

Early Childhood Teacher Education Students' Online Learning Readiness and Course Satisfaction: Best Service from the Indonesian Open University

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Abstract—Comprehensive online learning has been implemented in Indonesia, particularly in universities, in response to the COVID-19 pandemic. Universitas Terbuka is considered the most prepared institution for distance learning because it equips students with technology skills for education. Student satisfaction with learning is affected by the transition from traditional face-to-face instruction to online learning. Therefore, a survey was conducted to enhance the learning quality for students at Universitas Terbuka. This research aims to establish the relationship between online learning readiness and satisfaction with online courses among students enrolled in the Early Childhood Teacher Education program. This quantitative study employed a survey design with Partial Least Squares Structural Equation Modeling (PLS-SEM) analysis involving 286 participants. The results of PLS-SEM indicate that satisfaction with online courses is significantly influenced by several factors. Learning motivation (0.265) emerges as the most important predictor of online course satisfaction, followed by student control (0.257), computer/internet self-efficacy (0.210), online communication self-efficacy (0.159), and the independent learning factor (0.114). This information ensures that Universitas Terbuka Indonesia's excellent services have helped distance students become better prepared for online learning and have supported the university in formulating strategic goals to achieve the highest quality of education.

Keywords—online learning readiness, online course satisfaction, early childhood education, open university student

I. INTRODUCTION

The digital learning environment has become an essential platform for connecting learners and educators in the global digital space, facilitating the development of professional abilities necessary in the digital world [1]. This environment is characterized by high interactivity, providing personalized feedback and guidance to enhance the learning process [2]. The use of animated pedagogical agents in interactive computer-based multimedia environments has been shown to positively impact students' learning experiences and outcomes [3]. The evolution of technology-enhanced learning environments into smart learning environments has enabled personalized adaptive learning, catering to individual student needs, and learning styles [4]. Moreover, the development of an adaptive e-learning environment has shown the potential to engage students towards learning, indicating the possibilities offered by such technological advancements in education [5].

While plenty of tools are accessible for online education, using them can occasionally result in several problems. These difficulties and concerns with contemporary technology include downloads, installation errors, login troubles, and

audio and visual malfunctions. Sometimes, learners find online learning to be unreliable and boring. Students have a finite time to finish the extensive online teaching and learning process. The primary problem with online teaching and learning is the lack of one-on-one attention [6].

The students usually want a two-way discussion, but that might be not easy to facilitate in online learning. The student's learning process is not complete until they apply what they have learned. Sometimes the content of online courses is completely conceptual, which makes it challenging for students to practice and learn efficiently. During the pandemic era, the students found that the largest barriers to online teaching and learning were related to cost and technology [7].

Enforcing students to participate in online learning when they are not prepared may result in unfavorable online learning experiences and increase their aversion to online learning in the future. To enable success in e-learning, it is important to assess the learner's preparation for e-learning and know the tools available and many professionals are starting to wonder whether students are ready to thrive in an online learning environment, although the demand for online learning possibilities has increased recently [8]. Many studies have observed difficulties associated with e-learning preparation. Studies show that the lack of preparedness of universities and other educational institutions contributes to the failure to implement e-learning advances [9].

Additionally, another important factor to consider when assessing online learning is the risk of dropping out, for example, Johnson [10] highlights that other personal factors such as stress, anxiety, depression, burnout, and lack of a sense of community on campus that may contribute to their decision to leave college, but when former students are asked to explain why they left college early, they often cite significant changes in family obligations or health problems. The other obstacle to the budget implementation of information and technology-based learning and teaching for millions of people in developing countries is the inadequate amount of money allocated for education [11].

Online learning and teaching are hindered by a lack of experience in electronic resources and limited access to the Internet, computers, and other facilities due to social and economic factors [12]. The technical abilities of students play a crucial role in the effectiveness of online learning. Students with higher technical abilities demonstrate better online learning behaviors, such as higher task completion percentages, quiz scores, and video-watching hours,

indicating a positive impact on learning efficiency [13]. Several studies have uncovered evidence for a significant positive relationship between computer/internet self-efficacy and online course satisfaction [14–17]. Students reporting higher confidence in using technology tend to also report greater satisfaction with their online courses. This suggests technological competence enables more rewarding online learning experiences. However, other investigations found no significant link between computer self-efficacy and online course satisfaction [18].

Perceived capability with software, apps, and troubleshooting did not necessarily translate into perceptions of a satisfying virtual classroom. This indicates factors beyond technical skills shape students' subjective experience. Additionally, some researchers highlighted the importance of further examining how technology self-efficacy might influence satisfaction and academic performance in online settings [19, 20]. This relationship warrants ongoing attention given the rapid growth of remote learning. Scholars generally agree competency with computers facilitates success, but individual differences in needs and preferences may complicate universal generalizations.

The solution to various obstacles to online learning is to study online learning readiness and measure user satisfaction so that we can prepare for quality distance learning. Student satisfaction about the worth of courses and their involvement in learning activities are reflected in their level of satisfaction. As a result, they acknowledge the value of knowing it. One of the primary indicators used by higher education institutions to assess the quality of their online instruction is student satisfaction [19].

