

A model for flexible learning in graduate teacher education programs

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ABSTRACT

This study aimed to develop a model for flexible learning (FL) appropriate to graduate teacher education programs (GTEP) based on the different practices of the graduate faculty and students in a teacher education institution (TEI) before and during the COVID-19 pandemic. A multimethods approach was employed, utilizing survey questionnaires, semi-structured interviews, and focus group discussions (FGD). Data were collected from 215 graduate students and 43 graduate faculty members who were selected through convenience sampling. The study resulted in the development of a model of FL for GTEP (MFL-GTEP), reflected in an outcome-based syllabus that highlights 10 areas of FL, all beginning with P: purpose, process, pedagogy, platform, people, place, pace, performance, product, and policy of learning. The MFL-GTEP promotes self-agency, self-regulation, and self-determination among education professionals pursuing GTEP. The challenges that graduate faculty and students experience in the implementation of FL are addressed in the (MFL-GTEP) to make the model more relevant, inclusive, and sustainable in a graduate teacher education program.

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1. INTRODUCTION

In recent years, education has undergone profound changes and developments driven by key factors that have reshaped how we teach and learn. The onset of the COVID-19 pandemic compelled many educational institutions worldwide to innovate and adapt rapidly. Along with the impact of the pandemic, technological advancements, globalization, and mobility, access and equity issues, changing educational expectations, and pedagogical shifts, among others, have played a crucial role in transforming the learning ecosystem in higher education institutions (HEIs) [1]. Also, the traditional rigid structures of education may not be responsive to students because of a lack of personalization, inclusivity, and flexibility [2]. These factors collectively call for a flexible learning (FL) system that can accommodate the diverse needs and circumstances of students.

FL is described as customizing a course to meet the needs of an individual learner [3], which includes full online, blended learning, flipped classroom, and distance learning [4]. It is also perceived as a learning system that relies heavily on the internet [5] and e-pedagogy [6]. FL, therefore, refers to a way of

learning where students are provided different options for learning in terms of class time, course content, instructional approach, learning resources, location, technology use, assessment requirements, completion dates, communication medium, learning modality, and learning platform.

The need for a FL approach for teachers pursuing graduate education programs was first realized during the pandemic, when traditional in-person classes became impossible due to lockdowns and social distancing measures. However, even before the pandemic, various factors affected teachers' engagement in graduate teacher education programs (GTEP), such as time constraints, health considerations, geographical barriers, diverse learning needs, and work-life balance [7]–[9]. Years after the pandemic, it even shows that traditional graduate programs still do not seem to align with the realities teachers face at present [10]. It became clear that the one-size-fits-all model of traditional GTEP was inadequate for teachers, especially when they needed a dynamic, adaptable, and flexible system that could evolve alongside their evolving needs as educators.

In the Philippines, where the current study is situated, HEIs had already begun exploring FL models before the pandemic. To support the transition to new instructional modalities, the Commission on Higher Education (CHED) in the Philippines issued a memorandum in 2020 urging all HEIs to adopt FL. This approach ensured safety by allowing remote instruction through the use of both digital and non-digital tools [11]. FL during this time prioritized student safety by minimizing physical interactions while ensuring academic continuity through various platforms.

In the teacher education institution (TEI) where this study was conducted, a college managing online learning programs specifically designated and coded “e-courses” since other colleges also delivered the same courses onsite. The university used its Moodle-based learning management system (LMS) alongside module-based toolkits to deliver instruction when the pandemic reached the Philippines in 2020. The teachers migrated the courses online, focused on essential learning outcomes, conducted team planning to blend content from multiple courses, and offered instruction through synchronous and asynchronous means.

The theoretical framework for developing a FL model in graduate programs is grounded in four key learning theories: constructivism [12], self-regulated learning [13], experiential learning [14], and self-determination theory [15]. These theories collectively emphasize that learners actively construct knowledge through experience and social interaction, regulate their own learning processes, and are driven by intrinsic motivations such as autonomy, competence, and relatedness [16], [17]. In the context of graduate education, particularly for working professionals, learners are seen as capable of setting goals, managing their learning strategies, and reflecting on their progress with minimal supervision. Thus, FL aligns with their needs and preferences by allowing adaptability in content delivery and learning processes, making it essential to examine existing conceptions, practices, and challenges as a basis for designing an effective FL model.

