Journal of Education and Learning (EduLearn)
Vol. 18, No. 4, November 2024, pp. 1553~1561
ISSN: 2089-9823 DOI: 10.11591/edulearn.v18i4.21653

Customer satisfaction index in Indonesian student micro credentials program

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Article Info

Article history:

Received Dec 20, 2023
Revised Feb 18, 2024
Accepted Mar 7, 2024

Keywords:

Customer satisfaction index
E-learning
Micro credential
Satisfaction
Student

ABSTRACT

The Indonesian Student Micro-Credentials Program implemented by Universitas Muhammadiyah Sumatera Utara (UMSU) carries 5 courses, all of which are carried out online, in a relatively short time within 2 months. The learning objectives, which are intended to create practical skills, require students to master the courses they follow, thus causing many problems, which have an impact on the satisfaction of the participants of this program. This study aims to measure the customer satisfaction index (CSI) of participants in this program. Of the 514 participants who were used as respondents, 279 respondents filled out the google formula, and the response rate was 54%. The results showed that the CSI value of the program was 0.85, which means that the participants were very satisfied with the implementation of this program at UMSU. Based on the assessment of it is quality, the dimension assessment is carried out in order of the highest average value, namely this program (4.48), interaction and flexibility (4.33), managers (4.24), lecturers (4.23), students (4.20), assessment (4.16), process (4.14), content design (4.15), partners (4.11), and technology (4.05). Based on the assessment of the level of importance or expectation of this program, the dimension assessment is carried out in order of the highest average value, namely this program (4.47), interaction and flexibility (4.38), managers (4.23), lecturers (4.22), process (4.17), content design (4.17), students (4.13), peer (4.13), assessment (4.11) and technology (4.04).

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1. INTRODUCTION

The COVID-19 pandemic has caused learning to be held online, to prevent transmission of the virus. This led to the evolution of distance education. Information and communication technology (ICT) innovations and advancements have created new learning opportunities in educational settings where good communication between students and instructors has developed on online platforms, requiring lecturers to act as instructors or facilitators of knowledge sharing resources to increase student satisfaction [1], [2]. Online learning is not only

based on physical or virtual locations, but lecturers create synchronous or asynchronous instructional modules to increase learning and engagement, and information is provided online [3]. In asynchronous learning, learning videos can be used to help the learning process, where the use of videos in electronic learning (e-learning) affects student satisfaction [4]. This is understandable, considering that by watching the video students can feel an experience that is close to the actual situation and this is quite helpful in understanding the subject matter.

The use of e-learning is certainly expected to have an impact on student academic achievement, regardless of the various obstacles faced during its implementation. This has led to the emergence of research on e-learning and academic success [5], learning outcomes [6], success of online classes [7], as well as e-learning critical success factors [8]. Weerarathna *et al.* [5] stated that the e-learning dimensions that influence academic success consist of system quality, instructor quality, digital readiness, and e-learners attitude. Meanwhile, Eom and Ashill [6] used e-learning inputs (course design quality, instructor involvement, and student motivation) to explain their influence on learning outcomes. With qualitative analysis, Muthuprasad *et al.* [7] shows the components that support the success of online classes including the nature of the content, infrastructure, instructor competency, student readiness. Alhabeeb and Rowley [8] stated that e-learning success factors for academics in sequence: student characteristics, ease of access, teacher characteristics, and support and training; and e-learning success factors for students in sequence: instructor characteristics, student characteristics, support and training, and ease of access. The role of input, process and feedback is very important in the success of e-learning and student achievement.

Since 2020, the government has launched independent learning program, so that students can experience learning outside of campus, namely studying in the community or on other campuses. One of these programs is the Indonesian Student Micro-Credential, in which students take 1 course offered by a university and this course will be converted to the same or cognate courses. UMSU, implemented the Indonesian Student Micro Credential Program in 2021. In response to industry and/or entrepreneurship's need for knowledge, skills, and competencies in a variety of scientific fields for idea generation, product or service creation, business model creation, business management, marketing, sales, investment, and student business development, the program offers a more dynamic, competitive learning alternative. Learning in micro-credentials occurs in a short time and a flexible structure, the ease with which students can access digital learning materials such as digital books, online tutorials, video courses and various learning sites contributes to the global learning transformation, a fast, adaptive and cost-effective way to update learner skills in desired areas, enabling the acquisition of advanced knowledge and skills in a flexible learning environment [9]. Courses leading to micro-credentials vary in terms of design and delivery (e.g. variations in terms of length and level of workload, difficulty and effort of work, quality of description of learning outcomes and assessment of practice) [10]. Kiiskila *et al.* [11] emphasize that the interest and importance of digital credentials will increase as learners receive more digital credentials that allow them to gain a more comprehensive view of their abilities and evidence of learning. The implementation of ICT-based and applicable micro-credentials shows that the class is a smart class, where students are the main part of the class, and each student carried out experiments, all act as participants, and the teacher invited students to interpret simultaneously by demonstrating the material so that they understand the material through several constructions [12]. Although in a short time, micro credentials provide enormous benefits for improving student skills.