Previous research has extensively explored factors influencing online learning readiness and satisfaction among various demographic groups. Previous research by Suhandiah [21] aimed to determine student satisfaction with online learning, which was associated with perceived technological complexity, student learning experience, online learning readiness, and lecturer presence in online learning activities. The results of the research show that online learning satisfaction is positively influenced by student experience, online learning readiness, and the presence of lecturers in online learning. Meanwhile, the research conducted by Hasim and Yusof [22], was to determine the degree and correlation between e-learning readiness and online learning satisfaction. However, little research has specifically examined the readiness and satisfaction of adult students enrolled in professional development programs offered by open universities, which often serve non-traditional students seeking career advancement opportunities. This study addresses this gap by using a quantitative research approach to explore the perceptions and experiences of adult learners (teachers in service) because the early childhood teacher education study program at the Open University is in the Faculty of Teacher Training and Education which continues to develop in an online professional development environment. Our research examined adult students enrolled in job training programs offered by open universities about their readiness and satisfaction with online learning, in contrast to previous research that concentrated on undergraduate students.

Professionals in the world of work who want to develop their careers and develop their abilities are often included in this group.

Numerous research have examined the variables that affect learner satisfaction, and the success, or failure of online learning [23–25] and the online learning environment [26, 27]. Other research has determined factors that influence online learning environments, how students perform, or whether are they satisfied with the course. However, the author has not found any research that describes the readiness and satisfaction of fully online teacher education students with online learning and has not confirmed the best form of effort at the Indonesian Open University which has the most influence on online learning readiness and satisfaction of early childhood teacher education students at the Open University. This research aims to explain the influence of online learning readiness on online course satisfaction of Early Childhood Education teacher education students at open and distance learning universities in Indonesia. Learning readiness includes five sub-dimensions; computer/internet self-efficacy, independent learning, student control, learning motivation, and online communication self-efficacy. Our study intends to provide educators and administrators at open universities with information on how to best develop courses and support mechanisms by identifying factors unique to adult learners in vocational training. In the end, this can improve student readiness and satisfaction in online learning environments. Finally, to provide thorough coverage of all the variables influencing adult learners' educational experiences, we employ a methodical approach to investigate online learning readiness and satisfaction.

II. LITERATURE REVIEW

Student readiness for online or distance learning (called independent learning) consists of five sub-dimensions. Independent learning emphasizes students' ability to assume responsibility for managing their learning environment to achieve their learning goals. Student control refers to online learners' control over their learning efforts to direct their learning. Learning motivation can influence online learners' learning attitudes. Computer/internet self-efficacy tests online learners' proficiency in operating computers and the internet. In contrast, online learners' ability to adapt to the online learning environment through asking, answering, commenting, and discussing is referred to as online communication skills [28]. Students can create and manage their study schedule thanks to the digital learning environment. In the context of the autonomy of individual learning schedules, digital learning environments offer a variety of opportunities and challenges. Digital tools and teaching strategies have been identified to support students with disabilities in online learning environments, emphasizing the potential for inclusive and flexible learning experiences [29].

Real self-directed learning is like the self-directed learning that takes place online and learning circumstances, such as educational level and learning mode, should be considered by academics when examining the impact of culture on student performance. Rather than concentrating on students' beliefs, colleges should emphasize the development of abilities and

skills that increase internal motivation to improve students' online performance [30]. Compared to learners who are supposed to plan their learning by starting relevant learning assignments, independent learners are intended to learn freely and have more freedom to accomplish their learning objectives [14]. Learner control, as manifested through learner-instructor and learner-content interactions, was shown to have a positive and significant influence on online course satisfaction. Lin *et al.* [31] found that learner-instructor and learner-content interactions had a significant positive influence on satisfaction. The best indicator of learning satisfaction is the degree to which students can choose how their learning is assessed [32]. Learner-lecturer interaction, learner-student interaction, and learning content have a positive impact on online learning satisfaction [33]. These findings collectively suggest that learner control, represented by interaction and the ability to choose learning assessments, plays an important role in influencing online course satisfaction. Greater technological sophistication in online courses and higher levels of motivation were correlated with self-efficacy and course satisfaction. As one of the most important indicators of the success of a course and the efficacy of distance learning, student satisfaction is correlated with several variables, such as technology, autonomy, self-efficacy, student autonomy, interaction, and self-regulation [34].

Effective online communication skills are also important for students, especially in medical specialties, as this impacts the development of students' communicative abilities during online training, which is essential for providing quality healthcare services [35]. Students' and lecturers' perceptions of online learning, as well as their independent learning strategies, contribute to the effectiveness of distance learning, highlighting the importance of students' and educators' attitudes and approaches in online learning environments [36]. Therefore, technical ability, independent learning capacity, enthusiasm for learning, and online communication skills together contribute to the efficiency and effectiveness of online learning.

Lastly is about student satisfaction which shows students' perceptions of the value of courses and their experiences in learning activities. A key factor in determining the caliber of educational methods is student satisfaction with flexible or online learning. Students are less satisfied than faculty members [37]. Additionally, students' agency, engagements and collaborations, background, and experience all have a favorable impact on their level of satisfaction. Furthermore, issues with accessibility, such as a slow network connection that prevents students from accessing instructional materials, have been found to have an impact on students' satisfaction with flexible and distant learning options [38]. Increased motivation, tenacity in learning, and retention rate are all correlated with high satisfaction. Higher education needs to be democratized to give more people these advantages. Universities must, however, assist a student body that is becoming more and more diverse in succeeding and completing their degrees [39]. Administrators, instructors, and tutors can use data on student satisfaction to pinpoint areas where instruction needs to be improved and to advise on how to keep satisfaction levels high while enhancing the

institution's educational offerings. Greater levels of satisfaction will lead to better result [40]. Students with a high level of satisfaction tend not to leave class or stop studying because they are more motivated to participate in learning activities in class.

