

How Thai EFL Pre-service Teachers Develop Materials: A Grounded Theory Study

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ABSTRACT

This research is a grounded theory study that aims to generate a theory to account for Thai EFL pre-service teachers' materials development. The participants were twenty-two EFL pre-service teachers. Three rounds of stimulated recall interviews, consisting of five main research questions, were implemented. The resultant data was then analyzed using three coding processes: open, axial and selective coding. Peer debriefing and member checking were used to strengthen this qualitative research. The theory explains that Thai EFL pre-service teachers' materials development processes comprise four main stages. The first stage is the pre-development stage. The process is affected by two main aspects: personnel and school. These aspects are influential in terms of opportunities, awareness, and regulation. The second stage is the development stage, which deals with developing materials. The third stage is the implementation stage, in which pre-service teachers analyze the materials and either implement them as planned, or with difficulty. In the final, post-implementation stage, they reflect

	<p>on the suitability of their materials used in the classroom. The research demonstrates the professional development concerns of the pre-service teachers and has implications for the teaching profession community.</p> <p>Keywords: grounded theory, materials development, EFL pre-service teachers, teaching profession</p>
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Introduction

In general, students may prefer not to learn English because they may find the subject matter boring since subject matter presented in an unfamiliar language may be demotivating, and although they may try hard to express their ideas, they may be unsuccessful (Punthumasen, 2017). To solve this problem, instructional materials are used to facilitate language acquisition as well as increase students' motivation in the English classroom. However, as Maley (2016) stated, materials development is a highly complex process in which we constantly reflect on what is appropriate. Tomlinson (2011) introduced 16 principles for materials development derived from research and experience in second language acquisition. Additionally, he highlighted essential qualities of effective materials, such as usefulness and relevancy to students' lives. Nevertheless, applying all the principles of materials development is challenging for English teachers, especially pre-service teachers, who lack experience.

There is evidence that pre-service teachers experience significant difficulties in materials development. Ulla (2019) noted that inexperienced teachers often rely heavily on commercial textbooks rather than creating their own materials, largely because these resources already provide structured content and pedagogical activities. As a result, they tend to follow the textbooks' guidelines without engaging in the design process. This finding aligns with Donoso's (2018) study, which observed that most pre-service teachers gather activities from various sources such as textbooks, websites, and newspapers to use in their lessons, yet many lack the knowledge or skills to design original materials. This reliance on pre-existing materials contrasts with Tomlinson's (2011) perspective on effective materials, which emphasizes the importance of relevance and meaningfulness through connections to learners' interests and real-life contexts. Commercial textbooks and ready-made materials, however, are often centered around the social life and culture of Western authors (Gunantar, 2017), which may not align with students' actual needs (Triyoga, 2019) and frequently overlook their background knowledge (Behnke, 2018).

As is well-known in the ELT field, materials development is one of the most essential skills of pre-service teachers in order to provide a better

learning environment and outcomes for their students. In fact, a pre-service teacher is just a student in the university who requires knowledge and guidance to develop materials. They are still learning to be great teachers as well as to be good materials developers. Thus, in-depth study of EFL pre-service teachers' materials development processes in an authentic setting should be conducted in the hope that there will be a better understanding of these processes. The discussion and implications could shed light on approaches to assisting pre-service teachers in the materials development process while offering directions for future research on materials development in the EFL context.

The purpose of the study

The study aims to generate a theory to explain the process of Thai EFL pre-service teachers' materials development. To generate a theory, five main questions were addressed to elicit data from pre-service teachers.

1) What factors influence Thai EFL pre-service teachers' materials development?

2) How do Thai EFL pre-service teachers develop materials?

There were 4 sub-research questions:

2.1) What is the procedure for materials development of pre-service teachers?

2.2) How do pre-service teachers adopt and adapt materials?

2.3) How do pre-service teachers design and produce materials?

2.4) How do pre-service teachers evaluate materials?

3) How do pre-service teachers implement materials?

4) What do pre-service teachers do after implementing materials?

5) What challenges do pre-service teachers face in developing instructional materials and how can these challenges be overcome?

Literature Review

Materials development, as defined by Tomlinson (2011, p. 2), is "anything which is done by writers, teachers or learners to provide sources of language input and to exploit those sources in ways which maximize the likelihood of intake." Nunan (1991) added that material development deals with the selection, adaptation, and creation of teaching materials. In the same way, Tomlinson (2013) mentioned that materials development is a practical undertaking involving the production, adaptation, and evaluation of materials planned to promote language acquisition. Materials development encompasses the combination of essential components that help language

learners and teachers fulfill a good learning environment (Pardo & Tellez, 2009).

Why are materials crucial in the classroom? It is clear that the effective usage of various sorts of materials would support students' learning. Materials should be closely related to 'real-life' (Tomlinson 2011). Additionally, Ahmed et al. (2024) emphasized that teaching-learning materials are vital in improving students' academic performance since they make the learning process more interesting and stimulating for students. These materials facilitate students' understanding of complex concepts by presenting data in an interactive way. This emphasizes the fact that materials are the resources used to foster students' language learning processes.

However, materials development is not easy for teachers, especially pre-service teachers. There are many research studies demonstrating the challenges of materials development in Thailand. Noom-ura (2013) highlighted three areas which present problems. Firstly, curricula can be out of date and teachers lack the opportunity to choose their own textbooks. Secondly, curricula and materials are often inappropriate for local conditions, and thirdly, teaching aids are often inadequate. Likewise, Wattanavorakijkul's (2019) research showed that the teachers most needed to improve their skills in developing creative materials as well as to participate in academic enrichment and professional development programs.

Challenges in materials development extend beyond Thailand and are commonly reported in EFL settings worldwide. In Vietnam, pre-service teachers often face difficulties in designing materials that effectively maintain students' motivation (Listiyani, 2024). In Japan, a lack of technological skills and difficulty in creating relevant, engaging content are among the key issues (Walsh & Cullen, 2020). In Indonesia, teachers frequently struggle to select media appropriate to their students' proficiency levels and often need additional time to adapt materials to better align with learners' needs (Nababan & Amalia, 2020; Maharani & Fithriani, 2023).