At present, HEIs implement their respective FL strategies to accommodate the diverse needs of students enrolled in GTEP. These strategies are designed to offer greater access, personalized learning, and increased engagement to teachers. However, despite the increasing adoption of FL across HEIs, the literature on FL remains limited [18], [19], particularly regarding its application in GTEP. This study aims to answer the following questions:

- What FL practices did the graduate faculty implement during and after the COVID-19 pandemic?
- What comprehensive FL model can be developed to address the specific needs of graduate teacher education students?

The novelty of this study lies in its development of the model of FL for GTEP (MFL-GTEP), which moves beyond the usual view of FL as merely online, blended, or distance delivery. This study presents flexibility as a systemic and learner-centered framework composed of 10 interrelated dimensions that is grounded in the actual practices, challenges, and experiences of graduate faculty and students. It offers an empirically based and context-responsive framework that supports self-agency, self-regulation, and self-determination among graduate teacher education students. In addition, the significance of this study lies in its potential to contribute to the advancement of FL frameworks in higher education, offering insights that can inform policy, improve teaching and learning strategies, and better support diverse student populations in achieving academic success.

2. METHOD

2.1. Research design

This study made use of a multimethod design, which refers to the use of more than one method of data collection or analysis within a single study [20]. Multiple methods were used in this study, such as a survey of the practices of graduate faculty, focus group discussions (FGD), and interviews. The use of these methods allowed the researchers to gather both broad and in-depth information, thereby providing a more comprehensive understanding of the FL practices, experiences, and challenges of the participants.

2.2. Participants

There are 43 graduate faculty and 215 graduate students who were selected using convenience sampling from a TEI in Term 1 of academic year (AY) 2021-2022 to determine their practices on FL before and during COVID-19. The total number of survey participants in the initial phase was 258, composed of 43 faculty members and 215 graduate students. Since the study was primarily descriptive and developmental in nature, the sample size was not determined through power analysis for hypothesis testing but through the availability of eligible participants who had direct experience with the phenomenon being studied. This approach is consistent with descriptive survey research, where sample adequacy may be justified based on the purpose of the study, accessibility of respondents, and sufficiency of responses to describe the target group [21].

The second batch of respondents was 18 graduate students involved during the model development and tryout in Term 2 of AY 2021-2022 and Term 3 of AY 2021-2022. The inclusion criteria included graduate students who were officially enrolled in a graduate teacher education program and had experienced FL. All teachers handling graduate courses during these terms who implemented FL were involved in the study. They were surveyed on practices of FL before and after they had been exposed to the proposed FL model. They participated as well in the FGD. Two officials were interviewed for their leadership role in promoting FL in the TEI. Although the use of convenience sampling may limit the generalizability of the findings because the participants were selected from one TEI based on accessibility and direct involvement in FL, it was used because the participants were easily accessible and directly involved in FL, making data collection faster and more practical.

2.3. Instruments

Three instruments were developed, validated, and used in this study. The online survey questionnaire is a combination of forced-choice and constructed-response formats to gather the graduate faculty and students' conceptions and practices on FL. The tool was pilot-tested on 214 graduate students and faculty to determine its validity and reliability. Results of the tryout show that the tool is valid and reliable. The results showed that all items loaded significantly ($p < .001$) on their hypothesized factors, with factor loadings ranging from .47 to .92, suggesting acceptable item-level relationships with the proposed seven-factor structure. However, the overall model fit indices indicated only marginal support for the factorial validity of the instrument, as reflected in the comparative fit index (CFI)=.813, Tucker-Lewis's index (TLI)=.792, root mean square error of approximation (RMSEA)=.097 (90% confidence interval (CI): .092–.102), and standardized root mean square residual (SRMR)=.096. Thus, the validity evidence should be interpreted with caution, and the measurement model may require further refinement, such as reviewing weak or overlapping items, improving item wording, or re-examining the factor structure in future validation studies. The other instruments were the FGD and the interview guide, which supported the practices on FL gathered from the survey. Both instruments also underwent expert validation.

