An Adaptive Learning Scheme Towards a Flexible Learning Management System

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Abstract

During academic disruptions, a flexible learning management system is often used to ensure that the delivery of instruction is not compromised. The purpose of this study was to determine if there is a significant relationship between learners' perceptions and their experiences with a flexible learning management system, specifically as regards to the sub-dimensions of instructional delivery and assessment procedure. This study also examined if these sub-dimensions are predictors to learners' positive learning experience, and if they can be used as input for an adaptive learning scheme. The study utilised the descriptive-correlational research design utilising a questionnaire as the main tool in gathering data, as developed and validated by Spryridon as well as Rehu and Loyiso. Cronbach's alpha values of 0.75 and 0.85 were computed. The study was conducted at Eastern Samar State University, Guiuan Campus, involving as respondent students who were officially enrolled in their first semester of the 2020-2021 academic year. A simple random sampling was employed to determine the number of samples, resulting in 411 learners who took part in the study. Pearson's correlation was used to measure the relationship of variables, and regression analysis to explore the strongest predictor of a positive learning experience. The study found that in a flexible learning management system, collaborative learning between students and teachers is an effective method to foster understanding and improve academic performance in the absence of face-to-face contact. The correlation analysis revealed a significant relationship between learners' perceptions and experiences. Moreover, instructional delivery and assessment procedure were deduced to be significant predictors of learners' positive learning experience.

Keywords: assessment procedure, flexible learning, flexible learning management system, instructional delivery, learning experiences, learning scheme

1. Introduction

Covid-19 has had profound impact on human life and global educational systems. Due to the pandemic, all face-to-face classes were suspended to comply with social distancing principles (Amir et al., 2020). According to the World Economic Forum (2020), over 1.2 billion students globally were consequently left out of the classroom. As a result, education has undergone many changes, including the rise of e-learning, through which students study from home and on digital platforms. In the Philippines, around

the middle of March 2020, the Philippine government, through the President, made an announcement on national television, stating that concerning the Enhanced Community Quarantine (ECQ), classes had to be suspended amid fears of the coronavirus outbreak that was reportedly ravaging the country. This meant that universities and colleges had to find alternative ways to ensure continuity of delivery of instruction. Thus, most universities and colleges in the country began implementing a flexible learning management system following the Commission on Higher Education (CHED) Memorandum Order No. 4, series of 2020. College professors had begun researching best practices for learning at a distance in response to current educational demands. Several research studies show that high-quality learning can happen in flexible learning environments. Flexible learning is conducted using both synchronous and asynchronous modes, through which students interact with learning materials without the presence of the teacher and his peers (Su, 2020; Osguthorpe & Graham, 2013; Jeffrey et al., 2012; Al-Qahtani & Higginst, 2013; and Fryer et al., 2014). Atkinson et al. (2009) as well as Blitz (2013) agreed that flexible learning can build confidence and awareness on the effectiveness of the approach and instructional delivery.

Additionally, a flexible learning environment can provide a flexible, reflective, and personally relevant learning experience and the opportunity to participate in online communities that promote ongoing access to resources, support, and knowledge-sharing. This study aimed to investigate learners' experiences in flexible learning in the specific context of instructional delivery, and how it provides them opportunities to collaborate with other learners in accomplishing learning tasks. Matukhin and Evseeva (2014) pointed out that flexible learning can contribute positively to reducing the cognitive risk of information overload, and letting students engage in various targeted tasks through a range of technological tools. At the same time, Fleck (2012) emphasised in his study that flexible learning improves the effectiveness of learning. However, that research took place in a different context than the one we have today. This study was a furtherance of that investigation, and aimed to see if the same conclusions will emerge considering that most learners today are utilising the flexible learning management system against the background of a pandemic. The researchers were thus encouraged to examine deeper, from the learners' perspective, flexible learning classes utilising several online platforms. Students prioritise supportive pedagogies and motivational tactics that supported academic advancement and improved welfare over authenticity and collaboration. Technology effectively mediates supportive pedagogies, and an alternative framework was constructed to include these new findings (Yates et al., 2021). Purwanto et al. (2020) feels that the unplanned and quick transition to online learning with no proper orientation, limited bandwidth, and minimal planning will result in a bad user experience in instructional activities. According to Gillett-Swan (2017), very little technological capacity is required on the part of the facilitator, but a sense of community and belonging may need to be developed to better facilitate interactive and engaging online learning activities for students and reduce the obstacles they often feel in a quarantined situation. This may increase their motivation to engage in online learning activities. Many academic staff members also face hurdles related to online learning, as higher degrees of technological skill and proficiency are becomingly increasingly required for it.