III. MATERIALS AND METHODS

The methodology used in this study is a quantitative method with a survey design. This study involved students from the Early Childhood Education study program at the Open University in Indonesia. Students who participated in this study were women (99.7%), with an age range of 19–52 years and an average age of 31.5 years. Most of their last education level is senior high school (85.0%), and 11.5% of students have graduated from Diploma IV or graduated from S1 in non-educational programs. Most respondents are students in the second year (28.0%) or students around Semester 3 and Semester 4. The details of the characteristics of the respondent students are in Table 1.

Table 1. Demographic characteristics of the participants

Demographic Characteristics		N	%
Gender	Female	285	99.7
	Male	1	0.3
Age	19–26	100	35.0
	27–34	87	30.4
	35–42	72	25.2
	42–over	27	9.4
	First year	62	21.7
Class level	Second year	80	28.0
	Third year	43	15.0
	Fourth year	61	21.3
	Fifth year	40	14.0
	Senior High School	243	85.0
Education Attainment	Diploma 1/Diploma 2	7	2.4
	Academic	3	1.0
	Bachelor	33	11.5

A. Data Collection and Analysis

Data collection was done using a questionnaire with Google Forms, which was run online from August 23 to September 20, 2021. The data collection instrument was delivered by email and personal chat to students majoring in the Early Childhood Education study program at the Open Universities located throughout Indonesia. For ethical purposes, before filling out the questionnaire, participants gave consent in the consent form and stated that they voluntarily participated in this study and that all data obtained would only be used for research purposes.

The questionnaire in this study consisted of two parts, (1) a section for collecting sociodemographic data from students, and (2) a section that included questions based on existing research instruments, including collecting student online learning readiness data using the Online Learning Readiness Scale (OLRS) adapted from Hung *et al.* [41]. This scale consists of 18 question items, which are divided into five sub-dimensions, namely (1) computer/internet self-efficacy, (2) self-directed learning, (3) learner control, (4) motivation for learning, and (5) online communication self-efficacy. The data collection related to online course satisfaction was adapted from the Online Course Satisfaction Scale (OCSS) questionnaire [19]. OCSS is conceptualized with seven items

that refer to the general level of satisfaction of the student learning experience concerning the instructor and the design of the in-course learning. The original question items were translated and adapted into Indonesian. Variables were measured using a 4-point Likert-type scale (1 = strongly disagree, 4 = strongly agree). At the start of the questionnaire, students were informed about the research objectives, and informed consent was obtained.

SmartPLS 3.3.2 were used to examine the findings of the study. The Partial Least Square-Structural Equation Model (PLS-SEM) is employed when samples are not normally distributed and non-parametric analysis is required, as was the case in this study. Additionally, the PLS-SEM calculates the R^2 value while stressing the importance of the relationship between the model's components in defining the model's performance. Furthermore, PLS-SEM may simultaneously examine many independent variables [42]. All these considerations justify and support the current study's use of

PLS-SEM. Each indicator's reliability is determined by measuring the indicator's load and dimensions. The model fit was determined using the average of the retrieved variances, and discriminant validity was evaluated using the Fornell-Larcker criterion. Internal Consistency Reliability measures how capable an indicator can measure its latent construct [43]. The tools used to assess this are composite reliability and Cronbach's Alpha. If the composite reliability value is 0.6-0.7, it is considered to have good reliability [44], and the expected Cronbach's Alpha value is above 0.7 [45].

B. Research Design

The research model depicted in Fig. 1 illustrates the link between the research variables. The model includes all sub-dimensions of the Online Learning Readiness Scale (OLRS) and Online Course Satisfaction Scale (OCSS). Each circle represents a research variable, while a rectangular box represents each variable's question item.