2.4. Data gathering procedure

The study underwent five phases. The first phase involved planning and environmental scanning of the FL practices at the university. Different literature, studies, and policies were also reviewed to understand how FL was viewed and the models and practices employed. The second phase involved the initial data collection and model development. The researchers administered an online survey and conducted FGDs with graduate faculty and students, and interviewed officials who had experience in FL. The results led to the development of an FL model captured in an outcomes-based syllabus developed by the researchers. The third phase involved model tryout and data analysis, wherein the FL model captured in an outcomes-based course syllabus was tried out in the classes of four graduate faculty. The next phase focused on further data collection for model refinement. This was done after one term of tryout of the FL model. The changes in the FL were reflected in the outcomes-based course delivered the following term. Finalization of the model was done in the last phase. The final model was subjected to the review of the graduate students handled by the four graduate faculty members in the following term.

The data analysis of the study utilized both quantitative and qualitative approaches. For the survey instrument, descriptive statistics were applied. For the qualitative component, thematic analysis was employed, wherein responses were systematically coded, categorized, and organized into emerging themes. To enhance trustworthiness and confirmability, triangulation was conducted by comparing and validating findings across data sources from students and graduate faculty, ensuring that interpretations were consistent and grounded in multiple perspectives.

Before the study commenced, the research proposal was subjected to an Ethics Review by the University Research Ethics Committee (REC). REC gave the researchers the notice to proceed with the study. The graduate students and faculty involved in the survey, FGD, and interview consented to participate in the study.

3. RESULTS AND DISCUSSION

3.1. Practices of the graduate faculty and students on flexible learning before and during COVID-19

The practices or experiences of the graduate faculty and students involved in the study were also classified in terms of the 8Ps: purpose, process, pedagogy, pace, place, people, product, and performance.

3.1.1. Purpose of learning

The survey data reveal that there were three practices on FL in terms of the purpose of learning: i) co-development of course intended learning outcomes (66.1% of students claimed this is almost always evident); ii) identification of the competencies and skills in a course (61.9%); and iii) selection of the content of the course (62.3%). Data from the interviews and FGD showed that there was a collaborative effort between the students and faculty members of the institution in developing the course's intended learning outcomes. Through a series of consultations and open dialogues, students and faculty co-created learning objectives that were not only aligned with the academic standards but also reflected the diverse learning styles and preferences inherent in FL environments. According to the participants, there was a 50-50 ratio of input coming from the students and faculty members in crafting the contents of the course before and during the pandemic.

3.1.2. Process of learning

Based on the survey results, the practices of the graduate faculty and the experiences of the graduate students in different processes of FL include: i) sequencing of the course content (63.2%); ii) determining their own strategy in acquiring lesson content (87.9%); iii) choosing the modality of learning (75.8%); iv) providing learning materials using a range of media formats (93.7%); and v) using different technology tools and platforms to support learning (95.8%).

The analysis of the FGD data yielded two dominant themes on practices related to the process of learning: i) learners are provided with the opportunity to inform the design and delivery of course content and learning activities, and ii) the FL classes are designed to allow learners to become more active, more engaged, and more reflective. The former has one core idea - Students provide inputs to course content and other course-related decisions, while the latter has three core ideas: i) students are learners who can maximize the opportunities provided by FL delivery, allowing them to learn in ways that were not evident during face-to-face instruction; ii) students actively engage in classroom activities and discussion; and iii) students participate as reflective learners. Related to the first theme, a graduate faculty participant stated: "*we plan other ways for the submission of the requirements so everything is covered, because sometimes we cannot avoid that some graduate students who also have other work cannot attend all activities in all modalities.*"

3.1.3. Pedagogy of learning

The pedagogies practiced by the graduate faculty include determining their own strategy in acquiring lesson content (81.9%) and implementing a range of instructional strategies and learning activities (87.9%). A great majority of the graduate faculty reported that they practice allowing the graduate students to determine their own strategy in acquiring lesson content. This was supported by the report from graduate students.

