

The Influence of Education Personnel Competence on Student Satisfaction in Educational Services in Higher Education

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Abstrak

Kompetensi tenaga kependidikan di lembaga pendidikan memainkan peran krusial dalam menentukan kepuasan mahasiswa. Hal ini karena, kompetensi tenaga kependidikan di lembaga pendidikan tidak hanya berkaitan dengan pengetahuan dan keterampilan dalam bidang akademik, tetapi juga kemampuan interpersonal, kemahiran komunikasi, dan kesediaan untuk terus belajar dan berkembang. Penelitian ini bertujuan untuk menganalisis seberapa besar pengaruh dari kompetensi tenaga kependidikan terhadap kepuasan mahasiswa. Metode yang digunakan adalah metode kuantitatif dengan jenis penelitian survei. Populasi penelitian terdiri dari 4.164 mahasiswa, diperoleh jumlah sampel sebanyak 354 mahasiswa. Data penelitian dikumpulkan melalui penyebaran kuesioner kepada responden dan kemudian dianalisis menggunakan SEM-PLS dengan bantuan aplikasi SmartPLS. Hasil penelitian menunjukkan bahwa sebesar 71,5% dari unsur kompetensi tenaga kependidikan memiliki pengaruh positif dan signifikan terhadap kepuasan mahasiswa. Salah satu temuan menarik dari penelitian ini adalah indikator kompetensi kepribadian terkait item konsistensi dalam berbicara dan menyampaikan informasi memperoleh skor penilaian terendah. Hal ini menunjukkan adanya kesenjangan dalam konsistensi komunikasi yang diberikan oleh tenaga kependidikan kepada mahasiswa. Mahasiswa mungkin mendapatkan informasi yang berbeda-beda tergantung pada hari dan petugas yang mereka temui, yang dapat memengaruhi pengalaman belajar mereka. Berdasarkan temuan tersebut, dapat disimpulkan bahwa pola pengembangan kompetensi yang disesuaikan dengan kebutuhan individu bisa menjadi strategi yang efektif dalam memperbaiki aspek-aspek tertentu yang mempengaruhi kepuasan mahasiswa.

Kata kunci: Kompetensi, Tenaga Kependidikan, Kepuasan Mahasiswa, Perguruan Tinggi

Abstract

The competence of educational personnel in educational institutions plays a crucial role in determining student satisfaction. This is because the competencies of educational personnel in educational institutions are not only related to knowledge and skills in the academic field, but also interpersonal abilities, communication skills, and a willingness to continue learning and developing. This research aims to analyze how much influence the competence of educational personnel has on student satisfaction. The method used is a quantitative method with a type of survey research. The study population consisted of 4,164 students, a sample size of 354 students was obtained. Research data were collected through the dissemination of questionnaires to respondents and then analyzed using SEM-PLS with the help of the SmartPLS application. The results showed that 71.5% of the competency elements of education personnel had a positive and significant influence on student satisfaction. One of the interesting findings of this study is that the personality competence indicator related to the item of consistency in speaking and conveying information obtained the lowest assessment score. This shows that there is a gap in the consistency of communication provided by educational personnel to students. Students may get different information depending on the day and the officer they meet, which can impact their learning experience. Based on these findings, it can be concluded that competency development patterns tailored to individual needs can be an effective strategy in improving certain aspects that influence student satisfaction.

Keywords: Competence, Education Personnel, Student Satisfaction, Higher Education

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1. INTRODUCTION

Higher education institutions are one of the educational institutions that can help produce quality and highly competitive human resources. Higher education is required to be able to provide and organise quality educational activities (Magasi et al., 2022; Myalkina, 2019). The quality of educational institutions is considered good if the performance of human resources, infrastructure and academic atmosphere is good. So that indirectly, this requires that educational institutions maximise existing resources for optimal implementation. The

existence of competition between universities requires educational institutions to always strive to improve quality (Amoako et al., 2023; Bhurekeni, 2020; Cookson & Stirk, 2019). So that educational institutions that are able to organise their educational activities properly and understand their needs will excel in this competition.

Quality learning can be obtained by providing good and satisfying services to students. With good service the learning process can achieve the goals that have been set. University environments are increasingly similar to those of private companies, making universities more aware of the importance of student satisfaction (Al Mamun et al., 2022; Liaw & Huang, 2013). Student satisfaction is understood as a short-term attitude resulting from the evaluation of educational experiences. Student satisfaction as a comparison between the expectations that students want about employee services, lecturer competence supported by infrastructure and leadership facilities with what students feel after getting service (Canter, 2019; Yildirim, 2017). Where this sense of student satisfaction starts from quality educational services or not. Optimally implemented academic service quality can affect student satisfaction through responsiveness to student needs, provision of complete information, assistance in solving problems, staff quality, technology utilisation, and continuous evaluation (Liaw & Huang, 2013; Wang et al., 2021). By knowing the level of student satisfaction, this can help the college to improve services if they are not good, and further improve services if the level of satisfaction is good.