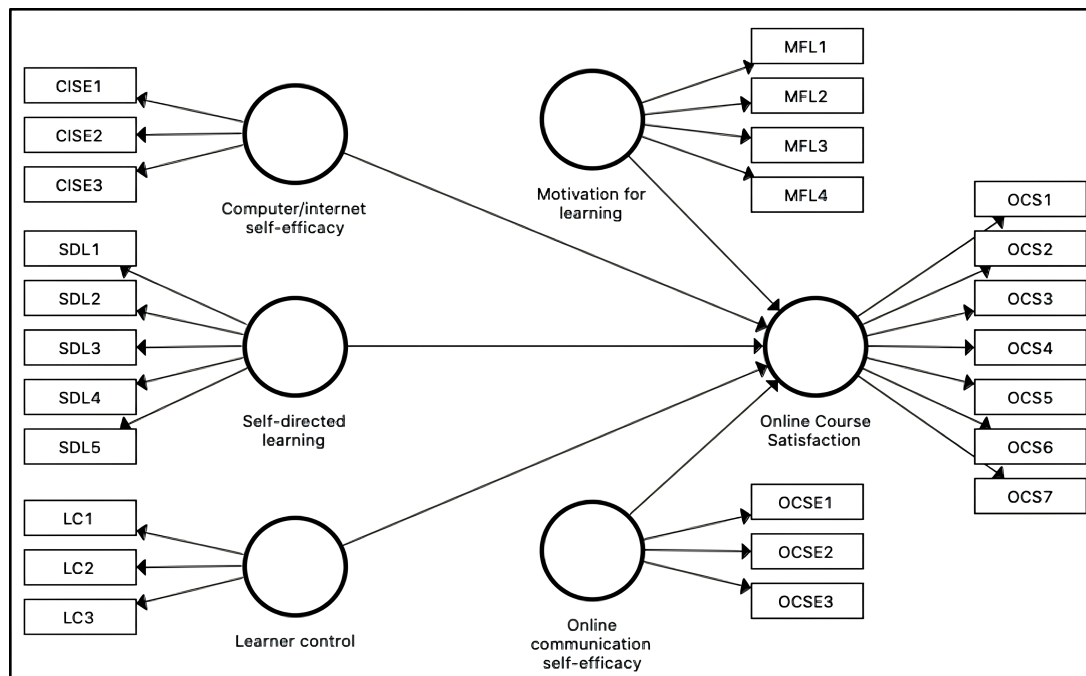


Fig. 1. Research PLS-SEM model.

The Materials and Methods subsection includes a research methodology flow/block diagram illustrating the sequence of the research process can be seen in Fig. 2.

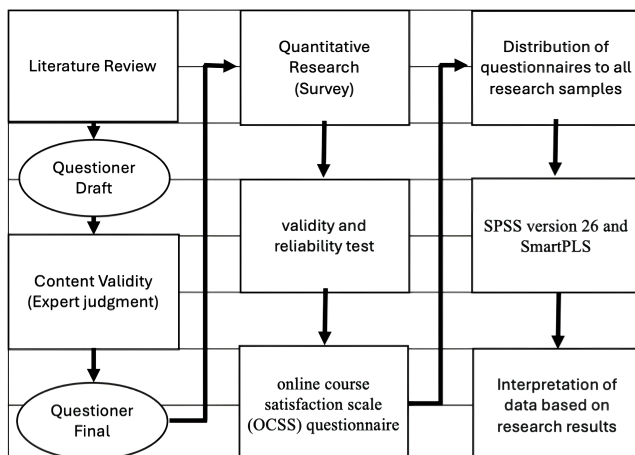


Fig. 2. Flow chart of research stages.

IV. RESEARCH RESULT

The reliability of the scale obtained by the internal consistency analysis is listed in Table 2. All scales showed acceptable to good reliability with Cronbach's alpha values between 0.712 and 0.869. The lowest alpha was for the 3-item computer/internet self-efficacy scale ($\alpha = 0.712$) and the highest was for the 7-item online course satisfaction scale ($\alpha = 0.869$). In the exploratory study, the reliability coefficient (Cronbach's alpha) on all measurement scales was more than the minimum expected 0.5. For each scale, the range of item scores contributing to the overall Cronbach's alpha are also provided. These give a sense of the variation in inter-item correlations within each scale. For example, the individual items measuring online course satisfaction showed correlations between 0.842 to 0.855 with the overall scale score (see Table 2).

Table 2. Reliability of scales by analysis of internal consistency

Scales	No. of items	Cronbach's Alpha	Range of Items Scores
Computer/internet self-efficacy	3	0.712	0.590–0.648
Self-directed learning	5	0.815	0.768–0.780
Learner control	3	0.762	0.673–0.688
Motivation for learning	4	0.833	0.767–0.837
Online communication self-efficacy	3	0.765	0.650–0.712
Online Course Satisfaction	7	0.869	0.842–0.855

Instrument validation with PLS-SEM includes analysis of the reliability of each item, internal consistency of dimensions using composite reliability, analysis of the extracted mean-variance, and discriminant validity. Table 3 presents construct validity analysis of the 6 multi-item scales using

partial least squares modelling. Several key metrics are reported to examine convergent validity. The expected cross loading value is greater than 0.7 [46]. Based on statistical tests with the help of the Smart PLS application, the cross-loading value obtained for each construct in this research is greater than 0.7. On factor loadings, all items showed high loadings on their respective constructs, with values ranging from 0.798 to 0.897. This suggests the items strongly reflect the latent variables they are purported to measure. Composite reliability values, which evaluate internal consistency, were also very good across all scales—between 0.861 and 0.946. Additionally, the extracted variance figures were acceptable, with all constructs explaining between 67% to 72% of variance in their items.

Table 3. Construct validity using partial least squares

Scale—Items		Factorial Weight	Composite Reliability	Extracted Variance
Computer/internet self-efficacy	I am confident in performing the basic operations of Microsoft Office products (MSWord, MS Excel, MS PowerPoint)	0.804	0.861	0.674
	I am confident in my knowledge and ability to manage software for online learning.	0.808		
	I am confident in using the internet to gather information.	0.850		
Self-directed learning	While studying online, I follow my own study plan.	0.805	0.910	0.669
	When faced with learning obstacles, I seek help.	0.832		
	I manage my time efficiently while studying online.	0.823		
	I set my online learning goals.	0.814		
	I set high expectations for my learning performance.	0.814		
Learner control	I can control my own learning progress while learning online.	0.820	0.867	0.686
	I am not easily distracted by other internet activities (WhatsApp, Instagram, FB) while learning online.	0.844		
	I reviewed online learning materials based on my needs.	0.819		
Motivation for learning	When it comes to online learning, I am open to new ideas and methods.	0.798	0.900	0.693
	I have motivation to undertake online learning.	0.853		
	While learning online, I grow from earlier failures.	0.837		
	I enjoy sharing ideas with others while learning online.	0.840		
Online communication self-efficacy	I'm confident in using online technologies to interact with others.	0.839	0.875	0.700
	I convey my opinions through internet text conversations and publishing comments.	0.828		
	I ask inquiries or post questions in internet discussions.	0.843		
Online Course Satisfaction	I'm pleased with the instruction approach.	0.830	0.946	0.715
	I am pleased with the learning materials and structure.	0.823		
	I am happy with the instructors and teaching assistants.	0.872		
	I am satisfied with my use of online discussion forums.	0.847		
	I am satisfied with the group projects for the course assignment and their criteria.	0.826		
	I am satisfied with the midterm and final exams.	0.823		
Overall, I'm satisfied with the course.		0.897		

