

Exploring the Creation of Online English Self-Learning Materials by Thai Pre-Service Teachers

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Abstract

This study explored the language learning challenges that Thai pre-service teachers faced during their secondary education and how they used their experiences to create online English self-learning materials. A qualitative research design was utilized in this study, incorporating a case study approach with content analysis. The participants comprised 50 third-year English major students enrolled in the course 'ICT and Communication for English Language Teaching.' Data was collected through written reflections and by analyzing the online English self-learning materials created by participants. Participants reflected on the challenges experienced during secondary education and then created online English self-learning materials based on these reflections. Content analysis was used to analyze the data. The findings indicated several language learning challenges, including a lack of diverse teaching materials, insufficient practical language exposure, learner-specific issues, technological problems, and teacher-related problems. The study highlighted the need for engaging and interactive teaching methods beyond traditional textbooks. Focus areas for the online English self-learning materials included vocabulary, applications and tools, pronunciation, practical usage, grammar, role plays, interactive learning and teaching techniques. These materials aimed to address

specific language learning difficulties and enhance the learners' overall proficiency and confidence in English. The study concluded that English learners creating their own online learning materials is valuable and effective, promoting active learning and critical thinking. The implications for teaching practices are to emphasize integrating technology and learner-generated content in language education.

Keywords: Language learning challenges, Language skills, Online English self-learning materials, Pre-service teachers, Technology-mediated language learning

Introduction

In an increasingly interconnected and diverse world, language education stands as key to fostering communication and understanding across cultures. As societies continue to evolve, so do the methods and tools used to facilitate language learning. Among these innovations, computer-assisted language learning (CALL) has emerged as a transformative force, revolutionizing the way languages are taught and learned. Through the integration of technology, CALL has made language education more accessible, interactive, and dynamic, catering to the diverse needs and preferences of learners worldwide (Chapelle & Sauro, 2017; Godwin-Jones, 2021).

In Thailand, where English proficiency is increasingly valued as a gateway to global opportunities, language teachers, particularly pre-service teachers, play critical roles. These teachers not only teach linguistics but also shape students' attitudes, motivations, and language learning strategies. However, despite an increasing number of CALL resources and initiatives, there remains a substantial gap in understanding how pre-service teachers use their own language learning experiences to create effective online English self-learning resources (Nguyen & Tran, 2022; Tafazoli & Meihami, 2023).

This study seeks to fill that gap by examining the reflections and creations of Thai third-year pre-service teachers enrolled in an English education program. These pre-service teachers have diverse backgrounds and come from many different regions. There are differences in the size of the high schools they graduated from, which affects the facilities and resources for learning English that they were exposed to (Boonmoh et al., 2022). Because of their different backgrounds, it is important to study their past experiences with language learning difficulties and the solutions they come up with using online resources. CALL offers significant benefits to these pre-service teachers by providing them with new opportunities for self-directed

learning in online settings. It allows them to take charge of the direction, speed, and content of their education, enabling them to tailor their learning experiences to fit their individual needs and interests. Thus, CALL can enhance learners' language skills flexibly and individually (Vijayakumar et al., 2024). This study aims to shed light on the intersection of personal experiences, pedagogical practices, and technological innovation in language education by investigating learners' previous language learning challenges and the solutions they devised by using online materials.

Language learning is a complex and multifaceted process influenced by various factors, including individual background, socio-economic status, and exposure to language input. In Thailand, where English proficiency is increasingly valued in both academic and professional settings, language education holds substantial importance. However, the traditional approaches to language teaching often fail to address the diverse needs and learning styles of students, particularly those from marginalized or disadvantaged backgrounds (Pianpadungporn, 2024; Sharma et al., 2024).

In this context, the integration of technology into language education offers promising avenues for innovation and inclusivity. CALL tools and resources provide learners with opportunities for personalized, self-directed learning experiences, allowing them to engage with language materials in ways that suit their individual preferences and abilities (Nasri et al., 2022; Tafazoli, 2021; Vijayakumar et al., 2024). Additionally, technology facilitates collaboration, communication, and access to authentic language input, enriching the learning environment and fostering a sense of global interconnectedness (Beaven, 2021; Bower, 2019; Godwin-Jones, 2021).

Despite the potential benefits of CALL, there remains a gap in the research regarding how pre-service teachers harness their own language learning experiences to create relevant and engaging online materials. By examining this intersection, this study seeks to shed light on the unique perspectives and insights that pre-service teachers bring to the development of language learning resources. Although studies often examine CALL tools' effectiveness in classrooms (Bakla & Demiröz, 2024; Lamb & Arisandy, 2019; Thedpitak & Somphong, 2021; Vijayakumar et al., 2024), few explore how teachers' personal language learning journeys influence their creation of such tools. Through a deeper understanding of their own reflections and creations, educators can enhance their pedagogical practices and better support diverse learners in their language learning journey.

Thus, this study contributes to inclusive CALL and teacher dynamics by exploring how pre-service teachers create inclusive, technology-driven learning materials based on their personal experiences, bridging the gap between theory and practice in teacher education. Teachers' personal experiences significantly influence their approach to CALL. CALL professional development is advocated as a way to change teachers' beliefs, professional identity, and teaching philosophy (Meihami & Esfandiari, 2021). It also encourages the integration of technology into teaching practices (Bataineh et al., 2020; Tafazoli et al., 2020), helps to overcome teachers' resistance, and enhances their skills (Van Gorp et al., 2019). Boonmoh and Kulavichian (2023) explored how Thai EFL pre-service teachers incorporate technology into their classrooms. The findings revealed that personal experiences and familiarity with technological tools were key factors influencing these pre-service teachers' integration of technology into their teaching. In the light of these findings, the present study seeks to answer the following questions:

RQ1: What types of language learning challenges did Thai pre-service teachers encounter during their secondary education, considering their diverse backgrounds?

RQ2: How do Thai pre-service teachers use their experiences of these challenges to inform the creation of online English self-learning materials?

By addressing this gap, the study aimed to contribute to the existing body of knowledge by providing a deeper understanding of how pre-service teachers navigate their own language learning challenges and translate these experiences into pedagogical practices. This study extends beyond simply observing how teachers use CALL tools; it also explores the relationship between their experiences and the development of inclusive materials. This exploration is crucial as it can reveal the underlying factors and personal insights that influence the creation of effective learning materials, thereby helping educators tailor their approaches to better support pre-service teachers. Through a comprehensive exploration of their reflections and creations, this research sought to inform the development of inclusive, learner-centered approaches to language education that resonate with the needs and preferences of diverse learners. Moreover, the findings of this study could offer valuable implications for curriculum designers and policymakers aiming to integrate technology more effectively into language education programs, ensuring that they are aligned with the real-world experiences and needs of pre-service teachers and their future students.