Many colleges and universities in The Philippines have been observed to pivot to online instruction on very short notice. As a result, there are many recorded difficulties related to the use of laptops and the Internet that affect the students' mental health and financial needs (Kamenetz, 2020). As Angdhiri (2020) reported, students who have participated in home learning or online school programmes faced problems adjusting to the new settings as they were not prepared or oriented beforehand, whether through simulation or practice. Furthermore, students considered online learning programmes to be even more stressful than regular classroom sessions, although they were highly beneficial and could be a good alternative to universities during the closure of educational institutions. However, online learning still requires some getting used to by students and teachers as it is an innovative concept not many have had experience with. Moreover, in adopting an online pedagogy, instructors are responsible for adopting online pedagogy while also identifying multiple ways to engage students with their course content while overcoming the numerous challenges associated with online learning. They are required to consider new ways to prepare, organise, deliver, and assess courses and learning materials for online teaching (Chen et al., 2017). This study focused on measuring the learners' perceptions and experiences with the flexible learning management system specifically as regards to instructional delivery and assessment procedure. This is to serve as input in developing an adaptive learning scheme. In addition, this study focused on determining if there is a significant relationship between learners' perceptions and experiences and the

flexible learning management system, as well as assessing which sub-dimensions are significant predictors to a positive learning experience. This also provides new thought concepts to teachers and educational institutions that would be valuable in the efforts to revisit and review ways a flexible learning management system could be introduced and delivered, develop resources needed to enhance instructional design during academic disruption, improve communication with learners to increase the overall success of the implementation of the flexible learning management system, and finally, improve student engagement and satisfaction. As the highlight of this study, adaptive learning is an integrative learning process involving the delivery of instructional content, activities, and assessment tailored to the individual needs of each learner. The goal of adaptive learning is to provide personalised experience that can adjust the difficulty and pace of learning materials based on the learner's progress and performance. Overall, adaptive learning is designed to enhance engagement, optimise learning outcomes, and accommodate diverse learning styles.

2.   Literature Review

According to Al-Qahtani and Higginst (2013) and Fryer et al. (2014), flexible learning allows students to interact with learning materials, with or without the physical presence of peers and instructors. In this kind of setup, the teachers are the conveyors of information, mentorship, coordination, and facilitation of learning, wherein the lectures are defined by the need of the learners (Jackson *et al.*, 2010). This also includes monitoring, discussion, guidance, and provision of interactive online learning activities. Students must thus be independent in completing their learning tasks while teachers focus on creating a learning environment that can develop the former's ability to develop different perspectives that can improve efficiency in the learning environment (Von Oech, 1983, as cited in Çubukçu, 2004, and Ya, 2016). Described by Atkinson et al. (2009), a flexible learning management system can build confidence and awareness on the effectiveness of the approach and instructional delivery. It can encourage reflective, flexible, and relevant personal learning experiences as well as opportunities to establish virtual communities that can influence ongoing access to online resources, support, and exchanges of knowledge (Blitz, 2013).

The effective use of technology and the Internet in educational activities today can yield excellent benefits in teacher-student interactions as well as for student success. As iterated by Emir (2013) an online learning environment provides an opportunity for students to exercise their personal thinking styles in developing critical thinking and high-level problem-solving skills. Students need to be challenged to engage, and one way of achieving this involves using an active collaborative teaching scenario through virtual teams (Hunt et al., 2010). However, regardless of the flexible or online nature of learning initiatives, the design of such programmes should be taken into consideration, i.e., this should be supported by learning theories that have been widely documented as having a significant impact in improving learning (Poelmans & Wessa, 2013). To better understand how a flexible learning management system may affect the students' learning experience and the educational institution itself, Burns (2013) studied the perception of graduate students relative to online courses. The results indicate that online students have positive experiences with online courses. It was suggested that a higher education institution needs to monitor the impact an online course has on programmes. Kehrwald et al. (2011) recommended that in improving the planning and delivery of courses in a flexible learning management system, it is essential to conduct a thorough analysis of the students' needs, expectations, and experiences to make practical decision-making part of the design and developmental process. Moreover, according to a study done by Bradley (2021), students favour a flexible learning management system that retains their autonomy, enthusiasm, and motivation to be engaged in learning. Also, faculty members can similarly engage by providing online activities, setting learning expectations, as well as providing learners with options and assisting them in problem-solving and decision-making processes. This system can be a platform that assists students in learning several topics.

On the other hand, Ya (2016) conducted a study on students' perception of the flexible learning management system, motivation, and success. Specifically, Ya's study aimed to investigate the effects of the flexible learning management system, consisting of blended face-to-face and e-learning approaches, on the academic success and motivation of students with different learning styles in a programming

language course. The results revealed that courses delivered through online learning had a positive effect on student motivation, and correspondingly, led to improvements in their academic success. Further, reclusive students need online learning tools more than others, as thinking styles affect motivation and academic success. Generally, using the flexible learning management system approach in teaching language courses has a positive effect on students' motivation, academic success, and satisfaction. Kariippanon et al. (2018) stated that students consider the flexible learning management system as a space facilitating the creation of a social environment that encourages greater motivation to learn and improves their well-being. According to Cleveland (2018), this flexible learning management system not only provides students digital resources for individual engagement but also allows for collaborative work between students and even other students outside the university. The system further strengthens their capacity for independent learning, with which they can explore beyond certain topics, and professionally explain situations through adapting skills with digital resources. Students can also become more familiar and aware of technological developments relevant to developing their professional competence (Engen, 2019).

