

## The Influence of Lecturer Performance Evaluation on Improving the Quality of Learning at STKIP Harapan Bima

Syahrir<sup>1</sup>, A. Fandir<sup>2</sup>

Universitas Pendidikan Mandalika<sup>1</sup>, STKIP Harapan Bima<sup>2</sup>

---

### Article Info

#### Article history:

Received: 2 July 2024

Publish: 15 July 2024

---

#### Keywords:

Evaluation, Lecturer Performance, Learning Quality.

---

### Abstract

*This research examines the influence of lecturer performance evaluation on the quality of learning at STKIP Harapan Bima using quantitative and qualitative approaches. Data was collected through questionnaires from 200 students and in-depth interviews with lecturers and students. The research results show that 75% of students are satisfied with lecturers' performance, with an average satisfaction score of 4.2 out of 5. The quality of learning has increased, shown by 60% of students getting an A or B grade and 70% of students feeling an increase in the quality of learning after routine lecturer performance evaluations are carried out. Statistical analysis with Pearson correlation shows a significant positive correlation between lecturer performance evaluation and learning quality ( $r = 0.65$ ,  $p < 0.01$ ), with lecturer performance evaluation explaining 42% of the variability in learning quality ( $R^2 = 0.42$ ). The most influential factor is the availability of lecturers for consultation. Perceptions of lecturers and students show that objective and constructive performance evaluations can increase lecturer motivation and, ultimately, the quality of learning. Research recommendations include implementing comprehensive and routine performance evaluations, using evaluation results for lecturer professional development, and further studies on specific factors and more extensive evaluation methods.*

*This is an open access article under the [Lisensi Creative Commons Atribusi-BerbagiSerupa 4.0 Internasional](https://creativecommons.org/licenses/by-sa/4.0/)*



---

### Corresponding Author:

Syahrir

Universitas Pendidikan Mandalika

syahrir85@gmail.com

---

## 1. INTRODUCTION

Quality learning in higher education is critical to improving educational experiences and outcomes for students. However, various challenges are still faced by higher education institutions in achieving the expected quality. Currently, there is a major shift towards online learning due to the COVID-19 pandemic, which has created various challenges in maintaining the quality of education. Factors such as administrative support, course design, instructor characteristics, and technological support greatly influence the quality of e-learning during the pandemic (Elumalai et al., 2020). This condition requires educational institutions to adapt their educational and research strategies to remain relevant and effective in the post-pandemic context (Rashid & Yadav, 2020).

Achieving optimal quality of higher education, where institutions not only focus on the content delivered but also on the culture and values upheld (Mikalauskas et al., 2012). Under ideal conditions, higher education institutions are able to meet student expectations and achieve predetermined program goals (Niku, 2023). Professional and effective lecturer performance, adequate technological support, and the use of innovative teaching methods such as multiliteracy pedagogy and blended learning, are expected to improve the quality of learning (Nawawi et al., 2021; Ansari, 2023).

There are various challenges in maintaining the quality of higher education during the transition to online learning. Despite ongoing efforts to improve the learning experience for students, challenges in implementing technology, adapting curricula, and supporting lecturers remain major obstacles (Rawabdeh & Tubaishat, 2019). Lecturers often face difficulties in adapting their teaching methods to online formats, which impacts learning effectiveness and student engagement. Apart from that, less than optimal evaluation of

lecturer performance can hinder improving the quality of learning in higher education (Widodo, 2023).

Previous research has shown that lecturer performance evaluation plays an important role in improving the quality of learning in higher education. Lecturer performance that is systematically evaluated can provide constructive feedback and encourage continuous improvement through coaching, training and professional development initiatives (Retnowati et al., 2021; Mutohar et al., 2020). Feedback from performance evaluations has a positive effect on lecturers' work behavior, thereby leading to improved performance and quality of education (Rakhmadani & Adhinata, 2021). Research also shows that technology-based evaluation approaches can help monitor and improve lecturer performance effectively, ensuring the delivery of quality education (Muhie et al., 2020).