Literature Review

The study is built upon a rich body of literature in the fields of language education, CALL, and teacher development. Previous research has highlighted the transformative potential of technology in language learning environments and the critical role of teachers in harnessing these tools to promote student engagement and achievement.

Integration of Technology in Language Education

In language education, CALL is a methodology where computers enhance learners' language acquisition by acting both as assistants and presenters of instructional content. Technology serves as a useful tool that facilitates the delivery, reinforcement, and evaluation of educational content. Moreover, technology frequently includes rich interactive elements (Abdallah, 2011; Bax, 2003; Stockwell, 2014). Studies show that CALL can improve language learning results, especially in grammar, reading comprehension, and vocabulary. Through a variety of technological tools and resources, it seeks to enhance language learners' linguistic proficiency, communicative abilities, and intercultural awareness (Chapelle & Sauro, 2017). Research highlights that CALL not only benefits students but also supports teachers' professional development. For instance, a study by Meihami and Esfandiari (2021) found that CALL training improved EFL teachers' readiness and promoted reflective teaching practices. Similarly, Hur et al. (2016) emphasized the significance of both internal and external factors, such as ongoing professional development and resource accessibility, for the successful integration of technology in classroom settings. Overall, CALL presents a promising approach to enhancing both language learning and teaching effectiveness.

For pre-service teachers, developing the ability to integrate technology into the classroom is essential for their future careers as teachers. For this reason, some studies investigated technology integration by pre-service teachers, particularly in the context of teacher preparation. For instance, Eragamreddy (2024) investigated how instructors of CALL are utilizing technology in language teaching, the challenges they face, and the impact of a CALL teacher preparation program on the professional development of English language teachers. The study revealed that the program positively influenced English language teachers' ability to integrate technology and enhance their professional development. Participants reported feeling more competent and confident in using technology, leading to improved learning outcomes and greater student engagement. However, they also identified challenges, such as perceived complexity and insufficient formal training in CALL.

Park and Son (2020) examined the readiness of EFL pre-service teachers (PSTs) in Hong Kong to use CALL. The study found that these PSTs employed a variety of software and web resources, including digital audio editors, recording programs, online quiz applications, learning management systems, and video sharing websites. Similarly, Akayoglu et al. (2020) surveyed the digital tools which Turkish PSTs used. The results indicated that pre-service teachers utilized a variety of digital tools, including social media platforms, learning management systems, quiz creation tools, material design applications, presentation software, and online storage solutions. Tomczyk (2020) investigated the attitudes and self-assessed fluency of PSTs regarding new digital devices and software. The findings indicated that nearly half of the participants strongly agreed that ICT positively influenced student motivation and engagement. Similarly, Mustafa and Sinan (2021) explored the self-efficacy beliefs of PSTs across four teacher education programs in Turkey, revealing high levels of self-efficacy for technology integration but only average confidence in using computer technology and low confidence in assisting others with it. Vo et al. (2020) interviewed Vietnamese pre-service English teachers to understand how they integrated technology into their teaching practicum. The results revealed that although they recognized the importance of ICT in teaching, they felt uncertain about how to integrate it effectively and had low confidence.

Although PSTs generally hold positive attitudes toward technology in lessons, they sometimes lack the necessary knowledge and skills for effective implementation in language teaching. In summary, practical experience in technology integration is essential for PSTs, as it strengthens their skills, boosts their confidence, encourages collaborative learning, and equips them to handle real-world classroom challenges. This experience is crucial for PSTs to integrate technology successfully into their teaching practices.

Aguilera-Hermida (2020) highlighted the growing acceptance of online learning due to COVID-19, which reflects the participants' increased reliance on technology for language learning during their secondary education. This observation is supported by research indicating the importance of practical language exposure (Aydoğan & Gönen, 2020; Yuh & Kaewurai, 2021).

Subsequently, Tafazoli and Meihami (2023) explored the technological needs and suggestions of CALL teachers during the COVID-19 pandemic. They emphasized the importance of tailored professional development programs that help PSTs adapt to technology-rich learning environments, which is critical in the context of creating effective online learning materials. This built on previous research by Tafazoli (2021), who examined how professional

development opportunities helped teachers integrate technology in their teaching practices during the pandemic, further underscoring the need for preparing PSTs for technology-enhanced instruction.

Research has also underscored the importance of empowering PSTs to leverage their own language learning experiences in the classroom. Additionally, Nguyen and Tran (2022) explored the perceptions of Vietnamese EFL PSTs and teacher educators about technology preparation and its role in the initial EFL teacher education curriculum at Vietnamese higher education institutions. The study recommended that the EFL teacher education program should utilize opportunities to explore and apply policies on CALL pedagogies to better develop the professional skills of PSTs. Similarly, Wiangsima and Boonmoh (2018) investigated Thai teachers' perceptions of ELT in the near future, emphasizing an increased role of technology in language teaching and a shift towards teachers becoming facilitators or motivators. Ito (2024) explored how in-service teachers are learning about and adapting to technology in their teaching practices, highlighting the importance of continuous professional development in keeping up with technological advancements in language learning.

Personalized Learning and Self-Directed Learning

In recent years, there has been a growing emphasis on personalized learning and self-directed learning approaches in language education. These approaches recognize the diverse needs and preferences of learners and seek to empower students to take ownership of their learning journey. Research has shown that self-directed learning can lead to increased motivation, engagement, and autonomy among language learners (Benson, 2011). Technology significantly enhances self-directed learning experiences by offering learners a broad range of resources and opportunities for engagement in collaboration and communication. Research indicates that creating content on social networking sites can enhance incidental language learning, which has positive effects on language skill development (Shahid et al., 2024). There are abundant online materials and software for language learners to access at their own pace (Abbas & Bidin, 2022; Beaven, 2021; Godwin-Jones, 2021; Kılıçkaya, 2018). Recent studies highlight the role of technology and learner autonomy in developing English language skills in PSTs. Inpeng and Nomniam (2022) examined the perspectives of Thai EFL PSTs on their use of Facebook as a means to enhance their autonomy in learning English. The findings indicated that these teachers engaged with all five dimensions of the Autonomous Learner Model: orientation, individual development, enrichment, seminars, and in-depth study. Moreover, the study concluded that

Facebook is an effective platform for professional development in English language teaching and for lifelong learning, especially during the disruptions caused by COVID-19.