Universities can increase student satisfaction by providing quality academic services. One of them is being able to fulfil the needs and desires of students. Quality academic services provide encouragement for students to establish mutually beneficial ties in the long term (Kautsar et al., 2016; Lampropoulos et al., 2019). Satisfied students will provide benefits to the institution, for example they will continue to use the services of the institution with further studies, they can also promote to others so that in the end it will improve the image of the university (Noviyani et al., 2022; Supriyanto et al., 2020). Students who are satisfied will convey positively about the services they use/consume. Dissatisfied students will take one of two actions. They may try to reduce dissatisfaction by leaving or transferring to another study programme or to another college. Or they may try to reduce dissatisfaction by avoiding information that might reinforce their low scores (Kautsar et al., 2016; Noviyani et al., 2022).

Education today has undergone many dynamic policy changes, which aim to create a smart generation so that it is ready to compete globally in all fields. One of the changes that need to be considered is the aspect of human resources (Harmoko, 2021; Miniawi & Brenjekjy, 2015). Whether or not the quality of education personnel can affect the level of service provided to consumers, one of which is students. The quality of education personnel has a significant effect on student service satisfaction. The progress of a university is related to the competence of each of its human resources, one of which is the education personnel (Cahyono et al., 2016; Payu et al., 2022). Education personnel serve students from the first time they come, besides that education personnel can also instil trust and a sense of security in students, and should always carry out their duties correctly and precisely. Qualified education personnel in providing services are able to provide good performance in educational institutions (Barakina et al., 2021; Demirgüneş & Özcan, 2022). As research conducted by Savitri on students of the Karawang Buana Perjuangan University Management Study Program, that there are still problems related to education personnel such as: still lack of accuracy of personnel in providing services as promised, lack of immediate service delivery, and lack of seriousness and priority in paying attention to student needs.

Similar to the results of research state there are still some education personnel who have poor service to students and lecturers (Nabiyevna, 2023). This is stated by the fact that there are still students and lecturers who feel that the services of education personnel are

lacking, both in terms of communication and speed of service. In addition, there are also the results of research at the University of Kaltara Tanjung Selor. That education personnel often complete work slowly and the work system is not optimal (Nabiyevna, 2023; Zaenab et al., 2020). In addition, education personnel also still often violate the rules, especially female education personnel who often use sandals during working hours.


Education personnel outlined that, currently, problems in the world of education in Indonesia are in the spotlight. One of the problems is the inaccurate placement of education personnel in accordance with what is owned and mastered by job applicants. This causes education personnel to occupy a field that is not in accordance with their competence. This proves that the competence of education personnel required in Law No. 20 of 2003 in the field is still not fully realised according to the rules. Student complaints related to educational services must be followed up immediately, so that the quality of service is as expected. If ignored, the impact that can arise is a decrease in demand, graduates who do not meet standards and are not absorbed in the world of work (Ishak, 2021; Supriyanto et al., 2020).

Based on the results of extracting data from researchers through questionnaires and observations, students of the Faculty of Administrative Sciences, Universitas Brawijaya also experience problems with the FIA UB education personnel itself. Some undergraduate students experience problems with postponing thesis proposal seminars. The quality of education personnel in this case shows how competent an education personnel is in carrying out their duties and functions. Therefore, this study uses indicators of competence that should be possessed by education personnel in carrying out their duties. So that the novelty of this study fulfilled the competencies as applicable rules, it will indirectly improve their quality as education personnel to have an impact on the administrative services they provide. The existence of this research is expected to provide useful and fundamental information for further researchers from both academics and practitioners related to the competence of educational personnel at the higher education level to improve quality and improve educational management.

2. METHODS

The research method used is quantitative method with survey research type. This study is to analyse and describe the effect of educational personnel competence on student satisfaction at the Faculty of Administrative Sciences, Universitas Brawijaya. Indicators used in educational personnel competency variables are personality competence, social competence and professional competence (Gopalan et al., 2020). Furthermore, indicators for student satisfaction use tangibles, reliability, responsiveness, assurance, and empathy. The population in this study were undergraduate students at the Faculty of Administrative Sciences, Universitas Brawijaya in the 2019/2020 - 2022/2023 academic year. The total number of active students in the academic year is classified into the Department of Public Administration and the Department of Business Administration as 566 active students in the 2019/2020 academic year, 1,066 active students in the 2020/2021 academic year, 1,211 active students in the 2021/2022 academic year, and 1,321 active students in the 2022/2023 academic year. So that the total population is 4,164 students. The sampling technique in this study used Cluster Random Sampling. In accordance with the determination of the sample size of Krejcie & Morgan, a sample size of 354 students was obtained. The distribution of research sample is show in Figure 1.

