Analysis of E-Course LePKom Gunadarma University Website Quality Uses Webqual 4.0 Method and Importance Performance Analysis (IPA)

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Abstract— *LePKom is one of the course institutions at Gunadarma University. This course was held online during the COVID-19 pandemic. E-Course LePKom website can access on the https://kursusvmlepkom.gunadarma.ac.id. This study aims to analyze the quality of the website uses the Webqual 4.0 method and Importance Performance Analysis (IPA). Webqual 4.0 method consist of four categories, namely usability, information quality, service interaction, and overall quality. While the Importance Performance Analysis (IPA) method consists of suitability analysis, gap analysis, and quadrant analysis. The result of the research showed that the suitability analysis was at 100.09% it means that the suitability level of the E-Course LePKom website has met user expectations. The gap analysis shows the result is 0 it means the level quality of the E-Course LePKom website is good, marked with a positive value or Qi (gap) ≥ 0 indicates the level of user satisfaction. Then Quadrant IPA analysis is recommended for improvement, focus on the first quadrant and the third quadrant. Recommendations for improvement based on three dimensions of Webqual 4.0 include the usability dimension related to improving service features, navigation, appearance, and website design. Second, the dimensions of information quality need to improve for timely information for users. Third, the service interaction dimensions need to improve community space and ease of communication with course institutions.*

Keywords— *E-Course LePKom; Importance Performance Analysis (IPA); Webqual 4.0; Website.*

I. INTRODUCTION

The development of information technology many used to help support the activities of human life. In the world of education, information technology is one of the options for organizing educational programs. Utilization of the internet in the form of web-based learning media is one form of e-learning which in this era is being popularly developed by various educational institutions (Hardyanto & Surjono, 2016).

E-learning as an electronic media can have an impact on changes in the learning process. Interaction between teachers and students is not only done face-to-face but can also use electronic media as an intermediary. On the other hand, the rapid development of the internet or information technology has changed how lecturers teach and how students learn. Learning is not only through lectures and books but also through the internet. Learning in this way has advantages because it is not bound by space and time. Learning can do anywhere and anytime. Learning through the internet can be done by accessing a website. A website is a collection of pages use to display text information, still or motion pictures, animations, sound, or a combination of all of them, both static and dynamic. A website consists of several web pages (Diana & Veronika, 2018).

In March 2020, elementary, junior high, high school / vocational school, and the university had to carry out online school from home due to the COVID-19 pandemic. One of them is Gunadarma University students who carry out lectures, practicums, courses, and workshops online from home. Lembaga Pengembangan Komputerisasi, is commonly abbreviated as (LePKom) Mandiri Virtual Based, is one of the course institutions at Gunadarma University. Gunadarma University students who take this course are students majoring in Information Systems, Informatics Engineering, and Informatics Management as one of the graduation requirements.

In general, the E-Course LePKom was held face-to-face. However, during the COVID-19 pandemic, courses are held online, which can be done at home or anywhere as long as they are connected to the internet. This course has been running since the even semester of 2020. The E-Course LePKom website can access on https://kursusvmlepkom.gunadarma.ac.id. With this website, students can more easily course without coming to campus. On the E-Course LePKom website, there is MOODLE. The MOODLE web E-Course LePKom contains several modules of Fundamental (Class 1), Beginner (Class 2), Intermediate (Class 3), and Project (Class 4) course materials. MOODLE also contains video tutorials to make it easier for students to understand the course material which followed.

This study aims to analyze the quality of the website uses the Webqual 4.0 method and Importance Performance Analysis (IPA). Webqual 4.0 method consists of four categories, namely usability, information quality, service interaction, and overall quality (Diana & Veronika, 2018). While the Importance Performance Analysis (IPA) method is a method used to measure the relationship between user perception and quality improvement priorities based on user perception. Attribute assessment in the IPA method consists of suitability analysis, gap analysis, and quadrant analysis (Barus, Suprapto, & Herlambang, 2018).

The results of this study are expected to be an evaluation material for course institutions whether the quality of the website used for online courses (E-Course LePKom) on the

https://kursusvmlepkom.gunadarma.ac.id web page has good quality and whether it has in line with the expectations of the user.

II. LITERATUR REVIEW

A. Course

The course is a training institution from non-formal education units. The learning method takes place as well as teaching and learning activities in general. The difference is that courses usually learn one skill in a short time (Fauzi & Widiastuti, 2018). In the explanation of article 26 paragraph 5, of law No. 20 of 2003, it is explained that "Courses and training are a form of continuous education to develop the abilities of learners with an emphasis on skills mastery, competency standards, development of entrepreneurial attitudes, as well as the development of professional personalities."