A great majority of the graduate faculty claimed that they implement a range of instructional strategies and learning activities (e.g., lecture, independent study, and games) for their graduate students. More of them claimed to have been practicing this process of FL during COVID-19 than before it. This was supported by the report from the graduate students that none of the faculty claimed that they had never practiced this way of FL before and during COVID-19. Pedagogies in FL allow graduate students to engage with diverse learning materials and methods, promoting a more personalized and adaptive educational experience.

3.1.4. Pace of learning

The practices of the graduate faculty and the experiences of the graduate students in terms of the pace of learning observed in the graduate programs include graduate students making decisions on the: i) time to spend in learning the course content/topic (80.9%); ii) time to spend in doing a learning task (82.4%); iii) time to interact with others and to study (78.6%); and iv) time one wants to submit a completed task or work (93.1%).

The analysis of FGD data yielded one singular theme on practices related to pace-adjustment in schedule and workload to promote optimal flexibility—presents two core ideas: i) flexibility in the submission of course requirements and ii) provision for wellness break or academic ease for faculty and students. The pace of learning in FL, according to the participants, was characterized by its adaptability to the individual needs and preferences of the graduate students. Unlike traditional, rigid structures, FL allowed students to progress at their own speed, accommodating variations in prior knowledge and learning styles.

3.1.5. Place of learning

The practices of graduate students in terms of place include choosing their place of learning (85.9%) and completing their learning activities and tasks regardless of their location or place (88.8%). This was confirmed by the graduate students themselves. Interestingly, there is one faculty member who claimed not to have practiced this before the pandemic but has learned to practice this during COVID-19.

From the FGD data, two themes on practices related to the place of learning were identified. First is learning opportunities are expanded as learning becomes more seamless, which has one singular core idea: learning becomes more seamless (learning wherever, whenever). The second is on provision for online learning classes, typically through a dedicated LMS with two core ideas: i) provision for synchronous and asynchronous classes and ii) the use of available LMS for online classes. The data revealed that the place of learning for graduate students was not confined to a specific physical classroom, but it was extended to virtual spaces - promoting accessibility, inclusivity, and adaptability.

3.1.6. People to learn with

The practices of the graduate faculty and the experiences of their graduate students in terms of the people they learn with in the graduate programs include: i) choosing from a range of options on how to study (85.2%); ii) choosing members of the class to study or collaborate with (75.8%); iii) choosing the instructor or faculty to learn with (51.5%); and iv) choosing the people to evaluate one's learning (56.3%).

Virtual forums, discussion boards, and collaborative online platforms were claimed to become essential tools in fostering interactions among students. These platforms facilitated the exchange of ideas, diverse perspectives, and collective problem-solving. Building a strong sense of community is particularly crucial for graduate students who may be pursuing advanced degrees in specialized fields, and by fostering connections with fellow students and faculty, graduate students benefit from a network of diverse expertise, experiences, and insights.

3.1.7. Performance in learning

The practices include graduate students: i) deciding on how to demonstrate acquired knowledge from the course (65.1%); ii) deciding on how to demonstrate acquired skills from the course (66.0%); iii) deciding on how frequently one is assessed (61.4%); iv) deciding on how frequently one is assessed (64.2%); v) deciding on the pieces of evidence of learning (66.0%).

Based on the analysis of FGD data, two themes on practices related to the performance of learning emerged. The first is the use of more innovative and more authentic methods in assessing learning outcomes with three core ideas: i) emphasis on performance-based assessment and other alternative forms of assessment; ii) course requirements that stimulate reflective thinking, critical thinking, and creativity, and understanding of peers; and iii) use of authentic and innovative assessment methods. The second theme is on Increased emphasis on faculty feedback to learners, with one core idea - emphasis on the faculty's role of providing feedback and coaching to students.

