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Analysis of Industry Needs for Indonesian Vocational Education Services Using the EduQual-IPA Method

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A B S T R A C T

The Indonesia's Open Unemployment Rate (TPT) is 5.45% or reached 7.99 million people as of February 2023. Therefore, government support and continuous improvement of the training-based curriculum system are needed. Link and match between Indonesian vocational education and the industrial world needs to be built so that Indonesian vocational graduates are significantly absorbed by the industry. The Indonesian vocational education curriculum needs to be developed together by involving the Business and Industrial World with a vision of implementation based on needs. The purpose of this research is to find out the educational service variables in Indonesian vocational learning needed by the industrial world. So that it can be used as a reference for vocational education in improving service quality. The results of research using EDUQUAL-IPA integration show that there are four priority variables that are the focus of improvement, namely; learning outcomes 1 (ability to use the latest technology), learning outcomes 2 (practical orientation in education), Physical facilities 8 (effective classroom management) and academics 4 (channeling the interests and talents of graduates).

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1. INTRODUCTION

The open unemployment rate is still quite high from various levels of education, including from vocational education (Habe & Ahiruddin, 2017). Indonesia's Open Unemployment Rate (TPT) is 5.45% or reached 7.99 million people as of February 2023 (viewed on 4-8-23, bps.go.id). This is due to the rapid growth of technology (Nurhadi et al., 2022), which drives the industrial revolution to point 4.0 so that the needs of Human Resources (HR) are required to have competencies that are in accordance with the needs of the industrial world. The impact of competition that cannot be avoided by every vocational education graduate (Amirian et al., 2022). indonesia's Open Unemployment Rate can be seen in Figure 1. The development of a competent industrial workforce needs to be carried out in vocational education through training and apprenticeship according to the Indonesian National Work Competency Standards (SKKNI) (Kemenperin, 2015).

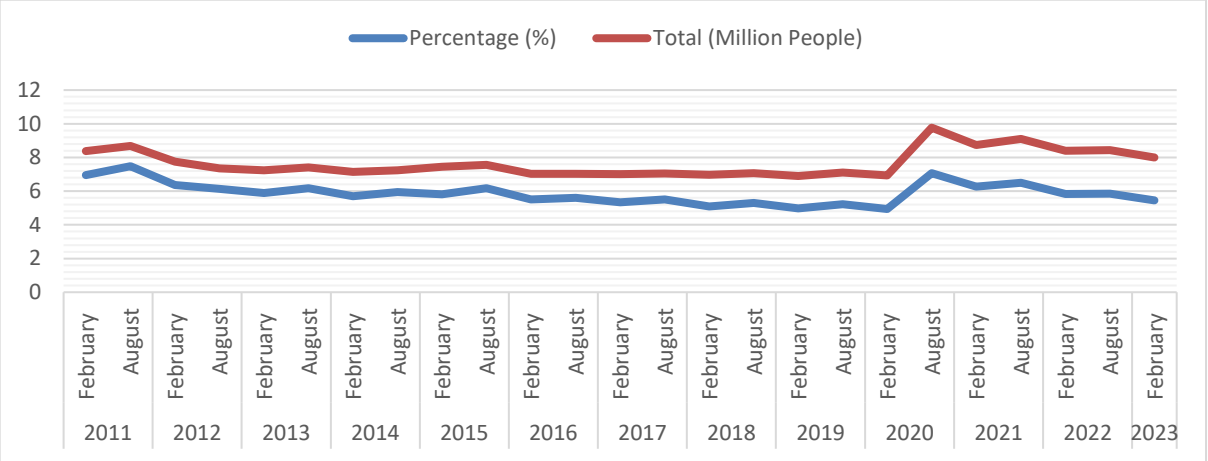

Figure 1. Data on Indonesia's open unemployment rate

Government support in improving the training-based curriculum system needs to be carried out continuously (Nugroho & Hasibuan, 2022; Chusaeni et al., 2021; Hanggara, 2019). Education services play an important role in developing science and creating human resources (Hamzah et al., 2019; Prasha et al., 2020; Setiawan et al., 2023). Therefore, service quality is a very competitive factor to win the competition (Sentia et al., 2022; Hanggara, 2019; Amalia & Zuraidah, 2022; Theresiawati et al., 2021).