These recurring challenges, observed both in Thailand and in other EFL contexts, highlight the complexity of materials development and the need for a deeper understanding of how pre-service teachers navigate this process.

Methodology

Research Design

This research employed grounded theory to investigate pre-service teachers' materials development processes and generate theoretical insights grounded in empirical data. As a flexible qualitative method, grounded

theory enables the systematic collection and analysis of data to uncover underlying patterns. Noble and Mitchell (2016) describe it as a method for developing theory rooted in data, particularly useful for exploring social relationships and group behaviors.

Context

Setting

This study was conducted in the context of the Faculty of Education in a public university in Northern Thailand, which runs bachelor's degree programs and prepares students to teach in a variety of school settings. The participants in this study were in an English Language Teaching program and were required to participate in pedagogical, linguistic, and general education courses which were to be completed within three and a half years. In the second semester of the fourth year, the undergraduate students, now regarded as pre-service teachers, were to gain more teaching experience by enrolling in the course of Teaching Profession Practicum in School.

Teaching Practicum

Supervisors provided a list of approximately 40 schools, located in the northern part of Thailand, that were available for teaching practicum. The number of pre-service teachers in each school was dependent on the school's decision. Undergraduate students were allowed to choose the school where they would participate. Pre-service teachers were responsible for English classes in grades 1 to 12, depending on the school supervisors' decision. Most students in the classroom were Thai. However, in some schools, classrooms included both Thai students and those from ethnic minority backgrounds, such as Karen and Tai-Yai. Although all students learn English in a foreign language context (EFL), the order in which they learn languages differs. Thai students typically learn English as their second language, while ethnic minority students often learn it as a third language, following their mother tongue and Thai. Pre-service teachers were in charge of English classes for 9 – 12 periods per week. They were responsible for preparing lessons and educating students as well as developing materials related to the lessons. They were also required to complete some duties such as library work, paperwork, and nursing work, depending on the schedule assigned by school supervisors.

Supervision

Supervision is the process of monitoring and ensuring the effective implementation of teaching practice aimed at achieving intended educational

outcomes. In this context, two groups of supervisors were involved: school supervisors and university supervisors. The school supervisors were in-service teachers where pre-service teachers performed their practicum. The university supervisors were four faculty members from the university. Supervisors were responsible for mentoring and supervising pre-service teachers. According to the regulations set by the Teachers' Council of Thailand, both school and university supervisors were required to observe each pre-service teacher's teaching performance at least three times per semester, totaling a minimum of six supervision per semester. The supervision focused on three core dimensions, which could be reflected in both lesson plans and classroom performance: 1) subject matter, 2) pedagogical aspects, and 3) desirable characteristics of a teacher. Materials development primarily related to the first two dimensions: subject matter content and pedagogical aspects.

Participants

The participants were twenty-two fourth-year EFFL pre-service teachers from the faculty of education who had recently completed their teaching practicum. Participants were selected using a purposive sampling technique. The criteria are 1) they were fourth-year EFL pre-service teachers 2) Their ages ranged between 20-22 years old. 3) Their levels of English proficiency were at the B1– B2 level of CEFR. 4) Their first language was Thai. The main goal of purposive sampling is to focus on particular characteristics of a population that are of interest, which will best enable a researcher to gain insight and understanding through the research study.

Data collection

Stimulated Recall Interview

A stimulated recall is an inner-directed measure in which the learner is provided with a stimulus and engaged in reflections on the thought processes he had in mind while developing materials. Stimulated recall is an introspective method that represents a means of eliciting data about thought processes involved in carrying out a task (Gass & Mackey, 2013).

The semi-structured stimulated recall interviews were conducted individually, either online via Zoom or in person at the researcher's office in the Faculty of Education. The date and time were scheduled according to each participant's availability. The duration of each interview ranged from 15 to 60 minutes, depending on the flow of the conversation, the number of subsequent questions, and emerging points of interest. Each participant took part in three rounds of interviews. The first round focused on the factors

influencing pre-service teachers' materials development. The second explored the processes they used to develop materials, while the third examined the challenges they faced and the solution. The lists of prepared questions for each round can be seen in Appendix A. This multi-phase interview process was conducted over five months to reach data saturation.

The stimuli in this study were lesson plans and materials used by pre-service teachers during their practicum. In interviews, participants discussed how they developed these materials, their thought processes, and reflections on strengths and weaknesses. The materials took various forms, such as textbooks, worksheets, videos, PowerPoint slides, handmade items, and ICT tools. This diversity aligns with the grounded theory approach, which seeks to explore the overall process of materials development as it naturally occurs in authentic teaching contexts.

Procedures of data collection

The purpose and procedures of the study were explained during an initial meeting with the participants, where it was also made clear that participation was voluntary and would not affect practicum grades. Information was delivered in a friendly manner, and participants were given seven days to consider signing the consent form. They were assured of their right to withdraw at any time, the confidentiality of their data and identities, and were provided with the researchers' contact details (e.g., Line ID and phone number) for further inquiries.

Data collection was divided into two phases: examining developed materials and the stimulated recall interview. The participants were asked to submit some lesson plans and materials they used in the classroom. The researchers examined the lesson plans and materials and then prepared some specific interview questions. The researchers then waited for pre-service teachers to schedule the time and date for the interview. During the interview, the prepared questions and subsequent questions regarding the research questions in each round were utilized to explore the materials development processes.