Population (N)	Sample (n)	Population (N)	Sample (n)	Population (N)	Sample (n)
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367



Class of Students	Population	Sample
2019	566	50
2020	1.066	95
2021	1.211	103
2022	1.321	106
Total	4.164	354

Figure 1. Research Sample

The data collection method is done by distributing questionnaires to respondents with statement items that have been tested for validity and reliability. The questionnaire that has been filled in by respondents with answers according to their respective opinions will then be processed and then analysed. The questionnaire statements used in this study are 12 items on the educational competence variable (X), as well as 19 item statements on the student satisfaction variable (Y). Operational definition of variables is show in [Table 1](#).

Table 1. Operational Definition of Variables

Variables	Indicators	Items
Competence education personnel (X)	Personality competence	1. Consistent in speaking and communicating
		2. Have a broad thinking
		3. Have authority in carrying out duties and responsibilities
		4. Polite in listening to words and deeds
	Social competence	5. Be able to adapt to the surrounding environment
		6. Have good communication with students
		7. Have good communications with fellow officers
		8. Be capable of positioning yourself according to the interlocutors
	Professional competence	9. Have a good mastery in the field of employment
		10. Have a qualification according to the standard
		11. Have a certificate supporting expertise
		12. Have experience in the same field
Student Satisfaction (Y)	Tangibles	13. Officer appearance in service
		14. Comfort in the place of service
		15. Facilities in the process of service
		16. Officer discipline in service
		17. Facility of access in service requests

Variables	Indicators	Items
		18. Use of auxiliary tools in service
		19. Officer speed in service
		20. There are clear standards of service
	Reliability	21. Officer ability to use aids in the service process
		22. Officer expertise in the use of aids during service process
		23. Every user who wants to get a service gets a response
	Responsiveness	24. Officers perform services quickly, accurately and carefully
		25. All user needs are answered by officers
		26. Officers give guarantees of timeliness in service
	Assurance	27. Officials give guarantee of legality in service
		28. Officers give assurances of cost in service
		29. Priority to the interests of the user
	Empathy	30. Service that is friendly, polite and non-discriminatory
		31. Service that respects every user

Data analysis is carried out by inputting data into Microsoft excel to become CSV format and processed through the SmartPLS application. This step involves inputting the data into the SmartPLS application, which is a powerful tool for Structural Equation Modeling (SEM). SEM allows researchers to test complex relationships between variables and assess the overall model fit. The measurement scale used in this study consists of 5 Likert scales, namely Strongly Agree / Very Good / Very Satisfied (SS / SB / SP) with a score of 5, Agree / Good / Satisfied (S / B / P) with a score of 4, Fair (C) with a score of 3, Disagree / Less Good / Less Satisfied (TS / KB / KP) with a score of 2, and Strongly Disagree / Not Good / Dissatisfied (STS / TB / TP) with a score of 1. The results of the validity test is show in [Table 2](#).

Table 2. Validity Test Results (Loading Factor Score)

Item	Competence of Education Personnel (X)	Description	Item	Student Satisfaction (Y)	Description
X.1	0.805	Valid	Y.1	0.819	Valid
X.10	0.834	Valid	Y.10	0.875	Valid
X.11	0.768	Valid	Y.11	0.895	Valid
X.12	0.765	Valid	Y.12	0.898	Valid
X.2	0.847	Valid	Y.13	0.852	Valid
X.3	0.840	Valid	Y.14	0.885	Valid
X.4	0.862	Valid	Y.15	0.875	Valid
X.5	0.868	Valid	Y.16	0.881	Valid
X.6	0.855	Valid	Y.17	0.814	Valid
X.7	0.837	Valid	Y.18	0.881	Valid
X.8	0.832	Valid	Y.19	0.877	Valid
X.9	0.827	Valid	Y.2	0.836	Valid
			Y.3	0.869	Valid
			Y.4	0.874	Valid

Item	Competence of Education Personnel (X)	Description	Item	Student Satisfaction (Y)	Description
			Y.5	0.882	Valid
			Y.6	0.821	Valid
			Y.7	0.888	Valid
			Y.8	0.877	Valid
			Y.9	0.841	Valid

In accordance with the results obtained in [Table 2](#), it can be seen that the loading factor value for all items is greater than 0.6. Next is testing the Average Variance Extracted (AVE) score.

Table 3. Validity Test Results (AVE Score)

Variable	Average Variance Extracted (AVE)
Competence of Education Personnel (X)	0.687
Student Satisfaction (Y)	0.749

In accordance with the results obtained in the table, it shows that the AVE score of the variables of competence of the education personnel (X) and overall student satisfaction (Y) is greater than 0.5. Then for the reliability test results were obtained as show in [Table 4](#).