However, a study done by Kavitha and Jaisingh (2018) investigating the experiences of students in a flexible learning management system environment found that this approach is only beneficial to students who are skilled in using certain programmes and applications. However, Moussa-Inaty (2017) pointed out in his study that most students preferred face-to-face classes over flexible classes. Importantly, through the qualitative responses given, most of the study's respondents said that they enjoyed the flexible learning management system experience and would either take another flexible course or recommend the same course to a friend. Purwanto et al. (2020) proposes that the students' experience while using online learning during this pandemic involves a feeling of being constrained due to having to study remotely without proper facilities and infrastructure at home.

Supporting these findings, El-mowafy et al. (2013) concluded that higher education students considered the flexible learning management system as an interactive approach that can contribute to improving their understanding of different required tasks. They found the e-assessment tool helpful in improving their performance and focusing on the objectives of each activity. The use of peer e-assessment improves their understanding and useful as a diagnostic tool for collaborative learning. Additionally, Joan (2013) studied the flexible learning management system as a new learning design in the classroom process to promote quality education. The objective of Joan's 2013 paper was to determine whether or not the flexible learning management system in the classroom can help promote quality education. Using an interview method, Joan prepared a flexible learning management system schedule to provide the new learning design in the classroom. Her findings revealed that with the flexible learning management system, learners were able to design their activities according to their interests and levels of enthusiasm. The study also concluded that introducing a flexible learning management system in the classroom helps promote quality education. According to another study by Amir et al. (2020), students perceived having more learning time with distance learning, although technical constraints still existed while they were engaged in distance learning. Only 34.2% of learners did not experience problems while studying at a distance. Data from open questions revealed most of the problems they faced were categorised as external factors, such as unstable Internet connections, and added financial burden for purchasing Internet quotas. Other challenges related to internal factors included student readiness for the new learning method, time management, and difficulty in focusing while learning through the computer for long periods. These challenges are likely to contribute to the stress experienced by 35.2% students while engaged in distance learning.

The study aimed to determine the learners' perceptions and learning experiences related to the flexible learning management system specifically as regards to instructional delivery and assessment procedure, which serve as input for the development of an adaptive learning scheme. This study also aimed to determine if there is a significant relationship between learners' perceptions and their learning experiences in the flexible learning management system, and to assess which sub-dimensions are a significant predictor to positive learning experiences.

3. Research Method

3.1. Research Design

This research study used a descriptive correlational design. According to Drummond and Murphey-Reyes (2017), a descriptive correlational design measures and describes the relationship or association between two variables. The researchers either were unaware of the relationship between the variables, or may estimate that one affects the other. In either scenario, the correlational design does not modify the independent variable.

3.2. Respondents

The study respondents were college students who were officially enrolled in at Eastern Samar State University, Guiuan Campus, for the 2020-2021 academic year. The researchers used simple random sampling to determine the number of participants. In this sampling method, the population is first randomly picked, using either a random number of generator or random number table. Each person remaining in the population then has an equal chance of being chosen for the sample (Arnab, 2017). A total of 411 learners participated in the study.

3.3. Instrumentation

The instrument was divided into two parts. The first part focused on the learners' perception of flexible learning adapted from the study of Varthis and Anderson (2018). The second part addressed the learners' perception of flexible learning specifically as regards to instructional delivery and assessment procedure, as adapted from the study of Reju and Jita (2018). The Cronbach's alpha values were 0.75 and 0.85, which is considered acceptable for statistical research. The instrument utilised a four-point Likert scale with the following range: 4: Strongly Agree, 3: Agree, 2: Disagree, and 1: Strongly Disagree. The content validity was checked by experts in instructional technology and three additional faculty involved in online teaching at the campus. Their suggestions and recommendations were used to modify the instrument to suit the local environment.

3.4. Data Gathering and Ethical Considerations

The data was gathered using Google Forms. Thus, there was no face-to-face contact, and travel was also restricted. The survey form was encoded to Google Forms and posted on social media along with an implied letter of consent. In particular, the researchers used the group chat function in an instant messenger as it is the most common social media channel used by the learners. The researchers provided contact points from which the respondents' queries were responded to immediately, specifically on terms or items in the instrument that they were not familiar with. As part of the study's ethical considerations, numerous measures were put in place, including an introduction letter asking for participants' approval and voluntary involvement. The accompanying letter and questionnaire explained the study's goals and how it would be carried out. The right to confidentiality and secrecy was likewise guaranteed, and the data gathering tools collected no information about the respondents' identities. There was no bias in the data and information acquired. Respondents were also treated with decency and respect throughout the investigation.

3.5. Data Analysis

To investigate the learners' perceptions and experiences, frequency counts, percentages, and the weighted mean were utilised with each corresponding equivalent description. A four-point Likert scale, described above, was used. Based on the mean range, scores of 3.26-4.00 were interpreted as "Always", 2.51-3.25 as "Often", 1.76-2.50 as "Sometimes", and lastly, 1.00-1.75 as "Never". Bivariate correlation was tested using the Pearson's r-correlation analysis for the relationship between learners' perception and experiences in flexible learning. Linear regression was applied to determine if instructional delivery and assessment are predictors of learning experience.