Öztürk (2019) explored the development of pre-service EFL teachers as autonomous learners over a 14-week period in a Turkish higher education context. The results showed a significant increase in the participants' autonomy, particularly in their learning independence. Furthermore, the study highlighted that enhancing self-awareness, taking control of their own learning, and altering their views on learning were the most significant benefits of the experience for the participants. Alcantud-Díaz and Soler-Pardo (2022) explored the effectiveness of the Communicative English Language Skills Improvement Program, an inclusive and technology-mediated tool for PSTs. The results were noteworthy, indicating that students' motivation levels were reflected in their oral English skills. This program has been shown to be a valuable resource for online learning and can help address challenges related to diverse learning styles.

Challenges in English Language Learning

Despite frequent daily interactions with English through channels such as social media and email, learning EFL can still be a difficult task for many students. Difficulties and challenges in EFL have been researched in many studies (Aydoğan & Gönen, 2020; Katemba & Barus, 2024; Tantiwich & Sinwongsuwat, 2021; Wahyuni & Ilyas, 2017; Yuh & Kaewurai, 2021).

Katemba and Barus (2024) investigated 102 ninth-grade students in Indonesia regarding the main challenges they faced while learning English. The results revealed that key barriers included the students' preference for their native language, grammatical mistakes, limited chances to practice speaking outside of school, a fear of errors, and a lack of vocabulary. Similarly, Aydoğan and Gönen (2020) conducted a survey with 130 Kazakh students to identify the challenges which they faced in mastering English. Their findings indicated that the most common difficulty students encountered in learning English was insufficient vocabulary, whereas the least common issue was difficulty comprehending English-language materials.

In the Thai context, Yuh and Kaewurai (2021) interviewed 100 Thai lower-secondary students to explore issues related to speaking English and the effectiveness of collaborative and communicative approaches in improving students' English-speaking skills. The findings revealed that students encountered linguistic challenges, including difficulty in constructing sentences with correct grammar, limited vocabulary use and comprehension across various contexts, pronunciation issues, and struggles with understanding different English accents.

Additionally, students faced instructor-related issues such as teacher-centric teaching methods, a tense classroom atmosphere characterized by negative and offensive feedback, and frequent use of the Thai language by teachers during lessons. Wahyuni and Ilyas (2017) similarly examined the English language difficulties and learning approaches of 10 Thai students enrolled in the English Study Program at the Faculty of Teacher Training and Education in Indonesia. The study found that the primary challenges for Thai students in learning English were listening and writing skills, with reading skills posing the least difficulty. Another significant issue reported was difficulty in writing essays within time constraints, along with persistent challenges in listening comprehension. According to these studies, there exist several challenges and difficulties for students in EFL, especially in terms of grammatical mistakes and insufficient vocabulary.

It can be seen that EFL learners face a variety of challenges and issues in their English learning journey. For PSTs, it is inevitable that they might also encounter similar problems. Research has been conducted on the problems and challenges encountered by EFL PSTs in some studies (Siregar et al., 2024; Syafryadin et al., 2021; Syamdianita & Cahyono, 2021). Siregar et al. (2024) evaluated the readiness of pre-service EFL teachers for integrating technology into the classroom of a rural university and identified the challenges that impacted their readiness. The findings highlighted the region's PSTs' readiness to incorporate technology, despite encountering barriers such as inadequate knowledge, poor perception, lack of confidence, financial constraints, limited student access, and inadequate facilities. Similarly, Syafryadin et al. (2021) explored various CALL applications used by pre-service English teachers, the difficult skills faced by students, various obstacles, and PSTs' own reflections. The study found that listening was the most challenging skill for students, while reading was the easiest. Additionally, various obstacles to using CALL applications were identified, including issues with internet connectivity, comprehension of materials, application procedures, assessment, discipline, costs, and differences in learning styles. Syamdianita and Cahyono (2021) investigated the experiences of EFL PSTs in creating and applying teaching materials using the Technological Pedagogical Content Knowledge (TPACK) framework within the 'Learning by Design' approach. The findings showed that these teachers faced several challenges, including limited computer skills, insufficient content knowledge, and a lack of available media resources when designing and implementing the materials. Further, Boonmoh and Kamsa-ard (2023) highlighted PSTs' anxiety during the teaching practicum, which can further complicate their language learning and teaching processes. In conclusion,

these studies revealed that significant issues for EFL PSTs included limited content knowledge and technological knowledge as well as insufficient facilities.

Methodology

Research Design

This study adopted a qualitative research design, combining a case study approach with content analysis to explore how Thai PSTs' language learning experiences shaped their creation of online English self-learning materials. A case study approach allows for a holistic understanding of an issue (Tight, 2017). In addition, Duff (2008, p. 19) emphasized that a well-conducted case study reveals "a more complex representation of the research participant as a multifaceted social being," rather than merely functioning as a research site. In our context, conducting a case study can provide an in-depth understanding of participants' personal reflections and the unique challenges they have faced, focusing on their diverse backgrounds and how these have influenced the materials they developed. This combined design enabled the study to uncover both common and unique challenges faced by participants, offering a holistic perspective on how CALL resources can be customized by PSTs to address specific language learning difficulties.

Participants

The participants in this study comprised 50 Thai PSTs enrolled in the 'ICT and Communication for English Language Teaching' course at a Rajabhat (polytechnic) university in Thailand. Recruitment utilized convenience sampling, with participants voluntarily deciding to participate in the study. The participants were third-year students who were taught by one of the researchers.

These participants attended different types of secondary schools, which is significant because school type in Thailand influences not only the number of students but also access to educational resources, funding, infrastructure, and teacher expertise. Schools are classified by size into extra-large, large, medium, and small categories. Larger schools typically benefit from greater government funding, more advanced facilities, and better access to technology. In contrast, students from small or medium-sized schools may face more challenges, including fewer technological resources, limited access to skilled teachers, and less exposure to English. Specifically, 22 participants had attended extra-large schools, 17 had attended large schools, nine had attended medium-sized schools, and two had attended small schools.

This variation in school type provided valuable insight into how different educational environments shaped participants' experiences with language learning and technology use. For instance, participants from larger schools may have had more opportunities to interact with technology, while those from smaller schools likely had to find creative ways to engage with English when faced with resource limitations.

Participants also varied in their possession of mobile devices and access to technology, which influenced both their personal learning experiences and their ability to create online English self-learning materials. For example, 44 participants owned a smartphone, but six did not. In terms of devices, 34 participants had access to a personal computer or tablet, while 16 did not. Access to Wi-Fi also varied: Wi-Fi was available at home for 45 participants, while 5 lacked access. At school, 40 participants had access to Wi-Fi, whereas ten did not.