Furthermore, research shows that innovative teaching methods, such as blended learning and multiliteracy pedagogy, can improve students' critical thinking skills, creativity, and motivation, which ultimately have a positive impact on the quality of learning (Nawawi et al., 2021; Ansari, 2023). Active learning strategies and formative evaluation have also been proven to increase student engagement and learning outcomes (Winarno et al., 2022; Sapri et al., 2019). Based on the description above, this research was conducted to determine the effect of lecturer performance evaluation on improving the quality of learning at STKIP Harapan Bima.

## 2. LITERATURE REVIEW

### 1. Lecturer Performance Evaluation Concept

Lecturer performance evaluation is a formal process that involves assessing the performance and effectiveness of lecturers' current or past work in an educational institution (Riadi et al., 2021). The main objectives of evaluating lecturer performance include increasing lecturer professionalism, supporting self-improvement, and facilitating continuous improvement in the quality of teaching practices (Saaludin et al., 2019). By evaluating lecturer performance, institutions aim to optimize teaching and learning activities, which ultimately improves the quality of education provided (Helmina, 2024). Apart from that, performance assessment is expected to improve the quality of lecturers and ensure the fulfillment of the Tri Dharma of Higher Education (Fatkhurrochman et al., 2022). In addition, evaluating lecturer performance is very important to identify areas of improvement and provide objective feedback to instructors. Without proper evaluation mechanisms, instructors may have difficulty recognizing and addressing problems in their teaching methods, resulting in stagnant or poor teaching performance (Kim & Hong, 2020). Feedback obtained from evaluations, including peer and student feedback, serves as a valuable tool for lecturers to identify strengths and weaknesses, thereby providing incentives for improvement (Dayal & Alpana, 2020).

Furthermore, leadership style in educational institutions has a significant effect on lecturers' job satisfaction, emphasizing the importance of supportive, participative and achievement-oriented leadership in fostering positive lecturers' performance (Handayani et al., 2019). Therefore, lecturer performance evaluation functions as a basis for increasing professionalism, continuous improvement, and increasing quality in the educational environment. By providing structured feedback, identifying areas for development, and aligning teaching practices with student needs, these evaluations play a critical role in ensuring effective and impactful teaching at higher education institutions.

Furthermore, the methods and tools used in lecturer performance evaluation include a variety of approaches aimed at assessing teaching effectiveness and guiding

professional development. One common method involves the use of technology-based evaluation systems, such as web-based platforms, to simplify the evaluation process and provide timely feedback to faculty. This system can facilitate monitoring lecturer performance, provide awards to lecturers who excel, and identify areas that need improvement to improve the overall quality of education (Muhie et al., 2020). Decision support systems, such as those based on artificial intelligence or fuzzy logic methods, offer a structured approach to evaluating lecturer performance by analyzing various criteria and providing data-based insights. This system can help measure the achievements, credibility and overall performance of lecturers in educational institutions (Widodo, 2023; Riadi et al., 2021).

Peer reviews and lecturer evaluations are also valuable tools for assessing lecturer performance, as they provide insight into the quality of teaching, student engagement, and overall effectiveness in delivering course content (Khamis et al., 2012). By combining peer feedback and student evaluations, institutions can collect comprehensive data to measure faculty performance and identify areas for improvement. The use of assessment tools rooted in cognitive load theory or behaviorally based assessment tools can offer a systematic way to evaluate lecture quality and provide constructive feedback to lecturers (Jordan et al., 2023). These tools aim to improve teaching skills, improve learning outcomes, and ensure effective and engaging lecture delivery.

Multivariate analysis methods such as the Simple Additive Weighting (SAW) method can help determine exemplary lecturers by combining student evaluation results and other assessment tools (Astuti & Winarno, 2021). By utilizing such an analytical approach, institutions can identify top-performing lecturers and support continuous improvement in teaching practices. The variety of methods and tools available to evaluate lecturer performance provide valuable insights for institutions to improve the quality of teaching, support professional development, and ultimately improve the experience. overall student education.