For learning to be productive and successful, it is important to consider the preferences (Kotni, 2023), of all the services and teaching provided to meet the set requirements (Sweta Chauhan, 2020). The quality of educational services provided is considered the most important force in meeting the needs of stake holders (Thankachan, 2019). To improve the quality of education services, learning must be developed innovatively (Kotsifakos et al., 2018). Link and match between vocational education and the industrial world needs to be built so that vocational graduates are significantly absorbed by the industrial world. Evaluation should be conducted to obtain data on the needs of stakeholders (Arul Oli & Dhanasekaran, 2023). The vocational education curriculum needs to be developed together by involving the World of Business and the World of Industry with a vision of implementation based on needs so that vocational education is able to produce graduates who are competent, skilled, competitive and characterized according to the needs of (seen on 4-8-23, kemendikbud.go.id). The purpose of this study is to provide information to vocational education institutions, especially in Indonesia, regarding vocational education service variables needed by stakeholders from the industrial world and important to be improved and improved.

To find out the vocational education service variables needed by stakeholders from the industrial world, expert respondents with special criteria from the industrial world are needed. Furthermore, data from expert respondents can be analyzed by applying the integration of the EDUQUAL-IPA method to classify the importance of each variable and at the same time determine the gap value of the service (Putera & Ikatrinasari, 2022). In research Setyaningrum, (2020) the IPA method shows attributes that need to be improved as a new formula specifically to improve the quality of service that has been measured. In research (Debora et al., 2023) shows the use of the IPA method can describe service quality objectively in a Cartesian diagram that not all attributes that have a negative gap need to be improved. In research (Ahmad & Wardhani, 2023) shows the use of IPA methods in vocational education can sort out from 47 attributes into five attributes that need to be improved.

2. LITERATURE REVIEW

EDUQUAL is a specialized method developed from SERVQUAL Parasuraman et al., (1991)

for educational services. There are five dimensions of EduQual first introduced to measure education quality by Mahapatra & Khan, (2007) (learning outcomes, responsiveness, physical facilities, personality development, and academics). Parasuraman et al., (1991) explain, to determine the level of consumer satisfaction, five dimensions of the gap are measured. The five dimensions of the gap are the mismatch of perceptions of the service received (perceived service) against the desired expectations of the service (expected service). With the following equation;

$$Q = \sum P - E \quad (1)$$

Description;
Q = Quality of service
P = Customer perception (perceived service)
E = Consumer expectations on services (expected service)
Five gaps (gaps) cause failure in service, are; (1) Gap between customer expectations and management perceptions. Caused by management being wrong in analyzing customer expectations. (2) The gap between management perceptions in determining the standard of service to be provided. In this case, management has correctly analyzed consumer expectations. But work standards are not specifically set. (3) The gap between service standards and the implementation of services that occur in the field. This occurs because the training provided is not maximized or the workload is too high so that employees do not want to meet the established work standards. (4) Gap between services and advertising promotions provided. Customer expectations are generally based on statements and advertisements from the company. (5) The gap between the service received and the expectations of the service the customer wants. Caused by differences in the way consumers measure company performance.

To provide quality service, the organization must be able to answer obstacles based on the five dimensions of the gap faced. The conceptual model of service quality can be seen in Figure 2.