Participants also demonstrated varying levels of academic performance and English proficiency. For example, their grammar grades from the previous semester spanned from A to E, with 2 earning an A and 2 receiving an E. Additionally, their current GPA varied: 14 participants reported a GPA of 3.5 or above, 25 had a GPA between 3.0 and 3.49, and 11 fell between 2.5 and 2.99. Table 1 below summarizes the participants' key demographic characteristics, including gender, school type, possession of mobile devices, access to technology, and academic performance.

Table 1
Participants' Demographic Information

Demographic information	Details	
Total participants (N)	50	
Gender	Male: 18	Female 32
School Type	Extra-large: 22 Medium: 9	Large: 17 Small:2
Students' possession of mobile devices and access to technology	Smartphone: 44 (Yes) PC/ Tablet: 34 (Yes) Wi-Fi at School: 40 (Yes) Wi-Fi at Home: 45 (Yes)	6 (No) 16 (No) 10 (No) 5 (No)
English Grade (Previous semester – Grammar subject)	A: 2 B: 10 C: 11 D: 5	B+: 5 C+: 7 D+: 8 E: 2
Current GPA	3.5 and above: 14 3.0 – 3.49: 25 2.5 – 2.99: 11	

The inclusion of participants from a variety of educational backgrounds, academic performance levels, and access to technology provides a comprehensive understanding of the challenges they encountered in language learning and the development of online learning materials. By exploring how participants from different school types overcame challenges with varying resources, this study offers valuable insights into the importance of resource availability and innovative teaching strategies. This diversity also allowed the study to explore how participants drew on their varied experiences to design self-learning materials that address the specific language learning difficulties they faced during their education. All participants consented to participate in the study and allowed their data to be collected by the researchers.

Instruments

The data collection involved two primary research instruments: written reflections and the analysis of online English self-learning materials.

Firstly, participants were asked to reflect on their past language learning experiences, specifically focusing on the challenges they encountered during their secondary education. Prompts included questions such as ‘What were the main difficulties you faced in learning English during high school?’, ‘Why these were problems for you?’ and ‘How did you overcome these challenges?’ The reflections were collected through written submissions, allowing participants to express their thoughts, emotions, and insights in their own words. Prompts were provided to guide participants in identifying specific language learning difficulties, such as spelling, pronunciation, vocabulary acquisition, and conversational limitations. Participants were requested to write a 500-word reflection detailing their challenges and proposing technological solutions. The diversity in their backgrounds ensured a wide range of perspectives and insights into the challenges faced in different learning environments.

Secondly, participants were tasked with creating online English self-learning materials based on their reflections on language learning challenges. These materials included videos, interactive quizzes, digital flashcards, or other multimedia resources designed to facilitate language learning. The materials were collected and analyzed to determine the platforms used (e.g., YouTube, Facebook, TikTok) and the characteristics of the materials, including accessibility, content variety, and interactivity. The videos were required to be 3-5 minutes long, engaging, informative, and directly addressing the identified learning challenges. The diversity of the participants' backgrounds influenced the focus areas and creative approaches in their videos.

Figure 1

Screenshots of Some of the Materials



Procedure

The procedure followed a systematic approach, ensuring that the data collection, analysis, and ethical considerations were thoroughly addressed throughout the study.

Firstly, in the first week of the 'ICT and Communication for English Language Teaching' course, participants were provided with detailed instructions for completing the written reflections and creating the online English self-learning materials. Written submissions were collected electronically to ensure confidentiality, while online materials were accessed

and analyzed by the researchers. Participants shared their videos on platforms like Facebook, and explanatory reflections were submitted to a Google Drive account. The use of different platforms also reflected the participants' varying levels of technological proficiency and access.

Secondly, participants were guided step-by-step through the process of creating the online materials, with workshops and in-class sessions offered to assist those with less technological proficiency. These sessions ensured that all participants had the opportunity to familiarize themselves with the platforms they intended to use and troubleshoot any technical issues.

Thirdly, ethical guidelines were followed throughout the data collection process to protect the rights and privacy of participants. Informed consent was obtained from all participants, and measures were taken to ensure anonymity and confidentiality. The study was approved by the Institutional Review Board (IRB) of King Mongkut's University of Technology under the expedited review process, with approval number KMUTT-IRB-COA-2024-044.

Data Analysis

The data analysis process employed three iterative steps to identify patterns, themes, and insights. Content analysis was employed to systematically analyze both the written reflections and the online learning materials, capturing the connections between participants' personal experiences and the strategies they adopted using CALL tools.

Firstly, the written reflections were subjected to content analysis to identify the common themes and language learning challenges encountered by the participants during their secondary education. The coding process involved an initial open coding phase, followed by axial coding to identify relationships between themes. Inter-coder reliability was ensured by having multiple researchers code a subset of the reflections and by comparing results to reach a consensus. Inter-coder reliability was calculated using Cohen's Kappa (1960) to measure the level of agreement between coders. A Kappa score of 0.85 was achieved, indicating high reliability in coding the data. This ensured the consistency and trustworthiness of the thematic analysis. Identified themes included spelling difficulties, pronunciation challenges, vocabulary acquisition issues, and conversational limitations.

Secondly, the online English self-learning materials created by the participants were analyzed to determine their content, interactivity, and accessibility. The analysis focused on identifying the platforms used, the length of the videos, and the roles assumed by the participants (e.g., expert, learner, teacher). The diversity of participants' backgrounds

influenced the selection of topics, teaching methods, and use of technology in their videos. The materials were categorized based on the platforms used and the characteristics of the materials, such as participant roles, focus areas, interactivity, platforms, and video lengths.

Thirdly, the findings from the content analysis of written reflections and the analysis of online materials were integrated and synthesized to provide a comprehensive understanding of how PSTs draw from their own language learning experiences to inform the creation of online English self-learning materials. Themes and insights were identified, and implications for language education practice and research were discussed.

Findings

This section presents the findings from the study, organized to address the two main research questions. The findings are organized in three tables, offering detailed insights into the challenges participants faced and their responses through the creation of online English self-learning videos. Table 2 presents the range of English learning challenges participants reported from their high school experiences. These challenges are categorized into five areas: environmental and exposure issues, curriculum and instruction, learner-specific issues, technology and facility-related concerns, and teacher-related issues.

