OPEN ACCESS

Australian Journal of Applied Linguistics
ISSN 2209-0959
https://www.castledown.com/journals/ajal/

Australian Journal of Applied Linguistics, *8* (4), 103076 (2025)
https://doi.org/10.29140/ajal.v8n4.103076

Self-directed professional development of Thai pre-service English teachers in rural Thailand: Adapting to limited resources and technology integration

ATIPAT BOONMOH[a]
INTRIRA KULAVICHIAN*[b]

[a]*School of Liberal Arts, King Mongkut's University of Technology Thonburi, Bangkok, Thailand*
[b]*English Education, Faculty of Humanities and Social Sciences, Nakhon Pathom Rajabhat University, Nakhon Pathom, Thailand*

Abstract

This study explores how Thai pre-service English teachers (PSTs) engage in self-directed professional development (SDPD) during their rural teaching practicum, where resource constraints and technological limitations challenge traditional teacher preparation. Drawing on Garrison's Self-Directed Learning model (1997), the Theory of Planned Behavior, Morris and Rohs's Digital SDL Framework (2021), and a culturally sensitive reinterpretation of SDPD, the study employed a mixed-methods design. Data were collected from 49 Thai pre-service English teachers through a structured questionnaire and from four purposively selected participants through semi-structured interviews. Quantitative results indicated high SDPD engagement, with Thai pre-service English teachers actively searching for teaching ideas, experimenting with techniques, and reflecting on their practice. However, much of this self-direction was relational, being supported by peer discussions, mentor guidance, and LINE-based collaboration networks. Qualitative findings further revealed challenges in adapting university-based lesson plans to rural, under-resourced classrooms, alongside struggles with classroom management and limited digital infrastructure. Digital tools and AI applications, such as ChatGPT and online resources, supported SDPD by enhancing lesson planning and creative approaches, though teachers noted concerns about information overload and an overreliance on algorithmic content. The study contributes a culturally contextualized understanding of SDPD as relational and socially mediated rather than purely individualistic, highlighting how Thai pre-service English teachers blend personal initiative with collective

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support. These insights have implications for teacher education policy and practice, emphasizing the need to prepare Thai pre-service English teachers for rural realities through critical digital literacy training, authentic scenario-based methods, and a recognition of culturally relevant peer networks.
Keywords: Digital literacy, pre-service English teachers, rural education, self-directed professional development, technology integration

Introduction

As technology becomes increasingly widespread in language teaching and learning, both teachers and learners are undergoing rapid role transformations (Stockwell, 2022). Consequently, language teachers, especially those in English as a Foreign Language (EFL) contexts, need to continually develop their technological and pedagogical expertise so as to integrate technological tools effectively (Marisa et al., 2024; Tafazoli, 2025). In this context, ongoing professional growth is essential for teachers to adapt to dynamic educational environments shaped by continual technological progress. Professional development that teachers pursue independently has been seen as an effective way to surmount external barriers in resource-limited settings where outside support is often scarce (Zhang, 2023). Schools, especially those in rural areas, face a range of significant challenges, such as poverty-stricken student populations, shortages of teachers, insufficient funding, unfair accountability systems, learning disruptions caused by COVID-19, and unreliable internet access (Darling-Hammond & Podolsky, 2019; Fontana et al., 2022; Garcia & Weiss, 2019). Rural schools typically contend with scarce resources, with tight budgets frequently limiting investments in technology; professional training, including in new technologies; and infrastructure (Francis, 2024).

Under these conditions, self-directed professional development (SDPD) appears to be a promising solution. By relying on their own initiative instead of external support, teachers can seek out resources that strengthen their teaching and address their students' classroom needs (Bakhshi, 2019; Carpenter & Green, 2018; Cirocki & Farrell, 2019; Zhang, 2023). In Thailand, SDPD among student teachers often involves socially mediated practices such as peer sharing and respectful advice-seeking, reflecting personal initiative (Sukkamart et al., 2023). Similar collaborative tendencies have also been observed in other cultural contexts (Yang, 2023; Ghaemi & Boroushaki, 2025), suggesting that social interaction is a common feature of SDPD across settings. SDPD is defined by autonomy, intrinsic motivation, and flexibility, allowing teachers to customize their learning based on personal interests and the evolving demands of pedagogy (Darling-Hammond et al., 2017). The habits of inquiry and self-regulation that PSTs develop during a practicum can shape their future learning careers and professional identity (Ardi et al., 2023; Sukkamart et al., 2023; Yang, 2023).

Most empirical SDPD studies to date examine in-service teachers. Much less is known about student teachers who are still working to connect theory with practice. This study explores how fourth-year pre-service teachers (PSTs) in a Bachelor of Education (English Teaching) program engaged in SDPD during their teaching practicums in rural Thailand. These PSTs complete a two-semester teaching placement in primary and secondary schools, where they face significant resource constraints, such as a lack of internet access, limited digital tools, and minimal institutional supervision.

While at university, PSTs have access to computers, projectors, Wi-Fi, and digital tools, but their practicum schools vary widely in resources. Some classrooms only have a TV, others may

have a projector but require teachers to bring their own laptops, while others lack digital technology entirely. As their supervising lecturer can only visit 2–3 times per semester, these PSTs must take responsibility for their own professional development. They must find ways to plan lessons, improve teaching methods, and integrate technology, often relying on AI tools such as ChatGPT, on online collaboration, and on freely available digital resources (Celik et al., 2025) to fill the gap between theory and practice.

Furthermore, in rural schools with minimal staff, mentor teachers often handle heavy teaching loads and have little time for thorough coaching. As a result, PSTs struggle to adapt their university coursework, which is generally designed for urban, well-resourced classrooms, to multigrade or mixed-age teaching situations. This study aims to identify self-directed learning strategies that PSTs employ, such as peer collaboration, online tools, and AI-based resources (e.g., ChatGPT), which they adapt to their practicum challenges. It also explores how PSTs modify lesson plans, create low-tech teaching materials, or repurpose available technology when faced with limited access to digital tools. Additionally, the study examines how AI and digital resources enhance or limit PST professional development, highlighting potential digital literacy gaps.