B. Webqual 4.0

Website quality becomes one of the strategic issues in communication and transactions with customers. Webqual is one of the website quality measurement methods developed by Stuart Barnes and Richard Vidgen (2000). It is based on the concept of Quality Function Deployment (QFD) which is a process based on the "voice of customer" in the development and implementation of products or services. From the QFD concept, Webqual is structured based on the end-user perception of a website.

Webqual has undergone several iterations in the preparation of categories and question items. The latest version is Webqual 4.0 that uses three measurement categories (usability, information quality, and service interaction) with 22 question items plus one question to measure overall quality related to the IPA method, as suggested by Liu and Chen (2014).

The usability category includes ease of navigation, design, and appropriate images presented to users. The information quality category relates to the quality of website content that is proprietary information for user purposes, such as the accuracy, format, and relevance information. The service interaction category relates to user perception interactions when deeply engaged with the website. The overall quality category is the overall quality of the website researched (Shia, Chen, Ramdansyah, & Wang, 2016).

C. Importance Performance Analysis (IPA)

The Importance Performance Analysis (IPA) method is used to measure the relationship between user perception and quality improvement priorities based on user perception. Its main function is to display information related to factors that the user thinks greatly affect user satisfaction and loyalty.

The IPA method has published by Martilla and James (1977). This method was developed with consideration that user satisfaction is a benchmark for assessing website attributes and performance. Attribute assessment using this method is consists of suitability analysis, gap analysis, and quadrant analysis (Barus, Suprapto, & Herlambang, 2018).

Suitability analysis is a result comparison between the implementation performance score and the interest score to determine the value of end-user satisfaction with the website, where X is the level of performance and Y is the level of importance (Umami, 2018).

Gap analysis is an innovative and helpful approach to conducting needs assessments and evaluating programs. A gap analysis is used to measure the difference between user satisfaction and website performance or actual (Pamungkas, Alfarishi, Muklhisin, & Aziza, 2019).

According to Martilla and James (1977), quadrant analysis in the IPA method of performance attributes is depicted by the X-axis and important attributes are described by the Y-axis. Ipa Quadrant diagram has 4 quadrants, namely first quadrant (priorities for improvement), second quadrant (keep up the good work), third quadrant (low priority), and fourth quadrant (possible overkill) (Pamungkas, Alfarishi, Muklhisin, & Aziza, 2019).

III. RESEARCH METHOD

In this study, several stages were conducted, including Problem Identification, Literature Study, Determination of Research Methods, Determination of Population and Sample, Data Collection, Questionnaire Data Processing, Discussion, and Conclusion shown in Figure 1 of the Research Flow Diagram.
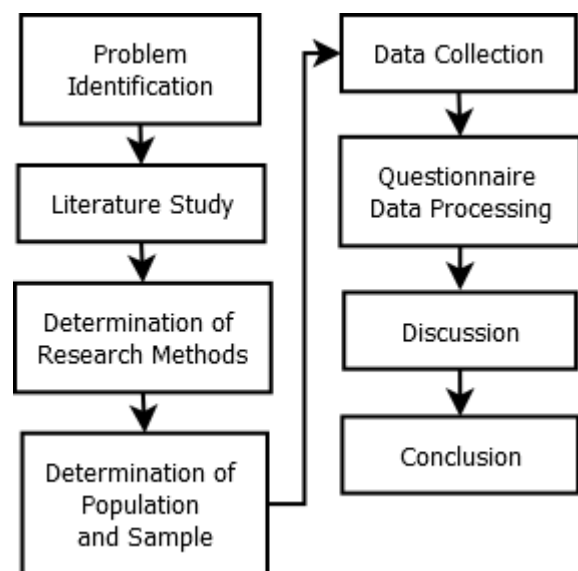

Fig. 1. Research Flow Diagram

A. Problem Identification

Problem identification aims to find out the problem by analyzing the matter that happened. The problem to be investigated in this study is how the influence of usability, information quality, service interaction, and overall quality on the quality of the E-Course LePKom website and how the influence of suitability analysis, gap analysis, and quadrant analysis of the relationship between user perceptions and priorities for quality improvement based on user perceptions.

B. Literature Study

Literature studies are conducted to get a comprehensive understanding of the E-Course LePKom website, Webqual 4.0 method, Importance Performance Analysis (IPA), and research-related questionnaires. The literature study was obtained through journals, scientific articles, websites, and related research.