Table 4. Reliability Test Results

Variable	Cronbach's Alpha	Composite Reliability
Competence of Education Personnel (X)	0.959	0.963
Student Satisfaction (Y)	0.981	0.983

[Table 4](#) shows that Cronbach's Alpha and Composite Reliability score are greater than 0.60. So overall, items used as variable measuring instruments in research can be said to be reliable, and can be used for further testing.

3. RESULTS AND DISCUSSION

Results

Education personnel are one of the parties who have an important role in providing services to students. So in this case the quality of educational personnel indirectly influences the services they provide. One of the qualities of educational personnel that can contribute to providing satisfaction to students can be seen from the competencies possessed by each educational personnel. Naturally, the better the competencies possessed by educational personnel, the more helpful it will be in providing services to students and making them satisfied. SEM-PLS analysis results is show in [Figure 2](#).

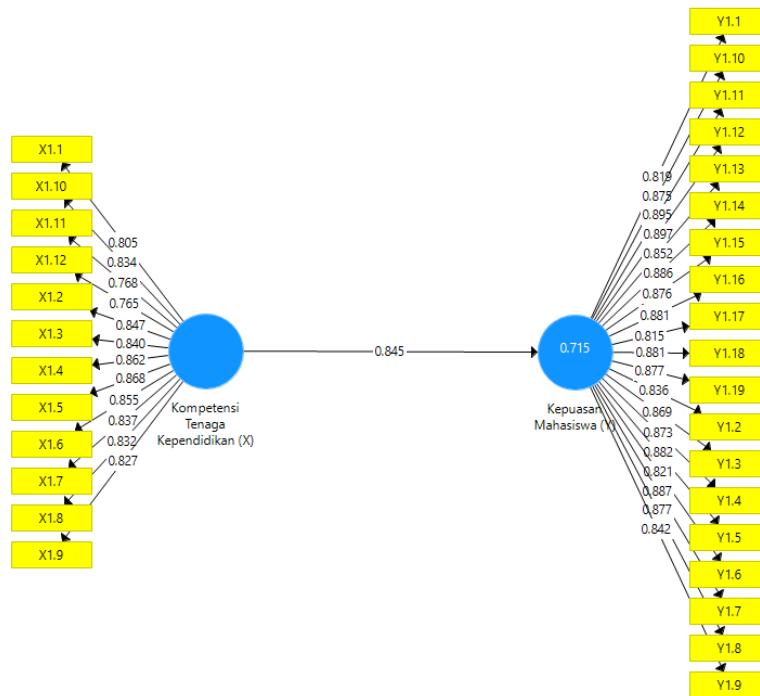


Figure 2. SEM-PLS Analysis Results

The results of the R-Square (Coefficient Determinance) test to determine the influence of educational personnel in students satisfaction is show in Table 5.

Table 5. R-Square Test Results

Variable	R Square	R Square Adjusted
Student Satisfaction (Y)	0.715	0.714

Table 5 show a figure of 0.715, this means that the influence of the competence of educational personnel in explaining student satisfaction is 71.5%, while the remaining 28.5% is explained by other factors that were not studied in this study. Following are the test results:

Then for the path coefficient test, the range of coefficient values is between -1 to 1 assuming that, if the coefficient value approaches 1 then the relationship between variables is positive and stronger. Vice versa, if the coefficient value approaches -1 then the relationship between variables is negative and weak. Furthermore, it is also seen based on the probability or significance (p-value) value of the analysis results. The hypothesis is acceptable or significant if the Statistical T value is >1.96 significance (5%) and the p-value value is <0.05. The results of the hypothesis test in this research's path coefficient is show in Table 6.

Table 6. Path Coefficient Test Results

Influence Between Variable	Path Coefficient	Standard Deviation (STDEV)	T Statistics	P Values	Description
The Influence of Education Personnel Competency (X) on Student Satisfaction (Y)	0.845	0.026	32.945	0.000	Significance

Base on [Table 6](#), the t-statistical value of the influence of education personnel competency on student satisfaction is $32.945 > 1.96$ and the significance value is $0.000 < 0.05$. So it can be concluded that there is a positive and significant influence between the competence of educational personnel on student satisfaction with a determination percentage of 84.5%. This means that if the competence of educational personnel (X) increases by one unit, then student satisfaction (Y) can increase by 84.5%. So the results of this analysis mean that the first hypothesis (Ha1) is accepted.

Then there is the Model Fit test, the closer the NFI number is to 1, the better the match. The NFI value is used as a percentage, namely 0.19 : Weak; 0.33 : Medium; 0.67 : Strong. The calculation results is show in [Figure 3](#).