Although SDPD is often associated with resilience and adaptability, PSTs may sometimes feel isolated due to minimal supervision and support (Hardwick-Franco, 2018; Siregar et al., 2024). The study also examines how peer networks, informal mentorship, and online communities serve as alternative professional development support systems in under-resourced teaching environments. By examining how PSTs adapt, use digital tools, and overcome teaching challenges, the study provides practical recommendations for teacher training programs and policy. These recommendations emphasize the role of self-directed learning, AI-based lesson-planning tools, and peer collaboration in professional development. They also suggest support for culturally responsive peer networks and sustainable digital-literacy training tailored to rural settings. Finally, the study is guided by the following research questions:

RQ1: To what extent do pre-service English teachers (PSTs) in rural schools engage in self-directed professional development (SDPD)?
RQ2: What challenges do they face when adapting their university training to resource-limited school environments?
RQ3: How do digital tools, AI, and online resources support or hinder their self-directed learning and technology integration?

Literature Review

This literature review covers how PSTs in rural Thailand engage in SDPD while coping with limited resources and restricted access to technology. It addresses central themes such as the characteristics of self-directed learning, the unique challenges faced by rural pre-service teachers, and the growing importance of digital tools, AI, and online resources in enhancing their professional development.

Self-directed Professional Development

SDPD for teachers involves educators relying on their own initiative to continuously customize and adjust their instructional practices, thereby enhancing their teaching effectiveness (Hiver, 2013; Shurr et al., 2014; Verster et al., 2024; Zhang, 2023). SDPD compels educators to engage in continuous, critical reflection on both their current and past instructional practices and to make appropriate adjustments based on that reflection (Shurr et al., 2014). In SDPD, pre-service teachers (PSTs) assume responsibility for their own learning by pinpointing

personal development needs, defining objectives, choosing appropriate resources, and assessing their progress (Kilic & Sağlam, 2023; Nissim & Simon, 2024). Instead of passively attending a single seminar, SDPD empowers future teachers to learn teaching methods by asking questions, reflecting on their practice, and collaborating with peers (Nissim & Simon, 2024).

In collectivist educational contexts like Thailand, SDPD may also include socially mediated and collaborative actions, reflecting relational autonomy rather than purely individualistic practice (Mokoena & Mafugu, 2024). As a core SDPD strategy, self-assessment fosters metacognitive awareness and critical reflection while also serving as a reflective practice that supports both personal and professional growth in teachers (Kilic & Sağlam, 2023; Mokoena & Mafugu, 2024; Warsi & Khurshid, 2022). In a study of Turkish PSTs, Kilic and Sağlam (2023) found that structured self-assessment deepens metacognitive reflection and autonomy in PSTs, enabling them to pinpoint specific competencies for ongoing personal and professional development. In Thailand, such self-assessment is also shaped by cultural norms of respect and collaboration, so autonomy often develops alongside peer and mentor guidance (Ghaemi & Boroushaki, 2025; Sukkamart et al., 2023; Yang, 2023).

Various frameworks describe SDPD as both individually driven and embedded within social contexts. For example, Shurr et al. (2014) outlined a model with three components, namely school-based, community-based, and universal growth. In their view, school-based PD takes the form of inquiry that is directly tied to one's daily work; community-based PD relies on support and collaboration among peers; and universal-growth PD consists of structured courses and involvement in wider professional networks. Subsequently, Sukkamart et al. (2023) applied Ajzen's Theory of Planned Behavior to examine Thai student-teachers' readiness for self-directed learning. They found that internal motivators such as peer support and external influences like institutional policies together account for more than half of the variation. This work reinforces the notion that effective SDPD depends on a balance of individual drive and supportive collaborative structures. Taken together, these ideas point to a research need: examining SDPD for Thai PSTs as a mix of personal initiative and collective support, which directly relates to RQ1, regarding how PSTs engage in SDPD.

Studies conducted in remote settings show how PSTs drive their own professional development when institutional support is minimal. For instance, Mokoena and Mafugu (2024) surveyed 67 final-year PSTs in rural South African schools. They found that easy physical access to the school, a welcoming atmosphere, the availability of mentor teachers, and even resource scarcity all combined to spark self-directed learning activities. Moreover, participants reported that they initiated peer-led lesson study groups, sourced locally relevant teaching aids, and used reflective teaching logs to adapt theoretical methods to on-site realities. Such findings suggest that rural student-teachers often transform constraints into catalysts for proactive professional learning. This international evidence supports the present study's focus on how Thai PSTs also turn constraints into opportunities through SDPD.

Rural Pre-service Teacher Challenges

Rural schools face distinct challenges, including limited access to professional development and a sense of isolation (Hardwick-Franco, 2018; Maanum, 2023). In many countries, teacher education programs often overlook the needs of underprivileged schools, leaving PSTs without proper training or formal instruction in the pedagogy, content, and classroom practices required for teaching in rural settings (TALIS, 2013).

PSTs typically begin their practicum in rural schools after completing university coursework which is predicated on the availability of ample instructional materials and technology. Consequently, they often encounter persistent mismatches when enacting predetermined

lesson scripts and pedagogical frameworks originally devised for well-resourced classroom environments.

To illustrate this problem, Mudra (2024) investigated the experiences of seven urban EFL PSTs during a six-month practicum in rural Indonesian schools. The study revealed four principal challenges: shifts in teacher identity construction, intercultural sensitivity barriers, inadequate instructional and technological resources, and limited opportunities for ongoing professional development. These findings highlight the critical need for culturally responsive training, improved infrastructure support, and structured reflective practices in order to better prepare teacher candidates for the distinct demands of under-resourced rural classroom settings. Similarly, Mokoena and Mafugu (2024) found that PSTs in rural South African work-integrated learning placements faced reluctant or under-prepared mentors and inconsistent supervisory support due to remote schools' isolation. They also encountered chronic shortages of essential infrastructure, such as laboratories, reliable electricity, and up-to-date teaching materials, alongside overcrowded classrooms and teacher shortages, which together often forced them into unsupported caretaker roles, collectively undermining their professional development. These parallels suggest that Thai PSTs may face similar mismatches between university training and rural realities, which is central to RQ2, concerning the challenges that Thai PSTs encounter.

Another major challenge in rural contexts is the digital gap. Siregar et al. (2024) investigated EFL PSTs at a remote Indonesian university. The results showed that low levels of ICT proficiency, tight budgets, and weak technological infrastructure all hindered the incorporation of educational technologies into their teaching practice. Similarly, Francis (2024) highlighted that limited internet connectivity and inadequate IT support in rural regions impede both student engagement with remote instruction and teacher involvement in online professional networks.