Table 2

Reported Challenges in Learning English During High School

Reported Challenges	Freq. (N = 50)	%
Environmental and Exposure Issues		
- Limited access to diverse teaching materials (only textbooks)	33	66
- Insufficient study periods/hours	7	14
- Difficulties with online learning modes	6	12
- No opportunities to practice with native speakers	5	10
Subtotal	51	35.2
Curriculum and Instruction Focus		
- Insufficient focus on listening and speaking skills	16	32
- Overemphasis on grammar	12	24
- Overemphasis on rote memorization	5	10
Subtotal	33	22.8
Learner-Specific Issues		

- Lack of confidence in speaking and pronunciation	16	32
- Limited vocabulary	6	12
- Weak understanding of grammar	5	10
Subtotal	27	18.6
Technology and Facility-Related Issues		
- Poor or slow internet connectivity	12	24
- Unavailability or malfunction of equipment	6	12
- Lack of basic educational facilities (computers, sound labs, etc.)	4	8
Subtotal	22	15.2
Teacher-Related Issues		
- Teacher personalities (strict, unapproachable)	5	10
- Teachers' age and lack of technology proficiency	3	6
- Ineffective teaching styles (boring, non-interactive, low energy)	2	4
- Overuse of native language (L1) in teaching English (L2)	2	4
Subtotal	12	8.3
Total	145	100

As can be seen in Table 2, the most common challenge reported was the lack of diverse teaching materials, with 66% of students indicating that textbooks were the primary resource used. This suggests a traditional approach to teaching that may not cater to varied learning needs.

In terms of environmental and exposure issues, 35.2% (51 out of 145 total mentions) of all challenges reported were related to this area. Limited access to diverse teaching materials (with recourse only to textbooks) was the most frequently mentioned issue, highlighting a significant gap in the variety of learning resources available to students.

Curriculum and instruction focus was another significant area of concern, with 22.8% (33 out of 145 total mentions) of all challenges reported. Sixteen out of 50 students (32%) reported that there was little focus on listening and speaking skills, which are essential for developing practical language use. An overemphasis on grammar and memorization was also noted, suggesting that the curriculum might not adequately support communicative language teaching.

Learner-specific issues accounted for 18.6% (27 out of 145 total mentions) of the challenges. A lack of confidence in speaking and pronunciation was reported by 16 students (32%), indicating that many students did not feel comfortable using the language actively. This lack of confidence, combined with limited vocabulary and weak grammar skills, points to a need for more supportive and engaging language learning practices.

Technological challenges, such as poor internet connectivity, accounted for 15.2% of the total mentions, as detailed in Table 2. Specifically, 24% of participants mentioned internet issues, while 12.0% noted equipment-related problems. These challenges highlight the infrastructural barriers that can hinder effective language learning, especially in a technology-enhanced learning environment.

Teacher-related issues were mentioned by 8.3% (12 out of 145) of the participants. Five students (10 %) described their teachers as strict and not approachable, while some noted that teachers lacked proficiency in using technology or had ineffective teaching styles. These findings indicate a need for better teacher training and support to create a more conducive learning environment.

In summary, Thai PSTs faced numerous language learning challenges during their secondary education. The major issues were a lack of diverse teaching materials (66%), insufficient practical language exposure (35.2% of total mentions), personal confidence barriers (18.6% of total mentions), technological problems (15.2% of total mentions), and teacher-related issues (8.3% of total mentions). Understanding these challenges is crucial as it can inform how these PSTs use their experiences to create online English self-learning materials, which will be discussed in the next section, addressing RQ2.

Table 3 provides an overview of participant roles, focus areas, interactivity, platforms, and video lengths for the online English self-learning materials made by these PSTs.

Table 3

Overview of Participant Roles, Focus Areas, Interactivity, Platforms, and Video Lengths

Categories	Freq. (N = 50)	(%)
<i>Participant's Role</i>		
Expert	21	42
Learner	18	36
English teacher	11	22
<i>Focus Areas of the Videos</i>		

Vocabulary	15	30
Applications and tools	10	20
Pronunciation	6	12
Practical usage and conversation	6	12
Grammar	5	10
Role play and interactive learning	4	8
Teaching techniques and classroom interaction	3	6
<hr/>		
<i>Interactivity of Videos</i>		
One person talking	37	74
Two people talking, act as teacher and students	2	4
One person talking and another is a student	2	4
One person talking and another one shows example situation at the beginning	1	2
One person role-playing as waitress and customer	1	2
<hr/>		
<i>Where Videos Were Posted</i>		
YouTube	46	92
Facebook	2	4
Tiktok	2	4
<hr/>		
<i>Length of Videos</i>		
3 to 5 minutes	45	90
More than 5 minutes	3	6
Less than 3 minutes	2	4
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Regarding participant roles, the data indicates a diverse range of roles undertaken by the participants in their videos. Specifically, 21 out of 50 participants (42%) acted as experts, showcasing their advanced knowledge of English. In comparison, 18 participants (36%) assumed the role of learners, reflecting their journey and learning processes. Additionally, 11

participants (22%) took on the role of English teachers, highlighting their teaching methodologies and approaches.

In terms of focus areas, Table 3 reveals that vocabulary was the most emphasized topic, with 15 participants (30%) concentrating on teaching new words, their meanings, and usage. Applications and tools were the second most common focus, with 10 participants (20%) demonstrating various language learning apps and tools. Pronunciation and practical usage and conversation were each highlighted by six participants (12%), respectively, indicating a balanced emphasis on these crucial aspects of language learning. Grammar was covered by five participants (10%), while role play and interactive learning were featured in four videos (8%). Lastly, teaching techniques and classroom interaction were the focus of three participants (6%).

The interactivity of the videos varied significantly. A significant majority, 37 out of 50 participants (74%), created videos where one person was talking, indicating a preference for lecture-style or monologue presentations. Only two videos (4%) involved two people talking, acting as a teacher and student. Similarly, another two videos (4%) featured one person talking, with another acting as a student. Additionally, one video (2%) included a scenario where one person talked, and another showed an example situation at the beginning. Another video (2%) involved one person role-playing as a waitress and customer, showcasing a practical conversation scenario.

Regarding the platforms used for posting videos, YouTube was overwhelmingly the preferred choice, with 46 out of 50 participants (92%) posting their videos there. This preference for YouTube may be due to its widespread familiarity and ease of use, especially for educational content that requires longer video formats. YouTube's accessibility and ability to reach a broader audience might also make it the favored platform for sharing learning materials. Facebook and TikTok were used by two participants each (4%), indicating a minor preference for these platforms compared to YouTube. These platforms, while popular, may not have been seen as suitable for the format and purpose of the self-learning materials, which typically require more detailed instructional content.