4. Findings and Discussion

4.1. Learners' Perception of the Flexible Learning Management System

Table 1 presents the findings on the learners' perception of the flexible learning management system during the first semester of the 2020-2021 academic year.

Table 1. Learners' Perception of the Flexible Learning Management System

Items	Mean	Description	Interpretation
The flexible learning management system method promotes self-regulated learning that facilitate meaningful and authentic learning.	2.86	Agree	Often
With the flexible learning management system, you can control how fast or slow you move through lessons.	3.00	Agree	Often
With the flexible learning management system, the information is obtained through more than one way.	2.86	Agree	Often
A path of information from the discussions made on the learning materials through documents in the web, e.g., video and simulation, results in a good understanding of the instructional material.	2.85	Agree	Often
Having access to online resources expands the information already obtained in the printing learning material.	3.01	Agree	Often
The flexible learning management system is an effective way to use resources.	2.84	Agree	Often
The flexible learning management system is more effective than traditional in-class delivery.	2.26	Disagree	Sometimes
A combination of synchronous and asynchronous learning is more effective than using a one-way delivery of information.	2.76	Agree	Often
I found the learning experience to be enjoyable.	2.58	Agree	Often
Additional online materials complicate learning rather than support learning.	2.67	Agree	Often
Online learning materials can be accessed more effectively and rapidly than only sitting in class.	2.38	Disagree	Sometimes
Face-to-face sessions are still more meaningful than the flexible learning management system.	3.46	Strongly Agree	Always
The flexible learning management system enables a student to become more involved in the learning process.	2.71	Agree	Often
The flexible learning management system includes greater flexibility in arranging learning activities, "me time", and leisure.	2.85	Agree	Often
Grand Mean	**2.79**	**Agree**	**Often**

Legend. 3.26-4.00: Always, 2.51-3.25: Often, 1.76-2.50: Sometimes, 1.00-1.75: Never

Learners find flexible learning ineffective during academic disruptions, as they prefer the traditional teaching mode. Several factors affect studying through flexible learning, and these can further be investigated to make the implementation of flexible learning more effective. Ultimately, it is important to note that learners find it more difficult to access online materials compared to the ones given during face-to-face interactions because of poor Internet connectivity in their respective localities. Moussa-Inaty (2017) obtained similar findings, pointing out that most students' preferred face-to-face classes to flexible classes. In discussing students' experiences in a flexible learning environment, Kavitha and Jaisingh (2018) inferred that a flexible learning approach is only beneficial to students who are skilled in using certain programmes and applications. However, this is in contrast to findings by Garrett & McMahon (2013) and Yagci (2016), who agreed that implementing courses in flexible learning, especially through electronic activities, positively influence student learning, academic success, and can improve motivation of students with different learning styles. Accordingly, online learning tools have a favourable impact on student motivation and academic performance.

Most respondents agreed that the objectives of course topics were made clear by the instructors/professors. Moreover, learners find the given learning materials fairly interactive and easy to

understand. The results also show that students have difficulty completing tasks, especially those requiring problem-solving skills. However, 75-95% of them pointed out that despite the use of flexible learning in the delivery of instruction, their instructors/professors effectively presented the skills, materials, and tools needed to attain information and knowledge required for certain subjects.

The learners value their instructors and professors' efforts in providing them with the necessary learning and instruction despite the absence of face-to-face interaction. Meyer et al. (2014) concluded that teachers should plan learning activities that support the students' mastery of the course content. They further added that learning activities provided must engage students and help them learn. Moreover, instructors also need training to help students use technology effectively. Kehrwald et al. (2011) recommended that in improving the planning and delivery of courses in a flexible learning management system, a thorough front-end analysis is necessary to understand students' needs, expectations, and experiences. This is to allow for realistic decision-making during instructional design and development.

4.2. Learners' Experiences in a Flexible Learning Management System

4.2.1. Instructional Delivery

Table 2. Learners' Experiences Related to Instructional Delivery

Items	Mean	Description	Interpretation
The instructor effectively presented tools such as materials, skills, and techniques needed despite the absence of face-to-face instruction.	2.87	Agree	Often
The objectives of the learning topics are made clear by my instructors/professors.	2.99	Agree	Often
Many leaning task activities and problems cannot be performed and solved through online and distance learning.	2.92	Agree	Often
The course materials are well-developed for learning. The contents are sufficient for understanding.	2.76	Agree	Often
Learning the course lessons through distance and online mode saves a lot of time and effort.	2.77	Agree	Often
The learning materials provided by my instructors/professors arouse my curiosity to learn more critical concepts and theoretical principles.	2.87	Agree	Often
I have access to course materials and other topics online over the Internet.	2.79	Agree	Often
The content covered in the learning materials is quite adequate for the period given to students to complete the coursework.	2.79	Agree	Often
The course materials in my institution meets students' experiential needs for skills.	2.82	Agree	Often
Grand Mean	**2.83**	**Agree**	**Often**