In terms of the first theme, one participant shared that *"focus is now given to performance-based types of assessment and alternative types of assessment in the online teaching and learning modality."* Related to the second theme, a participant shared, *"I am interested in improving myself in research writing, so I would really like to know the feedback of the professors."* Similarly, another participant commented, *"and of course, I suggest that feedback be given, too."*

3.1.8. Product in learning

The practices of the graduate faculty and the experiences of their graduate students in terms of the assessment of the performance of the graduate students' learning include graduate students: i) choosing the evidence of learning (67.9%); ii) deciding on the grade or mark to one's evidence of learning (61.9%); iii) deciding on how to receive a grade or mark from the course (65.9%); and iv) adopting a flexible grading system (79.1%). Meanwhile, the analysis of FGD data yielded one singular theme on practices related to the product of learning - learners become more independent, reflective, and self-regulated, and have two core ideas: i) the FLD allowed students to become more independent and self-regulated learners and ii) graduate students who are teachers learned to be more compassionate with their own students.

As discussed by a participant, *"I think the most valuable benefit I got from FLD is to be a better self-directed learner. Somehow, it became easier for me to have a work-life balance because of the much freer time that the FLD gives. It helps enhance my work habits so I can also manage my own mental well-being."* In a FL environment, data showed that graduate students have the autonomy to choose the format or medium through which they present evidence of their learning. This choice allowed students to align assessments with their strengths, interests, and career goals. This kind of flexibility fostered a more personalized and relevant learning experience, catering to the diverse needs of graduate students.

3.1.9. Platform in learning

The platform of learning has emerged as another dimension of FL drawn from the open-ended responses of the graduate students and faculty. In the context of FL, a platform was perceived to refer to the digital environment or online space where educational activities, resources, and interactions take place. It serves as the virtual infrastructure that supports the delivery of content, communication, collaboration, and assessment. Platforms in FL were found to play a crucial role in creating a dynamic and accessible learning environment. At the graduate level, LMS platforms were posited to serve as central hubs where students access course materials, submit assignments, engage in discussions, and receive feedback. These systems often offer features such as discussion forums, file sharing, grading tools, and collaborative spaces. The institution in this study made use of an LMS that both students and teachers use in facilitating the online mode of instruction.

3.1.10. Policy of learning

Policy of learning is a new dimension of FL that has emerged during the actual tryout of the model. As one graduate faculty participant mentioned during the FGD: *“we saw that there’s really a need to create, somehow, an internal policy wherein we should be able to monitor the interaction of the students and the cohort. When this began, there were new policies to be introduced, like having synchronous classes every other week. So, from that time on, I must say that students become more reflective when it comes to the tasks that we give them, papers, or requirements that we ask them to do.”* This dimension explains that in FL, the graduate faculty engages the students in formulating the policy to be followed by the class, allows the students to evaluate the applicability and relevance of policies observed in class, and allows the students to recommend improvement or better policies to be observed in class.

3.2. Proposed flexible learning model based on conceptions, practices, and challenges of the graduate faculty and students

The proposed MFL-GTEP was developed based on the analysis of the survey and the FGD on the practices in FL, conducted in a TEI before and during the pandemic. Figure 1 shows the proposed 10 components of the proposed PNU-MFLEx, and they all begin with P. The first eight were developed based on the reviewed literature, which was consolidated and confirmed through the survey that was conducted. These 8Ps are purpose, process, pedagogy, people, place, pace, performance, and product of learning. These 8Ps were supported by the conceptions, practices, and challenges that have been experienced by the graduate faculty and students who came out during the conduct of the interview and FGD. However, additional 2Ps have emerged from these data gathering methods, and these are platform and policy.

