Jurnal Penelitian dan Pembelajaran IPA JPPI
Vol.10, No.2, 2024, p. 241-253 p-ISSN 2477-1422 e-ISSN 2477-2038

A Feasibility of Flexible Learning Program on Social Networks for Prospective Science Teachers

(Received 8 July 2024 Revised 30 November 2024 Accepted 30 November 2024)

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DOI: 10.30870/jppi.v10i2.27447

Abstract

The innovative skills in designing effective lessons for both students and teachers through social networks is very crucial for modern classrooms. This study aimed to explore the novel and feasibility of flexible learning programs on social networks which are developed by researchers and for prospective science teachers. The program includes 5 main elements: 1) Program principles, 2) Program aims, 3) Program content, 4) Formats and activities used in the program, 5) Measurement and evaluation. The feasibility is explored at the highest level. In terms of content, technology, and pedagogy innovations, the exchange of information and resources made possible by the utilization of assets promotes new ideas and breakthroughs. The flexible learning program is new to implement in prospective science teachers and response to the professional standards.

Keywords: Feasibility, Flexible learning, Prospective science teacher, Social networks

INTRODUCTION

A new era of accessibility and adaptability has begun in the ever-changing world of education, and the concept of flexible learning is at the forefront of this change (Goh & Abdul-Wahab, 2020; Müller & Mildenberger, 2021). Flexible learning differs from conventional techniques in that it focuses on satisfying the requirements of students with diverse backgrounds, interests, and availability (Kanes, 2020; Thai et al., 2020). Flexible learning may enhance education, make classrooms more inclusive, and better prepare students for the challenges of the contemporary world (Nuangchalerm, 2020; Duangpim et al., 2021; Sosutha et al., 2021). Individuals have varied ways of absorbing material and remembering knowledge, and flexible learning takes this into consideration. Teachers may better meet their students' particular needs if they cater to their visual, auditory, and kinesthetic learning styles. This adaptability promotes a better understanding and retention of the subject while also accommodating different learning styles.

Individualized learning is a key component of flexible learning which, rather than being obliged to follow a tight timetable, this technique allows students to develop based on their abilities in certain skills (Fitzgerald et al., 2022; Li et al., 2022). Personalized learning plans not only help children achieve academically, but they also foster independence and responsibility (Martin & Godonoga, 2020; Cheung et al., 2021; De Torres, 2021). That is, will benefit them throughout their lives as they grow their knowledge. One of its most significant advantages is the potential for flexible learning to help overcome performance gaps and improve engagement. The ideal method for educators to create an inclusive learning environment that welcomes students with diverse talents, interests, and experiences is to accommodate multiple learning styles, provide alternative assessment techniques, and make online resources widely accessible.

In today's rapidly evolving world, more inclusive and modern educational techniques are replacing more traditional ones. A paradigm shift has occurred with the expansion of flexible learning programs, which allow prospective students more leeway to choose their own unique educational path. It could be helpful to give prospective students more control over when and where they engage with course material, as they frequently must balance work, family, and other obligations. Technological innovations have made education more accessible than ever before. By using online platforms, flexible learning eliminates

geographical barriers, allowing students to access instructional materials from any location with an internet connection even their own homes (Reich, 2020).

For prospective students who are unable to attend traditional on-campus programs. This accessibility is of utmost importance to learn and adapt in new learning environments. Prospective students have the freedom to choose courses that align with their own interests and career aspirations. In addition, students may engage with the subject in ways that are personalized to their interests to the availability of a range of learning tools such as video lectures, interactive modules, and discussion forums.

The increased use of technical tools has helped to define classroom flexibility. Flexible learning strategies combine in-person education with digital resources to make use of the best of both worlds (Alamri et al., 2020; Asio et al., 2021; Valtonen et al., 2021). This combination caters to students born in the digital age while also preparing them for a future in which technology plays an important role by fostering the development of critical skills such as digital literacy and independent study. The notion of flexible learning extends beyond conventional classrooms, enabling students to access course materials from anywhere (Chansanam et al., 2021; Dawilai et al., 2021; Sitthiworachart et al., 2022). Asynchronous learning models and online learning platforms allow users to study when it is most convenient for them. Students who are geographically or logistically disadvantaged will gain the most from the democratization of information access (Abenes & Caballes, 2020).

Students can form genuine relationships with one another via online forums, group projects, and virtual discussions, which in turn promotes a sense of community. The benefits of collaborative information sharing may be accessible to prospective students even in a virtual classroom. Students can progress at their own pace in flexible learning programs since they often use a continuous learning strategy. Skills like self-discipline, time management, and autonomous problem-solving are essential in today's ever-changing market, and this not only caters to different learning rates but also encourages their growth. A flexible learning environment encourages a variety of creative assessment strategies. Assessments for prospective students could include adaptive testing, real-

world applications, and project-based assessments.