Legend. 3.26-4.00: Always, 2.51-3.25: Often, 1.76-2.50: Sometimes, 1.00-1.75: Never

The results indicate that during academic disruptions, students value collaboration as a means to enhance their knowledge and maintain or improve their academic performance despite the absence of face-to-face instruction. They look for more opportunities to collaborate with students from other universities to share materials and exchanges ideas. These findings are supported by Atkinson et al. (2009), who asserted that flexible learning can build confidence and awareness on the effectiveness of the approach and instructional delivery. Flexible, reflective, and personalised learning experiences can be provided, as well as the chance to form online communities that enable continued access to resources, support, and knowledge exchange (Blitz, 2013).

4.3.   Assessment Procedure

Table 3 illustrates responses related to the learners' experiences of assessment procedure in the flexible learning management system.

Table 3. Learners' Experiences Related to Assessment Procedure

Items	Mean	Description	Interpretation
Assessment procedures are well-specified and included in the design of the course's learning materials.	2.94	Agree	Often
There are no adequate resources to support learners' assessment procedures.	2.61	Agree	Often
The guiding principle on course learning assessment is not well understood.	2.51	Agree	Often
The learners' assessment involves too much paperwork despite the online and distance learning delivery approach.	2.93	Agree	Often
The traditional method of assessment is effective in measuring students' understanding and knowledge.	2.74	Agree	Often
Our institution uses online and traditional assessment procedures in assessing student learning.	2.87	Agree	Often
I prefer traditional methods of assessment as opposed to online assessment.	3.01	Agree	Often
Access to assessment procedures in my institution's online and distance learning platform is very easy.	2.47	Disagree	Sometimes
Assessment feedback is promptly obtained online.	2.63	Agree	Often
Online and distance learning assessment procedures in our institution are very effective.	2.55	Agree	Often
Grand Mean	**2.83**	**Agree**	**Often**

Legend. 3.26-4.00: Always, 2.51-3.25: Often, 1.76-2.50: Sometimes, 1.00-1.75: Never

For assessment purposes, learners prefer the traditional over the online method. The results demonstrate that learners agreed that the assessment procedure should be well-defined and included in the planning and design of the learning materials. However, the paperwork in the assessment is excessive for the student. Therefore, there is a need for the university to review the online assessment utilised. Also, the university should design an assessment tool that can effectively assess student learning that will not become too much of a burden to them. This study's findings are in contrast to that of El-mowafy et al. (2013), who studied flexible learning in higher education through a student survey. They found that an e-assessment tool improves performance and helps students focus on the objectives of each activity. In addition, the use of peer e-assessment improves student learning and is valuable as a diagnostic tool for collaborative learning.

4.3.1. Learners' Learning Experiences

Among the 411 learners who participated in the study, 95% agreed that collaborative activities helped them improve academic performance. They also had the opportunity to experience academic-concerted activities with students from other universities, such as in the sharing of course materials. The results indicate that during the pandemic, learners learnt to value collaboration as a way to enhance their knowledge and maintain or improve their academic performance despite the absence of face-to-face instruction. They looked for more opportunities to collaborate with students from other universities to share materials and exchange ideas.

There are many things students can learn from sharing. For one, sharing gives them a deeper understanding of context in the learning material. Additionally, sharing makes their tasks easier to accomplish while they gain new concepts, designs, and processes that can clarify content. These findings

are supported by Joan (2013), who asserted that a flexible learning management system is a new learning design in the classroom process capable of promoting quality education. She further stated that in a flexible learning mode, learners can plan their activities according to their personal interests and levels of enthusiasm. Also, it is important that learners' minds can be shielded from external fears. Flexible learning in the classroom was also found to help promote quality education.

4.4. Relationship between Learners' Perception and Experiences with the Flexible Learning Management System

It was hypothesised that learners' perception of the flexible learning management system is correlated to that of their experiences. The Pearson's correlation below shows that the relationship between the variables being measured can serve as input in developing an adaptive learning scheme.

Data in Table 5 show that there is sufficient evidence to support the alternative hypothesis ($p>.05$) that learners' perception has a significant relationship with their experiences in flexible learning. All the Pearson's correlation values are highly correlated ($r = 0.76$ and 0.64).

Table 5. Pearson's Correlation of Learners' Perception and Experiences in Flexible Learning

	Learners' Experiences	r	Interpretation	p	Interpretation
Learners' Perception	Instructional Delivery	0.76	High correlation	.000	Highly significant
	Assessment Procedures	0.64	High correlation	.000	Highly significant

Note. N = 411, r = Pearson's Correlation, *p >.05

4.5. Regression Analysis for Instructional Delivery and Assessment Procedure as Predictors of a Positive Learning Experience

Table 6 below describes the regression summary of instructional delivery and assessment procedure as predictors of a positive learning experience. The constant variable is the learning experience. Based on the results, the researchers can conclude that if both independent variables are significantly related to a positive learning experience, they can also be used in crafting the learning scheme that can enhance learners' positive learning experience.

