Assessment of Students Satisfaction with Online Learning Experiences during the COVID-19 Pandemic: Customer Satisfaction Index and Importance Performance Analysis Case Study at Institut Teknologi Kalimantan

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Article Info

ABSTRACT

As COVID-19 has became a pandemic, all universities have been switched their learning methods into online classes. This new learning method certainly affects the conventional learning students, including two of six effective learning indicators according to Directorate General of Higher Education are no longer directly related to university namely students' activities/behaviour and learning climate. This research aims to measure the student satisfaction with online learning experiences during the COVID-19 pandemic at Institut Teknologi Kalimantan (ITK) using Customer Satisfaction Index (CSI) based on those six indicators. Importance Performance Analysis (IPA) was used to determine the most important attributes which affected the measured satisfaction or dissatisfaction. The results of this study shows that students at ITK have satisfaction level of 74.79 % who fall into the Satisfied category, this number shows that the implementation of online lectures at ITK had met students' expectations. The result of attribute mapping using IPA method shows that the students' disatisfaction mostly come from one item at learning climate indicator that stated about studying comfortably and conducively at home, it means that the students cannot concentrate when taking online lectures at home. Fortunately, the rest of important attributes had met students' expectations.

ABSTRAK

Saat COVID-19 telah menjadi sebuah pandemi, semua universitas mengubah metode pembelajaran mereka menjadi kelas online. Perubahan metode pembelajaran ini tentunya mempengaruhi para mahasiswa yang terbiasa dengan metode pembelajaran konvensional, termasuk diantaranya dua dari enam indikator pembelajaran yang efektif menurut Ditjen Dikti yaitu aktivitas/perilaku siswa dan iklim belajar yang tidak lagi berhubungan langsung dengan universitas karena perkuliahan dilakukan secara online. Tujuan dari penelitian ini adalah untuk mengukur tingkat kepuasan mahasiswa tentang pengalaman belajar online ketika pandemi COVID-19 di Institut Teknologi Kalimantan (ITK) menggunakan Customer Satisfaction

(CSI) berdasarkan enam indikator tersebut. Importance Performance Analysis (IPA) digunakan untuk menentukan atribut paling penting yang mempengaruhi hasil kepuasan atau ketidakpuasan. Hasil studi menunjukkan bahwa mahasiswa ITK memiliki tingkat kepuasan sebesar 74.79% yang masuk ke dalam kategori Puas, angka ini menunjukan bahwa pelaksanaan kuliah online di ITK sudah memenuhi ekspektasi para mahasiswa. Hasil pemetaan atribut dengan metode IPA menunjukkan bahwa sebagian besar ketidakpuasan mahasiswa berasal dari salah satu item pada indikator iklim belajar yang menyatakan tentang belajar secara nyaman dan kondusif di rumah, artinya mahasiswa tidak dapat berkonsentrasi saat mengikuti perkuliahan online di rumah. Atribut penting lainnya telah memenuhi harapan para mahasiswa.

1. INTRODUCTION

COVID-19 had caused the use of distance learning methods experienced a tremendous increase, all universities have been switched their face-to-face classes into online classes to avoid the spread of the virus. This new learning method certainly affects the conventional learning students from various aspects such as different classroom atmospheres and interactions, also the comprehension of study materials. In general, online learning is very different from conventional learning. Online learning is more thorough in students' accuracy and foresight receiving and processing information presented online (Riyana, 2019). In Indonesia, there are only limited institutions who were using online learning methods before the pandemic. Institut Teknologi Kalimantan (ITK) is one of the higher education institutions in Indonesia with 100% offline courses which then changed into online courses after the pandemic. This replacement will certainly change the dynamics of the learning system in ITK.

According to the Directorate General of Higher Education, Ministry of Education and Culture (2011) the quality of proper and effective learning can be seen through several indicators: (a) Lecturer's learning behaviour: lecturer's teaching skills show the general characteristics of a person related to knowledge and skills that are manifested in the form of action; (b) Students' behaviour or activities: students can do a lot of learning activities both in the classroom and outside the classroom such as extracurricular activities and others; (c) Learning climate: it can be seen in the form of a conducive classroom atmosphere and a comfortable school atmosphere; (d) Learning materials: the quality of learning materials can be seen from their compatibility with learning objectives and competencies that must be taken; (e) Learning media: it creates an active learning atmosphere, facilitates the interaction process between students and lecturers, students and students, students and experts in relevant fields of science; and (f) Learning system: the learning system in schools is able to show its quality if the school emphasizes the characteristics of its hallmark of excellence and emphasis the specificity of its graduates.