METHOD

The purpose of this research is to examine the potential of social media platforms for flexible learning programs with the objective of enhancing student teachers' capacity for creative lesson planning and delivery. It is possible to build manuals and program outlines around the requirements for creating a flexible learning program. The core of the content utilized in the program is easy to identify. To foster students' capacity to develop novel approaches to instruction, the program's structure and activities are structured to align with these goals. In secondary school science learning management courses, using flexible learning programs on social networks is divided into 3 phases: Phase 1 - Preparation before entering the development program, Phase-2 Development consists of content in each module: 1) problem analysis for innovation design, 2) innovation for learner development, 3) use of technology in learning management for learner development, and 4) development of technology for learner development, assessment for learning, and Phase 3 - Integration program into school practices.

Evaluation of program outlines and manuals for flexible learning programs on social networks to promote the ability to design innovative teaching and learning of students and teachers by 7 experts to assess usefulness, suitability, accuracy, and feasibility. Then, improvement of program outlines and manuals in according to the advice of experts conducted. A pilot study programs and manuals conducted with 30 enrolled teacher students. Finally, drafting programs and manuals were revised and corrected for its feasibility and suitability.

The feasibility of the draft program and manual assessed by experts based on a 5-level rating scale. The 7 experts who must be qualified as instructors in higher education with 5 years of teaching and research experience as experts in 1) curriculum and teaching, educational science and science learning management for 3 persons, 2) educational technology for 2 persons, and 3) measurement and evaluation for 2 persons. Data were analyzed by mean and standard deviation. Level of feasibility can be considered through criteria divided into 5 levels and interpreting the mean score according to the criteria 4.51-5.00 highest; 3.51-4.50 high; 2.51-3.50 average; 1.51-2.50 low; and 1.00-1.50 lowest level of feasibility in respectively.

RESULTS AND DISCUSSION

The elements of flexible learning program consisted of 5 key components: learning resources, delivery mode, technology, teaching methods, and ontology (Figure 1). The details inside the composition are as follows:

1. Learning resources is the flexibility of a variety of learning resources. Teachers must provide learning resources that help students achieve their desired learning. To support the provision of quality, appropriate and adequate teaching and learning.
2. Delivery mode is the flexibility of learning data transmission between learners and instructors or learners and learners consist of:
   - Synchronous physical formats are the transmission of learning data by interaction with each other that occurs at the same time. Physical confrontation is how it looks, such as workshops. Science experiments using laboratory kits, demonstration of various science teaching and learning techniques.
   - Synchronous online formats happen at the same time such as online teaching through online meetings, virtual classroom.
   - Asynchronous formats have not to be spent on the same page.
3. Technology is the flexibility of technology as a tool for teaching and learning. Teachers must create opportunities for students to use technology, establish a learning information center to assist in the search and acquisition of knowledge.
4. Teachers must be flexible in applying their knowledge and abilities about learning theories. Techniques, teaching methods in both face-to-face and online class management.
5. Learners' pursuit of actual knowledge or ontology, the flexibility of the nature of each individual learner to choose knowledge according to reality. They can independently choose a variety of learning methods according to their needs, such as self-learning. Study in a group learning through technological medias in the form of images, audio or text, etc.