C. Determination of Research Methods

This research uses Webqual 4.0 and Importance Performance Analysis (IPA) methods.

D. Determination of Population and Sample

The population in this research is all active students majoring in Informatics Engineering, Information Systems, and Informatics Management domicile Depok (Campus F4) and Kalimalang (Campus J5) who follow the online course (E-Course LePKom) Mandiri Virtual Based at Gunadarma University is 2,431 people.

Roscoe in Sugiyono (2018) argued that the appropriate sample size in the research was between 30 to 500 respondents. When the sample is divided into categories, the number of samples must match the sample size. Therefore, the samples were taken in this study as many as 150 respondents.

The sampling technique in this study is Non-Probability Sampling which is a sampling technique that does not provide the same opportunity for each element or member of the population to be selected into a sample. In Non-Probability Sampling, there is an accidental sampling technique used. Accidental sampling is a sampling technique based on chance, anyone who meets the researcher can be used as a sample if it is considered that the person met is suitable for the data source.

E. Data Collection

The data collected in this study is primary data because the data is obtained directly from students. Data collection was done using online questionnaires using Google Forms.

F. Questionnaire Data Processing

After the questionnaire is distributed to respondents, the next is to process the questionnaire data. The steps taken in processing data include:
- Conduct descriptive analysis of respondents' assessments.
- Classify respondents' assessments by using the interval class length formula.

IV. RESULT AND DISCUSSION

A. Validity Test

The validity test used in this study was to use Product Moment Correlation. According to Sujarweni Wiratna (2016), the instrument is valid when the result of the r count is compared to the r table where df = n-2 with sig 5%. If r count > r table then the instrument is declared valid. Otherwise, if r count < r table then the instrument is declared invalid.

The validity test was calculated by looking for the table r value with respondents (N) = 150 at a significance of 5% in the distribution of r values in the statistical table, then obtained the r table value of 0.159. So the research instrument is valid if the value of r count > 0.159. Webqual validity test results on importance can be seen in Table I.

TABLE I. Webqual Validity Test on Importance

No.	Variable	R count	R table	Result
1	Usability	0,630	0,159	Valid
2		0,607	0,159	Valid
3		0,684	0,159	Valid
4		0,646	0,159	Valid
5		0,563	0,159	Valid
6		0,604	0,159	Valid
7		0,619	0,159	Valid
8		0,676	0,159	Valid
9	Information Quality	0,732	0,159	Valid
10		0,767	0,159	Valid
11		0,716	0,159	Valid
12		0,767	0,159	Valid
13		0,811	0,159	Valid
14		0,740	0,159	Valid
15		0,721	0,159	Valid
16	Service Interaction	0,756	0,159	Valid
17		0,776	0,159	Valid
18		0,740	0,159	Valid
19		0,734	0,159	Valid
20		0,640	0,159	Valid
21		0,699	0,159	Valid
22		0,767	0,159	Valid
23	Overall Quality	0,742	0,159	Valid

From Table I webqual validity test results on importance, it is known that r count each question item > from r table, it can be concluded that all questionnaire items in importance are declared valid. Furthermore, the webqual validity test on performance can be seen in Table II.

TABLE II. Webqual Validity Test on Performance

No.	Variable	R count	R table	Result
1	Usability	0,793	0,159	Valid
2		0,838	0,159	Valid
3		0,774	0,159	Valid
4		0,781	0,159	Valid
5		0,681	0,159	Valid
6		0,707	0,159	Valid
7		0,700	0,159	Valid
8		0,738	0,159	Valid
9	Information Quality	0,807	0,159	Valid
10		0,787	0,159	Valid
11		0,759	0,159	Valid
12		0,833	0,159	Valid
13		0,825	0,159	Valid
14		0,807	0,159	Valid
15		0,824	0,159	Valid
16	Service Interaction	0,801	0,159	Valid
17		0,818	0,159	Valid
18		0,815	0,159	Valid
19		0,789	0,159	Valid
20		0,590	0,159	Valid
21		0,718	0,159	Valid
22		0,792	0,159	Valid
23	Overall Quality	0,753	0,159	Valid

From Table II webqual validity test results on performance, it is known that r count each question item > from r table, it can be concluded that all questionnaire items in performance are declared valid.

B. Reliability Test

The reliability test aims to see if the questionnaire has consistency or not if the measurement with the questionnaire is done repeatedly. Reliability test in this study using Cronbach alpha. According to Sujarweni (2014), the questionnaire is reliable if the value of Cronbach alpha > 0.6. The reliability test on importance can be seen in Table III.

