic motivation. Over 50% of participants engaged in self-directed English learning to pass language tests or to enhance future work or study opportunities. Most participants primarily used mobile technology for activities such as vocabulary learning and translation, compared to other language skills like listening, speaking, reading, and writing. Moreover, the results indicated that attitude towards mobile technology had the most significant predictive power on students' behavioral intention, while subjective norm was positively associated with behavioral intention. Both behavioral intention and self-regulation skills positively and significantly predicted actual behavior. Surprisingly, no significant relationship was found between self-efficacy and behavioral intention. Notably, a significant moderation effect of self-regulation skills on the relationship between intention and behavior was observed, indicating that higher self-regulation skills enhance the likelihood of transforming behavioral intention into actual behavior compared to lower self-regulation skills.

After examining the factors influencing students' initial adoption of mobile technology in self-directed learning, **Chapter 5** moved to focus on continued usage and satisfaction. To achieve this goal, we employed a quantitative study to examine the factors affecting learners' persistence and satisfaction when conducting SDLLMT. It also sought to investigate whether differences in SDLLMT existed between students with high and low language proficiencies. A total of 446 respondents visited the questionnaire website and 352 completed the questionnaire. Four stages of analyses were performed, including an independent sample *t*-test, the measurement model, the structural model, and a mediation analysis. The research questions that guided this study were (1) Is there any difference in SDLLMT between students with high and low language proficiency?; (2) How is learners' satisfaction explained by teacher support, learners' mobile readiness and engagement in SDLLMT?; (3) How is learners' persistence explained by teacher support, learners' mobile readiness and engagement in SDLLMT?; and (4) How do mobile readiness and engagement mediate the relationship between teacher support and both outcome variables of SDLLMT?

The findings revealed that students with varying levels of language proficiency did not exhibit statistically significant differences in their mobile readiness, engagement, satisfaction, persistence, or the level of teacher support they received. Moreover, teacher support was

significantly and positively associated with learners' mobile readiness. This suggests that teachers play a crucial role in enhancing students' self-directed learning skills, bolstering their perceived ability to utilize mobile technology, and their recognition of its benefits in language learning. Furthermore, learners' mobile readiness made a substantial contribution to their engagement in SDLLMT. This suggests that students who exhibit greater readiness for mobile learning, characterized by enhanced self-directed learning abilities, favorable attitudes toward the effectiveness of mobile technology in language acquisition, and increased confidence in its utilization, are inclined to sustain higher levels of engagement throughout their learning journey. While teacher support was significantly but negatively correlated with learners' engagement, it exhibited an indirect and positive impact on engagement by mediating through mobile readiness. This suggests that learners who receive more support from teachers tend to have higher mobile readiness, leading to increased engagement in SDLLMT. Although some self-directed learners may prefer autonomy in their learning, many may still require guidance from teachers to navigate their self-directed learning journey effectively. Moreover, mobile readiness significantly and positively predicted learners' satisfaction and persistence. However, the relationship between mobile readiness and persistence remains unclear since Leung and Chen (2019) have shown partially significant relations between mobile readiness and persistence. Therefore, it warrants further investigation. Additionally, teacher support did not significantly influence learners' satisfaction or persistence in SDLLMT, highlighting the need for deeper exploration of these relationships in the context of self-directed learning. While engagement did not directly relate to satisfaction, it had a direct effect on persistence. This finding contrasts with previous studies that suggested engagement could predict satisfaction (Fisher et al., 2021; Rajabalee & Santally, 2020). Thus, further research is needed to explore the nuanced relationships between the subdimensions of engagement and satisfaction, potentially through interview analysis to gain deeper insights into these dynamics.

Chapter 6 concluded this dissertation by reflecting on the main research findings of four studies, presenting the discussion in terms of learning experience and learning effectiveness, and providing directions for future research to further enhance our understanding of self-directed language learning using mobile technology in higher education.

The current dissertation deepens our comprehension of informal and self-directed learning with mobile technology in the subject of foreign language in higher education. Specifically, it

enhances our comprehension of the learners' experience of self-directed their learning process while preparing for IELTS, and offers implications for enhancing the effectiveness of self-directed learning for learners, educators, and IT practitioners. **Chapter 2** and **3** provide valuable insights into how learners navigate their self-directed learning process with the aid of mobile technology. However, there is a need for increased attention to be directed towards the self-reflection phase and affective aspects of learning. Moreover, **Chapters 4** and **5** delve into the factors influencing the initial adoption and continued usage of mobile technology in self-directed learning. The findings underscore the importance of learners' variables while also highlighting the crucial role of teacher support.

This dissertation makes several significant contributions to the field of informal and self-directed language learning with mobile technology in higher education. Researchers, self-directed learners, teacher educators, and IT practitioners stand to benefit from the insights provided, as the dissertation not only presents a comprehensive conceptual model for informal and self-directed learning with mobile technology in the context of foreign language education, but also identifies key determinants for student self-directed learning. Furthermore, it underscores the importance of ongoing efforts in advancing future research and practices related to self-directed learning. One notable contribution of this dissertation is its provision of a conceptual model outlining the dynamics of informal and self-directed language learning with mobile technology, along with a delineation of essential determinants influencing student self-directed learning. This model serves as a valuable framework for understanding and analyzing self-directed learning processes in the context of foreign language education. Moreover, the dissertation emphasizes the need for continuous exploration of self-directed learning, thereby paving the way for future research endeavors. Several directions for future research are identified based on the findings of the dissertation. Firstly, while the dissertation covers aspects such as students' learning experiences, perceptions, actual usage, satisfaction, and persistence, it does not delve deeply into learning outcomes and the affective domain. Future research could explore these dimensions to gain a comprehensive understanding of self-directed learning processes. Secondly, there is a call for research to investigate how facilitators can effectively support self-directed learning. Understanding the role of facilitators and identifying best practices in this regard can significantly enhance the efficacy of self-directed learning interventions. Thirdly, future research endeavors could leverage multiple methods of data collection to enrich the understanding of self-directed

learning processes. For instance, incorporating recorded data to track learners' actual usage, engagement, and persistence, along with employing sentiment analysis techniques to analyze learners' emotional perceptions from comments and reviews, can provide valuable insights into satisfaction and other affective aspects of self-directed learning.

The dissertation carries significant implications for empowering self-directed learners, educators/teachers, and software developers in the realm of language learning with mobile technology. Firstly, self-directed learners are encouraged to undertake necessary preparatory work before embarking on self-directed learning journeys. It is evident that self-directed learning is more conducive for intermediate and advanced language learners compared to beginners. Therefore, learners should attain a basic proficiency level and cultivate self-directed learning skills in order to make substantial progress in their language learning endeavors. Moreover, the positive influence of subjective norms, as revealed in Chapter 4, emphasizes the critical roles played by various agents such as teachers, peers, and parents in supporting learners' self-directed learning. Hence, these agents should offer assistance and encouragement as needed to facilitate learners' self-directed learning processes. Furthermore, Chapter 2 highlights that self-directed learners often possess limited knowledge of strategies and technology utilization. Teachers can play a pivotal role in bridging this gap by providing a diverse range of technological resources, imparting metacognitive and cognitive strategies to optimize resource utilization, and fostering active engagement with technology to enhance language learning outcomes. Lastly, software developers can contribute to enhancing self-directed language learning experiences by integrating more personalized and adaptive learning features into their applications. By incorporating features that cater to individual learning needs and preferences, developers can create a supportive and conducive learning environment, ultimately maximizing the effectiveness of mobile language learning applications.