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Teaching Effectiveness: A Design Feedback Process of One State University in the Philippines

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Abstract

This study examined the efficacy of teaching methods in flexible learning, specifically focusing on a state institution in the Philippines. The study sought to determine the impact of student learning engagement on teaching effectiveness, using the university's curriculum quality assurance (CQA SF 012) standards as a basis. The research used purposive sampling to select 281 teacher education students as respondents. Multiple regression analysis was utilized to determine the important factors of teaching effectiveness. The study revealed a substantial correlation between student learning engagement and teacher effectiveness in flexible learning. The respondents indicated significant levels of engagement in all aspects of student learning engagement, and teaching methods that effectively engage and support all students were highly effective. Furthermore, there was a favorable correlation between teaching effectiveness, instructional and assessment approaches, and the learning environment. The study additionally discovered that engaging in active learning and having a stimulating educational experience were favorable indicators of effective teaching. These findings may have significance for the institution's faculty development and teaching assessment practices. The study indicates that a firm dedication to enhanced education is crucial in guaranteeing that students acquire the aptitudes needed for achievement in the professional field. This study adds to the existing body of knowledge on flexible learning and the effectiveness of teaching, offering valuable insights that have the potential to enhance teaching methods and increase student learning outcomes.

Keywords

Flexible Learning, Student Evaluation, Teaching Improvement

INTRODUCTION

The advent of online learning and information and communication technologies (ICTs) has fundamentally transformed the conventional education system. The shift towards adaptable learning has resulted in substantial modifications in instructional approaches and has rendered technology an essential classroom component (Sadeghi, 2019). Consequently, educators must be equipped with the necessary skills to adapt to the current distant learning landscape to guarantee students a high quality of education. This research explores the impact of flexible learning on education and the utilization of technology in teaching and learning, specifically in the context of the contemporary educational landscape.

To enhance the integration of the current distance education environment, it is necessary to implement various measures, such as providing training for education professionals. Espino-Daz et al. (2020) propose that the growing utilization of online learning and information and communication technologies necessitates education professionals to adjust to the present circumstances. The necessity for training emerges because technology has become an indispensable

component of the classroom (Raja & Nagasubramani, 2018; Panergayo & Aliazas, 2023). Therefore, it is imperative to provide teachers with training on effectively utilizing technology to optimize the educational experience for students (Panoy et al., 2022). The training should encompass learning management systems, online teaching tools, and other information and communication technologies (ICTs) pertinent to the present education system.

Flexible learning delivery is a contemporary pedagogical method that has recently experienced a surge in popularity (Armstrong-Mensah et al., 2020). The strategy prioritizes leveraging technology to augment education and has significantly transformed conventional teaching methodologies (Wu et al., 2021). According to Al-Zahrani (2016), incorporating technology in classrooms enables students to engage in their education with greater involvement. Flexible learning delivery technology allows students to learn at their preferred speed and convenience (Shurygin et al., 2021). Additionally, it fosters a dynamic learning atmosphere in which students can actively engage with one another, collaborating and gaining knowledge collectively.

The COVID-19 pandemic has had a profound global effect on the school system (Scull et al., 2020). Due to the pandemic, schools have been compelled to close, leading to the widespread use of online learning as the predominant method of instruction (Armitage & Nellums, 2020). According to Yazon and Callo (2021), the present educational setting encourages widespread utilization of computerized language, and online education has become the standard. The pandemic has underscored the necessity for education professionals to adjust to the prevailing trend of distance education, known as the "new normal." The utilization of technology in education has become increasingly crucial, necessitating instructors' training to employ technology to provide high-quality education effectively (Kapasia et al., 2020).

Flexible learning delivery prioritizes using technology to enhance education and optimize student learning results (Ahmed, et al., 2021). According to Callo and Yazon (2020), this technique has allowed students to access information from learning management systems, analyze data, and engage in logical thinking. Online teaching technologies facilitate enhanced learning outcomes and the acquisition of diverse abilities pertinent to the contemporary professional landscape (Aliazas et al., 2022). These talents encompass critical thinking, problem-solving, and teamwork.

Evaluating teaching efficiency is a crucial component of the present education system. It evaluates the caliber of instruction and education and pinpoints areas needing enhancement. Utilizing technology-enhanced instruction in flexible learning modalities is an organizational innovation that can assist in evaluating teaching efficacy. The LSPU CQA SF12 (2021) report highlights that integrating modern educational technology with flexible learning methods can assist teachers and students in acquiring a range of skills by applying crucial information.