In terms of video lengths, the majority of the videos were between three and five minutes long, with 45 out of 50 participants (90%) opting for this duration. This likely reflects the participants' awareness of maintaining engagement, as shorter videos are easier for viewers to follow and retain. Only three videos (6%) exceeded five minutes, while two videos (4%)

were less than three minutes long, showing a clear tendency towards short and concise video content.

Overall, Table 3 illustrates that the majority of participants acted as experts or learners, with a strong focus on vocabulary and the use of applications and tools. The videos were primarily monologue presentations, predominantly posted on YouTube, and most videos were three to five minutes in duration. These findings reflect the participants' strategies to address the language learning challenges they previously experienced, with the aim of creating engaging, accessible, and educational content for their audiences.

Table 4 provides a detailed breakdown of the categories, frequencies, entries, and examples of the content included in the participants' online English self-learning videos.

Table 4

Categories, Frequencies, Entries, and Examples of the Content in the English Self-learning Videos

Category	Freq.	%	Entries	Descriptions	Examples
Vocabulary	15	30	7, 8, 9, 17, 20, 26, 28, 29, 32, 33, 35, 41, 44, 46, 50	Introducing new vocabulary, meanings, parts of speech, and examples.	Teaching 10 new words with pronunciation (Entry 7), emotion words with spelling (Entry 20), vocabulary before telling a story (Entry 26), teaching irregular verbs (Entry 29), vocabulary about fruit (Entry 46)
Applications and Tools	10	20	10, 11, 15, 21, 27, 31, 34, 37, 39, 47	Recommending and demonstrating English learning applications and tools.	Google Translate, Speak & Translate, iTranslate (Entry 10); Duolingo (Entries 11, 31, 47); Elsa Speak (Entry 15); Omegle (Entry 34); Dict Box (Entry 39)
Pronunciation	6	12	1, 2, 24, 25, 42, 43	Teaching pronunciation of words, accents, and phonetics.	Words with similar sounds (e.g., "to" vs. "too"), accents in different contexts, phonetic practice of challenging words (e.g., "fine" vs. "fire")
Practical Usage and Conversation	6	12	12, 13, 16, 18, 36, 40	Teaching phrases, sentences, and conversations for everyday use and specific scenarios.	Ordering at a restaurant (Entry 12); Everyday phrases (Entry 13); Greeting sentences (Entry 16); Hotel reservation sentences (Entry 36); Classroom sentences (Entry 40)
Grammar	5	10	6, 22, 23, 38, 49	Teaching grammatical structures and tenses.	Present simple tense (e.g., "I eat an apple"), past simple tense (e.g., "I ate an apple"), using verb to be in sentences
Role Play and	4	8	4, 5, 45, 48	Using role play and interactive activities for	Role-playing as waitress and customer, siblings discussing synonyms and idioms,

Category	Freq.	%	Entries	Descriptions	Examples
Interactive Learning				teaching.	students playing a rhyming game
Teaching Techniques and Classroom Interaction	3	6	3, 14, 19	Techniques for developing speaking skills, classroom interaction, and presentation skills.	Techniques for improving speaking skills, strategies for better classroom interaction, tips for developing effective presentation skills

Vocabulary was the most emphasized topic, with 15 participants (30%) focusing on introducing new vocabulary, meanings, parts of speech, and examples. Applications and tools were highlighted by 10 participants (20%), demonstrating various language learning apps and tools. Pronunciation and practical usage and conversation were each emphasized by six participants (12%), teaching the pronunciation of words, accents, and phonetics, as well as phrases, sentences, and conversations for everyday use. Grammar was covered by five participants (10%), focusing on grammatical structures and tenses. Role play and interactive learning were featured in four videos (8%), using role play and interactive activities for teaching. Finally, teaching techniques and classroom interaction were the focus of three participants (6%), showcasing techniques for developing speaking skills, strategies for better classroom interaction, and tips for developing effective presentation skills.

The Thai PSTs created online English self-learning videos that directly addressed the main challenges they faced during their own language learning experiences. By analyzing the focus areas, categories, frequencies, and examples detailed in Table 4, we can see how these videos helped solve the identified challenges. Below is a deeper analysis linking the reported challenges to the videos they created, in the process demonstrating how the main challenges were addressed.

A significant number of participants (66%) reported that their high-school English learning experience was limited to textbooks, lacking diverse and engaging teaching materials. To address this, 15 participants (30%) created videos introducing new vocabulary, meanings, parts of speech, and examples, such as teaching ten new words together with the pronunciation (Entry 7) and teaching vocabulary before telling a story (Entry 26). Additionally, ten participants (20%) demonstrated various English learning applications and tools, providing learners with additional resources to enhance their learning experience. Examples of these tools include Google Translate, Speak & Translate, iTranslate (Entry 10), Duolingo (Entries 11, 31, 47), Elsa Speak (Entries 15, 43), Omegle (Entry 34), and Dict Box (Entry 39). For instance,

Entry 43 noted, “Teaching solely by reading slides without allowing students to interact in class creates pressure on learners, making English language learning less enjoyable,” thereby addressing the need for interactive and engaging tools like Elsa Speak.

Furthermore, 35.2% of participants reported insufficient exposure to real-life English, with little focus on listening and speaking skills and no opportunities to practice with native speakers. To solve this, six participants (12%) created videos teaching phrases, sentences, and conversations for everyday use, including ordering at a restaurant (Entry 12) and greeting sentences (Entry 16). Furthermore, six participants (12%) focused on teaching the pronunciation of words, accents, and phonetics, thereby improving learners' confidence and accuracy in speaking. Examples include practicing words with similar sounds, e.g., “to” versus “too” and phonetically practicing challenging words, e.g., “fine” versus “fire.”

Addressing personal confidence barriers, 18.6% of participants reported a lack of confidence in speaking and pronunciation, with some having limited vocabulary knowledge. To boost confidence, six participants (12%) focused on teaching correct pronunciation, while 15 participants (30%) created videos to expand vocabulary knowledge, thereby increasing the learners' confidence in both their spoken and written communication. Examples include teaching irregular verbs (Entry 29) and vocabulary about fruit (Entry 46).

In terms of technological issues, 15.2% of participants reported problems with internet connections and the unavailability of equipment, hindering their ability to use CALL resources effectively. By showcasing how to use various language learning apps and tools, ten participants (20%) provided alternative resources that could be accessed even with limited technological infrastructure. For example, Entry 39 addressed the issue of insufficient internet by introducing Dict Box, an offline dictionary application, noting, “This video will help solve the problem of finding word meanings using an offline application.”