Table 6. Regression Analysis of the Association between Instructional Delivery and Assessment Procedure with a Positive Learning Experience

Variable	B	SE	t	p	95% CI
Instructional Delivery	.662	.283	18.25	.000	(0.590, 0.733)
Assessment	.756	.309	18.57	.000	(0.676, 0.837)

Note. N = 411, SE = Standard error, CI = Confidence level, R^2 = .544, *p<0.05

Multiple regression was calculated to predict the learners' positive learning experience based on instructional delivery and assessment procedure. A significant regression equation was found (F $(1,409)$ = 333.003, p<.000) with an R value of .449. Learners' predicted learning experience is equal to .343 + .391 (instructional delivery) + .464 (assessment procedure). Based on the regression displayed computation, instructional delivery *(B = .662, SE = .283, t = 18.25, p = .000)* and assessment procedure *(B = .756, SE = .309, t = 18.57, p = .000)* make for substantial evidence and input for the learning experience. This simply illustrates that academic institutions and their educators must always consider instruction and assessment in design and planning to ensure a positive learning experience for the learners. In short, both have to be considered hand-in-hand to improve the learning experience regardless of academic disruptions and absence of face-to-face interaction. The adaptive learning scheme is proposed below.
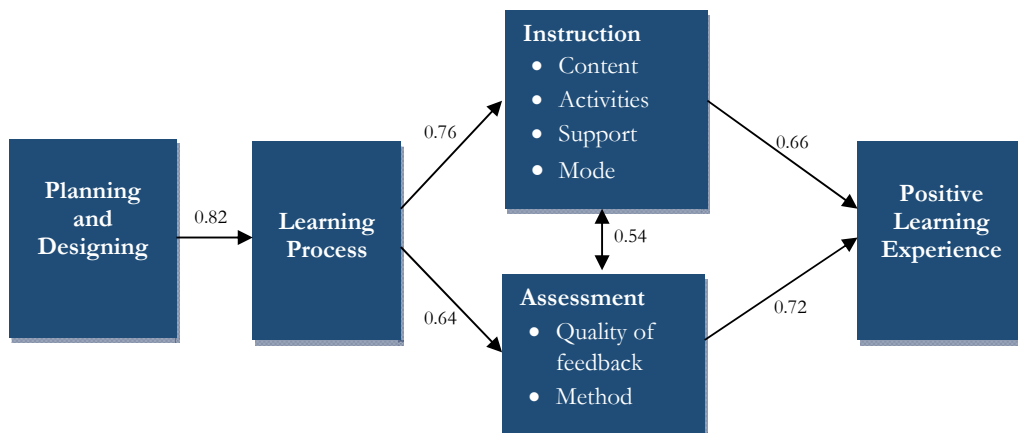
Figure 1. The Adaptive Learning Scheme

Figure 1 describes the adaptive learning scheme that could improve learners' positive learning experience in the flexible learning method of delivery. To provide a positive learning experience, the institutions' top management and faculty members must work together in planning and designing the learning process, taking into consideration both instructional delivery and assessment procedure as they are interconnected in the learning process. To guide academic institutions in using the learning scheme for planning and designing, the following framework derived from the learning scheme itself is presented.

Framework A describes areas that need to be focused on in the design and planning for instructional delivery. This entails how the management can provide support to teachers in designing their instruction to effectively deliver the knowledge, competencies, and skills that learners must acquire. It is a collaborative endeavour between teachers and the management. The management may consider designing a development plan for teachers not limited to seminars and training for improving teachers' efficiency and effectiveness as educators.

Framework A

Area	Considerations	Persons Involved
Instruction	▪ Learning content ▪ Learning activities ▪ Learning support ▪ Mode of delivery	Management Instructors/professors

- **Learning Content:** In planning and designing for the content, the management and faculty must focus on topics to be delivered following the curriculum designed for the specific educational level or specialisation considering the knowledge, skills, values, attitudes, and behaviours that are expected to be acquired by the learners.
- **Learning Activities:** Designing for learning activities is carried out by the teacher handling a specific subject matter. Therefore, the primary focus is on the tasks assigned in the learning content to enhance learners' understanding of the lessons by emphasising their critical thinking skills in analysing concepts and creatively presenting their understanding.
- **Learning Support:** This factor includes carefully selecting resources, strategies, and practices to be utilised by the teacher to support learners' intellectual, social, physical, and emotional development while actively engaging in the teaching and learning process.
- **Mode of Delivery:** This includes deciding and planning how the lessons will be delivered in the flexible learning environment considering the diversity of the learners.

Framework B describes the teachers' assessment procedures to attain student outcomes and achievements related to important competencies.

Framework B

Area	Considerations	Persons Involved
Assessment Procedure	▪ Quality of feedback ▪ Assessment method	Instructors/professors and students

In the assessment process, teachers should focus on the quality of feedback they can provide to learners based on standards following the lesson's learning objectives. Also, the assessment method must be planned over time to ensure the achievement of knowledge, skills, behaviours, and other competencies required from the course. Finally, in precept that the essential outcomes and objectives are unsatisfactory, the teacher must review the instructional delivery and make adjustments and revisions. The similar applies in the assessment process.