## 2. Quality of Learning in Higher Education

Learning quality refers to the effectiveness and excellence of the educational experience provided to students. Covers dimensions such as the provision of teaching materials, educational infrastructure, relevant knowledge, fulfillment of educational standards, teacher support, a conducive learning atmosphere, and quality educators. Quality teaching is closely linked to learning outcomes, emphasizing a student-centred approach and results-based assessment (Baghdadi, 2021). In e-learning, quality involves integrating education, technology, and economics to increase learning opportunities and empower students for community development (Weis, 2021). The quality of student learning experiences is subjective and affective, originating from the student's perspective and self-assessment, which reflects the effectiveness and flexibility of educational modules (Sashittal et al., 2012). Adaptive educational evaluation mechanisms aim to retain quality content and provide personalized learning outcomes based on students' cognitive states. In early childhood education, quality is examined through a Discrete lens to promote a pedagogy of wholeness, access, and interdependence, addressing issues of ableism and racism (Beneke & Love, 2022).

In addition, the concept of educational quality also includes professional learning communities, where knowledge sharing, collaborative learning, and continuous professional development are essential to improve teaching practices and student learning outcomes (Hassan et al., 2019). The development of evaluation tools such as rubrics supports the assessment of academic writing and increases students' social and

emotional intelligence (Supriyadi & Muslimin, 2020). Overall, the definition of learning quality takes a holistic approach, considering factors such as pedagogical strategies, learning outcomes, student engagement, and the effectiveness of the overall educational experience.

Furthermore, learning quality indicators are important metrics used to evaluate the effectiveness and excellence of the educational experience provided to students. These indicators include various dimensions that can predict student learning outcomes and overall satisfaction with the learning process (Hafeez et al., 2022). Indicators of the quality of the learning process often include aspects such as student-teacher interaction, fast feedback, service student support, application of appropriate media, and use of technology in online learning (Hafeez et al., 2022). In addition, the quality of the learning process can be assessed based on the adequacy of learning facilities, the learning environment, and the quality of information delivery in the e-learning system (Satuti et al., 2020). Indicators such as student satisfaction, engagement, and loyalty are very important in assessing the success and quality of e-learning systems (Pham et al., 2019; Abeysekera, 2024). -factors such as system quality, quality of instructors and course materials, quality of administration and support services, and perceived value of the learning experience (Pham et al., 2019). Furthermore, the impact of cognitive load on learning memory in online learning environments is evaluated through indicators related to teaching quality, learning content quality, and learning management system quality (Suharyat et al., 2022).

In higher education, online learning quality indicators during the COVID-19 pandemic have been highlighted in recent years to ensure optimal learning outcomes and student satisfaction. These indicators play an important role in evaluating the effectiveness of online learning platforms and the quality of educational services provided to students, improving quality in e-learning requires identifying critical success factors, benchmarks, and quality indicators to ensure continuous improvement and effectiveness in the delivery of educational content. Overall, learning quality indicators serve as valuable tools for assessing the impact of teaching methods, learning environments, and educational technology on student learning outcomes and satisfaction, ultimately contributing to the improvement of the overall educational experience.

### **3. The Relationship Between Lecturer Performance Evaluation and Learning Quality**

The relationship between performance evaluation and learning quality is based on various theoretical frameworks that explain how performance evaluation impacts the quality of learning outcomes. One of the key theories that contributes to this understanding is performance evaluation theory, which views performance evaluation as a management control tool for implementing organizational strategy Yin & Li (2019). This theory emphasizes the importance of assessing individual and organizational performance so that it is aligned with strategic goals, thereby influencing the quality of the learning experience in the educational environment. Equity theory, based on the concept of reciprocity in relationships, offers insight into how fairness and fairness in performance evaluations can influence relationship quality and, consequently, learning outcomes. These theories underscore the importance of a fair evaluation process in fostering positive relationships between educators and students, ultimately improving the quality of the educational experience.