Student satisfaction towards previously mentioned indicators from Directorate General of Higher Education is very important to be evaluated, especially on online learning experiences in higher education. The indicators were implemented on conventional learning beforehand, so there must be several big differences on its implementation on online learning, including two of six effective learning indicators are no longer directly related to universities: students' activities/behaviour and learning climate. One of the satisfaction measurement methods is Customer Satisfaction Index (CSI), it had been widely used by researchers to measure service satisfaction in many areas such as public transportation (Syukri, 2014), gym service (Budhi & Sumiari, 2019), health services (Sediawan, 2013), online education platforms (Chen *et al*, 2020), etc. In this study, CSI is useful for university to determine the level of students' interest and organizational performance according to students' perceptions, it also discover the service quality attributes which need to be improved to increase online learning quality.

Education itself is the process which transforms tangible resources into intangible output which difficult to measure because it's reflected in new knowledge and the change of individuals'

characteristics and behaviour (Eftekhar *et al*, 2012). Importance Performance Analysis (IPA) first introduced by Martilla & James (1977) is an analytical technique used to identify the important performance factors that must be demonstrated by an organization in order to meet the users satisfaction (Eriyanto, 2015). This method aims to determine the most important attributes by the users according to the measured quality criteria (Sampson & Howalter, 1999 in Sari et al., 2014).

The satisfaction of online learning classes need to be evaluated by focusing on the students' needs and requirements using Customer Satisfaction Index and Importance Performance Analysis method. By understanding students' needs and requirements, the online learning practice will be more accurate and efficient. From the aforementioned background, this research aims to measure the student satisfaction with online learning experiences during the COVID-19 pandemic at Institut Teknologi Kalimantan (ITK) using Customer Satisfaction Index and Importance Performance Analysis.

2. METHODS

2.1. Subject
The subjects of this study are students at Institut Teknologi Kalimantan (ITK) from various schools and faculties with a minimum one-year online learning experiences or equivalent to 2 semesters of effective online learning. Institut Teknologi Kalimantan is a new state university located in Balikpapan, East Kalimantan, Indonesia. ITK has a total of 20 undergraduate programs across five faculties with more than 3500 students.

2.2. Data Collection and Statistical Data Analysis
This study was held on July 2021 and the primary data was collected by distributing questionnaire to ITK students. Online learning at ITK had started before July 2020. This research was divided into pilot study and main study. In the pilot study, the questionnaires were distributed to 40 respondents to check the validity and reliability of the instruments. After conducting a pilot study and finding a valid and reliable instrument, the main study was carried out. The number of samples was calculated using Slovin's formula (Sugiyono, 2011).

$$n = \frac{N}{1 + (Ne^2)} \qquad (1)$$

where n is the number of sample collected, N is the number of total population and e is the margin of error.

The minimum number of samples calculated using Slovin's formula with 10% margin of error given 98 respondents. The sample was taken using simple random sampling method. Prior to statistical analysis, a normality test was performed to check the parametric assumption of the data. If normality asumption is violated, then non-parametric tests will be performed. The significance level was set $\alpha=0.05$. Statistical tests were carried out using JASP software.

2.3. Customer Satisfaction Index
Customer Satisfaction Index (CSI) is an index to determine the overall level of customer satisfaction with an approach that considers the importance of the measured product or service attributes (Syukri, 2014).
The following steps are used to measure the CSI (Aritonang, 2005):
1. Determine Mean Importance Score (MIS), this value is obtained from the average level of interest/expectations of the service users.

$$MIS = \frac{[\sum_{i=1}^{n} Yi]}{n} \tag{2}$$

2. Determine Weight Factor (WF), this weight is the percentage of the MIS value for each indicator compared to the total MIS of all indicators.

$$WF = \frac{MISi}{\sum_{i=1}^{P} MISi} \times 100\% \tag{3}$$

3. Determine Weight Score (WS), this weight is the multiplication between WF and the average level of performance (Mean Performance Score).

$$WSi = WFi \times M\ PS \tag{3}$$

4. Determine Customer Satisfaction Index (CSI) using the formula below:

$$CSI = \frac{\sum_{i=1}^{P} WSi}{HS} \times 100\% \tag{4}$$

CSI interpretation according to Fitriana et al (2014) can be seen in Table 1. The results of CSI can be used as a reference to determine the target to improve the online learning experiences for students.