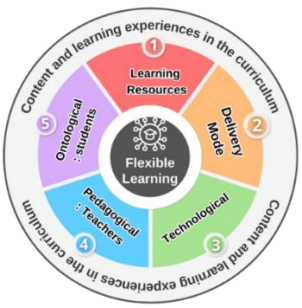

Figure 1 Elements of flexible learning on social networks

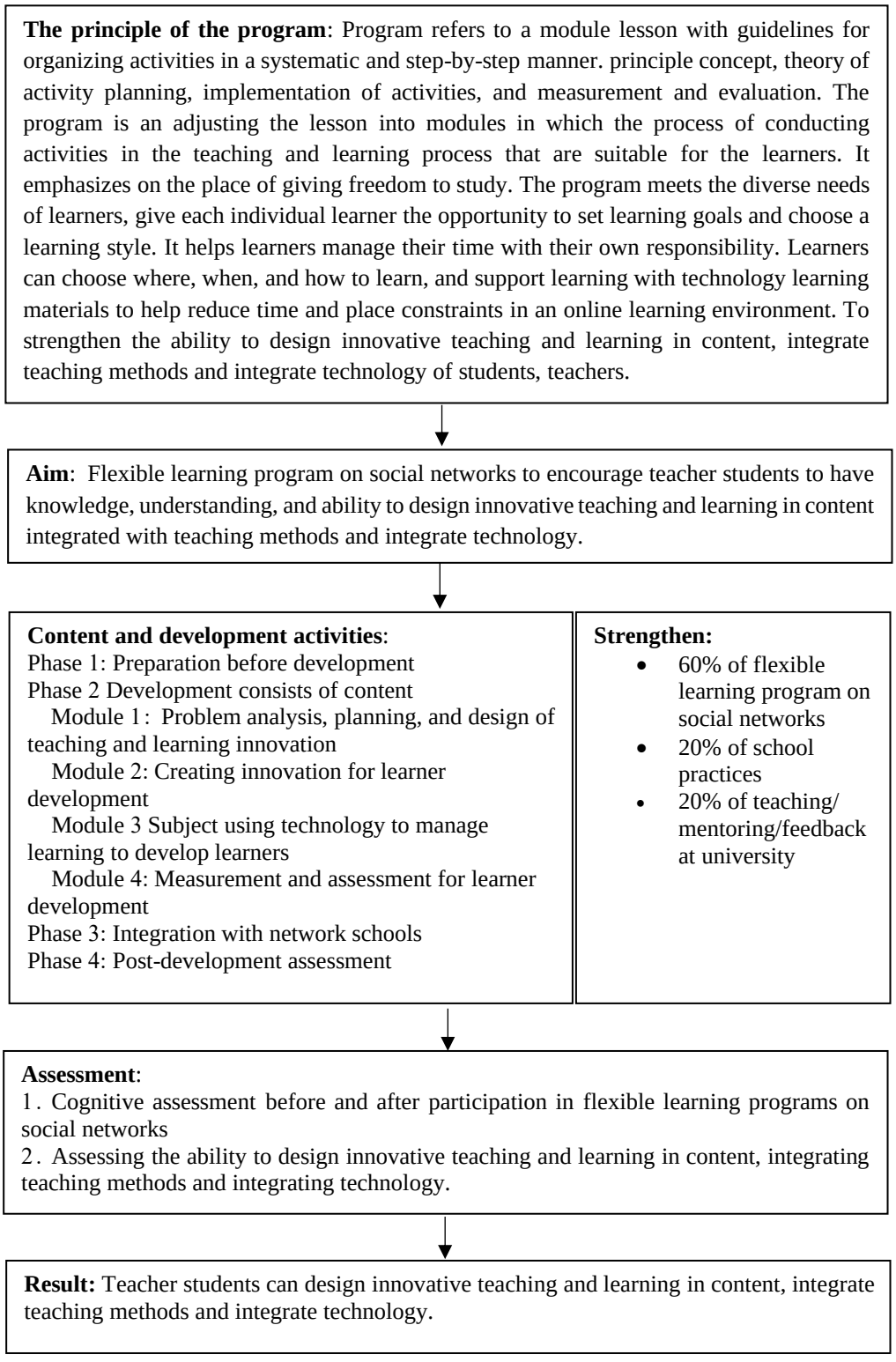

Figure 2 Components of flexible learning on social networks

The components of flexible learning on social networks is developed through the documentary research and empirical data. The feasibility is assessed by 7 experts, it revealed that the level of feasibility is at highest. The information can be shown in Table 1.

Table 1 Level of feasibility of flexible learning on social networks

Components	$\bar{X}$	S.D.	Level of feasibility
1. Teaching and learning innovation			
1.1 Characteristics of innovation	4.71	0.49	Highest
2. The process of developing teaching and learning innovations in content combined with teaching methods and technology			
2.1 Objectives and goals of developing innovative teaching and learning in content, integrating teaching methods and technology	4.57	0.53	Highest
2.2 Application of principles, concepts, and theory of the development of pedagogical innovation in content, integrating teaching methods and technology	4.57	0.53	Highest
2.3 Steps to design innovative teaching and learning in content integrating teaching methods and technology	4.86	0.38	Highest
2.4 Innovative development process of content integrates teaching methods and technologies	4.71	0.49	Highest
2.5 Participation in the development of teaching and learning innovations in content integrating teaching methods and technologies	4.71	0.49	Highest
2.6 Success in developing innovative teaching and learning in content, integrating teaching methods and technologies	4.57	0.53	Highest
3. The value and benefits of teaching and learning innovation			
3.1 Problem solving and improving the quality of learners	4.71	0.49	Highest
3.2 Use of resources in innovation development	4.57	0.53	Highest
3.3 Promoting mutual learning exchanges	4.57	0.53	Highest
3.4 Encouraging the process of inquiry	4.71	0.49	Highest