Insufficient preparation in terms of both teaching methods and technology constrains PSTs' adaptability. Kaoropthai and Boonmoh (2023) interviewed CALL instructors across Thailand's rajabhat (former polytechnic) universities and found that many teacher educators lacked either robust pedagogical content knowledge or technological knowledge, leading to uneven support for PSTs in ICT integration. Instructors with strong ELT backgrounds struggled with digital tool use, while ICT specialists needed deeper grounding in language-teaching methodologies. Consequently, practicum oversight became uneven, and the way technology was woven into teaching lacked consistent, well-structured support.

In addition, financial and logistical limitations amplify these adaptation challenges. Siregar et al. (2024) noted that, in the absence of institutional stipends or subsidies, PSTs routinely cover their own transportation to remote practicum sites and the purchase of basic instructional materials. This arrangement exacerbates their sense of resource scarcity and increases their stress. Altogether, these rural challenges show why SDPD strategies must be realistic, low-tech when needed, and supported by peers and mentors, which informs the framing of RQ2.

The Role of Digital Tools, AI, and Online Resources in Self-directed Learning

Digital tools, AI, and online resources can greatly support self-directed learning (Boonmoh & Kulavichian, 2025; Dizon, 2025; Morris & Rohs, 2021; Sim et al., 2024; Tran et al., 2024; Zhang, 2023). However, they also introduce challenges in terms of maintaining self-regulation, aligning with pedagogical objectives, and upholding ethical standards (Estaiteyeh & McQuirter, 2024; Pokrivcakova, 2023; Stockwell, 2024; Taşçı & Tunaz, 2024). In rural contexts, these tools may address some limitations, e.g., a lack of materials, but they may also

create new barriers, especially when internet connections are poor, devices are out of date, or guidance in their use is weak.

Morris and Rohs (2021) note that digital tools aid in self-directed learning (SDL) by giving learners the ability to access materials at their own pace, monitor their progress, and participate in interactive activities. These tools empower learners to learn at their own convenience, thereby fostering autonomy, which is a central aspect of SDL. For instance, Sim et al. (2024) interviewed nine Korean elementary English teachers about the development of professionalism in using Educational Technology (EdTech). The study identifies key aspects of EdTech professionalism, such as a proactive approach to technology, continuous professional growth, and the adaptation of teaching methods to evolving technologies. The findings emphasized the importance of self-directed learning, collaboration with peers, and the integration of pedagogical, content, and technological knowledge. Similarly, Major et al. (2021) evaluated the effectiveness of technology-supported personalized learning in low- and middle-income countries (LMICs), involving 53,029 learners across five countries. The findings revealed that personalized learning technologies significantly improve learning outcomes in both mathematics and literacy. Thus, digital support for SDPD can be helpful, but it may also be double edged when guidance is weak or when tools do not match local classroom needs (Yang, 2023; Zhang, 2023).

The use of digital tools also presents challenges. Zhang (2023) explored the role of Open Educational Resources (OERs) in supporting teachers' SDPD in under-resourced contexts through a case study of a secondary teacher in China. The findings showed that although OERs provide free and accessible materials that encourage self-directed learning (SDL), many teachers face difficulty in locating high-quality resources that suit their particular teaching needs. Additionally, the sheer abundance of available resources can result in information overload, making it challenging for learners to select the most effective materials. This highlights the need for learners to possess strong self-regulation skills to effectively navigate and manage the extensive range of available options.

Next, artificial intelligence (AI is becoming more important in digital language teaching and learning, and its role in the future of EFL education is expected to grow even further (Mena Octavio et al., 2024; Schmidt & Strasser, 2022; Zeevy-Solovey, 2024). AI technologies, especially generative AI (GenAI) such as ChatGPT, have become valuable tools for improving SDL. AI can enhance personalized learning, improve lesson planning, and promote reflective practice, leading to more flexible and responsive teaching methods (Holmes et al., 2019; Luckin et al., 2022). For example, using ChatGPT as a virtual speaking tutor has improved learners' speaking self-efficacy through low-anxiety practice and quick feedback (Celik et al., 2025).

Tran et al. (2024) examined how ChatGPT supports professional development for Vietnamese EFL teachers, finding that it supports reflective practices and improves teaching techniques. Teachers received personalized feedback and accessed new resources, making AI tools valuable for self-directed learning, especially when traditional professional development is limited. Tafazoli (2024) similarly investigated the transformative potential of GenAI in addressing the educational challenges faced by 23 Iranian English language teachers. The study emphasized GenAI's ability to provide accessible, personalized learning materials, bridge the digital divide, and support professional development, while simultaneously overcoming ideological biases and technological barriers. The findings suggested that integrating GenAI into English language instruction fosters critical thinking, intellectual freedom, and inclusive education by accommodating diverse learning needs and cultural backgrounds.

However, using AI in SDL is not without its drawbacks. Taşçı and Tunaz (2024) explored the views of Turkish PSTs, identifying both the benefits and drawbacks of AI. Their research revealed that while AI can help save time, customize learning, and assist with lesson planning,

it also raised concerns about excessive reliance on technology, diminished teacher autonomy, and potential risks to data privacy. Similarly, Pokrivcakova (2023) discovered that more than 64% of Slovak EFL PSTs were in favor of integrating AI, but they also voiced concerns that AI could lessen the need for personalized teaching and undermine crucial instructional skills. Additionally, Sucháňová (2023) noted that AI applications offered better linguistic analysis and customized learning experiences, but the study warned against depending too much on AI for making instructional decisions.

When incorporating GenAI, educators must focus on ethical issues such as data privacy, algorithmic biases, and the responsible use of AI in educational environments. It is essential to develop policies and guidelines that promote transparency, fairness, and accountability in AI-based teaching practices (Tafazoli, 2024). Similarly, Estaiteyeh and McQuirter (2024) raised concerns regarding the accuracy, bias, and ethical challenges of AI tools. They noted that AI could sometimes deliver inaccurate or biased information, and excessive dependence on it could undermine learners' critical thinking and decision-making abilities. These concerns underscored the importance of educators guiding learners to use AI responsibly, ensuring it enhances rather than substitutes for critical thinking in self-directed learning. For Thai PSTs, these ethical and practical issues are especially pressing in rural schools, where internet access is uneven and teacher guidance is limited.

To summarize, digital tools, AI, and online resources can support SDPD by helping PSTs plan, reflect, and adapt lessons. At the same time, weak guidance, limited access, and information overload can reduce their value. This review shows that while international studies provide useful insights, we still know little about how Thai PSTs in rural placements blend personal initiative with peer and mentor support when using these tools. Addressing this gap is the aim of RQ3.