Data analysis

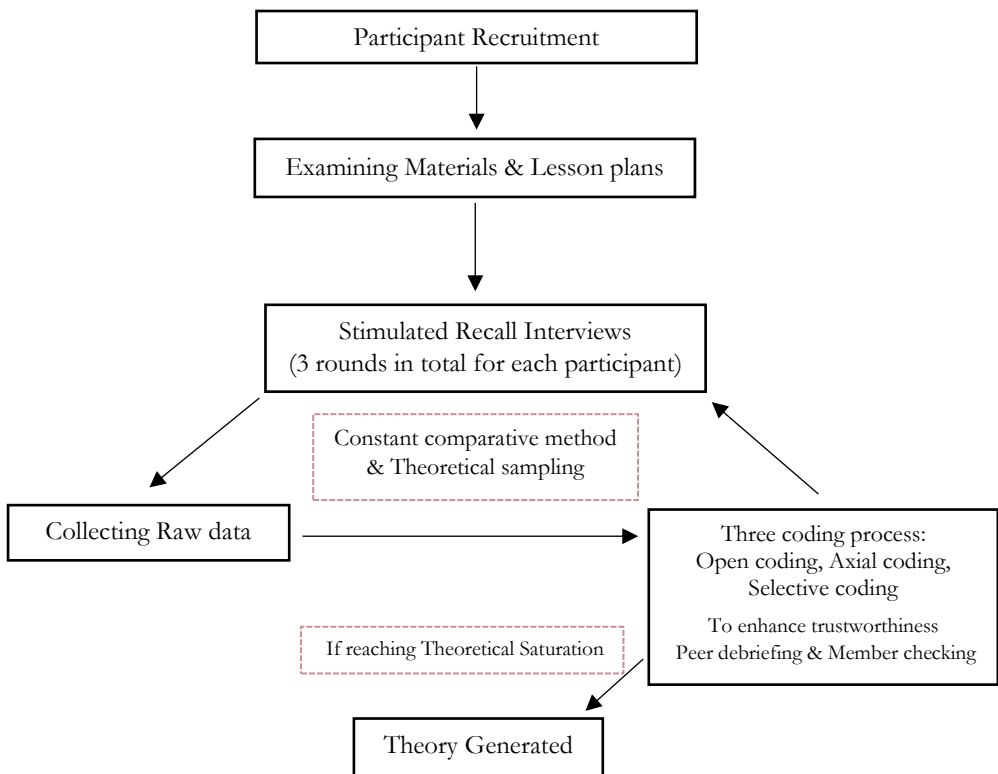
The data were analyzed using the three coding procedures proposed by Corbin and Strauss (2014): open coding, axial coding, and selective coding. Open coding involved breaking the data into smaller segments to identify core ideas and group similarities and differences. Axial coding built on this by exploring relationships among the categories, while selective coding integrated these categories into a cohesive theory. The researchers also engaged in a constant comparative method, moving between interview

transcripts and the development of codes and categories. Additionally, theoretical sampling was used to guide ongoing data collection based on emerging categories, meaning the researchers remained open to collecting any relevant data sources that could inform or refine the developing theory as it emerged during the research process.

To enhance trustworthiness, peer debriefing and member checking were employed. Colleagues and the research advisor reviewed the coding process, and participants were asked to verify the accuracy of summarized data to ensure it reflected their experiences.

To summarize the research procedure, Figure 1 presents an overview of data collection and data analysis.

Figure 1 Data Collection & Data Analysis Procedure



Results

Thai EFL pre-service teachers' materials development processes consist of four main stages: Stage 1 is the pre-development stage, Stage 2 is the development stage, Stage 3 is the implementation stage, and Stage 4 is the

post-implementation stage. Figure 2 demonstrates each stage of Thai EFL pre-service teachers' materials development.

Stage 1, the pre-development stage, is the stage before pre-service teachers develop materials. This stage identifies the factors that influence pre-service teachers before they develop materials. The influences include Personnel and School aspects. Personnel encompass school supervisors, students, pre-service teachers, graduates, lecturers, and teachers. School aspects include school policies, classroom settings, and school facilities. They influence pre-service teachers' materials development in several ways. Some influences are optional for pre-service teachers, and are labeled 'opportunities'. Influences which they are already aware of are labelled 'awareness' and those that are compulsory are labelled 'regulation.' Pre-service teachers consider these influences before developing materials.

Stage 2, the development stage, is the stage when pre-service teachers develop materials. Firstly, pre-service teachers examine the classroom activities contained in the lesson plan. Sometimes, they consider their limitations and decide how to develop materials. They have two options: searching for existing materials or designing new materials. If they choose to deal with existing materials, they search for them from sources and then evaluate them. If the materials are highly suitable, they adopt them. If the materials are not quite suitable, they adapt materials to fit in their classroom. If the materials are unsuitable for their context, they design new materials instead. When developing materials from scratch, they design and then produce materials. There are two different scenarios: produce as planned and produce with difficulty. If the materials production goes as planned, the materials are completed. However, if they have difficulty in producing materials, they find ways to solve problems and redesign them if the problems cannot be solved. After completing the materials, they are sometimes examined by school supervisors, peers, and parents - a father or mother who was also an English teacher or had a certain level of English proficiency. Then, pre-service teachers adapt materials accordingly before implementing them.

Next is stage 3: the implementation which shows how pre-service teachers implement their materials in the classroom. During the implementation, pre-service teachers start by evaluating the implementation of materials. They observe students' reactions and the classroom atmosphere to determine how effective their materials are. Apart from observing students, pre-service teachers are concerned about the time required to implement them. The time required for each piece of material is estimated during implementation. Pre-service teachers can also inspect flaws during the implementation of materials. After that, they analyze the implementation and make a judgment on the implementation, which can be categorized into two