Components	$\bar{X}$	S.D.	Level of feasibility
3.5 Usefulness	4.86	0.38	Highest
3.6 Implementation	4.86	0.38	Highest

Table 1 displays the top components of experts' total potential to create innovations in learning and teaching. When assessed separately in decreasing order. We found that the average score for instructional design procedures, creativity in learning material, and technology integration in the classroom was 4.86. Once everything was in place, the average score for five parts was 4.71. The act of developing novel methods of teaching that make use of technology resources and encourage students to reevaluate previously covered content. It takes part in the creation of new methods of education that combine technology with traditional teaching strategies to improve student learning.

The five components of the aims and objectives-establishing content-based teaching and learning innovations, integrating teaching techniques and technology, and supporting the process of inquiry-achieved an average score of 4.57 in problem-solving and the quality development of learners. Questions to ask before putting plans into action: The development of new approaches to teaching and learning that incorporate technology resources with established pedagogical techniques. By merging instructional methodologies with technology, we have made significant advancements in the development of teaching and learning. Our innovations in content have been cutting-edge. The utilization of assets promotes the exchange of information and expertise, which in turn encourages the development of fresh concepts and inventions.

The development of innovative pedagogical practices that make use of technological tools and encourage students. It stresses the significance of using technology to improve learning experiences and introduce new ideas into the field of education. The creation of new methods of education that combine technology with traditional teaching strategies to improve student learning. The five components of the aims and objectives-establishing content-based teaching and learning innovations, integrating teaching techniques and technology, and supporting the process of inquiry. The aspects of educational innovations, such as content-based instruction, the use of technology, and the promotion of inquiry-based learning. It

notes that these parts were helpful in improving students' problem-solving and quality of life skills (Rodrigues et al., 2021; Marchisio et al., 2022).

The historical development of new approaches to teaching and learning that incorporate technology resources with established pedagogical techniques. The significance of critically evaluating educational programs prior to their implementation is implied. This research-oriented stance is further supported by the field's emphasis on tracing the origins of innovative educational practices that integrate technological tools with time-tested methods of instruction (Muller, 2020; Ramirez-Verdugo & Otcu-Grillman, 2020; Andreescu & Dimitriu, 2021). Merging instructional methodologies with technology, we have made significant advancements in the development of teaching and learning (National Research Council, Division on Earth, Life Studies, Commission on Life Sciences, & Committee on Biology Teacher Inservice Programs 1996; Giannakos, 2022; Etkina & Planinsic, 2024). The effects of combining technological tools with established methods of instruction imply that great strides have been taken to enhance the educational experience for students (Nuangchalerm et al., 2020). Our innovations in content have been cutting-edge, content creation advances have been very innovative and effective, leading to breakthroughs in the area.

Development of flexible learning programs on social networks help prospective students gain their ability to design innovative teaching and learning among students and teachers. The results of the evaluation of the program by experts in all aspects are at the highest level. The use of social networks as a tool for flexible learning helps to create interaction between teachers and students with interacting and transmitting information (Hawkridge, 2022; Nithitakkharanon & Nuangchalerm, 2022; Phan et al., 2022; Sastria, 2023; Efwinda et al., 2023). The program allows learning through social networks provides an opportunity for students to share their opinions based on research. The utilization of assets promotes the exchange of information and expertise, which in turn encourages the development of fresh concepts and inventions (Posnanski, 2002). Utilization of resources, as this phrase shows, has good effects, such as promoting the sharing of information and skills, which in turn leads to the creation of novel ideas and technologies (Burbules et al., 2020; Haleem et al., 2022; Smith & Gillespie, 2023). It stresses the need to make good use of available resources to encourage creative thinking in the classroom.

CONCLUSION

Flexible learning programs on social networks help prospective science teachers promote their ability to design innovative teaching and learning among students and teachers which consisted of 5 components: 1) Program principles, 2) Program aims, 3) Program content, 4) Formats and activities used in the program, 5) Measurement and evaluation. The feasibility is explored at the highest level. The creation of novel educational practices that combine the use of technological resources with time-tested methods of instruction. Teaching and learning have progressed greatly due to the integration of technology with educational approaches (Triplett, 2023; Syachruroji et al., 2024). This study provides a flexible learning program on social networks which is suitable for implementation in prospective science teachers. We have been at the forefront of content innovation. New ideas and innovations are fostered via the sharing of knowledge and resources made possible by the exploitation of assets.

ACKNOWLEDGEMENT

This research is financially supported by Mahasarakham University.

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