Method

Research Design

The aim of this study is to explore how PSTs manage SDPD in demanding teaching contexts, with particular attention to their use of technology and problem-solving strategies. A mixed-methods research design was utilized. Data were collected using both quantitative surveys and qualitative interviews to explore how Thai English PSTs engage in SDPD during their practicum preparation. The quantitative part focused on a structured questionnaire, while the qualitative part included semi-structured interviews to gain deeper insights into personal experiences.

This design was informed by four theoretical frameworks: Garrison's Self-Directed Learning model (1997), the Theory of Planned Behavior (Ajzen, 1991), Morris and Rohs's (2021) Digital SDL Framework, and a culturally sensitive reframing of SDPD relevant to the Thai context. These frameworks guided both instrument construction and data interpretation, helping the study explore internal motivation, behavioral intention, digital engagement, and culturally nuanced expressions of autonomy. In this study, the culturally sensitive lens was not a validated framework but an interpretive approach, emphasizing the relational autonomy, respect norms, and peer collaboration commonly found in Thai educational settings. This interpretive lens was grounded in Thai and regional studies showing that peer support, mentor respect, and practicum realities shape self-directed growth and technology use; therefore, we treated autonomy as relational rather than purely individual (Ardi et al., 2023; Kaoropthai & Boonmoh, 2023; Boonmoh & Kulavichian, 2025; Sukkamart et al., 2023). This design allows the study to capture patterns across a group while also understanding individual experiences and cultural meanings behind the behaviors. Such a combination is especially appropriate in Thai teacher education, where context and personal reflection strongly influence professional development.

Setting and Participants

Participants were 49 fourth-year students in the English Education Program at a rajabhat (former polytechnic) university in Thailand. The research participants consisted of 14 male and 35 female students. These students were preparing for a one-year teaching practicum in their fourth year, in either primary or secondary schools across various provinces. Of these, 31 completed their practicum in secondary schools, and 18 in primary schools, allowing for a comparison of two different types of teaching contexts. All the participants were familiar with basic educational technologies and had completed teaching-related coursework. However, their practicum environments varied widely in terms of available resources, digital infrastructure, and institutional support. Some schools were relatively well equipped, while others had very limited facilities, as reflected in a comparison of university and school resources. The diversity of their assigned schools, ranging from urban to rural, helped reveal different patterns of SDPD behavior in response to different teaching environments. All participants provided informed consent, with voluntary involvement. This research followed ethical guidelines approved by the university's research ethics committee. The study upheld data confidentiality and integrity by following ethical standards for secure storage, data protection and preservation, and anonymity. In addition, the study was approved by the Institutional Review Board of King Mongkut's University of Technology, following its expedited review process (approval number: KMUTT-IRB-COE-2025-064).

Instruments

Two research instruments were used in this study: a structured questionnaire and semi-structured interviews. These tools were designed to explore how PSTs engage in SDPD during their rural practicum, and how they respond to contextual challenges through digital tools, personal initiative, and peer support.

The first instrument was a structured questionnaire, consisting of 40 items rated on a 5-point Likert scale: Never (0), Rarely (1), Sometimes (2), Often (3), and Always (4). The choice of a 0–4 scale allowed for a clear distinction between "never" and "rarely," which was important for detecting differences in the frequency of SDPD behaviors. These items were grouped into five analytical sections. guided by a hybrid coding approach. Deductively, the structure drew upon four theoretical sources, namely Garrison's SDL Model (1997), which emphasizes self-management, self-monitoring, and motivation; Morris and Rohs's Digital SDL Framework (2021), which highlights digital tools, peer learning, and contextual flexibility; the Theory of Planned Behavior (Ajzen, 1991), which explains intention and perceived control; and cultural insights from existing Thai and regional studies on teacher development. Inductively, the categories were selected based on the themes that emerged from the Thai practicum context and from previous research.

The five questionnaire sections were:

- Section A (Items 1–4) covered school facilities and background context, including access to Wi-Fi, computers, projectors, TVs, and whiteboards, in order to compare the resources of the university and of practicum schools.
- Section B (Items 5–18) examined support and autonomy, including mentor support, peer interaction, visits from supervisors, guidance from lecturers, and the perceived sufficiency of both school and university support.
- Section C (Items 19–25) explored SDPD engagement, such as reading online articles, experimenting with new techniques, reflecting on lessons, and discussing strategies with peers.

- Section D (Items 26–32) addressed challenges in rural practicum environments, including differences in classroom management, lack of teaching resources, limited availability of technology, feelings of isolation, and difficulties applying university training to real classrooms.
- Section E (Items 33–40) investigated digital and AI support, including the use of ChatGPT or Google Translate for lesson planning, AI-generated lesson plans, confidence in adapting AI materials, online collaboration with teachers, and difficulties due to school restrictions or poor internet.

The second instrument consisted of semi-structured interviews with four participants. These were purposively selected to reflect diversity in gender, type of practicum school (primary versus secondary), and confidence with technology. The interview protocol was designed to align with the five main sections of the questionnaire, allowing for effective triangulation between survey data and narrative responses. Interview questions asked for examples of facilities used, types of support received, SDPD activities, challenges in adapting theory to practice, and the role of AI and digital tools. This format allowed for a deeper understanding of how PSTs developed professionally on their own, within the complex constraints of the rural school setting. Although only four interviews were conducted, no new themes emerged beyond those already captured in the survey, suggesting that data saturation was reached. We used maximum-variation sampling (gender, school level, and confidence with technology) to capture contrasting cases. The interviews were designed to provide depth and explain survey patterns, not to be statistically representative. The clear convergence between interview themes and the 49-person survey indicated practical saturation for this mixed-methods design. Small, focused qualitative samples are also used in Thai CALL/teacher-education work when the goal is to illuminate context-specific practices (Kaoropthai & Boonmoh, 2023).

To ensure relevance and clarity, three field experts reviewed the instruments for content validity. The questionnaire was piloted with 10 students from a similar background, and feedback was used to refine item wording.

Data Collection

This study adopted a mixed-methods approach to understand how PSTs develop self-directed learning strategies in their practicum. The integration of survey and interview data allowed the researchers to examine both shared trends and personal stories, especially regarding digital tool use, contextual challenges, and individual agency.

In Week 16, the first phase of data collection involved the online survey, completed by 49 PSTs teaching English in rural primary and secondary schools. The survey data were analyzed using descriptive statistics to identify common practices, confidence levels, and contextual barriers.