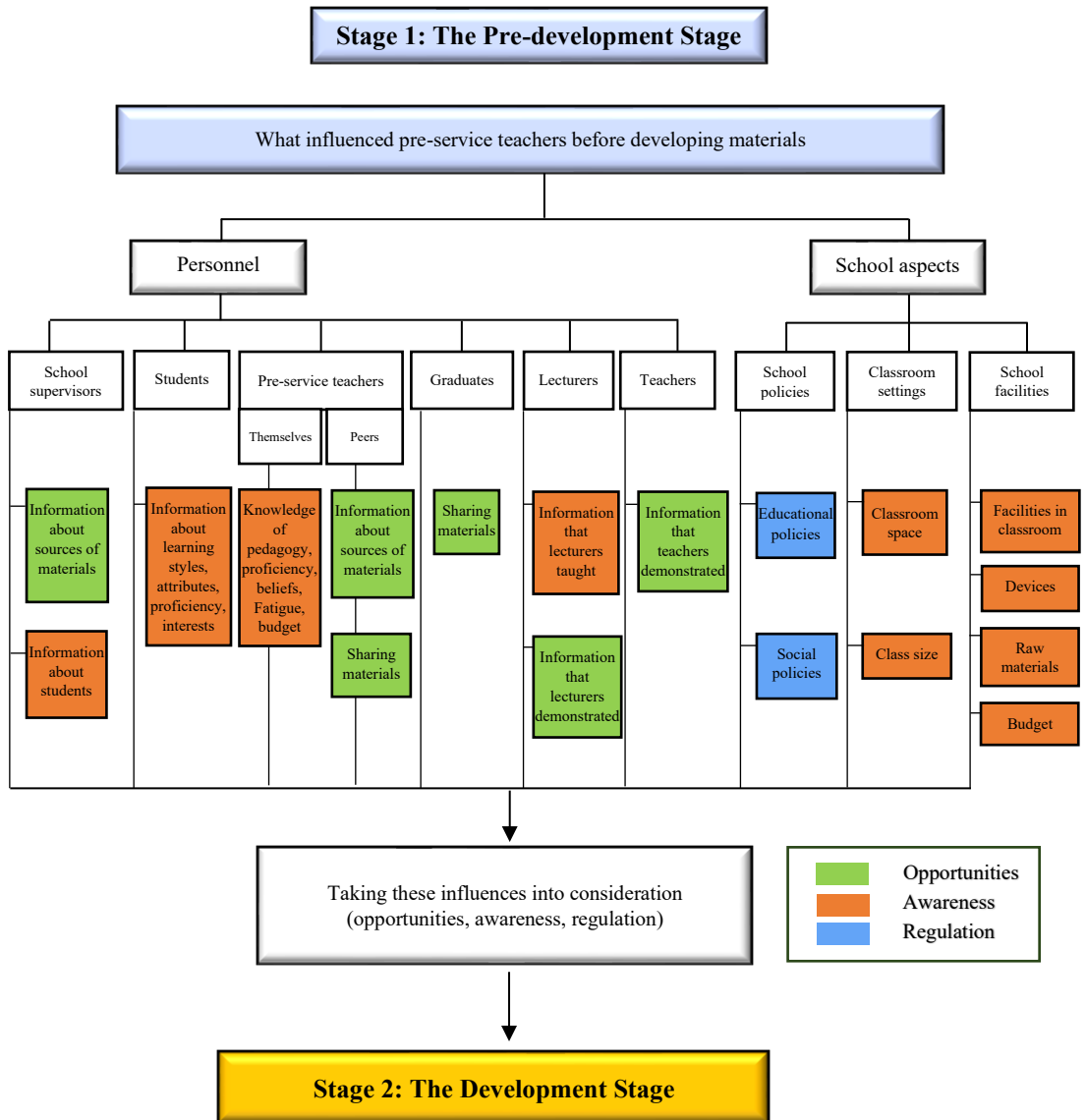
different circumstances: Implement as planned and implement with difficulty. If there are any difficulties in implementing materials, pre-service teachers find a way to solve the problems simultaneously. For example, during a game-based activity, the internet connection failed. To address this issue, they wrote the questions on the board instead. Students who answered correctly still earned points, so the game could continue.

The last process of materials development is stage 4: the post-implementation stage, which is the process of dealing with materials after use. After implementation, pre-service teachers sometimes receive feedback from supervisors. Regardless of whether they received feedback, they have two different circumstances when dealing with used materials: to use or not to use the material again. If a piece of material is no longer needed, the process ends there, and feedback may be disregarded, as adapting materials that will not be reused is seen as impractical. However, if a piece of material is expected to be used again, pre-service teachers evaluate its effectiveness by considering both their classroom experience and any supervisor feedback. Based on this evaluation, they either reuse the material if it is proved suitable, adapt it when proved not quite suitable, or replace it with a newly designed or sourced material if it was found to be unsuitable.

To be more concise, Figure 3 demonstrates an overview of Thai EFL pre-service teachers' materials development processes and outlines the four stages they go through. In the pre-development stage, pre-service teachers are influenced by both personnel and school-related factors, which can be classified as opportunities, awareness, or regulations. The development stage involves addressing materials in two ways: evaluating existing materials for suitability or designing and producing new materials, with problem-solving as needed during production. During the implementation stage, materials are used in classrooms and evaluated, with adaptations when facing challenges. Finally, in the post-implementation stage, teachers may receive supervisor feedback and evaluate the materials for reuse, adapting or redesigning them based on suitability.