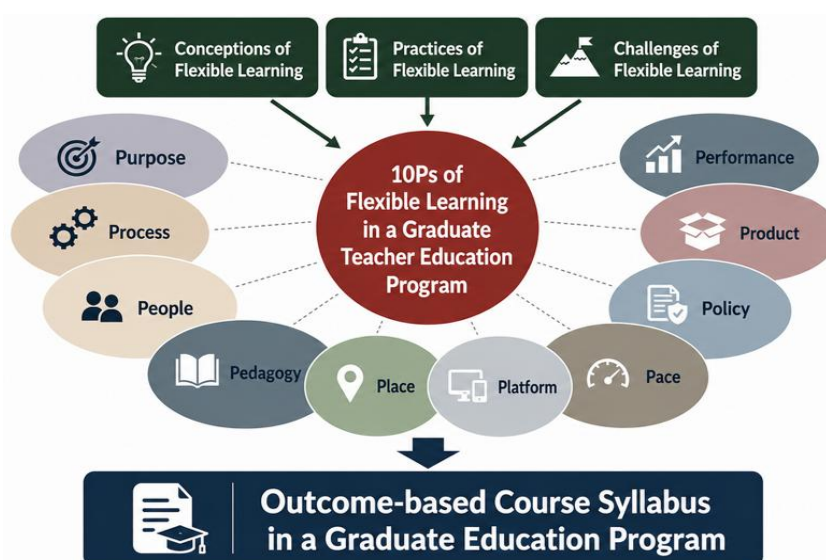


Figure 1. Proposed MFL-GTEP

The findings suggest that the 10Ps of the MFL-GTEP operate not as isolated elements but as an interdependent system in which purpose anchors learning goals, process and pedagogy shape meaningful engagement, platform and place enable access, people and policy sustain collaboration and governance, while

pace, performance, and product collectively regulate and evidence learning outcomes; thus, flexibility emerges from the dynamic alignment of these components rather than from any single dimension alone. Unlike existing FL models that often emphasize modality (e.g., online or blended delivery), the MFL-GTEP advances a holistic, outcomes-based andragogical framework grounded in self-agency, integrating structural (policy, platform), pedagogical (process, pedagogy), and learner-centered (pace, performance, product) dimensions specifically tailored for graduate teacher education. The trustworthiness of the findings is supported by methodological rigor, including multimethod data collection (survey, FGD, and interviews), triangulation across faculty and student perspectives, multiple implementation phases (from development to tryout and refinement), validated instruments, and formal ethics approval, ensuring both credibility and confirmability. Consequently, the model contributes new knowledge by offering an empirically grounded, context-sensitive framework that explicates how flexibility can be systemically designed to promote self-regulation, professional autonomy, and adaptive expertise among graduate-level teacher-learners, thereby extending the discourse beyond modality-driven approaches toward a more integrated and sustainable model of flexible graduate education.

4. DISCUSSION

The findings indicate that the 10Ps of the MFL-GTEP emerged because graduate teacher education students needed a FL system that responds to the realities of adult learners who balance graduate studies with work, family, and professional responsibilities. Purpose became important because participants valued the co-development of learning outcomes, competencies, and course content, allowing both faculty and students to clarify what learning should achieve. This emphasized the value of collaborative inquiry in the course design among graduate students [22], [23]. Process was considered essential because students needed flexible ways of accessing lessons, choosing modalities, and participating in the design and delivery of learning activities. This promotes equity and access in the delivery of FL [24]. Pedagogy was also emphasized because varied instructional strategies allowed faculty to address different learning styles, promote active participation, and make graduate learning more meaningful and responsive [25]. These findings are comparable to previous studies, which emphasized that collaborative approaches between students and teachers make learning more responsive to individual needs [26], while blended and ICT-supported instruction can increase student engagement, participation, and appreciation of FL modalities [27]. They also support the view that flexible pedagogies encourage self-directed learning by allowing students to manage their time, learning strategies, and resources more effectively.