In Week 17, the second phase consisted of the semi-structured interviews with four participants, two each from primary and secondary schools, selected to reflect different practicum contexts and personal profiles. These interviews were designed to explore in greater depth how PSTs engaged in SDPD, adapted to local conditions, and made use of technology, AI tools, or peer networks. The interviews were conducted by telephone and lasted approximately 30 minutes each. With the participants' consent, all interviews were audio-recorded and later transcribed for thematic analysis.

Data Analysis

All survey data were screened for completeness and normality assumptions prior to analysis. Internal consistency of each survey subscale was assessed using Cronbach's alpha (α), with values $\geq .70$ indicating acceptable reliability (Tavakol & Dennick, 2011).

The quantitative data were analyzed using descriptive statistics (means and standard deviations) to identify common trends in SDPD behaviors across the five confirmed conceptual categories. Category-level comparisons were used to explore which forms of SDPD (e.g., core engagement, digital support, contextual adaptation) were more frequently practiced by the PSTs (Field, 2024).

The qualitative data were examined through thematic analysis. A hybrid approach was used: deductive coding drew on the study's four theoretical frameworks, while inductive coding allowed for the identification of unique local patterns, such as culturally mediated peer learning or the adaptive use of LINE-based communities. To improve the scientific rigor, two researchers independently coded the interview transcripts, compared their coding, and resolved discrepancies through discussion until consensus was reached.

To strengthen interpretive depth and validity, triangulation was applied, allowing insights from the survey to be cross-validated with narratives from the interviews. All interviews were transcribed verbatim and checked for accuracy. A thematic analysis was conducted following Braun and Clarke's (2006) six-phase framework: (1) familiarization with data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the report. Themes were refined collaboratively by the researchers to ensure they reflected both theoretical alignment and cultural relevance. In particular, codes were applied for socially mediated forms of self-direction, such as peer support and group-based initiatives, which reflect culturally grounded professional development practices.

Findings

Table 1 compares six common teaching facilities between universities and practicum schools. At the university, all the participants reported access to free Wi-Fi and whiteboards. High proportions also had access to computers (73.5%), projectors (83.7%), and televisions (71.4%). In contrast, all the practicum schools offered universal access to free Wi-Fi and whiteboards, but they showed a notably lower availability of computers (38.8%), projectors (42.9%), and televisions (44.9%). This gap is an early indicator of the mismatch between university preparation and rural classroom realities.

Table 1. *Comparison of Universities' and Practicum Schools' facilities (N = 49)*

Facilities	Free Wi-Fi	Computer	Projector	TV	Whiteboard	None
University	49 (100.0%)	36 (73.5%)	41 (83.7%)	35 (71.4%)	49 (100.0%)	–
School	49 (100.0%)	19 (38.8%)	21 (42.9%)	22 (44.9%)	49 (100.0%)	–

Table 2 presents the levels of support and perceived autonomy reported by PSTs during their practicum. The highest mean scores were, in order, for in-person visits from a university supervisor, group discussions with classmates, and guidance from mentor teachers. These results indicate strong in-person and peer-oriented supports. A clear pattern is that the provision of direct supervision and peer talk was strongest, while the provision of structured resources and planning help were weaker. This supports the interpretation that SDPD in this group was proactive but relational.

Table 2. *Support and perceived autonomy of PSTs in practicum schools*

Support	Mean	SD
6. You received in-person visits from a university supervisor.	3.63	0.52
7. You had group discussions with classmates about practicum experiences.	3.42	0.73
12. You received guidance from your mentor.	3.40	0.95
5. You received online guidance from university lecturers.	3.32	0.74
9. You received feedback from the school principal or senior teachers.	3.26	0.80
11. You received support in classroom management from the school.	3.26	0.78
16. You feel that the support you received from your mentor teacher was enough.	3.26	0.96
13. You can observe your mentor teacher's classes before teaching.	3.14	0.94
14. You received emotional support from your mentor teacher.	3.10	1.07
8. You received online resources from the university (e.g., lesson plan examples, teaching guides).	3.04	0.81
10. You received assistance in lesson planning from the school.	2.93	0.93
15. You felt that the support you received from your university was sufficient.	2.91	1.03

Mid-level items were, in order, online guidance from university lecturers, followed by feedback from school principals or senior teachers, classroom management support from the school, and the perceived sufficiency of mentor support. These results show moderately positive perceptions of practical and administrative support at schools.

Observing mentor teachers' classes before teaching and emotional support from mentors received somewhat lower means, suggesting that while these supports were generally present, more variation occurred in students' experiences.

Lower mean scores were found for access to online resources from the university, lesson-planning help from the school, and perceived sufficiency of overall university support. These lower scores point to areas for improvement in structured resource provision and planning assistance.

Overall, the findings suggest that while PSTs generally experienced good supervisory and peer support, their confidence in university-provided resources and consistent planning help was more limited. This supports the idea that SDPD was partly relational, with PSTs relying more on peers and mentors than on formal university resources.

Table 3 shows PSTs' SDPD engagement. The overall means on a 0–4 scale ranged from 3.26 to 3.69, indicating generally high engagement. The highest mean was for reading online articles or taking free online courses to improve teaching, followed by experimenting with different teaching techniques and discussing teaching challenges with peers, suggesting that PSTs frequently use online resources and engage in peer-supported innovation to improve their lessons. This combination of individual and peer strategies suggests that SDPD was not a solitary activity, but one that blended autonomy with collaboration.

Table 3. *PSTs' SD activities*

SDPD Engagement	Mean	SD
21. You read online articles, watch videos, or take free online courses to improve your teaching.	3.69	0.80
24. You experimented with different teaching techniques to see what works best.	3.65	0.74
23. You discussed teaching challenges and strategies with your peers.	3.61	0.78
19. You searched for ways to improve your teaching skills on your own.	3.38	0.72
20. You reflected on your teaching experiences and adjust your methods.	3.38	0.64
25. You looked for feedback from mentors, peers, or students to improve your teaching.	3.34	0.77
22. You participated in online teacher communities (Facebook, LINE groups, forums).	3.26	0.80

Mid-level scores were seen for searching independently for ways to improve teaching skills, reflecting on teaching experiences, and seeking feedback from mentors or students, indicating moderate confidence in self-evaluative and reflective activities.