Figure 2

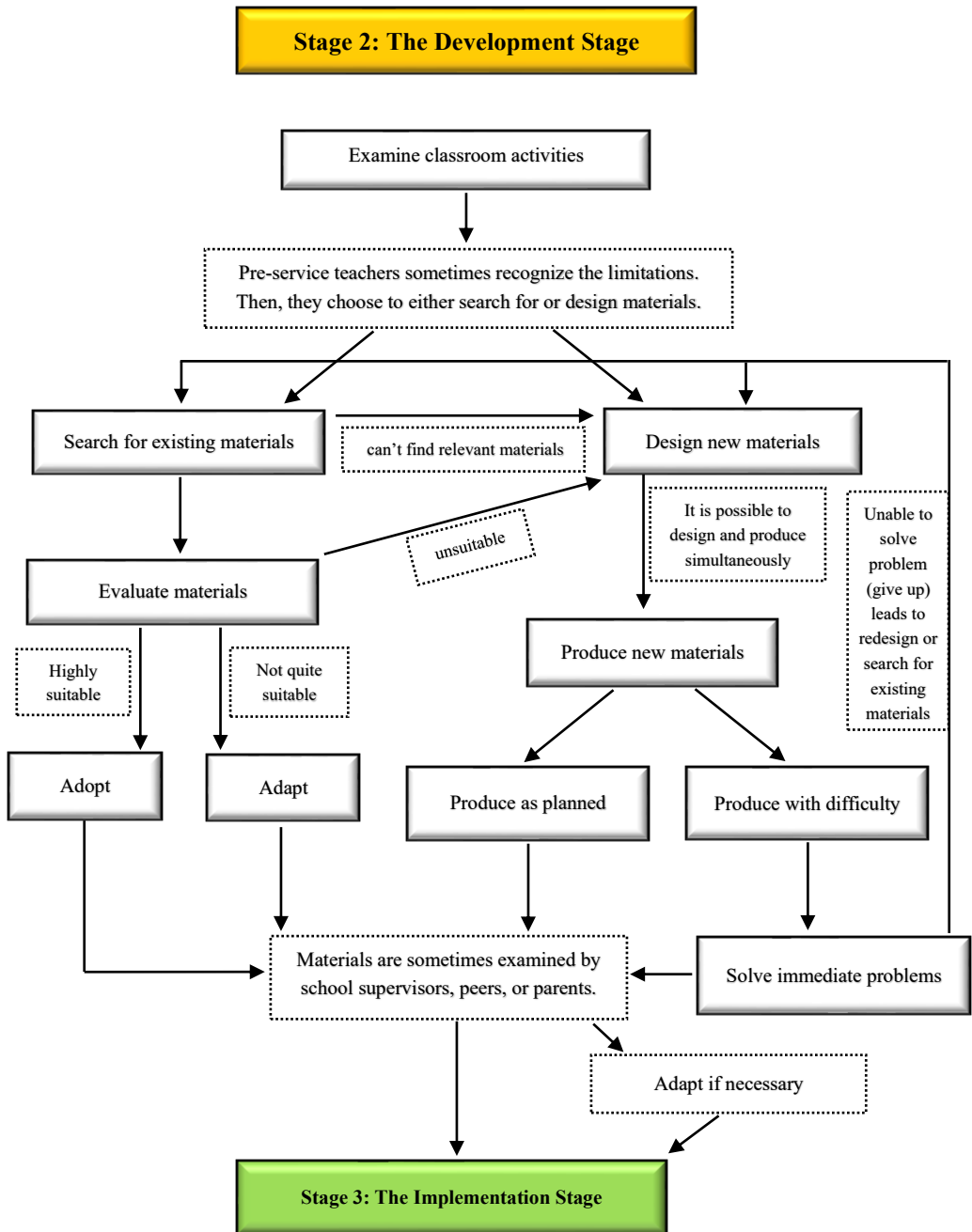
Theory of Thai EFL Pre-service Teachers' Materials Development Process



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Figure 2

Theory of Thai EFL Pre-service Teachers' Materials Development Process (Continued)



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Figure 2

Theory of Thai EFL Pre-service Teachers' Materials Development Process (Continued)