Organizational learning theory plays an important role in understanding how continuous learning and change management practices influence performance and, subsequently, the quality of learning (Budhiraja, 2021). This theory highlights the

importance of continuous learning initiatives in improving organizational performance, which can translate into better learning outcomes for individuals within the organization. In addition, resource-based view theory and organizational learning theory explore the relationship between resource acquisition, organizational performance, and learning capabilities. These theories suggest that effective utilization of resources, combined with a focus on organizational learning, can result in improved performance outcomes and, consequently, improved learning quality.

In sum, this theoretical foundation offers valuable insight into the complex interactions between performance evaluation processes, organizational strategy, learning outcomes, and the quality of educational experiences. By understanding these theories, educational institutions can develop effective performance evaluation systems that contribute to continuously improving the quality of learning and student outcomes.

### 3. RESEARCH METHOD

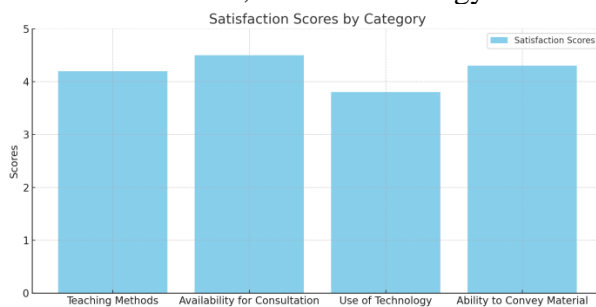
This research uses a quantitative approach to measure the relationship between lecturer performance evaluation variables and learning quality, as well as a qualitative approach to explore lecturer and student perceptions. The population of this study consisted of lecturers and students at STKIP Harapan Bima. The purposive sampling method was used to select a sample of lecturers and students who were relevant to this research. The research instrument is a tool used to measure lecturer performance which covers various aspects such as teaching skills, engagement with students, and use of technology in learning. Meanwhile, the tools used to measure the quality of learning are student satisfaction questionnaires and academic learning outcomes as indicators of learning quality.

Data collection was carried out through distribution of questionnaires to lecturers and students, as well as in-depth interviews with several selected lecturers and students. Descriptive and inferential statistical analysis is used to measure the influence of lecturer performance evaluation on learning quality. Thematic analysis was used to explore lecturer and student perceptions.

### 4. RESULTS AND DISCUSSION

#### 1. Level of Student Satisfaction with Lecturer Performance

Diagram 1 below shows the average score of student satisfaction with lecturer performance in various fields aspect, such as teaching methods, availability for consultation, use of technology in learning, and ability to deliver material.



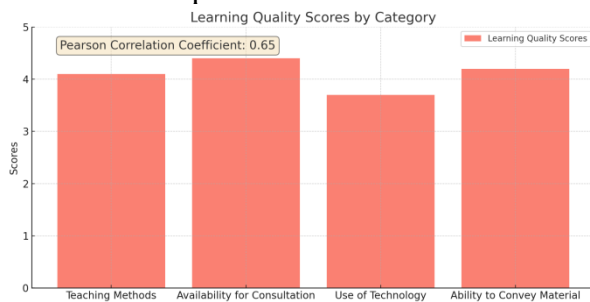
Based on a questionnaire distributed to 200 students at STKIP Harapan Bima, it was found that 75% of students were satisfied with the performance of their lecturers. The questionnaire covers various aspects such as teaching methods, lecturer availability for consultation, use of technology in learning, and lecturer's ability to deliver material.

The average score of student satisfaction with lecturer performance is 4.2 out of 5, which indicates a high level of satisfaction. The following are student satisfaction

scores by category: Teaching Method: 4.2, Availability for Consultation: 4.5, Use of Technology: 3.8, Ability to Present Material: 4.3.

## 2. Quality of Learning

Chart 2 below shows the percentage of students who get an A or B grade and the percentage of students who feel that the quality of learning has improved after routine lecturer performance evaluations.