TABLE III. Reliability Test on Importance

Reliability Statistics	
\Cronbach's Alpha	N of Items
,952	23

From Table III it is known that the result of Cronbach's alpha for each variable at importance is 0.952 with the number of question variables as much as 23 items. It can be concluded that all questionnaire items at importance are reliable because result of Cronbach alpha > 0.6. Furthermore, reliability tests on performance can be seen in Table IV.

TABLE IV. Reliability Test on Performance

Reliability Statistics	
Cronbach's Alpha	N of Items
,968	23

From Table IV it is known that the result of Cronbach's alpha for each variable at performance is 0.968 with the number of question variables as much as 23 items. It can be concluded that all questionnaire items at performance are reliable because result of Cronbach alpha > 0.6.

C. IPA Method Analysis

Importance Performance Analysis (IPA) method is an analysis technique used to identify importance-performance factors that must be demonstrated by an organization in fulfilling user satisfaction. The IPA method will generate a diagram, this diagram for the organization/company will be used for improvement strategies. In this study, the assessment was conducted through indicators or attributes of statements on questionnaires totaling 23 indicators. In the IPA method, several stages are suitability analysis, gap analysis, and quadrant analysis.

1. Suitability Analysis

Based on the assessment of importance and performance, so that the calculation of the percentage of suitability between the level of performance and importance. The suitability level will determine the order of priority of the increase in factors that affect the acceptance of the E-Course LePKom website. The suitability level calculated by the following formula (Supranto, 2011) in (Umami, 2018):

$$Tki = \frac{Xi}{Yi} \times 100\% \qquad (1)$$

Description:

Tki = Respondent's Level of Suitability
Xi = Performance Assessment Score
Yi = Importance Assessment Score

The results of the calculation of suitability level analysis can be seen in Table V.

TABLE V. Suitability Analysis Results

No.	Variable	Performance (Xi)	Importance (Yi)	Tki%	Priority
1	Usability	3,95	3,95	100,00	12
2		3,99	3,84	103,99	2
3		3,93	3,93	100,17	10
4		4,05	4,09	99,02	17
5		3,69	3,54	104,33	1
6		3,89	3,95	98,65	20
7		3,98	3,93	101,36	4
8		4,05	4,07	99,51	13
9	Information Quality	4,05	4,02	100,66	6
10		4,15	4,25	97,65	22
11		3,94	3,93	100,17	9
12		4,08	4,06	100,49	7
13		4,01	4,13	97,10	23
14		3,97	3,92	101,36	5
15		4,04	4,07	99,34	15
16	Service Interaction	3,97	3,99	99,33	16
17		4,09	4,09	100,00	11
18		4,03	4,09	98,53	21
19		4,01	4,05	98,85	19
20		3,47	3,51	98,86	18
21		3,89	3,91	99,49	14
22		3,99	3,91	102,22	3
23	Overall Quality	4,04	4,03	100,33	8
Total Average		91,26	91,24		
Mean		3,968	3,967		

From Table V, it is known that the highest rating is 104.33% which is a usability variable that discusses the E-Course LePKom website has an attractive look. While the lowest rating is 97.10%, which is an information quality variable that discusses the E-Course LePKom website provides information that is easy to read and understand.

The usability variable suitability rate is 100.88%, which means it has met user expectations. The suitability level of information quality variable is 99,54%, which means it has not met user expectations. The suitability rate of service interaction variables is at 99.61%, which means it has not met user expectations. The overall quality variable suitability rate is at 100.33%, which means it has met user expectations. Overall of the 4 variables webqual, the suitability rate of the E-Course LePKom website is at 100.09% which means it has met user expectations.

2. Gap Analysis

The level of gap can be calculated by the formula:

$$Qi(Gap) = Perf(i) - Imp(i) \qquad (2)$$

Description:

Qi (Gap) = Gap level
Perf (i) = Actual quality value (performance)
Imp(i) = Ideal quality value (importance)

110

A good level of quality marked with a positive value or Qi (gap) ≥ 0 indicates user satisfaction level is positive or has met user expectations. Conversely, if the Qi result (gap) < 0 or negative indicates user satisfaction level is negative or has not met user expectations (Pamungkas, Alfarishi, Muklhisin, & Aziza, 2019). Table VI shows the table of calculation results of the gap between the level of performance and importance.