Taken together, these results provide evidence that the measurement scales demonstrate adequate convergent validity and reliability in assessing the key variables of computer/internet self-efficacy, self-directed learning, learner control, motivation for learning, online communication efficacy, and online course satisfaction. The items strongly capture their intended constructs, with high factor loadings. The scales also show satisfactory composite reliability and extracted variance to confirm their construct validity for use in assessing the concepts with online learners. (see Table 3). The values obtained on the sub-scales were observed to confirm the reliability of the instrument.

The Fornell-Larcker [47], criterion was employed to assess discriminant validity, as shown in in Table 4. This strategy ensures that each construct has greater variance with its own components than with other constructs. The square root of extracted variance (values along the diagonal in parenthesis)

exceeds the inter-construct correlations in the rows and columns, providing support for this claim. As seen, all scales meet this condition. For instance, the self-directed learning scale's extracted variance square root is 0.818. This value exceeds its correlations with other constructs, which range between 0.711 and 0.789. The similar pattern emerges for each scale, demonstrating that they are measuring unique but related ideas.

The inter-construct correlations also provide information about the relationships between the variables. Online course satisfaction has substantial positive relationships with computer/internet self-efficacy (0.814) and motivation for learn (0.820), in particular. Overall, meeting the Fornell-Larcker criterion confirms the discriminant validity of the tools employed to assess key aspects associated with online learning success and satisfaction (see Table 4).

Table 4. Discriminant validity of sub-scales using the Fornell-Larcker criterion

Scales	1	2	3	4	5	6
1. Computer/internet self-efficacy	(0.821)					
2. Self-directed learning	0.811	(0.818)				
3. Learner control	0.764	0.717	(0.828)			
4. Motivation for learning	0.722	0.740	0.758	(0.833)		
5. Online communication self-efficacy	0.773	0.774	0.734	0.777	(0.837)	
6. Online Course Satisfaction	0.814	0.789	0.817	0.820	0.805	(0.846)

Bootstrapping is a non-parametric process that determines whether the path coefficient (beta) is significant [48]. Bootstrapping is a statistical procedure for predicting the population's top number by averaging estimates from multiple tiny data samples. The sample is formed by withdrawing observations one at a time from a large data collection and reintroducing them once selected, allowing a single observation to appear several times in each little sample. This sampling technique is referred to as replacement sampling to quickly assess the significance of the tested model. A computation is made that proposes the model be repeated 5,000 times in the software (see in Table 5). Bootstrapping technique (5000 times) using Smart PLS. p -value < 0.01 and $p < 0.05$.

Table 5. Significance of trajectory coefficients (beta)

Scales	Original Sample	Sample Mean	STDEV	t-Statistics	p
Computer/internet self-efficacy → Online Course Satisfaction	0.210	0.208	0.065	3.241	0.001
Learner control → Online Course Satisfaction	0.257	0.257	0.061	4.232	0.000
Motivation for learning → Online Course Satisfaction	0.265	0.264	0.062	4.273	0.000
Online communication self-efficacy → Online Course Satisfaction	0.159	0.163	0.065	2.430	0.015
Self-directed learning → Online Course Satisfaction	0.114	0.114	0.057	2.019	0.044

The results in Table 5 provide support for positive relationships between all five predictor variables (computer/internet self-efficacy, learner control, motivation for learning, online communication self-efficacy, and self-directed learning) and the outcome of online course satisfaction, as evidenced by statistically significant trajectory coefficients ($p < 0.05$). More specifically, motivation for learning exhibited the strongest linkage with satisfaction (beta = 0.265), followed by learner control (beta = 0.257), computer/internet self-efficacy (beta = 0.210), online communication self-efficacy (beta = 0.159), and self-directed

learning (beta = 0.114). As a result, improvements in students' internal drive and autonomy seemed especially important for their fulfillment with online learning. However, even the smallest effect for self-directed learning explained a significant portion of variance in satisfaction. So, all factors had an impact. Overall, the pattern of positive effects reinforces conclusions from past studies that student attitudes, preparedness, and perceptions of control in the virtual environment each contribute to more satisfying e-learning experiences or higher Online Course Satisfaction.