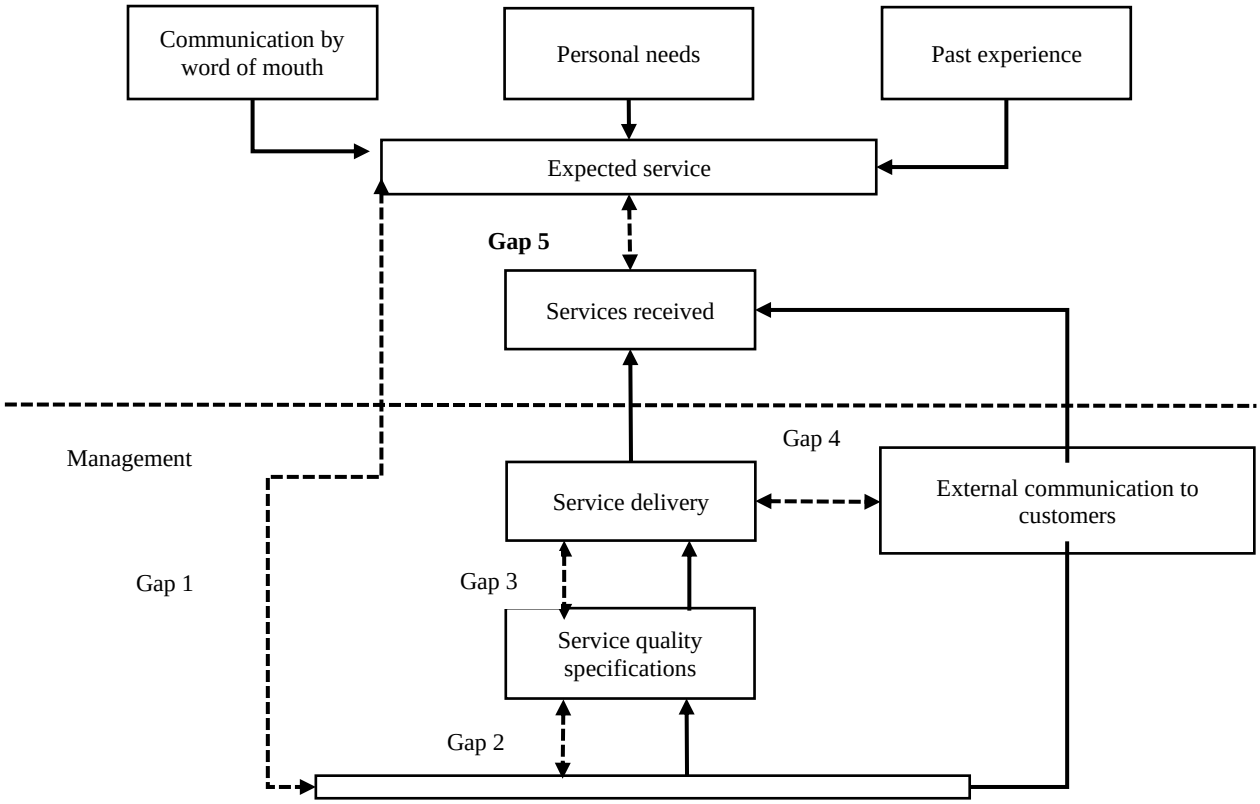

Figure 2. SERVQUAL gap model (Parasuraman et al., 1991)

The IPA method is used to analyze the concept of what customers want by measuring what the company should do to produce products and services with good quality. IPA was proposed by (Martilla & James, 1977). Service and product performance is displayed in four quadrants A, B, C, and D: (1) Quadrant A: is a quadrant that has areas with priority variables, but has not met the expectations of respondents. Variables in quadrant A must be improved by continuous improvement, the goal is that the difference in performance of the variables in this quadrant can be improved. The use of IPA in research will focus on improving the quality of the variables collected in this Quadrant, (2) Quadrant B: is a quadrant with areas that have variables that are important to respondents and have met expectations and the level of satisfaction with the variables in this quadrant is relatively high. Variables in quadrant B need to be maintained because respondents consider the variables in quadrant B to be superior, (3) Quadrant C: in quadrant C, respondents consider the variables in this quadrant to be less important even though their performance is not good. So it needs to be reconsidered before increasing the variables contained in this quadrant, (4) Quadrant D: in this quadrant, respondents consider the variables in this quadrant to be too excessive so that the variables in this quadrant need to be removed for company efficiency.

3. RESEARCH METHOD

This type of research is semi-quantitative descriptive research, where the educational service model studied is qualitative. While what is classified as quantitative in this research is a survey conducted to generalize stakeholder needs using a Likert scale on a questionnaire. This research design uses a descriptive research design, in which the researcher presents a description of the analysis of the quality of educational services needed by stakeholders using EDUQUAL-IPA integration. This research consists of two phases with the following explanation; (1) The first phase is to measure the service gap using EDUQUAL. In this phase, the criteria for stake holders from the industrial world who will become expert respondents in this study are first determined. After that, the researcher designed a questionnaire that referred to the EDUQUAL variables in Mahapatra & Khan, (2007) to be distributed. The Eduqual questionnaire that has been distributed is then tested for validity and reliability. Furthermore, it is analyzed to determine the gap between expectations and perceptions of industrial world stake holders. The EDUQUAL analysis process uses the help of SPSS 26 software with the following steps; (a) Conduct validity and reliability tests that refer to the analysis of significance values <0.05 = valid and Cronbach alpha value analysis> 0.6 = reliable, (b) Calculating the value of gap 5 using the data from the questionnaire using SPSS 26 with a reference value of significance <10%. (2) The second phase conducts IPA analysis which will produce a criticality index of stakeholder needs. The trick is to analyze the EDDUQUAL questionnaire that has been distributed using the IPA method. In this analysis process, researchers also used the help of SPSS 26 software.