The lowest mean among these items was participation in online teacher communities such as Facebook or LINE groups, although this still fell in the 'often' category. This pattern suggests that while this group of PSTs actively searched for knowledge and practiced new methods, their participation in broader online communities was slightly less frequent compared to their individual or small-group efforts.

Table 4. *Challenges reported by PSTs*

Challenges	Mean	SD
32. You experienced challenges in classroom management due to differences between university training and real-life teaching.	3.02	1.00
31. You felt confident in adjusting your teaching strategies to match the available resources.	2.81	0.82
26. You found it difficult to apply what you learned at university due to a lack of teaching resources in my practicum school.	1.97	1.17
29. You struggled to integrate technology into your lessons due to limited school resources.	1.83	1.33
30. You had to rely more on self-learning because you did not receive enough direct support.	1.75	1.17
27. You often felt unprepared because your practicum school environment was different from your university classroom.	1.69	1.18
28. You felt isolated because you could not meet with your university lecturers frequently.	1.55	1.20

Table 4 summarizes the challenges reported by PSTs. Mean scores ranged from 1.55 to 3.02. The most prominent challenge was classroom management difficulties due to differences between university training and actual teaching, showing this was a consistent obstacle. Confidence in adjusting teaching strategies to limited resources showed a mid-high mean, suggesting that some students were still working to adapt.

Mid-level challenges included difficulty applying university-learned methods due to resource shortages and struggles to integrate technology. The standard deviations on these items were relatively high, indicating wide differences in participants' experiences. This shows that while some PSTs adapted well, others struggled significantly, reflecting uneven levels of readiness for the reality of rural teaching.

Lower mean scores were reported for relying more on self-learning because of low direct support, feeling unprepared due to school–university differences, and feeling isolated from university lecturers. These lower scores suggest that some PSTs experienced occasional feelings of disconnection or uncertainty, but that these were less frequent than classroom management or resource challenges.

Table 5. *Use of digital tools, ai, and online resources by student-teachers*

Use of Digital Tools, AI, and Online Resources	Mean	SD
33. You used AI tools (ChatGPT, Google Translate, etc.) to help with lesson planning	3.14	0.97
34. You used online teaching resources (YouTube, educational websites) to improve your lessons	3.12	0.87
36. You found AI-generated lesson plans helpful in improving your teaching	2.67	0.98
37. You felt confident in modifying AI-generated materials to fit your students' needs	2.63	1.0
35. You collaborated with other teachers online to get new teaching ideas	2.59	1.09
39. You faced difficulties in using digital tools due to school restrictions or lack of internet	2.14	1.21
38. You struggled with using AI tools effectively in your teaching	2.12	1.19

Table 5 summarizes how PSTs used digital tools, AI, and online resources to support lesson planning and instructional practices. Mean ratings on a 0–4 scale ranged from 2.12 to 3.14, reflecting usage from 'sometimes' to 'often'.

The highest mean was for using AI tools such as ChatGPT or Google Translate to help plan lessons, followed closely by using general online teaching resources like YouTube or educational websites. This indicates that most PSTs actively sought digital support to supplement their teaching, particularly for lesson planning.

Mid-level mean scores were for using AI-generated lesson plans, confidence in adapting AI materials to suit students' needs, and collaborating online with other teachers to exchange ideas. These results suggest partial but not full confidence on the part of the PSTs in customizing digital resources and working through online communities.

The lowest mean scores were for difficulties due to school restrictions or poor internet and struggles to use AI tools effectively). Although these issues were less frequent overall, their relatively high standard deviations show wide variation in experiences with school digital infrastructure and AI readiness. This variability highlights that while many PSTs embraced AI tools, others lacked the skills or conditions to use them effectively.

Overall, the data show that PSTs made frequent use of digital and AI tools, but that there were practical and technical challenges to fully integrating these tools into their rural practicum settings persisted.

In addition, most participants (95.9%) reported that the overall support they received during the practicum was sufficient, and a large majority (85.7%) stated they felt more independent during the practicum compared to university classes. This reflects both the opportunities and risks of AI in SDPD, suggesting the need for stronger preparation in digital literacy.

Engagement in Self-directed Professional Development

The interviews confirmed that the PSTs actively engaged in SDPD. All four participants described searching for teaching ideas online, adapting those resources, and experimenting with lesson activities. For example, Student 1 explained:

> My school is in a rural area, so there isn't much supporting equipment available. However, because I aim to help the children improve their English skills, I often search for new teaching ideas and techniques on YouTube and various websites. Moreover, whenever there's content I'm unsure about, I review it and look for information online. I enjoy discovering engaging teaching techniques—including fun games—and adapting them for my students. Sometimes I jot down which techniques or games work best for them so I can compile and use them in future lessons.

This supports the survey finding that online articles and resources were frequently used for SDPD.

Furthermore, intrinsic motivation emerged as an important driver of SDPD. Student 4 explained:

> My goal is to help the children become more capable, so I have to strive to improve my teaching skills. I enjoy observing my students' behavior—whether they're interested or bored with this style of learning—to see if I'm making progress. When I see them answering correctly and enjoying the lesson, I feel that I've grown as well, and it makes me very happy.

This shows that internal motivation supported continuous improvement.

Extrinsic motivation and support from mentor teachers were also highlighted. Student 1 stated:

> During my practicum, my mentor teacher often gave me advice on lesson planning and various classroom management techniques. Sometimes I would observe his classes to learn from him. Beyond teaching methods, my mentor teacher also encouraged me during the early stages of my practicum. At first, I was quite anxious about teaching responsibilities and the school's paperwork, but the support I received from my mentor teacher in so many ways made me want to become as skilled a teacher as he is.

Besides mentor teachers, support from supervising instructors and peers was mentioned. Student 2 explained:

> Although the supervising instructor only came three times during the semester, I felt fully supported by them. They always encouraged me and spoke with me so I wouldn't feel isolated. In terms of teaching, the instructor consistently offered practical advice that I could apply in the classroom, as well as guidance on my work and life at school. Additionally, discussing and consulting with my friends from other schools—sharing teaching techniques, game activities, and classroom materials, and talking through various challenges—made me feel that I was growing and learning alongside them, which was incredibly valuable.

These findings suggest that both peer and institutional supports complemented self-directed actions. Interpreted alongside Tables 2 and 3, the interviews show a consistent pattern: PSTs acted on their own initiative while also relying on discussion, observation, and feedback in order to refine lessons. This indicates that SDPD was both proactive and relational in nature, rather than solitary.