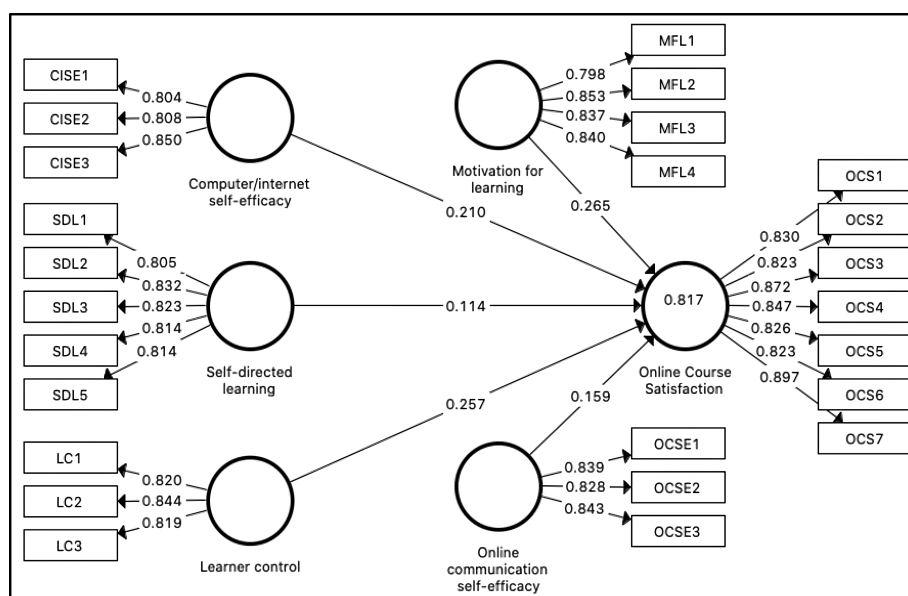


Fig. 3. Research model tested.

Fig. 3 shows the research model tested. The results confirm that computer/internet self-efficacy, self-directed learning,

learner control, motivation for learning, and online communication self-efficacy affect online course satisfaction

among students majoring in the Early Childhood Education study program at the Open Universities in Indonesia. Hypothesis 1 (H1). Computer/internet self-efficacy has a positive influence on online course satisfaction. Computer/internet self-efficacy has a positive influence of 0.210 over Online Course Satisfaction. The hypothesis was confirmed. Computer/internet self-efficacy, self-directed learning, learner control, motivation for learning, and online communication self-efficacy are 81.7% of online course satisfaction. Hypothesis 2 (H2). Self-directed learning has a positive influence on online course satisfaction. Self-directed learning has a positive influence of 0.114 over online course satisfaction. The hypothesis was confirmed. Hypothesis 3 (H3). Learner control has a positive influence on online course satisfaction. Learner control has a positive influence of 0.257 over online course satisfaction. The hypothesis was confirmed. Hypothesis 4 (H4). Motivation for learning has a positive influence on online course satisfaction. Motivation for learning has a positive influence of 0.265 over online course satisfaction. The hypothesis was confirmed. Hypothesis 5 (H5). Online communication self-efficacy has a positive influence on online course satisfaction. Online communication self-efficacy has a positive influence of 0.159 over online course satisfaction. The hypothesis was confirmed.

V. ANALYSIS AND DISCUSSION

The context of this research was indeed carried out during the pandemic, but the Open University is a university that has been implementing online learning long before the pandemic, and during the pandemic the university improved the quality of educational services and became the best in Indonesia for distance learning, therefore the researchers deemed it necessary to examine the level of student satisfaction both during the pandemic and after. We will add this to the discussion section. Currently, the open university provides learning by providing practical learning experiences carried out through practical courses and practicums which are supported by the application <https://lms.ut.ac.id/> and https://politik.ut.ac.id/custom_login. Practical activities are carried out using synchronous mode with webinar tutorials or asynchronous mix/combination with online tutorials. Providing technology-based learning that is student-centered and provides a learning experience with a high level of learning ability.

To make it easier for students to learn, teaching materials have been equipped with text-to-speech as an effort to improve teaching material services for people with visual impairments and students with an auditory learning style. Utilization of HTML5 technology in the form of "Text to Speech" in ePub format can be accessed by blind students through ePub format which allows texts in BA to be accessed via audio features. Apart from being intended for visually impaired students, the text-to-speech feature also provides easy learning support for students who have an auditive learning style. Digital teaching materials provided for students with special needs (blind) and auditive learning styles can be accessed via the page <https://p2m2.ut.ac.id/bakhusus>.

E-learning readiness involves the ability to use technology and online resources effectively for learning. Students need to be ready for online learning to succeed in their education. This readiness includes being prepared with the necessary components and having the skills to navigate technology and study independently. Assessing readiness is important for evaluating the effectiveness of digital learning strategies. The purpose of this study is to explain the relationship between online learning preparedness and online course satisfaction among students majoring in Early Childhood Education (ECE) at Indonesian Open Universities. To determine the predictive role of online learning readiness sub-dimensions (computer/internet self-efficacy, self-directed learning, learner control, motivation for learning, and online communication self-efficacy) on online course satisfaction, relational analysis, and PLS-SEM analysis were used to analyse the data. Participants in this study were primarily women, with 99.7% and more than a third between 19 and 26 years old. A total of 28.0% were in the second-year class. The findings of this study largely corroborate prior research demonstrating that technology and internet self-efficacy, learner control, motivation for learning, online communication self-efficacy, and self-directed learning positively contribute to student satisfaction with online courses [49]. Students with higher levels of attitude are likely to perceive larger amounts of technology use [50].