4. RESULT AND DISCUSSION

Respondents were taken as many as 30 people from the results of questionnaires that had been distributed to expert respondents from the industrial world to determine the variables of educational services in accordance with the needs of the industrial world, then the results of the questionnaire were analyzed using the integration of the EDUQUAL-IPA method. The profile of research respondents can be seen in Figure 3.

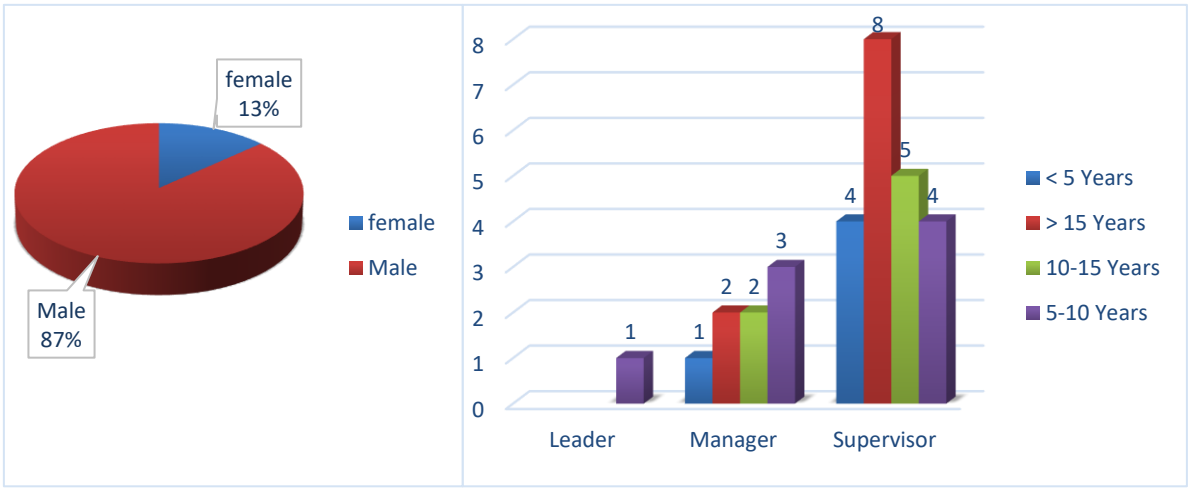

Figure 3. Respondents' profile

30 respondent data that has been collected is tested for validity and reliability which is carried out separately between the expectation and perception variables of EDUQUAL using SPSS Statistics 26 software.

Results of validity testing of the expectation and perception variables using SPSS software on 27 EDUQUAL indicators, all of them are valid with the results of the reliability test resulting in a Cronbach's alpha value of 0.928 for the expectation variable and 0.977 for the perception variable.

Furthermore, the measurement of the gap that occurs between the expectations of the quality of educational learning expected by the industrial world and the current perceptions is carried out. The gap is obtained from calculating the difference in average performance minus the average importance obtained from the questionnaire results. The results of the gap measurement can be seen in Table 2.

Table 2. Results of EDUQUAL gap measurement

No	Atribut	Attributes	Performance Average	Importance Average	Gap
1	Learning Outcome 1	Ability to use the latest technology	3,6000	4,6333	-1,0333
2	Learning Outcome 2	Practical orientation in education	3,5667	4,4667	-0,9000
3	Learning Outcome 3	Appropriateness of learning to the company system	3,6333	4,2000	-0,5667
4	Learning Outcome 4	Skills that are suitable for work purposes	3,7000	4,3333	-0,6333
5	Learning Outcome 5	Problem-solving proficiency	3,6667	4,2000	-0,5333
6	Learning Outcome 6	Sense of social responsibility	3,6333	4,1667	-0,5333
7	Responsiveness 1	Quick response to case studies	3,7000	4,2000	-0,5000
8	Responsiveness 2	Politeness and willingness to help	3,9333	4,5333	-0,6000
9	Responsiveness 3	Cleanliness, order, systematic and methodical	3,7333	4,3667	-0,6333
10	Responsiveness 4	Adherence to official procedures, norms and rules	3,8333	4,5667	-0,7333
11	Physical Facilities 1	Adequate facilities/infrastructure for education services	3,7667	4,5333	-0,7667
12	Physical Facilities 2	Well-equipped laboratories with modern facilities	3,6333	4,5000	-0,8667
13	Physical Facilities 3	Comprehensive learning resources	3,6333	4,5667	-0,9333
14	Physical Facilities 4	Academic, and recreational facilities	3,4667	4,1667	-0,7000
15	Physical Facilities 5	Aesthetic view of the facility	3,4333	3,9667	-0,5333
16	Physical Facilities 6	Training in a well-equipped laboratory	3,6667	4,5333	-0,8667
17	Physical Facilities 7	Opportunities for training and placement from educational institutions	3,5000	4,2000	-0,7000
18	Physical Facilities 8	Effective classroom management	3,6000	4,5000	-0,9000
19	Personality Dev. 1	Sports, games and cultural activities skills	3,3000	3,5667	-0,2667
20	Personality Dev. 2	Knowledge improvement	3,7667	4,4667	-0,7000
21	Personality Dev. 3	Discipline	3,9667	4,6000	-0,6333
22	Personality Dev. 4	Recognition from classmates	3,2333	3,0667	0,1667
23	Academia 1	Sufficiency of subject teachers	3,6667	4,4667	-0,8000
24	Academia 2	Counseling Guidance	3,5333	4,2667	-0,7333
25	Academia 3	Strict teacher supervision of student work	3,5000	4,1000	-0,6000
26	Academia 4	Channeling graduates' interests and talents	3,5333	4,4000	-0,8667
27	Academia 5	Good communication skills of academic staff	3,6333	4,4000	-0,7667