Table 1. Customer Satisfaction Index Interpretation

No	Index Value	Remark
1	81%-100%	Very satisfied
2	66%-80,99%	Satisfied
3	51%-65,99%	Quite satisfied
4	35%-50,99%	Less satisfied
5	0%-34,99%	Not satisfied

(Source: Fitriana *et al.*, 2014)

2.4. Importance Performance Analysis

Importance Performance Analysis (IPA) connects the level of importances of an atribute owned by a particular object to the reality (performance) perceived by the users. The first step for IPA is to calculate the average level of importance and satisfaction level for each item of the atributes with the following formula (Rangkuti, 2003):

$$\overline{X}_i = \frac{\sum_{i=1}^{k} X_i}{n} \qquad\qquad \overline{Y}_i = \frac{\sum_{i=1}^{k} y_i}{n} \tag{5}$$

The next step is to calculate the average level of importance and level of performance for the whole item with the formula:

$$\overline{\overline{x}}_i = \frac{\sum_{i=1}^{k} \overline{X}_i}{p} \qquad\qquad \overline{\overline{y}}_i = \frac{\sum_{i=1}^{k} \overline{Y}_i}{p} \tag{5}$$

After obtaining the average value of importance and performance level of each attributes of online learning satisfaction, the next step is to find the average performance of the overall service satisfaction attributes and then plot these values into a Cartesian diagram.
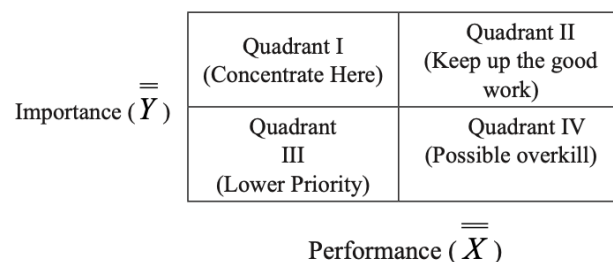
Figure 1. Four Quadrants of Importance Performance Analysis
Souce: Martilla & James, 1977

The Importance Performance Analysis (IPA) diagram consists of four quadrants (Rangkuti, 2003):

1) Quadrant 1, the area that contains items with a relatively high level of importance but in fact does not meet user expectations. Items that enter this quadrant must immediately improve their performance.
2) Quadrant II, the area contains the items with a relatively high level of importance and high level satisfaction as well. The items in this quadrant are considered as an additional factor for user satisfaction and should be maintained.
3) Quadrant III, the area contains items with a relatively low level of importance and the fact that their performance is not too special with a relatively low level of satisfaction. Items that fall into this quadrant have very little effect on the benefits perceived by the user.
4) Quadrant IV, this area containing items with a low level of importance with a relatively high level of satisfaction.

3. RESULT AND DISCUSSION
3.1. Customer Satisfaction Index (CSI)

In this study, CSI was used to determine the overall level of students' satisfaction by taking into account the level of importance/expectations and performances of the measured indicator based on the effective learning quality by Directorate General of Higher Education, Ministry of Education and Culture (Table 2). Statistical analysis resulted that all items on the questionnaire are reliable but the normality assumption is violated, non-parametric test is performed accordingly.

Table 2. Service Quality Attributes and Measured Items

	Atributtes		Statement
1	Lecturer's learning behavior	1	Lecturers comprehend the presented material
		2	Lecturers master the technology used for online classes
		3	Lecturers are able to deliver the material through online classes
2	Students' behavior or activities	1	Student associations activities can still be done online
		2	Students are actively asking questions to lecturers when studying online
		3	Study groups can still be done online
3	Learning climate	1	I can study comfortably and conducively at home
		2	I always understand the presented materials in online classes
		3	I prefer online classes than conventional classes
4	Learning materials	1	The learning materials given by the lecturers are complete
		2	The learning materials provided by the lecturers are in accordance with the learning objectives
		3	I could still gain the competency in the course I take online
5	Learning media	1	The learning media used by the lecturers are interesting
		2	The existing Learning Management System really helps the online lectures process

	3	I still actively interact with classmates and lecturers during online classes	
6 Learning system	1	The online classes learning system does not affect the skills and knowledge I get	
	2	The online learning system does not affect my quality when I graduate	
	3	College administrations requisite can still be done online	

Attributes number (2) students' behaviour/activities and (3) learning climate are not directly related to the university because of the online learning implementation. The two attributes are affected by different conditions of each students, such as learning climate for students to concentrate are affected by students' house noise conditions and internet connection. Meanwhile for students' behaviour/activities are affected by the students' eagerness to actively participate in the on-going online classes such as asking or answering questions to lecturers and giving opinions.