Indonesian Student Micro-Credential implemented to equip students with practical skills so that learning is focused on practice. However, the implementation of it, which is carried out online, faces challenges and obstacles in the process. One of the problems identified, namely the problem of computer facilities owned by students who are not always able to process quickly, computer specifications that do not support the application of the course used, lack interaction with colleagues because some students come from different universities or the same university but class so that they do not know each other so it is quite difficult to interact. Besides that, as much as 10% of the total students who take part in this program are students outside UMSU, even students from eastern Indonesia, which of course have differences in dialect and perception. In addition, the quality of the internet connection is very important, so that they can always follow the e-learning process on time so they do not miss the explanation of the material. These problems can have an impact on student dissatisfaction in participating in it.

E-learning is declared successful if it is able to satisfy its users, namely students. Student satisfaction in attending courses is very important because it can increase their motivation in the learning process. Student satisfaction with e-learning can be measured from various variables. The determinants of e-learning perceived satisfaction consist of information quality, system quality [13]–[15], where [14] divides system quality into educational system quality, technical system quality and support system quality. In [14]–[16] confirm that instructor quality has an effect on e-learning perceived satisfaction, however Cidral *et al.* [13] uses the instructor attitude variable toward e-learning. Tran [16] also found that course design, prompt feedback, and student expectations were highly correlated with perceived satisfaction. Darawong and Widayati [17] compared the dimensions of service quality that influence student satisfaction in Thai and Indonesian students,

and found that for Thai students, the strongest dimension of service quality influencing student satisfaction was reliability, followed by responsiveness and competence and for Indonesian students, samples, the strongest dimension of service quality affecting student satisfaction is empathy, followed by responsiveness, competence and reliability. Sumi and Kabir [1] used perceived e-learning service quality, with the dimensions of reliability, responsiveness, assurance, empathy, website design, and learning content and found its effect on student satisfaction. Meanwhile, Kornpitack and Sawmong [3] used performance expectancy, learner interaction, actual use, facilitating conditions as determinants of student satisfaction, and found that performance expectancy and actual use affect student satisfaction, but learner interaction and facilitating conditions did not.

Ebrahimzadeh *et al.* [18] measure student satisfaction and the results show that the three variables perceived quality, organization image and student relationship management can be stated as reliable indicators of student satisfaction, but the expectation variable cannot predict student satisfaction. On the other hand [19] who conducted research using the SERVQUAL method in Hungarian higher education, found that the first component relates to the assurance dimension by emphasizing politeness and partnership, the second and third components mostly reflect the responsiveness and reliability dimensions of SERVQUAL, while the fourth component, namely tangibles, reflects the existence of written documents. support and feedback provided by the supervisor during the semester. Meanwhile, Song [20] mentions that teaching competencies that lecturers must possess are cognitive characteristics, instructional skills, and affective characteristics, which are related to ICT. Incorporating ICT elements is very important, because the tendency of the millennial generation is the largest ICT user, in addition to e-learning requires students to be able to interact and learn through ICT.

Bismala and Manurung [21] measures student satisfaction in participating in e-learning in the production management course, using the importance performance analysis method, and found that students wanted more intensive interactions with lecturers and materials that could be more motivating in learning. More mentioned by Bismala and Manurung [21] that lecturers should play a social role to keep students motivated and improve their learning. In addition, the quality of the instructor, the timeliness of the instructor's response, teaching style, and assistance to students through the e-learning system a measures of instructor quality.

Based on this, it is very important to assess the customer satisfaction index (CSI) in participating in this program. Customer satisfaction gets very important attention. In the world of education, students are internal consumers, because students are part of the internal process, feel the service process, and feel satisfaction from the service. This research is important to do considering that it is a new program and its implementation using e-learning to acquire practical skills is relatively more difficult. This difficulty is due to the different quality of the network in different areas, differences in facilities and technology owned by students, different collaboration and interaction abilities among students.

Based on these problems, this study was conducted to determine and analyze the CSI of students in online participation in the program at UMSU. This is important to do so that organizers can assess the quality of implementation and can be the basis for program improvement in the future. In addition, it is very important to ensure consumer satisfaction (students) in participating in e-learning, because student satisfaction has a positive effect on individual benefits felt by students, which means that if a student is satisfied with the e-learning system, it will have positive influence on continuous learning intentions [22].