Academic data shows that 60% of students received A or B grades in courses taught by the evaluated lecturers. This shows quite good academic achievement. Another indicator of learning quality is student satisfaction with the learning process. From the survey conducted, 70% of students felt that the quality of learning had improved after routine lecturer performance evaluations were carried out.

The average learning quality score, which is measured through a student satisfaction questionnaire with learning, is 4.0 out of 5. The following are the learning quality scores by category: Teaching Method: 4.1, Availability for Consultation: 4.4, Use of Technology: 3.7, Ability to Present Material: 4.2 .

## 3. Correlation between Lecturer Performance Evaluation and Learning Quality

Statistical analysis using Pearson correlation shows that there is a significant positive correlation between lecturer performance evaluation and learning quality ( $r = 0.65$ ,  $p < 0.01$ ). This shows that the better the lecturer's performance evaluation, the higher the quality of learning felt by students.

Linear regression also shows that lecturer performance evaluation explains 42% of the variability in learning quality ( $R^2 = 0.42$ ). This shows that lecturer performance evaluation has a significant contribution to improving the quality of learning.

## 4. CLOSING

### Conclusion

Based on the research results, it was found that lecturer performance evaluations have a significant influence significant towards improving the quality of learning in higher education. The results of statistical analysis show that there is a significant positive correlation between lecturer performance evaluation and learning quality ( $r = 0.65$ ,  $p < 0.01$ ). Lecturer performance evaluation explains 42% of the variability in teaching quality ( $R^2 = 0.42$ ), confirming the importance of performance evaluation as a tool for improving teaching quality.

The most influential factor in evaluating lecturer performance is the availability of lecturers for consultation, which gets the highest satisfaction scores from students. This shows that lecturers who are available to provide guidance and support to students tend to be more appreciated and able to improve the quality of learning. Apart from that, teaching methods and the ability to deliver material also play an important role in determining student satisfaction and the quality of learning.

Lecturers' and students' perceptions of the lecturer performance evaluation process show that evaluations carried out objectively and constructively can increase lecturers' motivation to continue to improve their performance. Students feel an increase in the quality of learning after lecturer performance evaluations are implemented regularly and thoroughly.

### **Suggestion**

1. Recommendations for education policy in higher education (implementation of comprehensive and routine performance evaluations, use of evaluation results for lecturer professional development, objectivity and transparency in evaluations).
2. Recommendations for lecturers (increase availability for consultation, implement innovative teaching methods, take advantage of feedback).
3. Recommendations for further research (further studies on specific factors, development of more comprehensive evaluation methods).

## **5. BIBLIOGRAPHY**

- Abeyssekera, I. (2024). The effect of cognitive load on learning memory of online learning accounting students in the Philippines. *Sustainability*, 16(4), 1686. <https://doi.org/10.3390/su16041686>
- Ansari, B. (2023). Blended-learning training and evaluation: a qualitative study. *Journal of Intercultural Communication*, 155-164. <https://doi.org/10.36923/jicc.v23i4.201>
- Astuti, F. and Winarno, B. (2021). Decision support system design for determining exemplary lecturers using simple additive weighting (saw). *Jurnal E-Komtek (Elektro-Komputer-Teknik)*, 5(1), 31-42. <https://doi.org/10.37339/e-komtek.v5i1.523>
- Baghdadi, A. (2021). Students learning and outcomes as indicators of quality teaching in higher education.. <https://doi.org/10.33422/3rd.icreconf.2021.03.160>
- Beneke, M. and Love, H. (2022). A discrete analysis of quality in early childhood: toward pedagogies of wholeness, access, and interdependence. *Teachers College Record*, 124(12), 192-219. <https://doi.org/10.1177/01614681221147348>
- Budhiraja, S. (2021). Can continuous learning amplify employees' change efficacy and contextual performance? evidence from post-merger Indian organizations. *International Journal of Manpower*, 42(6), 1144-1158. <https://doi.org/10.1108/ijm-05-2020-0208>
- Dayal, H. and Alpana, R. (2020). Secondary pre-service teachers' reflections on their micro-teaching: feedback and self-evaluation. *Waikato Journal of Education*, 25, 73-83. <https://doi.org/10.15663/wje.v25i0.686>
- Elumalai, K., Sankar, J., Kalaichelvi, R., John, J., Menon, N., Alqahtani, M., ... & Abumelha, M. (2020). Factors affecting the quality of e-learning during the COVID-19 pandemic from the perspective of higher education students. *Journal of Information Technology Education Research*, 19, 731-753. <https://doi.org/10.28945/4628>
- Fatkhurrochman, F., Priyoatmoko, W., & Wahyudiono, S. (2022). Promethee algorithm in assessing lecturer performance. *International Journal of Computer and Information System (Ijcis)*, 3(2), 69-78. <https://doi.org/10.29040/ijcis.v3i2.71>
- Hafeez, M., Naureen, S., & Sultan, S. (2022). Quality indicators and models for online learning quality assurance in higher education. *The Electronic Journal of E-Learning*, 20(4), pp374-385. <https://doi.org/10.34190/ejel.20.4.2553>