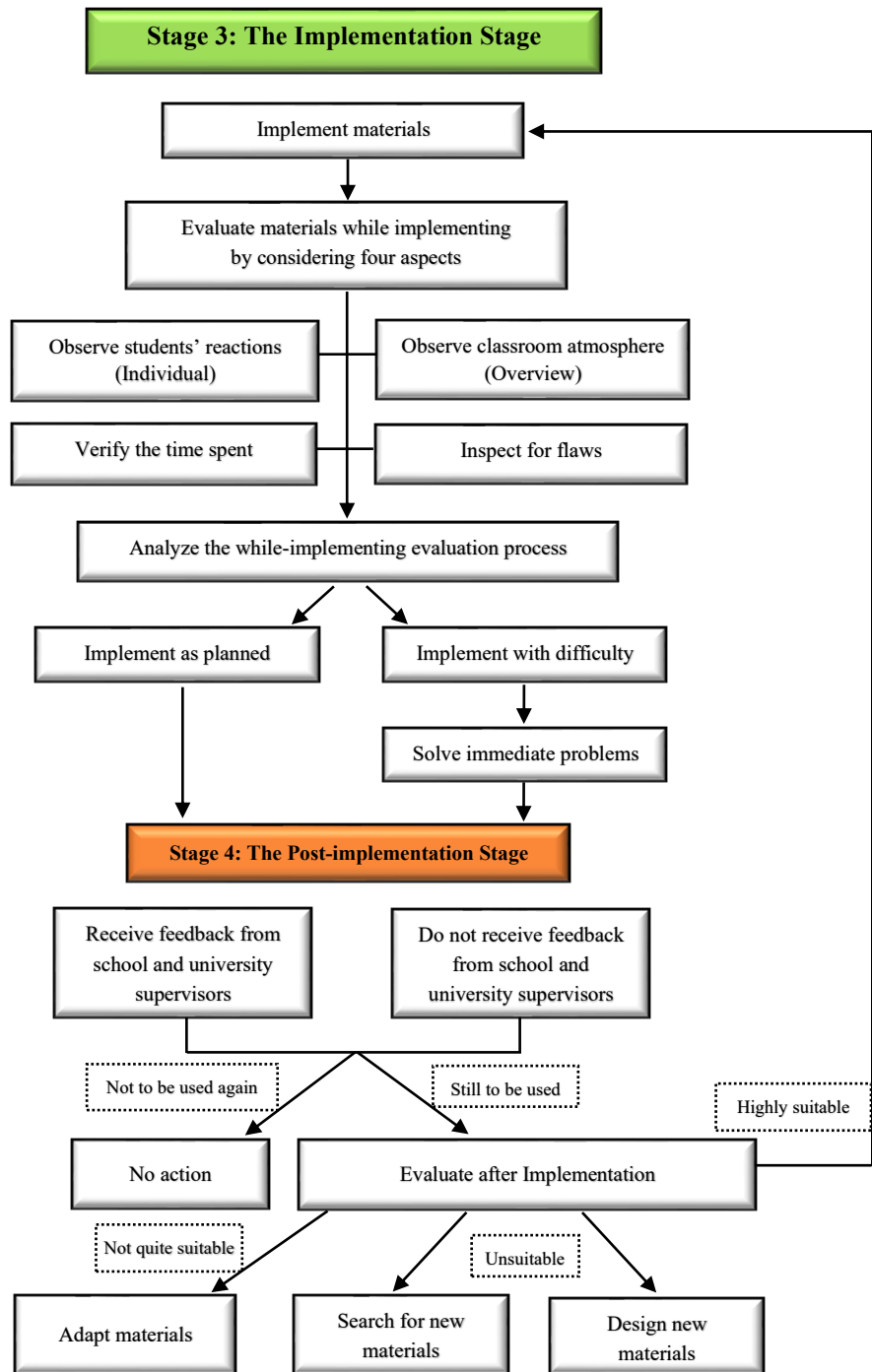
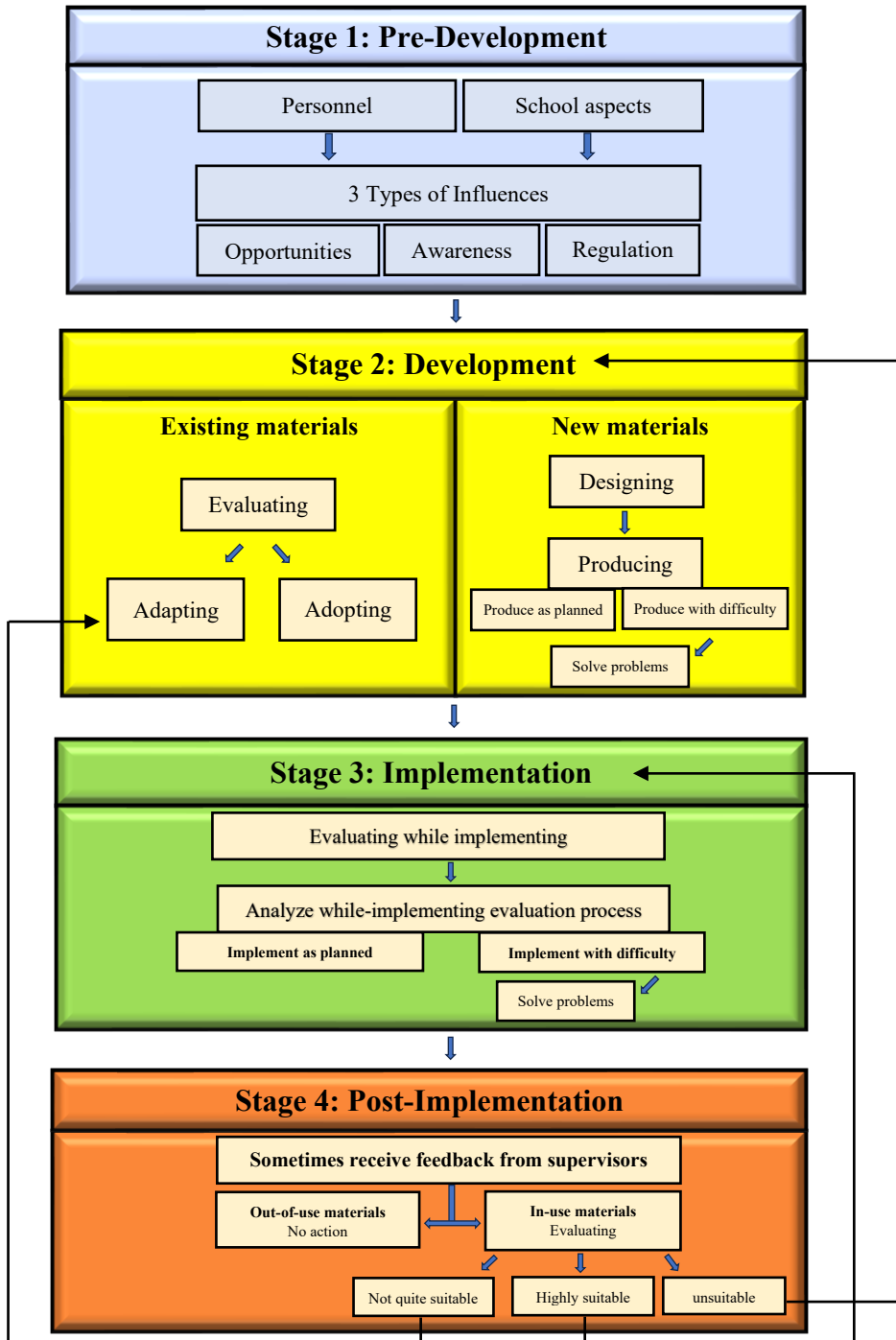


Figure 3

An overview of Thai EFL pre-service teachers' materials development processes



Discussion

The materials development process for Thai EFL pre-service teachers is an intricate process, which requires comprehensive knowledge and understanding across various subject areas. It involves four key stages, each with multiple sub-processes. Likewise, as claimed by Maley (2016), materials development is a highly complex process. It takes time and effort as it requires pre-service teachers to consider many aspects of knowledge, skills, and limitations.

When considering each stage, in Stage 1, the pre-development stage, pre-service teachers assess a wide range of influences that shape their approach to materials development. These influences, such as sources of information, knowledge, beliefs, and facilities, are derived from both personnel and school-related aspects. These influences are classified into three categories: Opportunities, Awareness, and Regulations. This stage is crucial because it sets the groundwork for the rest of the process, and it helps pre-service teachers identify the limitations and possibilities they will work within as they begin developing their materials. This is similar to Pardo et al.'s (2009) finding, which claimed that teachers' prior beliefs, expectations, and knowledge influence what they come to understand, value, and use. These affect decision-making when developing materials. With considerable influences, pre-service teachers should prioritize and analyze all influences carefully.

Stage 2, the development stage is the most complex, containing various processes, including materials evaluation, adoption and adaptation, design, and production. In this stage, five significant challenges in materials development and critical factors for materials production are addressed and discussed.

One major challenge was the lack of innovative ideas for new materials. Many pre-service teachers find themselves reverting to familiar resources and formats they have previously implemented. This is not entirely surprising since they are inexperienced teachers with limited background knowledge about learning activities and materials. This is consistent with Wattanavorakijkul's (2019) findings, which indicated that the teachers most needed to improve their skills in developing creative materials as well as to participate in academic enrichment and professional development programs.