Moreover, online learning and ICTs have substantially transformed the conventional education system (Adedoyin & Soykan, 2023). Technology has become an essential classroom component due to the increasing popularity of flexible learning delivery (Sandybayev, 2020). According to Marienkoe et al. (2020), education professionals must receive training on utilizing technology to augment the educational experience and adapt to the current remote education landscape. Amid the COVID-19 epidemic, the prevailing educational setting encourages widespread utilization of computerized language, and online education has become the norm (Panergayo & Aliazas, 2021). This demonstrates the utilization of technology for educational purposes in both professional and domestic environments. Implementing flexible learning delivery has empowered students to engage in their education actively, access information from a learning management system, analyze data, and engage in logical thinking (Filgona et al., 2020). When combined with flexible learning methods, modern educational technologies can assist teachers and students in developing abilities by applying crucial information.

Given the recent changes in the field of education, it is necessary to assess the efficiency of the teaching and learning process. Evaluation methods for teaching effectiveness can measure the quality of teaching and learning within the framework of organizational innovations, such as the flexible learning mode supported by technology-enhanced instructions. Educators can enhance students' learning experiences by assessing the efficacy of online learning and using ICTs in education, enabling them to pinpoint areas that require improvement.

Research Questions

This study aimed to comprehensively understand the dynamics between learning engagement and teaching effectiveness in flexible learning.

1. To what extent is learning engagement observed among teacher-education students in flexible learning regarding the academic challenge, active learning, staff-student interaction, enriching educational experience, supportive learning environment, and work-integrated learning?
2. To what extent is teaching effectiveness manifested in flexible learning regarding mastery experience, vicarious experience, and social persuasion/socialization?
3. Does a significant relationship exist between learning engagement and teaching effectiveness in flexible learning?
4. What parameters of learning engagement positively predict teaching effectiveness in flexible learning?

LITERATURE REVIEW

Learning Engagement

Flexible learning, known for its ability to adjust and accommodate, has become a promising method in education, meeting learners' various needs and preferences. The learning process's efficacy relies heavily on learning engagement, which includes the cognitive, emotional, and behavioral aspects of student involvement. According to Almusaed et al. (2023),

flexible learning permits students increased autonomy in their educational journey, enabling them to customize their learning experience according to their interests, speed, and preferred learning methods. Studies indicate that giving students more independence and options benefits their motivation and involvement in adaptable learning settings (Chiu et al., 2023).

Integrating interactive multimedia materials and collaborative platforms promotes peer engagement, the exchange of knowledge, and the facilitation of social learning experiences (Carvalho & Santos, 2022). Collaborative learning exercises facilitate active participation, analytical reasoning, and enhanced comprehension of course material (Qureshi et al., 2023).

According to Rahman et al. (2021), providing prompt feedback and support systems is crucial for maintaining student motivation and involvement in adaptable learning settings. Positive feedback and personalized assistance promote a feeling of proficiency and expertise, improving student self-assurance and involvement (Alshewiter, et al., 2024). Integrating technology effectively improves learning engagement by offering interactive and immersive learning experiences (Bizami et al., 2023). Digital tools and multimedia materials enhance student curiosity, creativity, and discovery, leading to long-lasting engagement and motivation (Ma et al., 2023).

Academic Challenge

Within the domain of flexible learning, academic challenge plays a vital role in shaping the total learning journey of pre-service teachers. Research findings suggest that participating in flexible learning environments is associated with a heightened perception of academic difficulty. (Kariippanon, et al., 2021). Kapasia et al. (2020) found that pre-service teachers who actively participated in online discussion forums reported experiencing greater academic difficulty compared to their peers who did not participate in these forums. This highlights that online exchanges can enhance intellectual rigor and elevate the academic experience (Papaioannou et al., 2023).

In addition, the research conducted by Chu et al. (2021) contributes to this viewpoint by demonstrating that pre-service teachers who engaged in online collaborative learning activities had greater academic difficulty compared to those who did not participate in such collaborative efforts. The combined results highlight the importance of flexible learning, especially through interactive and collaborative platforms, in creating an academic setting that encourages pre-service teachers to face problems (Gokbel, 2020). Educators and institutions must acknowledge the strong connection between flexible learning engagement and academic challenge to enhance the learning experience and foster intellectual development among teacher-education students (Fidan & Yildirim, 2022).