2. RESEARCH METHOD

This study aims to determine and analyze the CSI of students participating in the Indonesian student micro-credentials program at UMSU. So far, research on student satisfaction has been carried out by testing hypotheses about variables that influence student satisfaction in e-learning, using AMOS [1], [16], [23], LISREL [3], [18], Smart PLS [15], SPSS [5], [24]. [25] used analytic hierarchy process and TOPSIS the technique for order preference by similarity to ideal solution in their research to find the best alternative as e-learning critical success factors, while Bismala and Manurung [21] used importance performance analysis to determine what factors must be improved, maintained, or which are considered excessive and unnecessary in service quality.

The CSI is generally used to measure customer satisfaction in the service industry, while [26] use it on Trans Jakarta buses, [27] examined the robust CSI of domestic air travel using the American CSI, but has not been widely used in measuring student satisfaction in learning, especially with e-learning. CSI can be used as a method to measure the quality of course implementation, so that organizers can improve course implementation in the future.

The population in this study was 514 participants, and all of them were used as respondents. Researchers used the Google formula to collect questionnaire data and distribute it to all participants. The instruments used include program (5 items), colleagues (4 items), content design (3 items), interaction and flexibility (5 items), assessment (4 items), students (6 items), technology (3 items), lecturer (11 items), process (2 items), and manager (5 items). With a total of 48 questions, the researcher used a Likert scale of 5 alternative

answers used in the performance appraisal system (with a scale of five which included: very satisfied (5), satisfied (4), dissatisfied (3), dissatisfied (2), very dissatisfied (1)) and a system for assessing consumer expectations for e-learning (with a scale of five which includes: very important (5), important (4), less important (3), not important (2) and very unimportant (1)). In the given dimensions, higher scores correspond to higher performance and expectations, and lower points to lower performance and expectations. This study uses quantitative descriptive analysis to measure the CSI, with the following:

$$CSI\,\frac{\sum_{i=1}^{n}(I_i{*}P_i)}{\sum_{i=1}^{n} I_i{*}R} * 100\%[28]$$

where CSI is the CSI, n is the number of attributes, I is the importance score of attribute i, P is the performance score of attribute i, and R is the range of scale (where the scale is 5). With the interpretation of the customer satisfaction, index: 0.81-1.00 is very satisfied, 0.66-0.80 is satisfied, 0.51-0.65 is moderately satisfied, 0.35-0.50 is less satisfied and 0.00-0.34 indicates dissatisfaction.

3. RESULTS AND DISCUSSION

3.1. Results

The study population was 514 participants, and all of them were used as respondents, but as many as 279 respondents filled out the questionnaire, so the response rate was 54%. Respondents who filled out the questionnaire consisted of 162 women (58%) and 117 men (42%). Respondents who filled out the questionnaire consisted of participants in the digital marketing course as many as 99 people (35%), the Autodesk Revit course as many as 64 people (23%), the genetic engineering course in agriculture as many as 35 people (13%), modern accounting appliance (MACAN) By SAP Beone as many as 57 people (20%), computer numerical control (CNC) with Solidworks 3D CAM and Mach3Mill as many as 24 people (9%). The results of the performance and interest assessment are presented in Table 1.

Based on the calculation of the level of importance and performance of program implementation, the CSI values are as follows:

$$CSI\,\frac{\sum_{i=1}^{n}(I_i{*}P_i)}{\sum_{i=1}^{n} I_i{*}R} * 100\% = \frac{857.91}{(202.52{*}5)} = 85\%$$

a score of 85% or 0.85 indicates that participants are very satisfied with the implementation of the program at UMSU.

3.2. Discussion

Although the course is only carried out in a relatively short time, namely 2 months, and in a very tight time, where the course is held 2 times in 1 week. Based on the assessment of the quality of the program, the dimension assessment is carried out in order of the highest average value, namely the Indonesian Student Micro-Credentials Program (4.48), interaction and flexibility (4.33), managers (4.24), lecturers (4.23), students (4.20), assessment (4.16), process (4.14), content design (4.15), colleagues (4.11), and technology (4.05). Based on the assessment of the level of importance or expectation of program, the assessment of the dimensions of importance or expectation is carried out in order from the highest average value, namely this program (4.47), interaction and flexibility (4.38), administrators (4.23), lecturers (4.22), processes (4.17), content design (4.17), students (4.13), colleagues (4.13), assessment (4.11) and technology (4.04). The overall dimensions of the quality of the program give satisfaction to the participants. This shows that in general, the micro-credential program has been running well, providing a significant impact for its participants. It can be concluded that micro-credentials can be chosen to be one of the short courses that can equip participants with the necessary skills and competencies. To ensure the success of the program, the program must be well structured, allowing for interaction and flexibility, the management provides facilities that support the course, the instructor is willing to invest time and appropriate methods. Lecturers must ensure that students are involved in the learning process, designing course content that fit to the desired skills and competencies, and the assessments carried out are able to measure the achievement of skills and competencies. Program implementation must also be supported by the technology that possessed by students, there are no gaps in technology ownership so that all participants achieve the desired skills and competencies.