Model_Fit

Fit Summary		rms Theta	
	Saturated Model	Estimated Model	
SRMR	0.041	0.041	
d_ULS	0.830	0.830	
d_G	1.091	1.091	
Chi-Square	2029.268	2029.268	
NFI	0.850	0.850	

Figure 3. Model Fit Test Results

Based on the test results in [Figure 3](#), it can be seen that the NFI value in this study was 0.850. This means that the number 0.850 is greater than 0.67, which means that the model in this research has been strong in its testing. Next there is the predictive Relevance test or Q-Square, which is used to measure how well the observation values produced by the model and the parameter estimates are. If the Q-Square value is greater than zero (0) then the model has a predictive relevance value. However, if the Q-Square value is less than zero (0) then the model does not have a predictive relevance value.

Based on the calculation results, the Q^2 value was 0.715, which means that the great diversity of the research data described by the structural model was 71.5%, and the remaining 28.5% was explained by other factors that were not used in this research. Based on these results, the structural model in this research can be stated to have goodness of fit.

Discussion

When educational personnel have adequate competencies, they can better identify student needs, provide appropriate direction, and provide a supportive learning environment. This can also increase students' involvement in the learning process, because they feel supported and understood by educational personnel. Apart from that, competent educational personnel can also provide solutions to academic and non-academic problems faced by students more effectively ([Ozturk, 2017](#); [Rahim, 2022](#)). They can provide advice, guidance or support that suits student needs, thereby helping students to reach their maximum potential. Thus, increasing the competence of educational personnel will contribute significantly to improving the quality of educational services provided to students and ultimately increasing students' satisfaction with their learning experience ([Aji et al., 2019](#); [Jörg et al., 2024](#)).

Based on research results obtained both through descriptive and inferential analysis results, it shows that there is a positive influence between the competence of educational personnel on student satisfaction as seen from the results of computational measurement processing (SEM-PLS). The results of bootstrapping measurements show that the p-value value of the influence of X on Y is 0.000 smaller than 0.05 (significance level 95%). There are 3 indicators of competency for educational personnel in this research, namely personality competency, social competence and professional competence. This means that the higher the competence of educational personnel, the greater student satisfaction will be.

The better the competencies an employee has, the more positive this will have an effect on the employee's own performance level. This is the result of research which is also indirectly the same as the results of this research analysis (Agustini et al., 2020; Vartiainen et al., 2016). If there is an improvement in the competencies possessed by educational personnel, it will improve the performance of the educational personnel themselves and have an impact on the services provided to students. The more trained and honed the competencies of educational personnel, the more they will improve their performance in serving students (Ekwueme et al., 2015; Yildirim, 2017). Efforts to increase the competence of educational personnel have the potential to create a virtuous cycle of improvement, where enhanced faculty competence leads to increased student satisfaction, which in turn benefits the faculty itself through higher morale, job satisfaction, and overall effectiveness in fulfilling its educational mission.

As with research conducted previously one of the advances in a university depends on the competencies possessed by each human resource, including educational personnel. Education personnel serve students from the first time they arrive (Hendawi & Nosair, 2022; Torres-Gastelú & Kiss, 2016). Educational personnel can instill trust and a sense of security in students. Qualified and competent education personnel play a crucial role in delivering high-quality services and performance for universities. Higher education as an organisation depends on the performance of its human resources, including lecturers and education personnel (Delima & Cahyawati, 2021; Kowang et al., 2020). Leaders must be able to increase employee competence and motivation by providing intensive training and adequate education for their employees. This is intended so that employees continue to carry out all organisational activities properly and optimally in order to achieve organisational goals and maintain the survival of higher education organisations.

Talking about the competence of educational personnel, several students who were respondents to this research stated that educational personnel could be said to be competent if they were able to complete their duties in serving students well and there was no mis-communication (Plotnikova & Strukov, 2019; Tran et al., 2020). Some students still find that the educational personnel who serve them experience mis-communication, are less friendly in serving, and also the level of personnel responsiveness is still lacking. Apart from that, there are personnel who ask student questions to other personnel to get a response. This of course still does not reflect competent educational personnel. So the hope is not only to increase competence in work professionalism, but also personal and social competence (Kim et al., 2021; Liaw & Huang, 2013). So that educational personnel do not bring the personal problems they are experiencing to work and make students victims of their anger. This is because, whether educational personnel want to or not, they will face students every day with various complaints and the needs they need.

Quality human resources are very helpful in determining the success of an organization with the competence of each existing employee. To form quality human resources, of course, requires a long time and process as well as continuous efforts (Harmoko, 2021; Van Hong & Do Van Dung, 2019). Similar to the educational personnel in the faculty, it is a form of human resources to help achieve the success of the goals of the

faculty in particular and also the university in general. The process of monitoring and evaluating the work results of educational personnel certainly needs to be carried out continuously, not just at one time. So you can know what the weaknesses are and what can be strengthened from the competencies of each educational personnel (Cookson & Stirk, 2019; Taufan, 2022).