5.   Conclusion

A flexible learning management system can engender a positive attitude and confidence, and facilitate quick completion of projects and assignments, while also encouraging learners to think out of the box. However, learners find the face-to-face mode of instruction to be more effective than flexible learning. This may be because for the latter, students are required to have Internet access and the relevant technological devices that can support this mode of instruction. Moreover, the interactivity of course materials may not be adequate for their understanding. Learners also prefer the traditional assessment method over the online approach of assessing their academic performance. Nonetheless, assessment should be defined by their instructors/professors in the design and planning of the learning materials. Thus, in the context of the new normal in education following the Covid-19 pandemic, academic institutions must carefully devise a plan for instructional delivery in a flexible learning environment. This plan should cater to the different learning styles of the learners. The knowledge and skills needed for learners to be competitive must be delivered clearly according to set standards despite the absence of face-to-face interaction. Furthermore, assessment of learning should be revisited and redesigned, if necessary, to meet the needs of the new normal without compromising its main purpose of measuring the students' academic performance. Assessment should also be clearly defined following the course objectives. A study must be conducted to assess student performance, especially in skills-based courses during academic disruptions. Further investigation must also be conducted on factors that affect learning through the flexible approach. Finally, further studies on learners' cognitive and affective needs in developing a wide range of learning resources, activities, and exercises in flexible modality would also be worthwhile.

References

Al-Qahtani, A. A. Y. & Higginst, S. E. (2013). Effects of traditional, flexible and e-learning on students' achievement in higher education. *Journal of Computer Assisted Learning*, *29*, 220-234.

Amir, L. R., Tanti, I., Maharani, D. A., Wimardhani, Y. S., Julia, V., Sulijaya, B., & Puspitawati, R. (2020). Student perspective of classroom and distance learning during COVID-19 pandemic in the undergraduate dental study program Universitas Indonesia. *BMC Medical Education*, *20*(1), 1–8. https://doi.org/10.1186/s12909-020-02312-0

Angdhiri, R.P (2020, July 21). Challenges of home learning during a pandemic though the eyes of a student. *The Jakarta Post*. https://www.thejakartapost.com/life/2020/04/11/challenges-of-home-learning-during-a-pandemic-through-the-eyes-of-a-student.html

Arnab, R. (2017). Chapter 3 - Simple random sampling. *Survey sampling theory and applications* (pp. 51–88). Academic Press. https://doi.org/10.1016/b978-0-12-811848-1.00003-0.

Atkinson, K., Fluker, G., Ngo, L., Dracup, M., & McCormick, P. (2009). Introducing a learning repository using a flexible professional development approach, in Same places, different spaces. *Proceedings Ascilite Auckland, 2009,* 35-39.

Blitz, C. L. (2013). *Can online learning communities achieve the goals of traditional professional learning communities? What the literature says* (REL 2013-003). U.S. Department of Education, Institute of Education Studies, National Centre for Education Evaluation and Regional Assistance, Regional Educational Laboratory Mid-Atlantic.

Bradley, V. M. (2021). Learning Management System (LMS) use with online instruction. *International Journal of Technology in Education (IJTE), 4*(1), 68-92. https://doi.org/10.46328/ijte.36

Burns, M. (2011). Distance education for teacher training: Modes, models and methods. Education Development Center Inc.

Çubukçu, Z. (2012). Teachers' evaluation of student-centered learning environments. *Education*, *133*(1), 49-66.

Chen, P. D., Lambert, A. D., & Guidry, K. R. (2017). Engaging online learners: The impact of web-based learning technology on college student engagement. *Computers & Education, 54*, 1222-1232.

Cleveland, B. (2018). Innovative learning environments as complex adaptive systems: Enabling middle years' education. *Transforming education* (pp. 55-78). Springer. https://doi.org/10.1007/978-981-10-5678-9_4

Drummond, K., & Murphey-Reyes, A. (2017). Quantitative research designs: Experimental, quasi-experimental, and descriptive. *Jones & Bartlett Learning*, 155–183.

El-Mowafy, A., Kuhn, M. & Snow, T. (2013). A blended learning approach in higher education: A case study from surveying education. Design, develop, evaluate: The core of the learning environment: Proceedings of the 22nd Annual Teaching Learning Forum. Murdoch University. http://ctl.curtin.edu.au/professional_development/conferences/tlf/tlf2013/refereed/el-mowafy.html

Emir, S. (2013). Contributions of teachers' thinking styles to critical thinking dispositions (Istanbul-Fatih Sample). *Educational Sciences: Theory and Practice*, *13*(1), 337-347.

Engen, B. (2019). Understanding social and cultural aspects of teachers' digital competencies. *Comunicar, 61*, 9-19. https://doi.org/10.3916/C61-2019-01.