Lastly, 8.3% of participants faced challenges with teacher-related issues, such as strict and unapproachable teachers, together with teachers lacking proficiency in technology. To improve teaching methodologies, three participants (6%) focused on developing speaking skills, classroom interaction, and presentation skills through their videos. For instance, Entry 19 recommended techniques to develop presentation skills and highlighted personal challenges faced in high school, stating:

During high school, I had difficulty with public speaking in class because I was too shy to express myself. When speaking, I would stand stiffly and my hands would often tremble. Sometimes, I would even lose track of what I wanted to say.

Participant Reflections

Summarizing the key reflections from the study's participants on how their videos help address the challenges provides qualitative depth to the quantitative data. Many participants reflected that their videos could help reduce learners' anxiety by providing clear, step-by-step instructions and practical examples. For instance, one participant noted that by watching their video, students could practice in a low-pressure environment, which helps them gain confidence before speaking in front of others. Participants also emphasized that their videos aimed to boost learners' confidence, particularly in speaking and pronunciation, with one reflection stating that their video focuses on correct pronunciation, which helps students feel more confident when they speak. Several participants highlighted the importance of correct pronunciation in their videos, with reflections mentioning that by practicing the words and sounds demonstrated, students could improve their pronunciation significantly. For example, Entry 2 stated, "The video presentation aims to address issues related to pronunciation or accent by helping achieve a closer resemblance to native speakers and boosting learners' confidence in speaking," indicating the role of correct pronunciation in building confidence.

Participants created videos that provided scenarios for real-world English usage, with reflections mentioning that their videos included practical conversations that students might encounter in daily life, helping them apply what they learn in real situations. For instance, Entry 3 stated,

The problem previously mentioned is not using the language in daily life because of uncertainty about how to use it, which hinders skill development. Our video helps solve this problem by encouraging speaking practice. The more consistently we practice speaking, the more we use it every day, becoming familiar with it and continuously improving. This approach is similar to learning a native language during childhood.

Entry 4 also reflected on this, stating,

I believe this video can help individuals interested, like myself, learn English beyond what's covered in textbooks, so they can apply it in real-life situations. Textbook content may not always be applicable in real-world scenarios. In my video, I address both issues I previously mentioned: 1. the lack of resources - uploading clips helps solve this problem, and 2. the issue of educational relevance, where textbook content often doesn't translate to practical use, such as informal conversations with friends using colloquial expressions not typically found in textbooks.

Some participants reflected on introducing various language learning tools and applications in their videos, noting that showcasing different language learning apps provided students with additional resources to improve their skills independently. Entry 10 highlighted this by stating, "It helps students learn new vocabulary or specific vocabulary they want to learn." Entry 15 elaborated on the use of technology, explaining,

I recommend the application called ELSA Speak for practicing speaking because it teaches pronunciation from the basics and uses AI to provide feedback for improvement in speaking skills. Using websites or applications for self-practice in listening and speaking will help learners become most familiar with English, emphasizing foundational learning and continuous development.

In terms of enhancing presentation and speaking skills, Entry 19, whose problems are described above, recommended five techniques to develop presentation skills, such as practicing a lot, speaking in front of a mirror, and not using a monotone voice.

By integrating these reflections, the findings highlight not only the quantitative impact of the videos but also the qualitative benefits perceived by the participants. This comprehensive approach demonstrates the effectiveness of the created videos in addressing the identified challenges and enhancing English language learning.

In conclusion, the findings, as detailed in the tables, provide a thorough understanding of the challenges faced by Thai PSTs during their high school years and how they have addressed these challenges through their online self-learning English videos. By linking the reported challenges to the solutions provided in the videos, the study demonstrates the participants' strategic approach to creating accessible, engaging, and practical learning resources.

Discussion

This study investigated the language learning challenges faced by Thai PSTs in secondary school and how they utilized those experiences to create online English self-learning materials as PSTs. The first research question was, “What types of language learning challenges did Thai PSTs encounter during their secondary education, considering their diverse backgrounds?” Based on the findings of this study, many challenges were identified with learning English during the participants' secondary education. The most common challenge was the lack of teaching materials other than textbooks. Although books provide theoretical knowledge and structured exercises, they might not effectively prepare learners for real-life conversations. Books cannot provide the interactive practice that helps solidify language skills. Many participants noted that their learning was limited to these books, suggesting a traditional teaching method that may not effectively engage students or address diverse learning needs. This finding aligns with previous research highlighting similar challenges in other contexts (Abdallah, 2011; Bax, 2003).

Another major concern was insufficient practical language exposure. The findings revealed that there was little focus on listening and speaking skills, which are vital for practical language use. This suggests that the curriculum may not effectively support communicative language teaching. Using authentic materials is essential for second language acquisition, as learning a foreign language demands strong motivation and opportunities for practical application. Authentic materials expose learners to real-world language use, while using inappropriate materials can hinder language acquisition. Properly selected and sourced authentic materials immerse students in contexts that are relevant to their everyday lives (Godwin-Jones, 2021). This observation is supported by research indicating the importance of practical language exposure (Aydoğan & Gönen, 2020; Yuh & Kaewurai, 2021).

In terms of technology usage, Tafazoli (2021) emphasized the importance of teachers being adequately trained to use technology effectively to enhance students' language exposure.

In the wake of the COVID-19 pandemic, CALL professional development has become essential, as it provides teachers with the tools to create more interactive, real-world language learning environments. Hur et al. (2016) further emphasized that factors both internal (teacher beliefs, motivation) and external (training, access to resources) impact the successful integration of technology in the classroom. This aligns with the present study's findings, where participants reported issues such as poor internet connectivity and limited technological proficiency among teachers. Furthermore, Aguilera-Hermida (2020) highlights the growing acceptance of online learning due to COVID-19, which reflects the participants' increased reliance on technology for language learning during their secondary education.

Learner-specific issues were another notable challenge. Students demonstrated a lack of confidence in speaking and pronunciation, suggesting that many were uncomfortable actively using the language. This lack of confidence, along with limited vocabulary and weak grammar skills, highlights the need for more supportive and engaging language learning strategies. The results are consistent with the findings of Aydoğan and Gönen (2020), Katemba and Barus (2024), Siregar et al. (2024), Syamdianita and Cahyono (2021,) and Yuh and Kaewurai (2021), who found that students encountered linguistic challenges, including difficulty in constructing sentences with correct grammar, limited vocabulary use, and pronunciation issues.