Table 3. Customer Satisfaction Index Calculation Results

	Statement	Performance (P) (Scale 1–5)	Importance (I) (Scale 1–5)	Weight Factor	Weight Score
1	Lecturers comprehend the presented material	4.13	4.40	0.063	0.26
2	Lecturers master the technology used for online classes	4.06	4.25	0.061	0.25
3	Lecturers are able to deliver the material through online classes	4.07	4.35	0.062	0.25
1	Student associations activities can still be done online	3.79	4.04	0.058	0.22
2	Students are actively asking questions to lecturers when studying online	3.57	3.76	0.054	0.19
3	Study groups can still be done online	3.91	4.08	0.058	0.23
1	I can study comfortably and conducively at home	3.59	3.99	0.057	0.21
2	I always understand the presented materials in online classes	3.41	3.55	0.051	0.17
3	I prefer online classes than conventional classes	3.08	3.10	0.044	0.14
1	The learning materials given by the lecturers are complete	3.80	3.90	0.056	0.21
2	The learning materials provided by the lecturers are in accordance with the learning objectives	3.95	4.09	0.059	0.23
3	I could still gain the competency in the course I take online	3.70	3.90	0.056	0.21
1	The learning media used by the lecturers are interesting	3.70	3.75	0.054	0.20
2	The existing Learning Management System really helps the online lectures process	4.06	4.21	0.060	0.24
3	I still actively interact with classmates and lecturers during online classes	3.72	3.87	0.055	0.21
1	The online classes learning system does not affect the skills and knowledge I get	3.33	3.41	0.049	0.16
2	The online learning system does not affect my quality when I graduate	3.28	3.31	0.047	0.16
3		3.88	3.88	0.056	0.21

College administrations requisite can still be done online				
Mean	3.88	3.72		
Total	69.83	67.02	1.00	3.74

Customer Satisfaction Index $= \dfrac{\sum_{i=1}^{p} WSi}{HS} \times 100\%$

$$= \frac{3.74}{5} \times 100\% = 74.79\%$$

The calculation result shows that student satisfaction index is 74.79 %. From CSI Interpretation in Table 1, it can be deduced that the students at Institut Teknologi Kalimantan are satisfied with their online learning experiences. The number also shows that the implementation of online lectures at ITK had met students' expectations. As stated above, there are only four indicators of online learning efectiveness that directly related to the university because of online learning implementation, they are (1) lecturers' learning behaviour, (4) learning materials, (5) learning media, and (6) learning system.

From Table 3, it can be seen that lecturers' learning behavior indicator has the highest satisfaction score, followed by learning materials and learning media indicators. Meanwhile for (2) students' behavior or activities and (3) learning climate indicators which are not directly related to ITK, have the lowest score of satisfaction. All indicators or atributes affect the satisfaction of online learning experiences differently, but some atributes might be more important than other atributes according to the students. The level of importance and the level of satisfaction for all attributes were mapped using Importance Performance Analysis (IPA) below.