TABLE VI. Overall Gap Analysis Results

No.	Variable	Performance (X)	Importance (Y)	GAP (P-I)
1	Usability	3,95	3,95	0,00
2		3,99	3,84	0,15
3		3,93	3,93	0,00
4		4,05	4,09	-0,04
5		3,69	3,54	0,15
6		3,89	3,95	-0,06
7		3,98	3,93	0,05
8		4,05	4,07	-0,02
9	Information Quality	4,05	4,02	0,03
10		4,15	4,25	-0,10
11		3,94	3,93	0,01
12		4,08	4,06	0,02
13		4,01	4,13	-0,12
14		3,97	3,92	0,05
15		4,04	4,07	-0,03
16	Service Interaction	3,97	3,99	-0,02
17		4,09	4,09	0,00
18		4,03	4,09	-0,06
19		4,01	4,05	-0,04
20		3,47	3,51	-0,04
21		3,89	3,91	-0,02
22		3,99	3,91	0,08
23	Overall Quality	4,04	4,03	0,01

From Table VI, the results of the gap calculation show satisfaction that there are 12 indicators out of a total of 23 indicators. While the results of the calculation of gaps that show dissatisfaction there are 11 indicators out of a total of 23 indicators.

After the calculation of the overall gap of 23 indicators, it will be done the calculation of gaps from four variables web equal, namely usability, information quality, service interaction, and overall quality shown in Table VII.

TABLE VII. Gap Analysis Results Based on Webqual Variables

Variable	Performance (X)	Importance (Y)	GAP (P-I)
Usability	3,94	3,91	0,03
Information Quality	4,03	4,05	-0,02
Service Interaction	3,92	3,94	-0,02
Overall Quality	4,04	4,03	0,01
Average	3,98	3,98	0

From Table VII, the results of the gap calculation were obtained from the four variables webqual. The usability variable, the gap value is 0.03 that indicates the level of user satisfaction. Furthermore, the information quality variable obtained a gap value of -0.02 that indicates user dissatisfaction.

The service interaction variable, the gap value is -0.02 that indicates user dissatisfaction. Then the overall quality variable

obtained a gap value of 0.01 that indicates the level of user satisfaction.

If the average calculation of the four web equal variables was conducted, the overall gap analysis shows result = 0, which means the E-Course LePKom website has a good quality level, marked by a positive value or Qi (gap) ≥ 0 indicating the level of user satisfaction or has met user expectations.

3. Quadrant IPA Analysis

The steps for quadrant analysis are as follows:
1. The first step is to calculate the average of each attribute of importance and performance. The average value of each indicator importance (Y-axis) and performance (X-axis) into intersections of two lines to divide the quadrant into 4 parts.
2. Then, the second step from the average result was made a diagram to see which attributes will occupy quadrant I, quadrant II, quadrant III, and quadrant IV. The points located in each quadrant are obtained from the average performance (X) and importance (Y). Cartesian diagram or Quadrant IPA diagram is a build divided into four sections bounded by two lines that are cut perpendicular to the point (X, Y) where X is the average performance score divided by the number of attributes, while Y is the average importance score divided by the number of attributes of the statement (Supranto, 2011:242) in (Umami, 2018). The cartesian diagram or IPA quadrant diagram is shown in Figure 2.
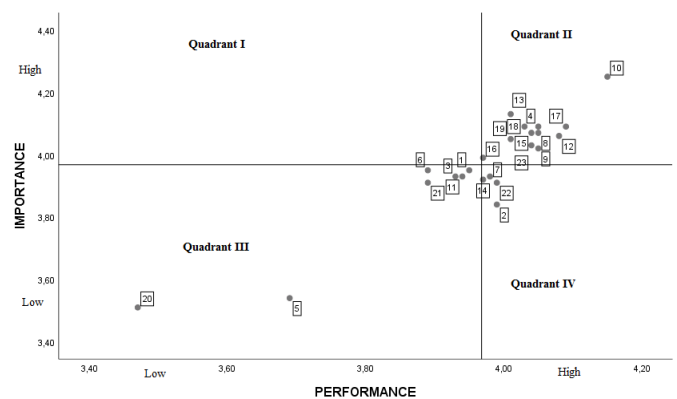

Fig. 2. Quadrant IPA Diagram

Figure 2 is an IPA quadrant diagram based on indicators on webqual variables totaling 23 indicators. The following will describe the indicators that go into each quadrant. IPA quadrant diagram has four quadrants, namely:
a. First quadrant: "Concentrate Here" attribute that is within the scope of the first quadrant with low performance but very influential, because it has high priority importance, so it becomes an important point in quality improvement. In this quadrant, the course institutions can make quality improvements to achieve the desired results by the user. From Figure 2. The IPA quadrant diagram for the E-Course LePKom website does not have any indicators included in quadrant I.