There are several ways that can be done to develop the competencies of educational personnel. This was revealed by previous study the first is a general competency development pattern, this can be done through education and training (diklat), workshops, and leadership training or diklatpim (Shaffer & Thomas-Brown, 2015). This first pattern is intended so that educational personnel can have a good and appropriate understanding of the duties and responsibilities they have and be productive at work. Next is the pattern of developing technical/functional competencies, where the development of these competencies is carried out based on the positions held by the educational personnel. Such as functional training, IT competence development, structural or inservice training (Sultan et al., 2020; Vila et al., 2012).

As described above, that the competence of the educational staff does have an influence on the satisfaction felt by students during their stay in higher education institutions. Although in this study the competence variable of the educational force is measured on the basis of the indicator of competence of the education force in Act No. 20 Year 2003. Which of the previous studies listed in this study did not use this measurement indicator. The same is true of student satisfaction measured by the indicators of Parasuraman. Besides, analysis techniques using SEM-PLS have not been used in previous studies. The results showed correlations, as well as supported by several previous studies that yielded the same results despite using different indicator sizes.

4. CONCLUSION

This study shows that H_a is accepted and H_o is rejected, that there is indeed a significant influence between the competence of education personnel on student satisfaction. As much as 71.5% of the competency elements of education personnel influence the sense of satisfaction felt by students. Therefore, it is necessary for higher education institutions not only to focus on building and improving infrastructure facilities such as lecture buildings. But also on the quality of the education staff, especially the improvement and development of their competence. Because education personnel will always deal with students and can affect the satisfaction felt by students.

5. REFERENCES

- Agustini, K., Santyadiputra, G. S., & Sugihartini, N. (2020). Visualizing the stages of the educational research methodology into animation infographics for vocational students. *Jurnal Pendidikan Vokasi*, 9(3), 317–327. <https://doi.org/10.21831/jpv.v9i3.22017>.
- Aji, A. P., Martono, S., & Fakhruddin, F. (2019). The effect of teacher motivation in mediating commitment and professional competence on teacher's performance of vocational school in Blora regency. *Educational Management*, 8(2), 150–156. <https://journal.unnes.ac.id/sju/index.php/eduman/article/view/32889>.
- Al Mamun, M. A., Lawrie, G., & Wright, T. (2022). Exploration of learner-content interactions and learning approaches: The role of guided inquiry in the self-directed online environments. *Computers & Education*, 178, 104398. <https://doi.org/10.1016/j.compedu.2021.104398>.

- Amoako, G. K., Ampong, G. O., Gabrah, A. Y. B., Heer, F., & Antwi-Adjei, A. (2023). Service Quality Affecting Student Satisfaction in Higher Education Institutions in Ghana. *Cogent Education*, 10(2), 2238468. <https://doi.org/10.1080/2331186X.2023.2238468>.
- Barakina, E. Y., Popova, A. V., Gorokhova, S. S., & Voskovskaya, A. S. (2021). Digital Technologies and Artificial Intelligence Technologies in Education. *European Journal of Contemporary Education*, 10(2), 285–296. <https://doi.org/10.13187/ejced.2021.2.285>.
- Bhurekeni, J. (2020). Decolonial reflections on the Zimbabwean primary and secondary school curriculum reform journey. *Educational Research for Social Change*, 9(2), 101–115. <https://doi.org/10.17159/2221-4070/2020/v9i2a7>.
- Cahyono, B. Y., Mukminatien, N., & Amrina, R. (2016). Indonesian Students Writing Proficiency in Using Complex Sentence. *International Journal on Studies in English Language and Literature (IJSELL)*, 4(9), 22–32. <https://www.researchgate.net/profile/Bambang-Cahyono-3/publication/311707316>.
- Canter, M. (2019). Enhancing Self-Regulation Skills in E-Learning Environments. *Conference Proceedings Of» ELearning and Software for Education*, 2(15), 32–38. <https://www.cceol.com/search/article-detail?id=782645>.
- Cookson, M. D., & Stirk, P. M. R. (2019). Developing Students' Writing Skill in English - A Process Approach. *Journal for Research Scholars and Professionals of English Language Teaching*, 2(6). <https://www.researchgate.net/profile/V-Chandra-Rao/publication/325489625>.
- Delima, N., & Cahyawati, D. (2021). Students' Mathematics Self-Concept, Mathematics Anxiety and Mathematics Self-Regulated Learning during the Covid-19 Pandemic. *Jurnal Pendidikan Matematika*, 15(2), 103–114. <https://doi.org/10.22342/jpm.15.2.13200.103-114>.
- Demirgüneş, S., & Özcan, E. (2022). Values Education in Turkish Textbooks in Primary Education. *European Journal of Educational Sciences*, 9(3), 1–11. <https://doi.org/10.19044/ejes.v9no3a1>.
- Ekwueme, C. O., Ekon, E. E., & Ezenwa-Nebife, D. C. (2015). The Impact of Hands-On-Approach on Student Academic Performance in Basic Science and Mathematics. *Higher Education Studies*, 5(6), 47. <https://doi.org/10.5539/hes.v5n6p47>.
- Gopalan, M., Rosinger, K., & Ahn, J. B. (2020). Use of quasi-experimental research designs in education research: Growth, promise, and challenges. *Review of Research in Education*, 44(1), 218–243. <https://doi.org/10.3102/0091732X20903302>.
- Harmoko, D. D. (2021). Digital Literacy As A Solution To Improve The Quality Of Indonesia's Human Resources. *Research and Development Journal of Education*, 7(2), 413. <https://doi.org/10.30998/rdje.v7i2.10569>.
- Hendawi, M., & Nosair, M. R. (2022). Students' technological awareness at the College of Education, Qatar University. *Cypriot Journal of Educational Sciences*, 15(4), 749–765. <https://doi.org/10.18844/cjes.v15i4.5057>.
- Ishak, D. (2021). Mechanism, Implementation, and Challenges in Independent Campus Education Policy in Indonesia. *International Journal of Science and Society*, 3(4), 52–63. <https://doi.org/10.54783/ijssoc.v3i4.393>.
- Jörg, V., Hartmann, U., Philipp, A., & Kunter, M. (2024). Teachers' proactive behaviour: Interactions with job characteristics and professional competence in a longitudinal study. *British Journal of Educational Psychology*, 94(1), 198–215. <https://doi.org/10.1111/bjep.12642>.
- Kautsar, I. A., Kubota, S., Musashi, Y., & Sugitani, K. (2016). Lecturer Based Supportive Tool Development and Approaches for Learning Material Sharing under Bandwidth