Challenges in Resource-limited Environments

In addition to technology problems, PSTs described classroom management as a significant challenge. Student 4 explained:

> I think teaching real students in school is nothing like my training at university. In university, everything followed a set pattern step by step, and classmates could answer every question. But in real lessons, when managing the class, students may choose to respond or not, and unexpected issues can arise at any time. Sometimes, while teaching, the screen suddenly goes black, which forces me to handle the situation urgently.

Student 1 added:

> At first, I felt I had to adjust a lot to dealing with real elementary students. They're quite playful and can't stay focused on the teacher's instructions for long, unlike at university where I could cover every step according to the lesson plan. Sometimes the Wi-Fi signal was poor, the internet would drop and I had to reconnect often, and the classroom TV wouldn't turn on.

These excerpts confirm the challenge of adapting planned lessons to unpredictable, resource-poor contexts. The first excerpt illustrates a shift from scripted lessons to the real-time management of mixed responses, while the second provides concrete examples of unstable connectivity and equipment. These points correspond with the hardest challenge in Table 4, i.e., classroom management, as well as the moderate difficulties with technology and resource gaps. They also help explain why some items demonstrated high variability, i.e., because school conditions and mentoring differed across placements.

Role of Digital Tools, AI and Online Resources

The participants described how digital tools, AI, and online resources supported their professional development. Student 2 explained:

> When I want to research and discover fresh teaching techniques, I sometimes ask ChatGPT to suggest engaging activities or games on various topics. I then adapt them to my students' level, which saves me time and makes my lessons more fun and vibrant. I also like to find and download clips from YouTube to show the students... I think they engage more with the lesson than if we only learn from the textbook.

However, Student 3 expressed the need for caution when using digital tools:

> I think digital tools, AI, and online resources are incredibly helpful for teaching—they introduce me to many new techniques and strategies. But, sometimes the sheer volume of information makes it hard to filter and choose the most appropriate content or materials. Teachers need to exercise good judgment when using AI...

This supports the quantitative finding that while AI and digital tools were widely adopted, confidence in adapting them varied. The interviews align with the findings presented in Table 5: use of AI and online resources was frequent for lesson planning, but confidence in modifying AI outputs was moderate, and conditions such as connectivity and school policy were uneven. These patterns suggest a need for simple protocols and critical digital literacy so that PSTs can select, adapt, and apply materials that fit their students and school contexts.

Summary of Interview Insights

Across the three interview themes, the narrative evidence complements the survey results: PSTs demonstrated active self-improvement, faced practical classroom and resource constraints, and used digital tools to bridge gaps when possible. The balance of initiative and collaboration appears central to how SDPD was operationalized during the practicum.

Discussion

SDPD Engagement: Proactive and Relational

The results indicated that the Thai PSTs showed high levels of SDPD, including searching for new teaching ideas, trying out different classroom techniques, and setting personal teaching goals. These findings resonate with Garrison's (1997) concept of self-management, self-monitoring, and motivation as essential elements of SDL, confirming that even in under-resourced contexts, teachers can sustain autonomous growth.

However, this study also highlighted that much of the SDPD took place through collaborative peer networks, such as LINE groups, discussions with classmates, and informal sharing of resources. This finding supports Yang (2023), who showed that autonomy in blended learning can be double-edged and often requires social negotiation, and Ghaemi and Boroushaki (2025), who emphasized the role of culturally responsive collaboration in teacher preparation. While classic SDPD frameworks (Garrison, 1997; Shurr et al., 2014) emphasize individual initiative, the present study supports Sukkamart et al. (2023), Oeamoum and Sriwichai (2020), and Mokoena and Mafugu (2024) in suggesting that SDPD in collectivist settings may take a

relational form, blending personal initiative with social support. This culturally grounded pattern is also visible in Thai teacher education research (Kaoropthai & Boonmoh, 2023; Boonmoh & Kulavichian, 2025), which shows that peer collaboration, respect norms, and resource improvisation often drive professional growth where institutional support is limited.

Challenges: Adapting University Training to Rural Realities

The findings also revealed that the PSTs struggled with mismatches between the university's structured, resource-rich lesson plans and the unpredictable, resource-poor rural school environments. Problems included classroom management difficulties, limited equipment, and the need to improvise lessons due to broken or absent technology. These barriers reflect the challenges described by Francis (2024) and Mudra (2024), who noted that rural practicum placements often expose teachers to unfamiliar multigrade or mixed-ability settings, with limited support.

The lack of targeted preparation for rural realities, including managing students with diverse needs and minimal resources, parallels the gaps noted by Kaoropthai and Boonmoh (2023) in Thailand's teacher education programs. PSTs in the present study reported feelings of anxiety, stress, and unpreparedness, echoing similar concerns in Maanum (2023), Oeamoum and Sriwichai (2020), and Siregar et al. (2024). Despite these challenges, the findings showed that some PSTs reframed constraints as opportunities for growth, demonstrating resilience and adaptive agency.

Digital Tools, AI, and Online Resources: Opportunities and Risks

The results confirmed that digital resources and AI tools played a significant role in supporting SDPD. PSTs frequently relied on YouTube, websites, and ChatGPT to fill resource gaps. This supports previous findings by Boonmoh and Kulavichian (2025) and Tran et al. (2024), who found that AI-assisted tools and online communities can enrich lesson planning and reflective practices.

However, the data also showed that students sometimes struggled to critically evaluate or adapt AI-generated resources, a problem noted by Estaiteyeh and McQuirter (2024) and Taşçı and Tunaz (2024), who warned of risks related to over-reliance and reduced teacher agency. In the present study, PSTs described difficulty in selecting high-quality materials from the overwhelming quantity available online, a challenge consistent with Zhang (2023).

Overall, the role of digital tools and AI in SDPD was seen as positive but partial: they expanded access to knowledge, yet depended on the teacher's confidence, skills, and judgment. This underscores the need for teacher education programs to embed critical digital literacy skills, as argued by Major et al. (2021) and Sim et al. (2024) . These findings further support Yang (2023) in that flexibility without structure may overwhelm learners, and they align with Ghaemi and Boroushaki's (2025) call for culturally responsive preparation that recognizes diverse digital realities.

In summary, these interpretations suggest that SDPD in Thai PSTs combines universal elements of self-directed professional learning with culturally specific, relational practices. While technology and AI offer valuable support, they cannot fully replace strong pedagogical preparation or local adaptation to rural school environments.