Active Learning

Active learning is an interactive educational method that actively incorporates students in learning, promoting engagement and improving comprehension (Hodges, 2020). According to Ullah and Anwar (2020), active learning encompasses a range of methodologies, such as problem-based learning, group collaboration, and experiential learning. The efficacy of active learning is apparent in studies, specifically in the setting of pre-service teacher education (Lander et al., 2020).

Research has revealed that flexible learning environments are beneficial for increasing active learning among prospective educators (Eickholt et al., 2020). Dissanayake's (2019) study emphasizes the beneficial effects of a blended learning program on pre-service teachers. The course included online conversations, collaborative group work, and real-world case studies, which heightened active learning engagement. This exemplifies the adaptability of active learning techniques, highlighting their ability to be effortlessly incorporated into many educational environments (Bean & Melzer, 2021). As education progresses, the focus on active learning remains crucial in fostering a dynamic and engaging learning experience for students, equipping them with the demands of a constantly evolving environment (Ribeiro-Silva et al., 2022).

Staff-Student Interaction

The connection between staff and students is essential in educational environments, as it determines the quality and impact of communication and involvement between teachers and learners (Díez et al., 2020). Research highlights the need for adaptable learning settings to promote constructive staff-student engagement (Trowler et al., 2022). The research conducted by Adedoyin and Soykan in 2023 emphasizes the importance of blended learning methodologies. The study involved pre-service instructors who participated in a course that effectively integrated traditional and online components. This included features like virtual conversations and feedback provided through videos. The findings demonstrated a significant rise in the level of engagement expressed by participants compared to those in traditional environments.

According to (Bereczki & Kárpáti, 2021), the capacity of creative instructional approaches utilizing technology to improve the interaction between teachers and students. Educators can adopt various teaching methods to establish a nurturing and stimulating environment, empowering students to interact and collaborate with their teachers (Jaswal & Behera, 2024). These findings highlight the significance of adjusting educational methods to enhance staff-student contact, ultimately leading to a more enhanced and efficient learning experience.

Enriching Educational Experience

Adopting flexible learning promotes adaptability in instructional methods and improves the entire educational experience for pre-service teachers (Aliazas et al., 2021). A study conducted by Atmacasoy and Aksu (2018) highlights that pre-service teachers who participated in a blended learning course, which incorporated multimedia resources, case studies, and reflective activities, expressed greater satisfaction with their educational experience than those in traditional settings. Integrating different learning methods accommodates different ways of learning and fosters a more profound comprehension and admiration for the subject.

Moreover, the study by Armitage et al. (2020) emphasizes the beneficial effects of creative learning methods. The study by Dalinger et al. (2020) found that pre-service teachers who participated in an online simulation game reported that it offered them a unique and valuable learning opportunity. This underscores the capacity of technology-driven tools to generate immersive and engaging educational settings (Abendan et al., 2023). Incorporating flexibility into educational delivery equips future educators with the necessary skills to navigate the ever-changing teaching environment and guarantees a more fulfilling and rewarding educational experience (Wu et al., 2021).

Supportive Learning Environment

An essential factor in the professional growth of pre-service teachers is a supportive learning environment, and research emphasizes the importance of adaptable learning in promoting such an atmosphere (Boz & Cetin-Dindar, 2023). In their study, Chen and Lin (2019) found that participating in online discussion forums can be crucial in establishing a nurturing learning environment for pre-service teachers. The study of (Sundström et al., 2021) unveiled that individuals engaged in these online platforms expressed camaraderie, feeling at ease expressing their ideas and obtaining valuable input from their fellow members. The significance of interactive and adaptable learning systems surpasses the limitations of traditional classroom settings (Imhof et al., 2020).

Moreover, technology significantly improves the learning environment's supportive nature (Al-Zahrani, 2016). Online forums allow pre-service teachers to overcome limitations imposed by distance, making it easier for them to collaborate and share ideas (Atmacasoy & Aksu, 2018). The flexibility in learning styles fosters active engagement and cultivates a sense of inclusion and camaraderie among pre-service instructors. (Bereczki & Kárpáti, 2021). Adopting adaptable learning methods, especially online platforms, greatly contributes to developing a supportive educational environment, promoting collaboration and improving the overall learning experience for pre-service teachers (Yazon & Callo, 2021).