- Limitation. *Journal of Information Processing*, 24(2), 358–369. <https://doi.org/10.2197/IPSJJIP.24.358>.
- Kim, E.-J., Kim, J. J., & Han, S.-H. (2021). Understanding Student Acceptance of Online Learning Systems in Higher Education: Application of Social Psychology Theories with Consideration of User Innovativeness. In *Sustainability* (Vol. 13, Issue 2). <https://doi.org/10.3390/su13020896>.
- Kowang, T. O., Bakry, M. F., Hee, O. C., Fei, G. C., Yew, L. K., Saadon, M. S. I., & Long, C. S. (2020). Industry 4.0 competencies among lecturers of higher learning institution in Malaysia. *International Journal of Evaluation and Research in Education (IJERE)*, 9(2), 303. <https://doi.org/10.11591/ijere.v9i2.20520>.
- Lampropoulos, G., Siakas, K., & Anastasiadis, T. (2019). Internet of Things in the Context of Industry 4.0: An Overview. *International Journal of Entrepreneurial Knowledge*, 7(1), 4–19. <https://doi.org/10.2478/ijek-2019-0001>.
- Liaw, S. S., & Huang, H. M. (2013). Perceived satisfaction, perceived usefulness and interactive learning environments as predictors to self-regulation in e-learning environments. *Computers & Education*, 60(1), 14–24. <https://doi.org/10.1016/j.compedu.2012.07.015>.
- Magasi, C., Mashenene, R. G., & Ndengenesa, D. M. (2022). Service Quality and Students' Satisfaction in Tanzania's Higher Education: A Re-examination of SERVQUAL Model. *International Review of Management and Marketing*, 12(3), 18–25. <https://doi.org/10.32479/irmm.13040>.
- Miniawi, H. El, & Brenjekjy, A. (2015). Educational Technology, Potentials, Expectations and Challenges. *Procedia - Social and Behavioral Sciences*, 174, 1474–1480. <https://doi.org/10.1016/j.sbspro.2015.01.777>.
- Myalkina, E. . (2019). Diagnostics of the education quality in the higher educational institution. *Vestnik of Minin University*, 7(3), 4. https://vestnik.mininuniver.ru/jour/article/view/1006/736?locale=en_US.
- Nabiyevna, N. D. (2023). Quality Education is the Foundation of Our Future. *Web of Synergy:International Interdisciplinary Research Journal*, 2(2), 229–233. <https://www.indianjournals.com/ijor.aspx?target=ijor:aca&volume=12&issue=1&article=071>.
- Noviyani, S., Wasliman, I., Hanafiah, H., & Gaffar, A. (2022). Implementation Of Management Standards In Improving The Quality Of Academic Services In Elementary School. *International Journal of Educational Research & Social Sciences*, 3(5), 2052–2060. <https://doi.org/10.51601/ijersc.v3i5.501>.
- Ozturk, N. (2017). An analysis of teachers' self-reported competencies for teaching metacognition. *Educational Studies*, 43(3), 247–264. <https://doi.org/10.1080/03055698.2016.1273761>.
- Payu, C. S., Mursalin, M., Abbas, N., Umar, M. K., Yusuf, F. M., & Odja, A. H. (2022). Development of Guided Inquiry Learning Model Based on Critical Questions to Improve Critical Thinking on the Concept of Temperature and Heat. *Journal of Humanities and Social Sciences Studies*, 4(2), 174–180. <https://doi.org/10.32996/jhsss.2022.4.2.21>.
- Plotnikova, N. F., & Strukov, E. N. (2019). Integration of teamwork and critical thinking skills in the process of teaching students. *Cypriot Journal of Educational Sciences*, 14(1), 1–10. <https://doi.org/10.18844/cjes.v14i1.4031>.
- Rahim, N. B. (2022). the Interaction Between Teaching Competencies and Self-Efficacy in Fostering Engagement Amongst Distance Learners: a Path Analysis Approach. *Malaysian Journal of Learning and Instruction*, 19(1), 31–57. <https://doi.org/10.32890/mjli2022.19.1.2>.