Additionally, issues related to technology and teaching were important factors. Poor internet connectivity and problems with equipment can impede effective language learning, particularly in a tech-based learning environment. These issues can prevent learners from accessing online resources, educational apps, and interactive tools that are crucial for practicing and enhancing their English skills. Teacher-related issues were also noted. Teachers are vital in motivating students to learn English. When English teachers are excessively strict and unapproachable, it can instill in their students the fear of making mistakes, which may discourage students from taking risks and actually practicing their language skills. In addition, if teachers are not proficient with technology or employ ineffective teaching styles, this can greatly affect students' learning experiences, resulting in reduced engagement, motivation, and English proficiency. This finding is in line with the research of Akturk and Ozturk (2019), who discovered that teachers who are skilled in using technology relevant to their subject area have a positive impact on their students' academic performance.

The second research question of this study was "How do Thai pre-service teachers use their experiences of these challenges to inform the creation of online English self-learning

materials?” As a response to the participants’ English learning problems, online English self-learning videos were created to solve their issues. The participants believed that these videos could solve their problems effectively. Creating their own materials benefits English learners in many ways. Learners can design materials that align with their interests, learning styles, and specific needs, making the content more engaging and relevant. Moreover, the process of creating materials involves active learning. It requires learners to think critically, apply their knowledge, and solve problems, which enhances their understanding and retention of language. This aligns with the findings of Boonmoh et al. (2022), who reported that the integration of technology by Thai teachers not only facilitates more dynamic learning environments but also encourages students to take ownership of their learning through interactive practices. Shahid et al. (2024) similarly found that creating content on social networking sites is believed to have a notably positive effect on language skill development through incidental language learning. By connecting the identified challenges with the solutions presented in the videos, the present study illustrates the participants' methodical approach to developing engaging, accessible, and practical learning materials.

Additionally, Ito (2024) explored how in-service teachers are learning to adapt to technological advancements in language education, further validating the findings of this study. As participants in the present study used CALL tools to address their language learning challenges, Ito’s (2024) findings confirm the importance of continuously developing technological skills to foster active learning. Furthermore, Bakla and Demiröz (2024) emphasized the potential of interactive videos in EFL learning, particularly for listening comprehension, which correlates with the use of online self-learning videos by participants in this study.

Wiangsima and Boonmoh (2018) emphasized that the shift to a digital era has driven changes in ELT methodologies, with a significant increase in the use of educational technology. They noted that teachers need to adapt by acquiring technological skills and becoming facilitators rather than traditional instructors. This position aligns with the findings of the current study, highlighting the importance of integrating technology to address learning challenges and enhance student engagement. In line with these observations, Tafazoli and Meihami (2023) noted the increasing need for CALL teacher preparation programs, emphasizing the role of technology in equipping teachers with the tools necessary to foster active learning in digital environments. This is particularly relevant as many participants in the

present study highlighted how creating online learning materials using CALL tools directly addressed their own language learning challenges.

Pedagogical Implications

This study's findings suggest several key recommendations for language teachers. It is significant for English teachers to use a variety of materials to boost student motivation and enthusiasm. Books often provide theoretical knowledge, but real-world materials like videos, podcasts, and conversations help students understand how English is used in practical, everyday contexts. Engaging students with a range of resources can make learning more enjoyable and less predictable. Students have diverse learning preferences. While some may benefit from textual content, others might learn better through visual aids, audio resources, or hands-on activities. To support all students effectively, teachers should incorporate a variety of these preferences into their teaching methods (Oxford, 2003).

In terms of curricula and instruction, teachers should prioritize communication skills over strict grammar instruction. Overemphasizing grammar can create anxiety and reduce students' confidence, causing them to worry more about making errors instead of participating in effective communication. As noted by Boonmoh and Kamsa-ard (2023), the anxiety that pre-service teachers experience can similarly affect their ability to engage with language actively. Therefore, fostering a positive classroom environment that encourages risk-taking is essential for enhancing learners' confidence and participation.

Furthermore, due to the fast-paced evolution of technology and the frequent introduction of new tools and platforms, English teachers should continually engage in technology training. Zhou et al. (2022) found that more experienced primary EFL teachers often possess less technological pedagogical knowledge, which contradicts the common belief that greater experience equates to superior teaching expertise. Regular refresher training helps teachers keep up with the latest educational technologies, improving their teaching methods and classroom experience. It also enables them to adapt to various teaching environments, such as hybrid or online formats. Proficiency in technology then allows them to manage different teaching setups and support students effectively. Boonmoh et al. (2022) also teachers' comfort and familiarity with technology directly influence their ability to create engaging and diverse online learning experiences for their students, highlighting the importance of professional development focused on technology integration.

Based on the findings, it is recommended that educators adopt a more diverse range of teaching materials and techniques. Incorporating technology such as language learning apps and interactive tools can enhance the learning experience and address the challenges identified in this study. Teachers should also seek to create an inclusive learning environment that recognizes and addresses the diverse backgrounds of their students. This includes being mindful of different learning styles and providing personalized support to students who may struggle with specific aspects of language learning.

Finally, it is highly advisable to let students produce their own materials in an English class. When students have the chance to generate their own content, they tend to be more engaged and committed to the learning process. Offering these opportunities promotes a more interactive and student-centered classroom, aiding in the development of a variety of skills that benefit them academically and personally.

This study has several limitations. The use of convenience sampling limits the generalizability of the findings. Specifically, the study involved a small group of participants from a single university in Thailand and covered only a few provinces, which may limit the generalizability of the results. If the research had included students from other Thai universities or from institutions in different countries, the findings might have been different. Additionally, the study relied on self-reported data, which can be subject to biases. These limitations should be considered when interpreting the findings and their implications. Therefore, future research should involve larger samples from diverse provinces and countries to acquire a more comprehensive understanding of the challenges PSTs encounter in terms of language learning and how they utilize their experiences to develop online English self-learning materials.

Conclusion

This study has contributed to the understanding of how PSTs, specifically Thai ones, can draw from their past learning experiences to create online English self-learning materials. By addressing the specific challenges they encountered during their secondary education, such as a lack of diverse teaching materials, insufficient practical exposure, and technological barriers, the participants were able to craft relevant and engaging learning resources. The findings emphasize that allowing such students to create their own content can significantly enhance their language learning.

Future research should explore the long-term impact of using diverse and engaging teaching materials on language learning outcomes. Longitudinal studies could provide valuable

insights into the effectiveness of these approaches over time. Additionally, expanding the research to include participants from different educational settings and socioeconomic backgrounds would enhance the generalizability of the findings. For instance, students from more highly developed countries with better access to technology and higher levels of computer literacy may create more complex and interactive self-learning materials, while those from less developed regions might struggle with limited resources and digital skills. Further research could also investigate the specific features of online self-learning materials that are most effective in reducing language learning anxiety and improving language proficiency. By addressing these aspects, educators and researchers can better support PSTs in creating impactful and engaging language learning resources.

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