In addition, the model shows that flexibility depends on the learning environment and the relationships that support it. Platform became a key dimension because online systems and digital tools served as spaces for accessing materials, submitting outputs, joining discussions, and receiving feedback. It serves as the virtual infrastructure that connects the different dimensions of FL [28], [29]. People were important because participants recognized that learning in graduate education is strengthened through collaboration with classmates, faculty, and learning communities. The interview data articulates that students do not learn effectively through independent access to materials alone; they also need meaningful interaction with faculty, peers, and learning communities for guidance, feedback, collaboration, motivation, and shared reflection [30]. Place emerged as vital because students needed opportunities to learn beyond the physical classroom, especially when geographic, professional, and personal conditions affected their participation. Pace was equally significant because flexible schedules, submission arrangements, and workload adjustments helped graduate students manage academic requirements alongside work and other responsibilities. This implies that the inclusion of place and pace in the model shows that FL arrangements expand access, strengthen interaction, and help graduate students manage learning despite professional and personal constraints [31], [32].

Finally, the findings reveal that flexibility must also be evident in how learning is demonstrated, evaluated, and governed. Performance became important because participants saw the value of authentic and performance-based assessments that allowed students to demonstrate knowledge and skills in meaningful ways. Product was emphasized because students needed options in presenting evidence of learning through outputs that reflect their strengths, interests, and professional contexts. Policy emerged as a necessary dimension because participants recognized the need for shared class agreements, clear expectations, and participatory decision-making to sustain FL practices. These results are consistent with previous literature showing that authentic and performance-based assessments, flexible grading, feedback, self-assessment, and peer evaluation promote reflection, collaboration, learner autonomy, and shared responsibility for learning, while clear learning policies help sustain fairness and accountability in FL environments [33], [34].

Holistically, the developed model implies that GTEP may institutionalize FL not only as a delivery mode but as a comprehensive instructional system that integrates flexible course design, digital platforms, collaborative learning structures, authentic assessment, and learner-responsive policies. For educational policy, the 10Ps may serve as a framework for developing institutional guidelines on FL, faculty training, LMS support, assessment practices, and student participation in shaping learning arrangements.

5. CONCLUSION

The development of a model in the conduct of FL appropriate to graduate programs in teacher education, based on the different practices and challenges experienced by the graduate faculty and students in a TEI, is an initial step to furthering areas of strength of this andragogy for adult learners. Such a model promotes self-agency, self-regulation, and self-determination, which adult learners usually desire to exercise their autonomy in decision-making for the furtherance of their learning. The development process can be a good reference in creating more models that could support the use of FL in advanced higher education. The model of FL provides 10 areas where flexibility can be applied and appreciated by professionals in their attempt to advance their knowledge and skills in the teaching profession and education leadership.

This study has several limitations that need to be addressed in future iterations or the development of new FL models. The limited number of participants (only four classes representing different specializations) prevents generalization of the model's effectiveness across all graduate programs at the institution. A broader faculty implementation of the model would provide a more conclusive result. Limitations of resources, both in terms of print and digital materials, hinder the model's potential, especially for graduate students in mature professional programs, suggesting the need for more varied learning resources and modality choices to accommodate a wider student population, including international students. Additionally, there is a need for stronger technological support and improved faculty and student training to address the lack of understanding and practices related to FL. To foster a collective practice, continuing professional development programs and knowledge-sharing sessions should be organized. The lack of existing literature on FL models in graduate teacher education underscores the importance of disseminating this study and conducting further research to validate and refine the model for master's and doctoral programs in the field.

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AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

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C : Conceptualization

M : Methodology

So : Software

Va : Validation

Fo : Formal analysis

I : Investigation

R : Resources

D : Data Curation

O : Writing - Original Draft

E : Writing - Review & Editing

Vi : Visualization

Su : Supervision

P : Project administration

Fu : Funding acquisition

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no known competing financial, personal, or professional interests that could have influenced the work reported in this paper. The authors state no conflict of interest.

ETHICAL APPROVAL

This research has received ethical clearance from the University Research Ethics Committee (REC) of the Philippine Normal University.

DATA AVAILABILITY

The complete data that support the findings of this study are available from the corresponding author, [ABB], upon reasonable request. Due to privacy and ethical considerations, the data are not publicly available.

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