In Table 2, five EDUQUAL variables (learning outcomes, responsiveness, physical facilities, personality development, and academics) with their 27 indicators were analyzed to determine the gap between perceptions and expectations. Through this analysis, it is known that 26 indicators have a negative gap and One indicator shows a positive gap in personality development 4 Indicator of recognition from classmates.

After the weight of the service gap is known, the next stage is mapping using the IPA method to find the criticality index in the form of priority variables contained in quadrant A. The results of the IPA analysis can be seen in Figure 4.

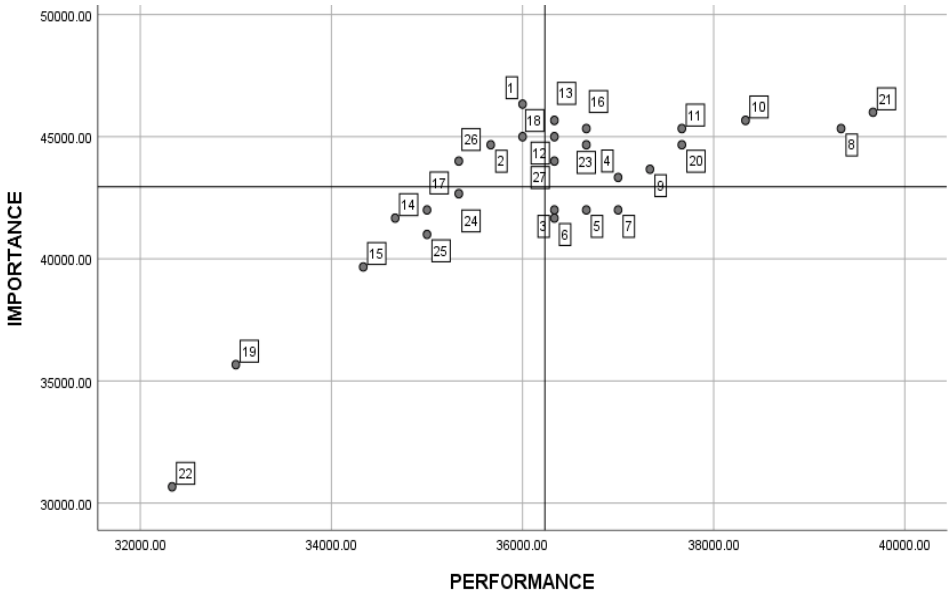

Figure 4. Results of IPA analysis

The results of the IPA analysis in Figure 4. show that there are four priority attributes in quadrant A that are the focus of improvement, namely; learning outcomes 1 (ability to use the latest technology), learning outcomes 2 (practical orientation in education), Physical facilities 8 (effective classroom management) and academics 4 (channeling the interests and talents of graduates). Of the five Eduqual variables that have been analyzed, it can be concluded that learning outcomes are the most influential variables on the needs of the industrial world because they have two of the four indicators that are in quadrant A position.

The main finding of this study is that there are four priority variables that need to be improved in Indonesian vocational learning, namely;

Learning outcome 1 (ability to use the latest technology). This variable is important to improve considering the rapid development of science and technology in recent years and the industrial revolution 4.0 which applies IoT to industrial machines and the implementation of papper less in the management reporting system so that stakeholders require the need for Human Resources who have the ability to use the latest technology as implementers of their production activities. In previous research, Parsons et al. (2019) utilized the trello application as a digital kanban for lean learning.