- Handayani, S., Sugiharto, D., & Sutarto, J. (2019). Power Influence of leadership on lecturer performance for university quality management. <https://doi.org/10.2991/assehr.k.191217.009>
- Hassan, R., Ahmad, J., & Boon, Y. (2019). A professional learning community in Malaysia. *International Journal of Engineering and Advanced Technology*, 8(6s3), 524-536. <https://doi.org/10.35940/ijeat.f1095.0986s319>
- Helmina, A. (2024). Development of teaching performance evaluation application for lecturers using the k-nearest neighbor method with the Manhattan distance approach. *JTP - Jurnal Teknologi Pendidikan*, 26(1), 278-290. <https://doi.org/10.21009/jtp.v26i1.44443>
- Jordan, J., Haas, M., Hickam, G., Murray, C., Hill, J., Cico, S., ... & Santen, S. (2023). Development of a lecture evaluation tool rooted in cognitive load theory: a modified Delphi study. *Aem Education and Training*, 7(1). <https://doi.org/10.1002/aet2.10839>
- Khamis, N., Sulong, A., & Deros, B. (2012). A case study on peer review and lecturer evaluations in an academic setting. *Asian Social Science*, 8(16). <https://doi.org/10.5539/ass.v8n16p192>
- Kim, P. and Hong, S. (2020). Question items for specific lecture types in college for more adequate student evaluation of instructors' teaching performance. *Journal of Engineering Education Transformations*, 34(2), 16-24. <https://doi.org/10.16920/jeet/2020/v34i2/155395>
- Muhie, Y., Wolde, A., & Tesfay, C. (2020). Efficiency management system as a tool to monitor lecturer's performance. *Journal of Computer Science*, 16(11), 1526-1534.
- Mutohar, P. and Trisnantari, H. (2020). Contribution of visionary leadership, lecturer performance, and academic culture to the competitiveness of Islamic higher education in Indonesia. *Journal of Advances in Education and Philosophy*, 04(02), 29-45. <https://doi.org/10.36348/jaep.2020.v04i02.002>
- Nawawi, M., Christanti, A., Izzudin, A., & Laili, M. (2021). The multiliteracy pedagogy for teaching speaking to enhance the students' higher order thinking skills (hots).. <https://doi.org/10.4108/eai.4-11-2020.2314187>
- Niku, E. (2023). Quality management of distance learning higher education. *International Journal of Social Science and Human Research*, 06(03). <https://doi.org/10.47191/ijsshr/v6-i3-72>
- Pham, L., Limbu, Y., Bui, T., Nguyen, H., & PHAM, H. (2019). Does e-learning service quality influence e-learning student satisfaction and loyalty? evidence from Vietnam. *International Journal of Educational Technology in Higher Education*, 16(1). <https://doi.org/10.1186/s41239-019-0136-3>
- Rakhmadani, D. and Adhinata, F. (2021). A web-based information system for lecturer's performance appraisal using gamification concepts and rating scale methods. *Jurnal Riset Informatika*, 3(2), 167-174. <https://doi.org/10.34288/jri.v3i2.201>
- Rashid, S. and Yadav, S. (2020). Impact of COVID-19 pandemic on higher education and research. *Indian Journal of Human Development*, 14(2), 340-343. <https://doi.org/10.1177/0973703020946700>
- Rawabdeh, A. and Tubaishat, R. (2019). The worldwide setting of higher education quality enhancement activities coupled with KPIs: an open composition for Yarmouk University in Jordan. *Proceedings on Engineering Sciences*, 1(2), 591-596. <https://doi.org/10.24874/pes01.02.058>
- Retnowati, T., Mardapi, D., Kartowagiran, B., & Hamdi, S. (2021). A model of lecturer performance evaluation: sustainable lecturer performance mapping. *International Journal of Instruction*, 14(2), 83-102. <https://doi.org/10.29333/iji.2021.1426a>