A. Effects of Attitude and Mental Training Carried Out by Lecturers at the Indonesian Open University for Online Learning Motivation

Learning motivation showed the strongest influence on online course satisfaction, followed by learner control and computer/internet self-efficacy. This highlights that students' attitudes and perceptions towards the online learning experience play an important role in determining the level of satisfaction. Student motivation has the strongest influence on readiness and satisfaction with online learning experiences, which is in line with previous research emphasizing the important role of independent learning, which is characterized by motivation, in online learning environments [51]. Previous research included self-motivation as one of the independent variables in their research, indicating its potential as a determinant of online learning satisfaction. These findings collectively indicate that learning motivation is a significant factor influencing online course satisfaction [52].

Thus, collectively there is growing evidence that fostering adaptive motivational beliefs, autonomous behaviors, and technology skills enhances students' experience with remote instruction. Although some previous studies failed to uncover significant relationships [18, 53], our results consistently showed that enhancing students' competencies and self-beliefs in the online setting can improve their overall fulfillment. For instance, in an analysis of university students, the dimensions of self-regulated learning in time management, the level of external motivation, the level of self-efficacy, and the initial behavioral intentions of participants all have an impact on e-learning satisfaction [54]. In a similar vein, students who demonstrated greater desire and self-regulation in their learning were also more likely to finish online courses and report satisfaction. Li *et al.* [55]

suggest that college students should be conscious of the difficulties associated with online learning as well as the value of self-regulation. Since it produces the biggest positive compound effect, the path of task-specific self-regulated learning, cognitive presence, and online learning motivation has been determined. The significance of self-regulation learning is emphasized by the self-directed and student-centered character of online learning, and students' self-regulation learning behaviors must be modified by various learning tasks. Teachers shouldn't presume that pupils who perform well have superior self-regulated learning abilities [55].

The findings corroborate other studies on the connection between online course satisfaction and learning motivation. As a result, educators must provide activities, information, and technologies that motivate students to study online and assist them in adapting to the system to sustain motivation during online learning. Motivation is considered as a necessary condition for successful online learning. Due to the highly individualized and autonomous nature of online learning, motivation is essential for both high-quality learning and successful online learning dropout rates. When examining academic progress and satisfaction, motivation for e-learning is critical to measure.

B. Learning Control as a Tool for Evaluating and Improving the Quality of Distance Learning

The second important finding is student control. Learner control includes guiding the learning process when studying online, avoiding distractions from other online activities (WhatsApp, Instagram, Facebook), and being willing to revisit online learning resources based on their needs. This ability is more about the process of staying focused, staying motivated, and sticking to the learning goals that have been set. Online learning environments allow students to take control of their education by choosing the most effective learning processes and steps for their specific situation. It is hoped that students with increased learner control will be able to guide their learning process better resulting in higher levels of learning performance. Furthermore, Tien *et al.* [33] found that learner-lecturer contact, learner-student interaction, and learning content all increased readiness and satisfaction in online learning.

C. Computer/Internet Self-Efficacy is the Best Tool to Achieve Learning Success and Online Course Satisfaction

The results of the PLS-SEM analysis also show that computer/internet self-efficacy is the third predictor factor for online course satisfaction. Internet/computer self-efficacy is one of the e-readiness sub-dimensions that has received relatively less attention in the literature than other sub-dimensions. Previous research has documented the beneficial effects of internet/computer self-efficacy in e-learning contexts. Internet self-efficacy can influence achievement levels in web-based learning environments. Additionally, numerous investigations affirmed links between technology competence and online learning success. The rise in enrollment in remote learning programs introduces a distinct degree of complexity that is prompting researchers to look for strategies to boost participation in online learning

settings. Wolverton and Lanier [56] examined the potential relationship between student involvement and satisfaction with online learning and their perceptions of computer self-efficacy. According to the results, student involvement is influenced by computer self-efficacy, and, in turn, student engagement affects group satisfaction. Bhagat and Spector [57] also demonstrated that Internet self-efficacy increased university students' cognitive absorption and perceived learning from the web.

In addition, online communication self-efficacy has a positive influence on online course satisfaction. It shows that online communication self-efficacy can be used as a predictor of online course satisfaction. Effective communication leads to favourable learning in an e-learning environment and encourages students to more actively participate in class discussions. Online learning can support regular communication between teacher and student without requiring in-person interviews. In online learning environments, it is essential to interact with other users of the system, and people's online self-efficacy should be seen as an effort to get past the limitations of online learning.

Online course satisfaction can be predicted using online communication self-efficacy. These findings attest to the fact that online learning's autonomous learning procedure adheres to the initial self-learning paradigm. Because of this, e-learning professionals must help their students align their learning requirements and objectives with e-learning. Additionally, assigning pupils the task of selecting and putting into practice suitable learning strategies can help them perform better academically.

The last sub-dimension that becomes a predictor is self-directed learning. Independent learning is the factor with the lowest influence on user satisfaction, this is because it is influenced by various factors. The last ten years have seen a tremendous increase in the number of online courses, and the COVID-19 pandemic has suddenly accelerated online education. Many students and instructors are unprepared for online learning. In particular, online learners are expected to use independent learning skills to be successful. A qualitative study conducted by Zhu *et al.* [58] examined self-directed learning strategies and student satisfaction in online courses. Student satisfaction depends on course design (e.g., well-structured organization) and teaching approach (e.g., instructor presence). This factor is also an aspect close to the actual learning paradigm. Students with a higher level of self-regulation in online courses reported higher learning outcomes, indicating a positive relationship between self-regulated learning and satisfaction [52]. Similarly, Dinh and Nguyen [16] found that self-regulated learning had a direct positive effect on student satisfaction in online learning. Additionally, Bećirović *et al.* [34] highlighted how self-efficacy and self-regulated learning affect satisfaction with online learning, bolstering the beneficial effects of self-directed learning on satisfaction.