Learning outcome 2 (practical orientation in education), Learning in vocational education ideally focuses on practical activities. It is intended that students can naturally apply the theories of the knowledge learned into a real action in the form of competence and ability to create a product. Nitu & Gavriluta, (2019) developed a lean learning factory at Pitesti University to create production-based learning.

Physical Facilities 8 (effective classroom management). To produce graduates who are disciplined, able to work in teams requires continuous habituation of learning routines so that students are accustomed to discussing and working with colleagues in completing work

effectively and efficiently. Hurbungs & Nagowah, (2019) in previous research created a team-based learning concept called EduScrum to create effective learning activities. Nitu & Gavriluta, (2019) created 5S and VSM plate forms as learning media. Academics 4 (distribution of graduates' interests and talents). This variable is the main output of vocational education, therefore it is very important to identify students' interests and talents in advance so that learning can be adjusted. The EduScrum learning concept of Hurbungs & Nagowah, (2019) gives each group the freedom to choose their own learning products and allows learning groups to create new products as a result of the creativity of their talents.

There are five previous studies that have the most relevance to research and researchers make references in conducting research. Analysis of the relationship between this research and previous research is as follows;
In Wibisono's research, (2018) with the object of high school education research using EDUQUAL and QFD methods with the research objective of evaluating service quality, the research found the results of 11 out of 32 indicators of education services need to be improved. The difference with this study is in the object of research, where the previous study examined high school education while this study examined vocational education. As well as the use of the integration of the EDUQUAL-IPA method in this study which provides more significant results through the use of IPA which is able to classify the level of importance of stake holder needs so that this study only needs to improve services on four variables. In research by Rinanto et al., (2019) with the object of vocational education research using the EDUQUAL-KANO method with the aim of measuring service quality found large Gap results on the responsiveness variable. The difference with this research is in the integration of the EDUQUAL-IPA method, where the use of the IPA method is easier to classify the level of service importance.

Research by Lizarelli et al., (2021) using the EDUQUAL-KANO-QFD-FUZZY method produces a strong method and is able to cover the shortcomings of using the EDUQUAL method, but the research is still in the form of method research and has not been practiced on the research object. Just like in the research of Rinanto et al., (2019) the difference with this research is in the integration of the EDUQUAL-IPA method, where the use of the IPA method is easier in classifying the level of service importance. Putera & Ikatrinasari's research, (2022) with the object of PKBM research using the EDUQUAL-IPA-QFD method produced three technical responses that improve the quality of education. The difference with this research is in the object of research where the object of the research is PKBM while in this study the research was conducted in vocational education. This shows that this research strengthens previous research where the use of the EDUQUAL-IPA method can be applied to various educational objects. Surtiningtyas & Saputra's research, (2023) with the object of research on aviation polytechnics using the FUZZY-SERVQUAL-KANO-IPA-QFD method with research results 14 out of 23 service indicators as voice of customer.

The research has a more complex method than this research. However, the indicators generated as voice of customer input are still too many, meaning that although the research is better in detail analysis, the use of simpler methods in this study is more effective and efficient to do.
Based on the explanation above, it can be concluded that the method of this research has a close relationship with Putera & Ikatrinasari's research (2022), it's just that this research has a different research object and the criteria for expert respondents selected from the industrial world Stake holders who are end users of learning outcomes in vocational education. This shows that this research strengthens previous research that the use of the EDUQUAL-IPA method integration is effectively applied to various types and levels of education to improve service quality in the world of education.

The limitation of this research is that the application process for service improvement has not been carried out. In accordance with the purpose of this study, the researcher hopes that the results of this study can be used as a basis for reference for improvement for vocational education in improving educational services.

5. CONCLUSION

The results of the analysis of 5 variables and 27 EDUQUAL indicators resulted in one variable having an insignificant positive gap and 26 indicators having a significant negative gap. IPA analysis shows four priority variables in quadrant A that are the focus of resolution, namely; learning outcomes 1 (ability to use the latest technology), learning outcomes 2 (practical orientation in education), Physical facilities 8 (effective classroom management) and academics 4 (channeling the interests and talents of graduates). Through analysis of the relationship with previous research, it is known that the use of the EDUQUAL-IPA method integration is effectively applied to various types and levels of education to improve the quality of services in the world of education. The results of the research that have been carried out are findings that can be used as a basic reference for improvement according to the needs of each vocational education unit.

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