Culturally Contextualized Reinterpretation of SDPD

This study offers a culturally grounded reinterpretation of SDPD in the Thai rural teaching practicum. The findings indicate that PSTs did not experience SDPD as a purely individual or solitary pursuit, as is often assumed in Western-oriented frameworks (Garrison, 1997;

Shurr et al., 2014). Instead, their self-direction frequently involved relational, socially mediated strategies, for example, discussing lesson ideas with peers via LINE, informally sharing classroom materials, and observing their mentor teachers in practice. These patterns reflect a Thai cultural emphasis on collective responsibility, respect for seniority, and learning within social networks (Sukkamart et al., 2023).

From this perspective, the study suggests that relational forms of SDPD should not be discounted as a lack of independence, but instead recognized as authentic, culturally legitimate expressions of professional agency. This aligns with Mokoena and Mafugu (2024), who argued that rural PSTs in South Africa relied on peer-led lesson study groups and informal knowledge sharing as valid strategies for SDPD in a similarly collectivist setting.

Furthermore, the findings showed that the PSTs demonstrated what could be called culturally mediated agency. For example, they adapted lesson plans, modified AI-generated materials, and repurposed available resources to meet local needs despite limited conditions. These adaptations echo the Thailand-based studies conducted by Kaoropthai and Boonmoh (2023), Boonmoh and Kulavichian (2025), and Oeamoum and Sriwichai (2020), who all highlight that professional growth often depends on improvisation, peer consultation, and navigating resource scarcity.

This reinterpretation contributes to the literature by expanding the definition of SDPD beyond the Western-centric focus on solitary initiative and individual reflection. It argues that self-direction, when viewed through a Thai cultural lens, is best understood as relationally autonomous, where collective knowledge, mentor guidance, and peer support play integral roles in sustaining a teacher's professional growth.

Such culturally contextualized understandings are vital for designing teacher education programs that respect and build upon the social norms and educational traditions of non-Western, under-resourced environments. They also invite international scholars to rethink SDPD more inclusively, acknowledging diverse pathways of agency and autonomy.

Implications for Policy and Practice

This study offers several key implications for teacher education policy as well as actionable suggestions for improving day-to-day practice for PSTs, mentors, and teacher educators.

At the policy level, the results highlight the need for teacher education curricula to explicitly prepare PSTs for resource-limited environments. Current programs often emphasize teaching strategies, lesson scripts, and technologies suited to urban or well-equipped schools, yet PSTs reported difficulty applying these models in rural classrooms with multigrade groups, limited technology, and unpredictable student behaviors. Teacher education policy should therefore integrate more authentic, scenario-based training that anticipates rural realities, echoing Yang (2023) on balancing autonomy with guidance.

Additionally, the role of peer networks and informal mentoring deserves greater institutional support. The Thai PSTs benefited tremendously from sharing ideas through LINE groups, consulting with classmates, and observing mentors, which functioned as culturally authentic forms of SDPD. This aligns with Ghaemi and Boroushaki's (2025) call for culturally responsive frameworks that respect collective practices.

The findings also suggest a need for targeted training in critical digital literacy. While PSTs embraced digital tools and AI applications to enrich their lessons, they also described challenges in evaluating, adapting, and modifying online content. This supports recommendations by Major et al. (2021) and Sim et al. (2024) to embed digital literacy skills explicitly in teacher training. Similarly, Celik et al. (2025) demonstrated that structured AI use can enhance learners' confidence when framed pedagogically, suggesting that PSTs need scaffolding to use AI effectively.

Finally, policymakers should address structural inequities by investing more resources in rural PST education infrastructure. This includes improving internet connectivity, upgrading hardware, and ensuring consistent mentor teacher support, as well as providing stipends for travel or materials.

Limitations of the Study

While this study provides valuable insights into how Thai PSTs engage in SDPD during rural teaching practicums, it has several limitations. Firstly, the study was conducted with a relatively small sample of 49 PSTs from a single Rajabhat university. As a result, the findings may not fully represent PSTs from other universities, private institutions, or regions with different resources and educational cultures. Secondly, the interview data came from only four participants, which, while offering rich narrative detail, may limit the diversity of voices included, particularly with respect to provincial or ethnic variations. Thirdly, the study relied on self-report questionnaires and interviews. This approach may introduce a social desirability bias, as participants could have described their behaviors in a more positive light or under-reported struggles to appear professionally competent. Fourthly, the study was cross-sectional, capturing a snapshot in one semester of practicum. Longer-term patterns of SDPD, including how these habits sustain into a teacher's early professional years, remain unclear and could benefit from a longitudinal design. Finally, while this study proposes a culturally sensitive reinterpretation of SDPD, it is built on evidence from a single national context. Further comparative research is needed to validate whether similar patterns of relational autonomy and peer-supported SDPD appear in other collectivist or under-resourced societies.

Conclusion

This study explored how Thai PSTs engage in SDPD during their rural practicum experiences, with a focus on how they use technology, problem-solving strategies, and culturally rooted collaboration to bridge gaps between university preparation and real classroom contexts.

The findings showed that PSTs took active responsibility for their professional growth by searching online resources, experimenting with diverse teaching methods, and reflecting on their practices. At the same time, they benefited strongly from culturally grounded, socially mediated support systems, such as mentor advice, peer discussions, and informal LINE networks. These patterns reveal that SDPD among Thai PSTs blends personal initiative with relational forms of autonomy, reflecting a culturally appropriate adaptation of professional learning.

The role of digital tools and AI emerged as significant, providing PSTs with flexible, affordable, and immediate resources to support lesson planning and creativity. However, these tools could not fully substitute for strong pedagogical foundations or for critical thinking about local student needs, highlighting the necessity of culturally responsive, context-aware teacher preparation.

The study contributes to the literature in several important ways. It extends SDPD frameworks by showing how collective forms of autonomy and peer-supported initiatives can be powerful in collectivist, under-resourced settings (Kaoropthai & Boonmoh, 2023; Boonmoh & Kulavichian, 2025; Oeamoum & Sriwichai, 2020). It also resonates with Celik et al. (2025), Ghaemi and Boroushaki (2025), and Yang (2023) in positioning Thai PSTs' practices within wider debates about AI, autonomy, and culturally responsive teacher learning.

In sum, this research highlights that SDPD is shaped by both universal principles of autonomy and culturally specific practices of social learning. By acknowledging and supporting this dual nature, teacher education programs can build more relevant, sustainable, and empowering pathways for the next generation of Thailand's teachers in Thailand and perhaps other collectivist, resource-constrained education systems worldwide.

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