Fleck, J. (2012). Alternative Models Flexible learning and communities: opportunities and challenges. *Journal of Management Development, 31*(4), 398 - 441. http://dx.doi.org/10.1108/02621711211219059

Fryer, L. K., Bovee, H. N., & Nakao, K. (2014). E-learning: Reasons students in language learning courses don't want to. *Computers and Education, 74*, 26-36.

Garrett, M., & McMahon, M. (2013). Indirect measures of learning transfer between real and virtual environments. *Australasian Journal of Educational Technology*, *29*(6).

Gillett-Swan, J. (2017). The challenges of online learning: Supporting and engaging the isolated learner. *Journal of Learning Design*, *10*(1), 20-30.

Hunt, C. S., Smith, L. B., & Chen, M. (2010). Incorporating collaborative technologies into university curricula: Lessons learned. *Journal of Computing in Higher Education, 22*(1), 24-37.

Jeffrey, L. M., Milne, J., Suddaby, G, & Higgins, A. (2012). *Help or Hindrance: flexible approaches and student engagement.* Ako Aotearoa National Centre for Tertiary Teaching Excellence. https://ako.ac.nz/assets/Knowledge-centre/NPF-09-041-Help-or-Hindrance-Blended-approaches-and-student-engagement/RESEARCH-REPORT-Help-or-Hindrance-Blended-Approaches-and-Student-Engagement.pdf

Joan, D. R. R. (2013). Flexible learning as new learning design. *i-manager's Journal on School Educational Technology, 9*(1), 37–42.

Kamenetz, Anya (March 19, 2020). *Panic-gogy.* Teaching Online Classes During Coronavirus Pandemic. https://www.npr.org/2020/03/19/817885991/panic-gogy-teaching-online-classes-during-the-coronavirus-pandemic.

Kariippanon, K. E., Cliff, D. P., Lancaster, S. L., Okely, A. D., & Parrish, A. M. (2018). Perceived interplay between flexible learning spaces and teaching, learning and student wellbeing. *Learning Environments Research*, *21*, 301-320.

Kavitha, R. K., & Jaisingh, W. (2018). A study on the student experiences in blended learning environments. *Int. J. Recent Technol. Eng, 7*(4S), 2277-3878.

Kehrwald, B., Rawlins, P., & Simpson, M. (2011). *Learner experiences of online learning in a blended learning situation: Different cohorts, different needs* [Doctoral dissertation, University of Tasmania].

Matukhin, D. L., & Evseeva, A. M. (2014). Further Professional Training as a Constituent Part of Continuing Vocational Education. Lecture Notes in Management Science. 2nd International Conference. *Humanities, Social Sciences and Global Business Management (ISSGBM 2014)*, *London, UK., 31*, 104-109.

Meyer, S., Wohlers, S., & Marshall, B. (2014). Flexible learning: student experiences. In B. Hegarty, J. McDonald, & S.-K. Loke (Eds.), *Rhetoric and Reality: Critical perspectives on educational technology. Proceedings Ascilite Dunedin 2014* (pp. 89-98).

Moussa-Inaty, J. (2017). Student experiences of a blended learning environment. *International Journal of Learning, Teaching and Educational Research*, *16*(9), 60-72.

Osguthorpe, R. E. & Graham, C. R. (2013). Flexible learning environment: Definitions and directions. *The Quarterly Review of Distance Education*, *4*(3), 227-223.

Poelmans, S., & Wessa, P. (2013). A constructivist approach in a flexible e-learning environment for statistics. *Interactive Learning Environments*, 1-17.

Purwanto, A., Pramono, R., Asbari, M., Hyun, C. C., Wijayanti, L. M., & Putri, R. S. (2020). Studi eksploratif dampak pandemi COVID-19 terhadap proses pembelajaran online di sekolah dasar. *EduPsyCouns: Journal of Education, Psychology and Counseling*, *2*(1), 1-12.

Reju, C. O., & Jita, L. (2018). Instructional delivery and students' experiences with distance and online learning of undergraduate mathematics in Nigeria. *International Review of Research in Open and Distributed Learning*, *19*(2).

Su, F. (2020). Flexible Learning Pedagogy in Higher Education. In: Peters M. Herard R (ed). Encyclopedia of Educational Innovation. Springer, Singapore. DOI: 10.1007/978-981-13-2262-4_19-2.

Varthis, S., & Anderson, O. R. (2018). Students' perceptions of a blended learning experience in dental education. *European Journal of Dental Education*, *22*(1), e35-e41.

World Economic Forum. (February 24, 2020). The COVID-19 *Pandemic has changed education forever.* https://www.weforum.org/agenda/2020/04/coronavirus-education-global-covid19-online-digital-learning.

Yagci, Mustafa. (2016). Blended learning experience in a programming language course and the effect of the thinking styles of the students on success and motivation. 15. 32-45.

Yates, A., Starkey, L., Egerton, B., & Flueggen, F. (2021). High school students' experience of online learning during Covid-19: the influence of technology and pedagogy. *Technology, Pedagogy and Education*, *30*(1), 59-73.

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