Work-Integrated Learning

Work-Integrated Learning is an interactive method that effectively combines academic knowledge with practical experience in a working environment (Berndtsson et al., 2020). This teaching style especially applies to pre-service teachers since it improves their comprehension and utilization of academic topics in practical situations. A study conducted by McGrew et al. (2018) highlights the efficacy of blended learning as a means of work-integrated learning (Bernhardsson, 2023). According to (Schmid et al., 2023), blended learning combines online resources with a hands-on practicum in a school setting, resulting in a comprehensive learning environment (Abendan et al., 2023). This integration enhances the students' involvement in work-integrated learning and fosters a well-rounded set of skills, equipping them for the demands of the teaching profession (Gokbel, 2020).

Flexible learning strategies enhance work-integrated learning by meeting various schedules and individual learning preferences. (Yazon & Callo, 2021). The mutually beneficial interaction between academic institutions and industries facilitates an interchange of knowledge, ensuring that pre-service teachers understand theoretical frameworks and acquire practical competencies crucial for their future jobs (Schmid et al., 2023). As education adapts to the needs of a constantly changing society, work-integrated learning plays a crucial role in developing skilled and flexible workers.

Teaching Effectiveness in Flexible Learning

Flexible learning has become a famous educational method that provides various chances for teaching and learning in modern educational environments (Whalley et al., 2021). Comprehending teaching effectiveness in flexible learning is crucial to maximizing student results and guaranteeing high-quality education (Bereczki & Kárpáti, 2021). Flexible learning allows teachers to use customized teaching methods adapted to each students' needs, preferences, and learning styles (El-Sabagh, 2021). By offering a range of learning materials, instructional techniques, and assessment choices, teachers can ensure equal access to education and cater to the needs of different learners (Fung et al., 2022).

Encouraging students to participate in interactive learning activities promotes a more profound comprehension, analytical thinking, and long-term memory of the course material (Ahmed, et al., 2021). Teachers in flexible learning environments can encourage active learning by implementing collaborative projects, problem-solving exercises, and interactive multimedia resources. This approach promotes student involvement and autonomy (Callo & Yazon, 2020).

Within flexible learning environments, educators can offer tailored feedback and support systems to cater to specific learning requirements and foster academic advancement (Papaioannou et al., 2023). Providing feedback promptly, offering individual consultations, and facilitating peer collaboration can improve student motivation, self-confidence, and academic achievements (Zacarian & Silverstone, 2020).

Teacher Techniques to Engage and Support All Students' Learning

Within the domain of flexible learning, teachers encounter the crucial obstacle of guaranteeing the involvement and assistance of every student (Almusaed et al., 2023). Research highlights that proficient educators effectively utilize various strategies to address and overcome this difficulty. Serrano et al. (2018) state that effective teachers employ various communication methods, including email, discussion forums, and video conferencing, to enhance their teaching strategies. This comprehensive strategy seeks to establish a feeling of connection and participation, cultivating an atmosphere in which every student is actively involved in the learning process (Atmacasoy & Aksu, 2018).

Expanding on this, Scull et al. (2020) emphasize further strategies skilled educators utilize in flexible learning. Scaffolding, a technique that offers gradual assistance to improve students' understanding and abilities, emerges as a fundamental tool (Margolis, 2020). In addition, Reeves (2022) indicated that proficient educators establish unambiguous standards, providing students with a clear path for their educational progress. They acknowledge the need for collaborative learning possibilities, establishing venues where students can collaborate, exchange thoughts, and collaboratively address the problems of adaptable learning settings (Boz & Cetin-Dindar, 2023).

Using these methods increases student involvement, and a comprehensive support structure is established for students with different needs (Filgona et al., 2020). Amid the changing nature of education, these flexible teaching methods are crucial in guaranteeing that the advantages of adaptable learning are available to every student, irrespective of their learning styles or preferences (Lander et al., 2020).

Instructional and Assessment Practices

Integrating instructional and assessment approaches is essential for promoting effective teaching (Lumando et al., 2023). Educators need to use various teaching methods in adaptable learning settings to improve student involvement and academic performance (El-Sabagh, 2021). Zhao et al. (2018) found that when teachers used project-based learning, it increased student engagement and helped develop critical thinking skills. In addition, Chu et al. (2021) emphasized the beneficial effects of using gamification approaches in flexible learning implemented by teachers on student motivation and academic performance, thereby emphasizing the significance of creative teaching methods.