b. Second quadrant: "Keep Up the Good Work" attributes that are within the scope of the second quadrant with the same performance and priority importance, so it only needs to be maintained its value to maintaining quality. In Quadrant II there are 12 indicators included, namely indicators with the numbers 4, 8, 9, 10, 12, 13, 15, 16, 17, 18, 19, and 23. Quadrant II included in the webqual variable usability is indicator number 4 (USA4), and number 8 (USA8). Quadrant II included in the webqual variable information quality is indicator number 9 (INF1), number 10 (INF2), number 12 (INF4), number 13 (INF5), and number 15 (INF7). Quadrant II included in the webqual variable service interaction is indicator number 16 (SERV1), number 17 (SERV2), number 18 (SERV3), and number 19 (SERV4). Quadrant II included in the webqual variable overall quality is indicator number 23 (OQ).

c. Third quadrant: "Low Priority" attribute that is within the scope of the third quadrant with low performance and importance, so there needs to be an improvement in the aspects contained in the scope of this quadrant. In Quadrant III there are 7 indicators included, namely indicators with the numbers 1, 3, 5, 6, 11, 20, and 21. Quadrant III included in the webqual variable usability is indicator number 1 (USA1), number 3 (USA3), number 5 (USA5), and number 6 (USA6). Quadrant III included in the webqual variable information quality is indicator number 11 (INF3). Quadrant III included in the webqual variable service interaction is indicator number 20 (SERV5) and number 21 (SERV6).

d. Fourth quadrant: "Possible Overkill" attribute that is within the scope of the fourth quadrant with too high performance compared to its importance level. In Quadrant IV there are 4 indicators included, namely indicators with the numbers 2, 7, 14, and 22. Quadrant IV included in the webqual variable usability is indicator number 2 (USA2) and number 7 (USA7). Quadrant IV included in the webqual variable information quality is indicator number 14 (INF6). Quadrant IV included in the webqual variable service interaction is indicator number 22 (SERV7).

The next step is to make recommendations for quality improvement of the E-Course LePKom website. Based on the results of IPA quadrant analysis, the attributes that must improve are the attributes that are in the first quadrant and the third quadrant because those two quadrants have a low level of performance which will affect the level of importance of users to rely on those attributes (Kusuma, Suprapto, and Az-Zahra, 2019).

Recommendations for improving the service quality of the E-Course LePKom website there are 7 indicators that must be improved, namely indicators contained in quadrant I and quadrant III. But because in quadrant I there are no indicators included in it, so in this improvement, a recommendation will only discuss indicators included in quadrant III.

In the usability variable, 4 indicators in quadrant III must be improved, namely USA1, USA3, USA5, and USA6. In the information quality variable, there is 1 indicator in quadrant III that must be improved, namely INF3. In the service interaction variable, 2 indicators in quadrant III must be improved, namely SERV5 and SERV6.

V. CONCLUSION AND SUGGESTIONS

A. Conclusion

Based on research, data processing, and analysis that has been done on the E-Course LePKom website using Webqual 4.0 and Importance Performance Analysis (IPA) methods, it can be concluded that the suitability analysis was at 100.09% it means that the suitability level of the E-Course LePKom website has met user expectations. The gap analysis shows the result is 0 it means the level quality of the E-Course LePKom website is good, marked with a positive value or Qi (gap) ≥ 0 indicates the level of user satisfaction.

Then Quadrant IPA analysis is recommended for improvement, focus on the first quadrant and the third quadrant. Recommendations for improvement based on three dimensions of Webqual 4.0 include the usability dimension related to improving service features, navigation, appearance, and website design. Second, the dimensions of information quality need to improve for timely information for users. Third, the service interaction dimensions need to improve community space and ease of communication with course institutions.

B. Suggestions

Based on the conclusion, several suggestions can be given to the E-Course LePKom website, namely:

1. LePKom institutions need to improve website performance so that the level of performance is higher than the level of importance by making continuous improvements on the E-Course LePKom website.
2. Conduct regular evaluations on the service to improve the website in the future.
3. Research was conducted to analyze the quality of the E-Course LePKom website using Webqual 4.0 and Importance Performance Analysis (IPA) methods. For further research can use different methods or approaches in measuring the quality of the website.

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