Time constraints pose a considerable challenge, particularly when pre-service teachers encounter difficulties in developing interactive materials. Due to the demands of their practicum and other school-related responsibilities, allocating adequate time for material development becomes increasingly difficult. Consequently, many pre-service teachers rely on pre-existing materials such as textbooks, handouts, and worksheets. This reliance often

reflects a preference for traditional materials, which are generally associated with passive learning (Kooloos et al., 2020), rather than interactive or communicative tasks. For example, one pre-service teacher chose to use a grammar worksheet obtained from an online source instead of designing materials that would facilitate communicative grammar practice. Thus, to alleviate the time constraints among pre-service teachers and maximize the use of new materials, it is recommended that schools allocate the appropriate workload for pre-service teachers. They require more time to deal with materials, including developing ideas and developing materials in practice and excessive workload may block pre-service teachers' creativity in developing interactive materials.

Another significant challenge is developing materials that suit students. Pre-service teachers often find it difficult to determine what materials would be appropriate for the diversity of students. These challenges include addressing differences in proficiencies, interests, and learning styles. It becomes more challenging for pre-service teachers to develop materials that fit the diverse needs of their students, and it is nearly impossible to achieve this in situations such as classes with mixed level students. From the researchers' point of view, one way to help pre-service teachers deal with the differences in language proficiency is to divide students according to their proficiency level. This may help pre-service teachers develop more suitable materials and allow learners to learn language at their own pace. School authorities should be concerned about this issue and implement some policies to divide students into the right classes when it comes to English subjects. However, it can be criticized that some schools with a limited number of English teachers may have difficulty doing so. In such cases, teachers must find a balance in the level of difficulty presented in the core materials to ensure that the content remains accessible to lower-proficiency learners without being too simplistic for higher-level students and prepare supplementary materials or activities to challenge more advanced learners to maintain engagement and promote continued development within a mixed-proficiency classroom.

The fourth challenge in this stage is producing ICT materials. As technology continues to evolve, pre-service teachers often find it difficult to learn how to use new technologies effectively. Beyond producing the ICT materials themselves, they are not certain about implementing these materials in the classroom. They seek help from peers who possess expertise in technology and ask for recommendations on practical applications and guidance on their effective use. This is consistent with Seenivasan (2024), who claimed that barriers to effective technology integration include a lack of teacher collaboration and pedagogical support, time to master new ICT software, and limited knowledge and experience of ICT in teaching contexts.

Thus, it is recommended that pre-service teachers update their knowledge and gain more experience in ICT materials and applications regularly. Moreover, in university courses, introducing pre-service teachers to learning applications may not be enough for these modern times, but training them to access the way to find and learn new applications and equip them with ICT skills would be helpful for their professional development.

One area of difficulty arises from the need to associate their materials with social and educational policies, such as the Sustainable Development Goals (SDGs), the Sufficiency Economy philosophy, and competency-based learning. Many pre-service teachers indicated that they feel unprepared to incorporate these critical concepts into their English language classrooms. The results showed that personnel who have authority launch policies regarding social or educational approaches without adequate preparation. There is no doubt that those new policies are constructive, but there is a need to make sure that the teachers, especially pre-service teachers who are inexperienced, can implement those policies in their classrooms effectively and accurately. Some approaches require a significant amount of understanding and experience to develop learning activities and materials consistent with the core concepts of a particular approach. As a result, the authorities should provide some guidance to ensure that teachers are adequately informed and trained.

The last essential discussion in the development stage is that the production of materials is conditional on two critical factors: time and motivation. As discussed earlier, the limited availability of time can reduce their ability to produce materials. Moreover, motivation plays a crucial role in the production process; without sufficient motivation, pre-service teachers may struggle to produce materials as planned. Factors such as workload and fatigue can significantly affect pre-service teachers' motivation, which can, in turn, impact the production of materials. Therefore, motivation level and materials development are associated. This is in line with Lauermaann's (2017) study, which stated that teachers' motivations have critical implications for the teaching profession, including those for teachers' professional commitment, psychological well-being, and instructional practices. Teacher motivation has emerged as a key element of teachers' professional competence. Lauermaann also expressed concern that research on teacher motivation represents a relatively new, but until recently "overlooked" phenomenon. Therefore, increasing motivation should not be neglected since it could improve teaching performance, including the production of materials.

Stage 3, the implementation stage, generates three essential discussions. First, materials evaluation is the core of this stage. Equipping pre-service teachers with skills in materials evaluation, as well as emphasizing the awareness of characteristics of effective materials, can be helpful for pre-

service teachers. Another point is problem-solving skills in terms of materials adaptation. Implementing materials in classrooms may present opportunities to deal with immediate challenges. Materials may appear flawed or irrelevant to the students. Pre-service teachers have to deal with materials right away. Therefore, they should be well-trained and equipped with skills in simultaneous materials adaptation. In the university course, pre-service teachers should be provided with hands-on experience in adapting materials while implementing them to gain more problem-solving skills since these cannot be acquired overnight (Gauvain & Richert, 2016). Preparing pre-service teachers with these opportunities will facilitate their skills when they conduct teaching practicum in school. Lastly, student dissatisfaction with the materials can emerge, particularly when using authentic resources that may not resonate with all learners. For instance, some students may feel uncomfortable engaging with certain content, such as food-related activities, due to personal sensitivity. One pre-service teacher brought authentic local food into the classroom and asked students to match the food items with their names by identifying them through smell. A few students expressed discomfort, noting that the smell of certain foods was unpleasant for them. This highlights the importance of considering learners' comfort and preferences when designing culturally embedded or sensory-based activities. Moreover, pre-service teachers should remain flexible and prepared to adapt not only their materials but also the way they are implemented, as such discomfort can sometimes be unpredictable. This idea is supported by Le Cornu (2009), who claimed that resilience is important for novice teachers as it can enhance teaching effectiveness and better prepare teachers to adjust to education's ever-changing conditions.