- Riadi, I., Fauzi, F., Yusuf, A., & Yudono, M. (2021). Decision-making employee performance evaluation at XYZ University using the Mamdani fuzzy logic method. *Fidelity Jurnal Teknik Elektro*, 3(2), 27-31. <https://doi.org/10.52005/fidelity.v3i2.92>
- Saaludin, N., Ismail, M., Mat, B., & Harun, S. (2019). Improving lecturers' evaluation score by using analytic hierarchy process (AHP): a case at Universiti Kuala Lumpur. *Indonesian Journal of Electrical Engineering and Computer Science*, 15(1), 391. <https://doi.org/10.11591/ijeecs.v15.i1.pp391-398>
- Sapri, J., Agustriana, N., & Kusumah, R. (2019). The application of dick and carey learning design toward student's independence and learning outcome.. <https://doi.org/10.2991/icetep-18.2019.53>
- Satuti, J., Sunaryanto, S., & Nuris, D. (2020). Does student satisfaction mediate the correlation between e-learning service quality, academic engagement, and academic achievement? *Jabe (Journal of Accounting and Business Education)*, 5(1), 38. <https://doi.org/10.26675/jabe.v5i1.12699>
- Schönwetter, D., Gareau-Wilson, N., Cunha, R., & Mello, I. (2016). Assessing the impact of voice-over screen-captured presentations delivered online on dental students' learning. *Journal of Dental Education*, 80(2), 141-148. <https://doi.org/10.1002/j.0022-0337.2016.80.2.tb06069.x>
- Suharyat, Y., Susilawati, T., Sikki, M., & Nurhayati, S. (2022). Online learning quality evaluation in higher education during the COVID-19 pandemic. *Society*, 10(1), 207-219. <https://doi.org/10.33019/society.v10i1.406>
- Supriyadi, S. and Muslimin, M. (2020). Development of participative and collaborative learning evaluation tools of academic writing to enhance students' social and emotional intelligence. *Journal of International Conference Proceedings*, 3(2), 67-85. <https://doi.org/10.32535/jicp.v0i0.906>
- Weis, L. (2021). Theoretical approach to e-learning quality. *Economics Ecology Socium*, 5(1), 33-45. <https://doi.org/10.31520/2616-7107/2021.5.1-4>
- Widodo, Y. (2023). Artificial intelligence-based decision support system for education management in higher education. *Al-Fikrah Jurnal Manajemen Pendidikan*, 11(2), 352. <https://doi.org/10.31958/jaf.v11i2.12120>
- Winarno, S., Rohmani, A., Senata, D., & Andono, P. (2022). Impacts of formative evaluation model towards improving students' learning outcomes in online teaching platforms. *Cypriot Journal of Educational Sciences*, 17(9), 2990-2998. <https://doi.org/10.18844/cjes.v17i9.7963>
- Yin, S. and Li, B. (2019). Evaluation of enterprise learning performance in the process of cooperation innovation using heronian mean operator. *Mathematical Problems in Engineering*, 2019, 1-14. <https://doi.org/10.1155/2019/8653164>