3.2. Importance Performance Analysis (IPA)

Attribute mapping using Importance Performance Analysis (IPA) aims to determine the most important quality attributes according to the students in online learning experiences by clustering the items into four quadrants. The following diagram shows the IPA results in this study:
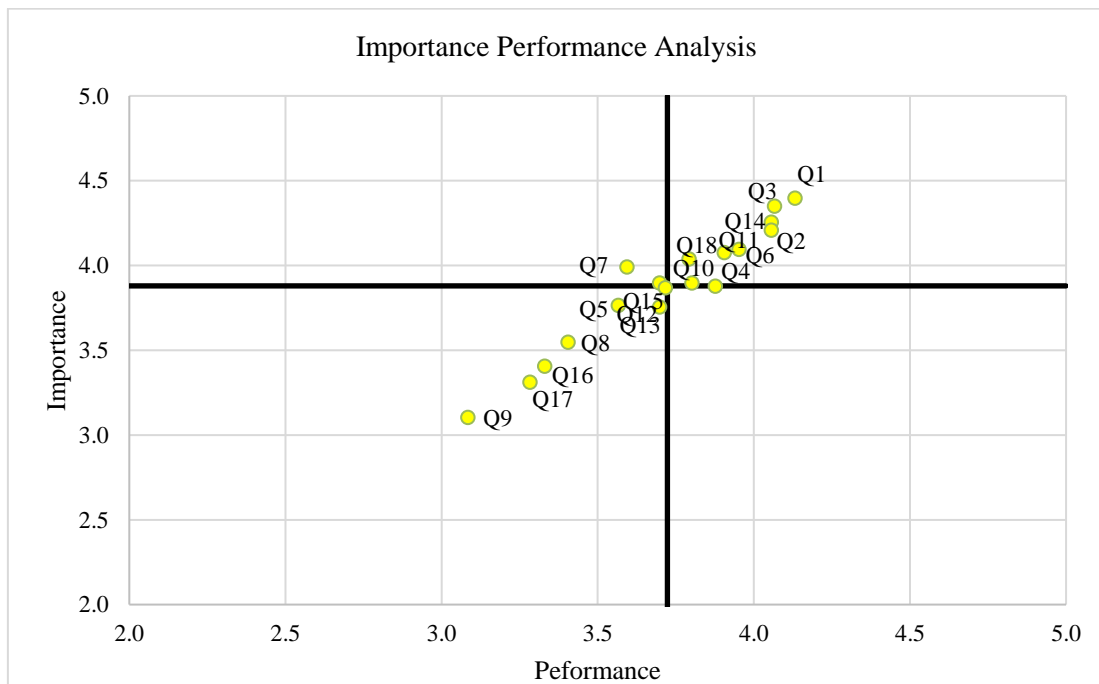
Figure 2. Importance Performance Analysis Diagram

From the diagram above we could see that there is only one item that enters Quadrant I namely Q7, it means that the students cannot study comfortably and conducively at home. As mentioned above, learning climate for students are affected by each students' house noise conditions and internet connection. Students may be able to concentrate in a relatively quiet home environment with a stable internet connection, two conditions that sometimes can be difficult for some students to control. Due to pandemic, everyone is being asked to stay at home so a quiet home atmosphere for studying might be difficult to maintain. In offline classes, students could receive lectures directly from lecturers and could discuss directly with their friends in a classroom, so that a conducive and comfortable learning climate can be more easily created and maintained.

Meanwhile, there are nine items in Quadrant II which considered as an additional factor for students satisfaction and should be maintained because those items have a high level of importance and high level of satisfaction. Those items are Q1, Q2, Q3, Q4, Q6, Q10, Q11, Q14 and Q18. The first three items (Q1, Q2, and Q3) represent lecturers' learning behavior, so it can be conclude that the students at ITK are satisfied with lecturers' learning behavior and considered it as a very important attribute. On the other hand, Q4 & Q6 represent student behaviour/activities which means students at ITK are satisfied with their online student association activities. Meanwhile Q10 & Q11 represent learning materials atribute. For Q14 represent learning media atribute and Q18 represents online college administration requisites. All of those nine items are considered important for the students and the implementations of those items had met their expectations.

The diagram shows that there are eight items in Quadrant III with a relatively low level of importance and a relatively low level of satisfaction. Items that fall into this quadrant have very little effect on the benefits perceived by the students, so the improvement for the items in this quadrant is not demanding. In contrast, there are no attributes in Quadrant IV so it can be concluded that there are no items with too much efforts because all items are considered important to the students.

4.   CONCLUSION

The level of student satisfaction for online learning experiences during the COVID-19 pandemic at ITK was measured with Customer Satisfaction Index (CSI). The results shows that the students have satisfaction level of 74.79% which fall into Satisfied category in CSI interpretation. It can be concluded that the students at Institut Teknologi Kalimantan were satisfied with online learning experiences and the implementation of online lectures at ITK had met students' expectations. Importance Performance Analysis (IPA) was used to determine the most important attributes which affected the measured satisfaction or dissatisfaction. The result of attribute mapping using IPA method shows that the students' disatisfaction mostly come from one item at learning climate indicator that stated about studying comfortably and conducively at home, it means that the students cannot concentrate when taking online lectures at home. Fortunately, the rest of important attributes had met students' expectations.

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