Assessment procedures that guarantee fairness and effectiveness in flexible learning are equally crucial (Panergayo & Aliazas, 2023). Skilled educators utilize various evaluation methods to measure students' comprehension and proficiency accurately (Saleh, 2021). Begum et al. (2020) discovered that skilled instructors in adaptable learning environments utilized strategies such as self-evaluation, peer assessment, and formative assessment. (Carless, 2022). In order to create a flexible and efficient learning environment, it is crucial to combine dynamic teaching methods and careful assessment techniques as educational environments change (Callo & Yazon, 2020).

Learning Environment

In education, the learning environment plays a crucial role in the effectiveness of adaptable learning approaches (Alshewiter, et al., 2024). Extensive research highlights the crucial impact of the learning environment on the efficiency of teaching in flexible settings (Boz & Cetin-Dindar, 2023). Studies confirm that skilled educators in flexible learning possess a deep capacity to create a positive and supportive environment that promotes optimal learning results (El-Sabagh, 2021).

An illustrative example of this phenomenon is a study by Chang et al. (2020), which provides insights into the tactics proficient educators utilize in the adaptable educational environment. These instructors utilize tactics beyond established teaching conventions, embracing creative alternatives. The educators employ timely feedback methods, utilize multimedia materials, and foster a sense of community within the virtual space to create an environment that promotes learning.

Providing timely and helpful feedback helps students improve their performance and encourages them to feel more involved and motivated (Lee et al., 2022). Integrating multimedia materials enhances the learning process by accommodating various learning preferences. Moreover, the focus on community development cultivates a cooperative environment, promoting peer interactions and assistance (Wright et al., 2022). In flexible education, the learning environment becomes a dynamic canvas where skilled teachers combine educational innovation with interpersonal dynamics to create an environment that promotes student success and engagement.

Synthesis

According to the literature, flexible learning offers pre-service teachers a range of opportunities to engage in learning. These opportunities include academic rigor, active participation, interaction with staff and students, a valuable educational experience, a supportive learning environment, and integration of work and learning. Nevertheless, it is crucial to acknowledge that the efficacy of flexible learning is contingent upon the meticulous planning and execution of learning activities and the level of assistance offered to students. In general, the literature indicates that the success of teaching in flexible learning is impacted by a range of elements, such as the teachers' methods to involve and assist all students in their learning, the practices used for instruction and evaluation, and the learning environment. Skilled educators in adaptable education employ several strategies to foster student involvement and success while establishing a favorable and encouraging learning atmosphere for their pupils.

METHODOLOGY

Flexible learning has experienced a surge in popularity in the Philippines, particularly in response to the COVID-19 pandemic. Therefore, assessing instructional efficacy in flexible educational settings has gained significance. This study sought to make a valuable addition to the existing body of knowledge by examining the effectiveness of teaching in a state university in the Philippines, particularly emphasizing student engagement in the learning process.

The study aimed to determine the impact of student learning engagement on teaching effectiveness using the LSPU CQA SF 012 criteria, which are standards for assessing teaching effectiveness in flexible learning contexts. To accomplish this, the study technique entails conducting a survey of 281 teacher education students using purposive sampling as respondents throughout the academic year 2021-2022.

The primary tool utilized for the investigation was a survey questionnaire consisting of two sections. Part 1 focuses on the level of monitoring of the pre-service teachers' participation in flexible learning delivery. Part 2 specifically relates to the LSPU CQA SF 012 criteria for assessing the efficacy of teaching in flexible learning. The survey questionnaire was employed to gather data from students in teacher education programs.

The data from the survey questionnaire was analyzed using descriptive statistics, such as the mean and standard deviation. Subsequently, a multiple regression analysis was performed to find significant predictors of instructional efficiency. This enabled the researchers to ascertain the parameters influencing teaching efficiency in flexible learning environments.