Because the program implementation time is very short and dense, lecturers need to play a social role to keep students motivated and improve their learning. Meanwhile, the quality of lecturers can be measured from the timeliness of the response, teaching style, and assistance to students through the e-learning system as a measure of quality. Lecturers need to provide inspiration for students, so that students are more engaged with

their learning [29]. Lee *et al.* [30] emphasizes that the higher the instructor's involvement in the learning process, the higher the student satisfaction. In addition, instructors' facilitation is critical, especially timely responses to questions and timely feedback on assignments, encouraging students to become more engaged in their courses, and moving them to higher levels of learning [31].

Table 1. Results of calculation of average performance and importance of implementation

Instrument	Average performance	Average importance	Importance * Performance
The program helps in improving competence	4.61	4.63	21.34
The program provides an interesting new experience	4.54	4.56	20.70
The independent campus learning program is suitable to answer the needs of the industrial world	4.48	4.41	19.76
The independent campus learning program is suitable to answer the needs of the business world	4.43	4.43	19.62
The independent campus learning program is suitable to answer the desire to study at other campuses	4.32	4.31	18.62
Colleagues assist in the implementation of e-learning	4.23	4.08	17.26
I can discuss with colleagues interactively about the material in e-learning	4.06	4.30	17.46
There is a study group to discuss assignments	3.96	3.90	15.44
Colleagues support each other in the learning process	4.20	4.22	17.72
The material presented in e-learning is easy to understand	3.99	4.04	16.12
The content and appearance of the lecture material motivates to learn	4.18	4.19	17.51
The material delivered is following the lesson plan	4.29	4.28	18.36
In the process of online learning, there is communication with instructor	4.28	4.31	18.45
Interaction with instructors regarding the subject matter (not regarding network issues or student faults that cause delays)	4.21	4.28	18.02
There is flexibility (time tolerance) given regarding the signal	4.36	4.38	19.10
Flexibility is given if it is related to difficulties in understanding the material	4.33	4.38	18.97
Lecturers provide interactive explanations if students ask questions	4.47	4.54	20.29
Fair assessment in this program	4.33	4.33	18.75
Students can estimate the value they get based on the work they have done	4.18	4.15	17.35
Open assessment in the program	4.13	4.06	16.77
Assessment can be known after collecting assignments	3.98	3.91	15.56
I can study independently with e-learning in this program	3.90	3.86	15.05
I have high self-motivation even though I study independently, to follow this program	4.14	4.10	16.97
With e-learning, I can repeat material anywhere and anytime	4.46	4.17	18.60
I can understand the use of e-learning so that it is easier to follow the program	4.28	4.26	18.23
I can understand the instructions given by the lecturer easily	4.09	4.08	16.69
I have a great interest in increasing competence by participating in it	4.30	4.28	18.40
The existence of a place to live makes it possible to receive signals easily	4.04	4.04	16.32
Have a device to carry out e-learning	4.12	4.10	16.89
Have a device that supports the course learning process in the program	3.99	3.99	15.92
The lecturer gives clear instructions	4.33	4.28	18.53
Lecturers provide feedback related to the material	4.28	4.25	18.19
Lecturer's explanation can be understood by students	4.16	4.16	17.72
Lecturers answer student questions without exception	4.38	4.37	19.14
Lecturers are willing to help students with difficulties in doing assignments	4.28	4.28	18.32
Lecturers teach in a fun way	4.15	4.12	17.10
Lecturers answer student questions without exception	4.14	4.14	17.14
Lecturers are willing to help students with difficulties in doing assignments	4.21	4.21	17.72
Lecturers teach in a fun way	4.25	4.19	17.81
Lecturers teach in an interesting way	4.27	4.18	17.85
Lecturers are willing to answer student questions outside the course hours	4.20	4.19	17.60
Need to study specifically to better understand the course material	4.11	4.19	17.22
Need more study hours to understand the course material	4.16	4.15	17.26
The committee provides accurate information	4.22	4.33	18.27
The committee provides good service	4.23	4.19	17.72
The committee is quick to respond in answering participant problems	4.23	4.29	18.15
The committee is ready at any time to help with participants' difficulties	4.33	4.15	17.97
The committee monitors the learning process	4.19	4.18	17.93
		202.52	$\sum_{i=1}^{n}(I_i * P_i)$ =857.91