Stage 4, the post-implementation stage, creates two essential discussions. First, feedback from both school and university supervisors is essential in this phase since it was found that pre-service teachers were not able to inspect for flaws in the materials themselves. Feedback becomes very important for the evaluation process when dealing with in-use materials. However, according to Donoso (2018), it was found that during the teaching practicum, supervisors would be more concerned about learning activities rather than the quality of materials. Therefore, feedback after supervision should focus on both learning activities and materials development to promote all components of teaching practice. Second, post-use materials evaluation is a fundamental process in this stage. However, the evaluation criteria used by pre-service teachers are often similar to those employed during the development stage, potentially resulting in the omission of key elements of effective materials. For instance, some pre-service teachers overlooked content accuracy, as seen in their misunderstanding of the difference between spaghetti and pasta, mistakenly treating them as entirely

different types of food. This reflects a broader issue: teaching a language inevitably involves cultural components. As such, pre-service teachers need a deeper understanding of the topics they teach. A similar issue was reported in Metboki's (2018) study, which revealed that pre-service teachers often lacked the knowledge needed to incorporate cross-cultural elements into their materials. While supervisor feedback can help address these gaps, such feedback is not always provided after every class. This means that some issues were still unresolved. Thus, supervisors should raise pre-service teachers' awareness of materials evaluation, especially in terms of content accuracy, by encouraging them to have a review process that focuses on the relevant information to broaden their background knowledge before using the materials. This also helps pre-service teachers understand the subject matter more clearly and can be helpful when it comes to the discussion part of a subject matter. In addition, peer assessment is recommended as a complementary approach. Reviewing materials through peer evaluation allows for diverse perspectives and can significantly improve material quality. Tuglar (2019) found that peer feedback helped pre-service teachers gain new insights and reflect more deeply on their work. Thus, alternating between supervisor feedback and peer review can help pre-service teachers evaluate their materials more thoroughly and effectively.

Implications

From the results and discussions of the study, the theory of Thai EFL pre-service teachers' materials development processes provides some implications for ELT communities, including curriculum developers, lecturers, university supervisors, school supervisors, principals, pre-service teachers, and commercial textbook companies.

For curriculum developers, it has been proved that materials development is an intricate process that inexperienced teachers have some difficulties with. Materials development courses should be included in the ELT curriculum. These courses should provide not only the principles of materials development but also allow pre-service teachers to develop several types of materials under various conditions. An adequate number of courses related to materials development should be considered since materials development is difficult to promote. It requires exposure to hands-on experience, which can be gained through authentic tasks and settings.

Lecturers should incorporate materials development elements into their courses. Providing students with opportunities to develop materials in courses would be advantageous for pre-service teachers as it would provide them with knowledge, skills, and experiences for developing materials. More importantly, lectures are likely to focus on lesson plans and the use of learning activities rather than the materials. However, materials are as important as

learning activities, since without them, teachers cannot facilitate and scaffold students to master the subject matter being learned. Additionally, an essential part of the materials development process is materials evaluation. Lecturers should equip pre-service teachers with knowledge and skills in materials evaluation as it is a fundamental process for materials development.

Supervisors should review materials during the developing phase since some materials are complicated to develop. Pre-service teachers required guidance during this process to make the materials more well-produced. Moreover, supervisors, especially university supervisors, should examine materials before pre-service teachers implement them. As the findings indicate, supervisors rarely examine materials before implementation in class. Implementing materials with flaws can cause some misunderstanding among students. More importantly, supervisors often examine materials in the post-implementation stage by providing feedback on materials, but they do not go further on how pre-service teachers adjust or revamp the materials. It is noted that pre-service teachers sometimes do not know how to adapt their materials based on feedback if it is too subjective or intangible, e.g., ‘make it more attractive’ or ‘make it more concise’. Supervisors should give more explanations, scaffold pre-service teachers during the process, and examine the materials after they have been adjusted to ensure they are appropriately adapted.

School principals, school directors, government supervisors, policymakers in the Ministry of Education, and other personnel with policy-making authorities often introduce policies related to social or educational approaches such as the SDGs, competency-based learning, and community-based learning. It is essential to ensure that teachers, particularly pre-service teachers, can implement these policies effectively and accurately, as doing so requires a deep understanding and experience in developing learning activities and materials that align with the core concepts of each approach. Therefore, authorities should offer guidance by establishing teacher training programs or providing guidebooks to ensure teachers are well-informed and properly trained.

Pre-service teachers should be aware that developing effective materials requires a great amount of time and effort, and a thorough understanding of linguistics, pedagogy and language acquisition theories, as well as the understanding of their students. Pre-service teachers should notice and take all things into consideration. Also, regular consultation with supervisors could help prevent flaws in materials, as it provides valuable feedback and guidance on materials development. This process also helps refine their skills in materials development and develop more effective teaching materials.

For commercial textbook companies, it is recommended that the teacher manual or guidebook contain relevant information on a particular topic to prevent misunderstandings, especially cross-cultural dimensions. Some language teachers may lack cultural understanding, which leads to wrong interpretation of a subject matter. Therefore, the company should consider the complexity of the cultures and provide some background knowledge for teachers to prevent inappropriate materials implementation.

Recommendations for future research

This study mentions many processes of materials development. Researchers can develop research studies focusing on a systematic process for pre-service teachers to facilitate them in each stage of materials development. Moreover, research studies based on quantitative, qualitative, or mixed-methods design can be conducted to test the theory in larger populations of pre-service teachers and any other personnel involved in the materials development process.

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Appendix A

Interview questions

List of Interview Questions: Round 1

1. What factors influence your materials development?
2. How do the factors influence your materials development?
3. How do you come up with these materials?
4. What is the procedure in your materials development?
5. What action do you take after implementing materials?

List of Interview Questions: Round 2

1. How do you adopt and adapt materials?
2. Where do you get the existing materials?
3. How do you design materials?
4. How do you produce materials?
5. Can you produce materials as designed?
6. How do you evaluate materials?
7. What dimension do you evaluate for materials?

List of Interview Questions: Round 3

1. What challenges do you face in developing materials?
2. How do you overcome the difficulties in materials development?

* Subsequent questions are not included in the list above