The results of this study are anticipated to enhance the efficacy of instruction in flexible learning settings in the Philippines. To enhance student engagement and accomplishment in flexible learning environments, educators might employ tactics that involve recognizing the factors that impact teaching effectiveness. This can ultimately result in improved student outcomes and optimize the advantages of flexible learning

RESULTS AND DISCUSSION

Table 1 The extent of learning engagement is observed among teacher education students in flexible learning

Learning Engagement			Mean	SD	VI
Academic Challenge			4.19	.538	HO
Active learning			4.24	.602	HO
Staff-Student Interaction			4.21	.586	HO
Enriching Educational Experience			4.22	.607	HO
Supportive Learning Environment			4.26	.525	HO
Work Integrated Learning			4.25	.556	HO
Note:	4.50-5.00	VHO	Very Highly Observed		
	3.50-4.49	HO	Highly Observed		
	2.50-3.49	MO	Moderately Observed		
	1.50-2.49	LO	Least Observed		
	1.00-1.49	NO	Not Observed		

Active participation in the learning process is a fundamental aspect of effective education, as evidenced by the literature (Bada & Olusegun, 2015). Student engagement enhances the ability to remember knowledge and fosters a more profound comprehension of the subject matter (Licorish et al., 2018). Moreover, consistent engagement reduces the likelihood of students becoming disinterested in the content, creating a favorable atmosphere for successful learning. Elements such as focus, curiosity, enthusiasm, and emotional attachment all have a role in determining the overall excellence of the educational encounter, whether it takes place in a conventional classroom environment or during self-directed learning.

Within flexible learning, where educational models are changing, research emphasizes the crucial significance of student participation in influencing favorable learning results (Moyer, 2014). The evidence reported in Table 1 supports this viewpoint, illustrating that flexible learning successfully involves teacher education students. This involvement is accomplished through several methods, such as interactive course materials, collaborative learning exercises, and regular instructor communication. These tactics collectively provide a dynamic and interactive learning environment, showcasing the adaptability and efficiency of flexible learning methodologies in engaging and maintaining student attention. Acknowledging and supporting student involvement, especially in adaptable learning, is important to maximize educational results and promote a favorable and efficient learning experience.

The data in Table 1 demonstrate that flexible learning is a transformative method that favors student performance in online courses. The unhindered availability of course materials and resources, regardless of time or location, enhances student satisfaction and fosters a greater will to learn (Armstrong-Mensah et al., 2020). Moreover, flexible learning allows students to customize their learning experience according to their speed and chosen learning methods, creating an environment that promotes enhanced learning results.

While flexible learning offers numerous benefits, it is not exempt from difficulties, and a significant issue to consider is the possibility of student isolation (Gillett-Swan, 2017). Nevertheless, evidence contradicts this idea, demonstrating that adaptable learning might alleviate rather than worsen isolation. Flexible learning fosters a sense of connection among learners by strategically including collaborative learning opportunities and maintaining open lines of communication with instructors and classmates (Yuan & Kim, 2014).

The extensive analysis presented in Table 1 confirms that flexible learning successfully involves students in learning. Flexible learning is an adaptable educational strategy that can improve performance, increase satisfaction, and reduce feelings of isolation. It can promote beneficial learning outcomes in various environments. It is crucial to acknowledge the diverse effects of flexible learning and utilize its capacity to establish educational settings that are both enriching and inclusive.

Table 2 The extent of teaching effectiveness manifested in flexible learning

Teaching Effectiveness in Flexible Learning			Mean	SD	VI
Teacher Techniques to Engage and Support All Students in Learning			4.32	.499	E
Instructional and Assessment Practices			4.42	.508	E
Learning Environment			4.32	.544	E
<i>Note:</i>	4.50-5.00	VE	Very Effective		
	3.50-4.49	E	Effective		
	2.50-3.49	ME	Moderately Effective		
	1.50-2.49	SI	Somewhat Ineffective		
	1.00-1.49	I	Ineffective		

Table 2 provides a thorough summary of the extent to which teaching efficacy is displayed in the setting of flexible learning. The research findings highlight a notable benefit of flexible learning, emphasizing its ability to structure students' academic endeavors based on their passions and interests (Atmacasoy & Aksu, 2018). The individualized strategy improves student enthusiasm and involvement, ultimately improving learning results (Scull et al., 2020).

Another notable advantage of flexible learning is its capacity to foster a fearless and pleasurable learning environment. The strategy described in the study by Callo and Yazon (2020) reduces stress levels. It promotes a pleasant learning experience by allowing students to learn quickly without being limited by time restrictions or external influences. By allowing students to explore their studies independently, they can develop a more profound comprehension of the subject matter (Chang et al., 2022). The various benefits of flexible learning described in Table 2 highlight its effectiveness in enhancing individual learning experiences and promoting a favorable and supportive educational environment.