Instructors play a key role through their course organization, facilitation, and support. But students also need opportunities to direct their own education. Thus, a shared partnership focused on enhancing both skills and agency promises the greatest benefits. Adapting existing learning strategies to virtual forums, while expanding technology

access and training, can set the stage for more engaging and satisfactory e-learning. In line with the results of recent research which shows that overall student satisfaction with learning modalities is influenced by the teaching and learning process, course content, and course materials (quality, accessibility, and completeness) [59]. Overall, concentrations on motivation, control and self-belief emerge as worthy priorities for nurturing online achievement. To create a conducive learning environment, students are granted the autonomy to design their own learning programs. This is achieved through the completion of exercises, accessing relevant content, and utilizing desired learning materials.

However, several factors contribute to the efficiency and effectiveness of this learning activity. Firstly, students must possess adequate technical abilities to navigate the online learning platform and utilize the available resources. Additionally, the capacity for independent learning plays a crucial role in ensuring that students can effectively engage with the learning materials. Students' capacity for independent learning significantly influences their learning outcomes in online learning. Independent learners are actively involved in maximizing learning opportunities, control their learning process, and are responsible for their learning, thereby leading to increased learning efficiency [60]. Students' enthusiasm for learning is closely related to their learning efficiency because it influences mastery of knowledge and skills, psychological and moral quality, as well as overall learning outcomes [24]. Furthermore, students' enthusiasm and motivation to learn, as well as their ability to communicate effectively online, also contribute to the overall success of the learning experience.

This finding can attract the attention of universities so that they can get a better understanding of the factors that are considered necessary by students. Students can ask the institution for changes to the content of online learning, including the provision of digital learning content that can improve the quality and satisfaction of students' online learning. In addition, this study can also be used as a reference for universities with open and distance learning patterns to select new students or even make online study preparation classes for new students before entering the actual course. It can be a unique attraction for prospective students to register at the university. Furthermore, our study lends further weight to these conclusions. Still, more research is warranted to unpack specific causal mechanisms and boundary effects. The sample was also limited to university students in a developing country context, suggesting the need for replication across educational levels and cultural settings.

The fact that we only had one male respondent is indeed a limitation in this study. Although we consider this limitation to not really affect our findings, it is more about the magnitude of the influence of attitude and mental training carried out by Indonesian Open University lecturers on online learning satisfaction, learning control as a tool for evaluating and improving the quality of distance learning, and computer/Internet self-efficacy. is the best tool to achieve learning success and Online learning satisfaction. The reason our research distribution is limited is because of the phenomenon of the lack of male teachers in early childhood education and in early childhood education teacher education.

This is confirmed by Maulana's *et al.* [61] which explains the existence of male teachers and their role in early childhood education, that the presence of male teachers in Early Childhood Education (ECE) in Indonesia is still low. One of them is because society has different perceptions of men's work as ECE teachers.

VI. CONCLUSION

The study's findings show that all sub-dimensions of learning readiness can predict online course satisfaction among ECE teacher education students. The results showed that satisfaction with online courses was significantly influenced by several variables, including computer/internet self-efficacy (0.210), independent learning (0.114), student control (0.257), learning motivation (0.265), and online communication self-efficacy (0.159). The PLS-SEM results suggest that motivation to learn is the most important predictor of online course satisfaction. Furthermore, learner control is the second-most important predictor of online course satisfaction, with computer/internet self-efficacy coming in third, followed by online communication self-efficacy and self-directed learning.

This study addresses the gap in similar research by using a quantitative research approach to explore the perceptions and experiences of adult learners (service teachers) because the Early Childhood Teacher Education study program at Universitas Terbuka is in the Faculty of Teacher Training and Education which continues to develop in an online professional development environment. Our study examines adult students enrolled in a work training program offered by an open university about their readiness and satisfaction with online learning (a group of professionals in the working world who want to develop their careers and develop their skills), so it is different from previous studies that concentrate on undergraduate students. Other studies have determined the factors that influence the online learning environment, how students perform, or whether they are satisfied with online courses. The novelty of our study refers to the absence of research results that describe the readiness and satisfaction of full online teacher education students towards online learning. As well as the need for data that ensures the best form of Universitas Terbuka Indonesia's efforts that have the most influence on the readiness and satisfaction of online learning for early childhood teacher education students at Universitas Terbuka. The findings carry important implications for designing and delivering fulfilling online classes by strengthening students' competencies and perceptions of their online learning experience. Doing so can in turn improve retention and achievement in virtual classrooms. This study involved 286 students domiciled on the big islands in Indonesia, the limited network in areas other than the big islands is one of the shortcomings of this study. It is hoped that the next study can involve a larger and more evenly distributed number of students so that it can capture the readiness and satisfaction of learning online along with the improving internet network in Indonesia.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

Siti Aisyah identified the key subjects, created drafts of proposals, gathered, examined, and interpreted data before drawing findings and confirming them. Erie Siti Syarah contributed ideas for study topics, organized a discussion of the findings, and made conclusion. All authors had approved the final version.

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