- Shaffer, L., & Thomas-Brown, K. (2015). Enhancing Teacher Competency through Co-Teaching and Embedded Professional Development. *Journal of Education and Training Studies*, 3(3), 117–125. <https://doi.org/10.11114/jets.v3i3.685>.
- Sultan, S., Morgan, R. L., Murad, M. H., Falck-Ytter, Y., Dahm, P., Schünemann, H. J., & Mustafa, R. A. (2020). A Theoretical Framework and Competency-Based Approach to Training in Guideline Development. *Journal of General Internal Medicine*, 35(2), 561–567. <https://doi.org/10.1007/s11606-019-05502-9>.
- Supriyanto, A., Hartini, S., Irdasari, W. N., Miftahul, A., Oktapiana, S., & Mumpuni, S. D. (2020). Teacher professional quality: Counselling services with technology in Pandemic Covid-19. *Counsellia: Jurnal Bimbingan Dan Konseling*, 10(2), 176. <https://doi.org/10.25273/counsellia.v10i2.7768>.
- Taufan, M. Y. (2022). Professional Development of Teachers, Competencies, Educational Facilities and Infrastructure on Teacher Performance and Learning Achievement of High School Students in Makassar City. *Golden Ratio of Social Science and Education*, 2(1), 24–38. <https://doi.org/10.52970/grsse.v2i1.168>.
- Torres-Gastelú, C. A., & Kiss, G. (2016). Perceptions of students towards ICT competencies at the University. *Informatics in Education*, 15(2), 319–338. <https://doi.org/10.15388/infedu.2016.16>.
- Tran, T., Phan, H. A., Le, H. Van, & Nguyen, H. T. (2020). ICT integration in developing competence for pre-service mathematics teachers: A case study from six universities in Vietnam. *International Journal of Emerging Technologies in Learning*, 15(14), 19–34. <https://doi.org/10.3991/ijet.v15i14.14015>.
- Van Hong, B., & Do Van Dung. (2019). Development of Vietnamese Vocational Education Teachers to adapt the Industrial Revolution 4.0. *Asian Journal of Interdisciplinary Research*, 1–7. <https://doi.org/10.34256/ajir1941>.
- Vartiainen, H., Pöllänen, S., & Liljeström, A. (2016). Designing Connected Learning: Emerging learning systems in a craft teacher education course. *Design And*, 21(2), 32–40. <https://ojs.lboro.ac.uk/DATE/article/download/2115/2281>.
- Vila, L. E., Perez, P. J., & Morillas, F. G. (2012). Higher education and the development of competencies for innovation in the workplace. *Management Decision*, 50(9), 1634–1648. <https://doi.org/10.1108/00251741211266723>.
- Wang, S., Wang, H., Jiang, Y., Li, P., & Yang, W. (2021). Understanding students' participation of intelligent teaching: an empirical study considering artificial intelligence usefulness, interactive reward, satisfaction, university support and enjoyment. *Interactive Learning Environments*, 29(8), 1–17.
- Yildirim, S. (2017). Approaches of Designers in the Developed Educational Purposes of Infographics ' Design Processes. *European Journal of Education Studies*, 3(1), 248–284. <https://doi.org/10.5281/zenodo.231283>.
- Zaenab, S., Chamisijatin, L., & Wahyuni, S. (2020). Strengthening character education through literacy movement at Muhammadiyah junior high school. *Journal of Community Service and Empowerment*, 1(1), 54–63. <https://doi.org/10.22219/jcse.v1i1.11516>.