Given that all programs are implemented entirely online, learners must also be "e-ready" so that strategies can be achieved in a coherent manner tailored to meet their needs. Participants must demonstrate their ability to interact with technology, be responsive so that learning objectives can be met. E-learning emphasizes the importance of self-regulated learning, the ability to use internet technology, which leads to engagement

between lecturers and students, to achieve learning success. This emphasizes the importance of an education process that is centered on students, which requires self-regulated learning skill. Kara [32] revealed that digital literacy, independent learning, and learning motivation have a significant influence on engagement.

The online course program which is carried out in a short and dense time certainly puts considerable pressure on participants, coupled with assignments that must be completed, so that learning objectives can be achieved. This requires high motivation from students [33], [34] to complete tasks. Collaboration with colleagues, of course, is very meaningful in completing tasks. Collaboration can form good teamwork, helping each other in understanding the problems that must be solved. This is confirmed by the results of the research. Pham *et al.* [35] suggest several factors that can help lecturers to find conditions that can increase student involvement in the e-learning environment, namely psychological motivation, peer collaboration, cognitive problem solving, interaction with instructors, community support, and learning management. Furthermore Lee *et al.* [30] emphasized the role of the instructor in online education and the level of instructor involvement. The program demands intense interaction between students and lecturers because in e-learning there are often obstacles in terms of internet connections and facilities owned by students. This is also confirmed by [35] which states that the quality of e-learning services is shaped by the quality of the e-learning system, e-learning instructors and course material quality, and the quality of e-learning administration and support services. In addition, overall e-learning service quality is positively related to e-learning student satisfaction, which in turn positively affects e-learning student loyalty.

Technology is a component of satisfaction, especially in the implementation of the program that uses programs that support the achievement of participants' practical competencies. Most important is the use of ICT, as stated by Batez [36] that there is a correlation between online education satisfaction and ICT skills, frequency of use of ICT, which indicates that students with higher ICT knowledge are more satisfied with online education and the more ICT is included, the more satisfied students are. The program, which is completely online, and uses application programs that support student skills, gives students satisfaction because by participating in this program, students increase their competence in the use of the programs taught. Post-pandemic, of course, e-learning will still be considered for continued use, given the flexibility it provides, but it needs to be supported by the quality of infrastructure and all available resources.

Ensuring the success of e-learning will face challenges, due to various facilities and human resource constraints. E-learning organizers must ensure that lecturers and students have high motivation to ensure the success of e-learning. Students must ensure that they have self-regulated learning skills, and are willing to provide feedback so that all interested parties can maintain the implementation and quality of e-learning. The success of e-learning is determined by the system and user characteristics, where e-learning users are lecturers and students. Adopting e-learning will give lecturers the extra role of further motivating and engaging with their students by providing feedback.

4. CONCLUSION

The Indonesian Student Micro-Credential Program organized by UMSU within 2 months, must achieve the learning objectives that have been set. Short and dense time and problems that arise related to online learning provide different levels of satisfaction among students. By measuring the CSI, the manager can find out how the student satisfaction index is as a consumer. With a CSI value of 0.85, it shows that students are very satisfied with the program they are participating in. From the perceived quality dimension, the researcher gave a ranking according to the highest value, namely the program (4.48), interaction and flexibility (4.33), managers (4.24), lecturers (4.23), students (4.20), assessment (4.16), process (4.14), content design (4.15), peer (4.11), and technology (4.05). Students view that the achievement of micro credential learning, namely providing practical skills, has been achieved, with all dimensions that support the implementation.

Micro credentials are a very useful program to acquire skills, with a relatively short time. Micro-credentials carried out using e-learning must be supported by the students and lecturers involvement, availability of facilities, content design that is appropriate to learning outcomes. In the future, researchers suggest that students should include elements of student engagement and self-regulated learning as behavioral factors for students to support the achievement of values and competencies. This is important, considering that e-learning causes student engagement to decline and difficulties in self-regulated learning in implementing e-learning.

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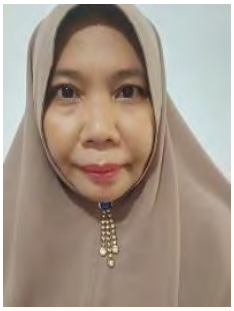

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