The assessment of teaching efficacy in flexible learning has revealed a crucial benefit—students can actively participate in the learning process by customizing their courses to meet their specific requirements. This represents a significant deviation from conventional classroom environments, where students frequently face an inflexible curriculum that may not correspond to their individual learning needs and preferences.

Customizing courses in adaptable learning offers benefits since it improves students' capacity to retain information and attain exceptional outcomes. This individualized approach enables students to learn at their preferred speed, revisit materials when needed, and focus on areas that require additional attention. This adaptability guarantees that students are completely engaged in learning, unleashing their maximum capabilities and cultivating a profound connection with the subject matter (Espino-Díaz et al., 2020).

The extensive analysis in Table 2 confirms the efficacy of flexible learning as a pedagogical method. Facilitating student autonomy in customizing their courses, advancing at their speed, and fostering a constructive and encouraging learning atmosphere enhances learning achievements. Flexible learning, through granting students autonomy in their educational path, not only caters to their specific learning requirements but also boosts overall involvement, highlighting its potential as a successful and student-centered teaching method.

Table 3 Test of correlation between learning engagement and teaching effectiveness in flexible learning

Learning Engagement	Teaching Effectiveness in Flexible Learning		
	Teacher Techniques to Engage and Support All Students in Learning	Instructional and Assessment Practices	Learning Environment
Academic Challenge	.179**	.245**	.207**
Active learning	.661**	.256**	.250**
Staff-Student Interaction	.263**	.294**	.218**
Enriching Educational Experience	.700**	.255**	.219**
Supportive Learning Environment	.336**	.206**	-
Work Integrated Learning	.330**	.301**	.238**

** Correlation is significant at the 0.01 level (2-tailed)

Table 3 presents the results of the correlation analysis investigating the connection between the engagement of pre-service teachers in learning and their success in teaching using the flexible learning framework. The evidence suggests that engaging students actively in learning leads to notable advantages by improving their focus and concentration and promoting advanced critical thinking abilities. This discovery highlights the crucial importance of student participation in attaining effective teaching within the flexible learning framework, which aligns with other research emphasizing student engagement's key significance (Kapasia et al., 2020).

The association between pre-service teachers' learning engagement and teaching effectiveness in flexible learning is deemed to be modest to moderate. Although it may seem unassuming, this association significantly impacts educational research. It emphasizes acknowledging and fostering student interaction as a fundamental aspect of successful teaching in adaptable learning settings (Aliazas et al., 2022). Even a seemingly minor correlation underscores the need to foster active engagement, as it enhances the overall effectiveness of teaching tactics (Bernhardsson, 2023). This highlights the subtle interaction between engagement and effectiveness, providing insight into the complex dynamics educators and institutions must consider while improving the flexible learning experience.

The findings from Table 3 highlight a notable correlation between successful instruction in adaptable learning and the execution of dynamic learning and enhancing educational encounters. The results emphasize the significance of employing various teaching methods and techniques and forming meaningful relationships with students to attain the best possible results (Chu et al., 2021). To promote favorable outcomes, instructors must actively involve students in acquiring knowledge and offer engaging educational opportunities, establishing a dynamic and stimulating learning atmosphere (Begum et al., 2020).

The relationship between teachers' methods, students' level of involvement, and teaching success in flexible learning is crucial. Active learning and enriching educational experiences are essential elements that contribute to good teaching. This supports the idea that a comprehensive strategy, including different teaching approaches and a strong rapport with students, is crucial for success in adaptable learning settings (Dissanayake, 2021). Educators can enhance student support and promote favorable educational achievements through integrating these components (Fidan & Yildirim, 2022).

Overall, the results shown in Table 3 highlight that successful teaching in flexible learning requires a careful combination of student involvement, active learning methods, meaningful educational opportunities, and skilled teaching approaches. Educators must acknowledge and support these interrelated aspects to improve teaching effectiveness and raise student learning outcomes in the ever-changing landscape of adaptable learning environments.

Table 4 Prediction of learning engagement to teaching effectiveness in flexible learning

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.854	.141		20.242	.000
Enriching Educational Experience	.181	.062	.288	2.923	.004
Active Learning	.174	.063	.274	2.782	.006
<i>F</i> (2,278) = 57.820; <i>Adjusted R</i> ² = .289; <i>p</i> < .01; <i>N</i> = 281					
Dependent Variable: Teaching Effectiveness in Flexible Learning					

Table 4 displays the results of a stepwise multiple linear regression analysis. The analysis examines the relationship between teaching efficiency in flexible learning (dependent variable) and the independent variables, which are the characteristics of pre-service teachers' learning engagement. The findings indicate that the concepts of learning engagement, particularly enriching educational experience and active learning, contributed substantially to the regression model and explained 28.9% of the variability in teaching effectiveness as measured by flexible learning scores.

The F-test value of 57.820 indicates that the regression model is statistically significant, implying that the independent variables have a substantial predictive effect on the dependent variable. This outcome strengthens the notion that successful instruction in flexible learning is greatly impacted by student involvement, particularly in enhancing educational experiences and engaging in active learning.

Furthermore, the regression coefficients for enhancing educational experience and engaging in active learning are positive, suggesting that these factors favor predicting instructional success in flexible learning. As pre-service teachers participate in stimulating educational activities and actively engage in learning, they are likelier to become effective teachers in adaptable learning environments.

The results displayed in Table 4 have important ramifications for the development and execution of adaptable learning programs in teacher education. Teacher education programs can enhance teaching efficacy in adaptable learning environments by prioritizing immersive educational experiences and engaging learning opportunities for aspiring teachers (Chang et al., 2022).

One can enhance educational experiences by integrating diverse and captivating teaching methods that encourage critical thinking, problem-solving, and creativity (Bada & Olusegun, 2015). Teachers can enhance the authenticity and relevance of the learning experience by integrating real-world scenarios or simulations (Filgona et al., 2020). In addition, educators can utilize multimedia materials, such as movies, podcasts, and interactive learning tools, to actively involve students and offer a more dynamic educational experience.

Active learning possibilities engage students in learning by promoting their interaction with the subject and their peers (Dissanayake, 2021). This can be achieved through small-group discussions, debates, problem-solving activities, and collaborative learning experiences. Teachers can enhance student involvement, motivation, and subject recall by encouraging active learning (Licorish et al., 2018).

Moreover, these findings emphasize the significance of integrating student engagement techniques into teacher education programs to improve the standard of instruction in adaptable learning settings. Teacher education programs

should prioritize promoting student participation in adaptable learning settings and provide aspiring teachers with the requisite abilities and knowledge to effectively involve students in the educational process (Yazon & Callo, 2021).

The results shown in Table 4 clearly illustrate the crucial importance of student participation in enhancing teaching effectiveness in flexible learning contexts. Teacher education programs can enhance effective teaching in adaptable learning environments by prioritizing immersive educational experiences and interactive learning opportunities while equipping pre-service teachers with the essential skills to cultivate student engagement. Consequently, this can enhance student learning results and contribute to the triumph of adaptable learning systems in teacher education.

CONCLUSIONS

The study offers useful insights into the correlation between student learning engagement and instructor efficiency in adaptable learning environments. The results indicate that student involvement is crucial in enhancing teaching effectiveness, providing enriched educational experiences and supporting active learning is positively associated with teaching effectiveness. The study's findings have important implications for the development and execution of adaptable learning programs in teacher education. Specifically, it emphasizes the crucial role of integrating student engagement tactics into teacher training programs.

Moreover, the study's results significantly affect the institution's policies on faculty development and teaching evaluation. Faculty development programs can be structured to offer education in student engagement tactics, instructional and evaluation practices, and the establishment of a nurturing learning environment. This training program aims to equip faculty members with the essential skills to cultivate student engagement and enhance teaching effectiveness in adaptable learning settings.

The study's ramifications also apply to the institution's practices in evaluating instruction. The results indicate that assessments should consider how faculty members encourage student involvement in adaptable educational settings. By implementing this approach, institutions may guarantee the accurate assessment of teaching performance and appropriately acknowledge and incentivize faculty members for their contributions in fostering student engagement. This study adds to the existing knowledge on flexible learning and teaching effectiveness. It offers valuable insights that have the potential to enhance teaching methods and increase student learning outcomes. Teacher education programs can enhance effective teaching in flexible learning environments by prioritizing student involvement and equipping pre-service teachers with the requisite skills to foster engagement. This, in turn, contributes to the overall success of flexible learning programs in teacher education.

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