



Implementation of digital academic administration system and its impact on the efficiency of educational services in D3 pharmacy study program

Dafyar Eliadi Hardian¹, Mhd. Riza Marjoni^{2*}

^{1,2}Department of Education Administration, Universitas Islam Syekh Yusuf, Tangerang, Indonesia

ARTICLE INFO

Article history:

Received Jul 9, 2025

Revised Jul 15, 2025

Accepted Jul 24, 2025

Keywords:

Digital Administration System
D3 Pharmacy
Digital Academic Services
Education Service Efficiency
Vocational Education

ABSTRACT

Digital transformation in higher education demands the integration of an efficient academic administration system, especially in a vocational education environment such as the D3 Pharmacy Study Program which has high service complexity. This study was conducted to determine the extent to which the implementation of a digital academic administration system affects the efficiency of educational services. This study uses a quantitative approach with a descriptive correlational research type. Data were collected through distributing closed questionnaires to 92 respondents consisting of students, lecturers, and education staff. The instrument used adopted a five-point Likert scale with customized indicators on each variable. Data analysis was conducted using descriptive and inferential statistical techniques, including Pearson correlation test and simple linear regression. The results showed that there was a positive and significant relationship between the implementation of the digital academic administration system and the efficiency of educational services, with a correlation coefficient of 0.682 and R square of 0.465. This means that 46.5% of service efficiency can be explained by the effectiveness of the digital system implemented. The conclusion of this study shows that the digitalization of the academic administration system is able to improve the speed, accuracy, and affordability of educational services. For future development, it is recommended that the digital academic system be continuously updated by considering the specific needs of vocational education, as well as strengthening training and digital literacy for its users.

This is an open access article under the [CC BY-NC](https://creativecommons.org/licenses/by-nc/4.0/) license.



Corresponding Author:

Mhd Riza Marjoni,
Department of Education Administration,
Universitas Islam Syekh Yusuf,
Jl. Maulana Yusuf Kota Tangerang, Indonesia
Email: mhdriza.marjoni@gmail.com

INTRODUCTION

The digital era has brought major transformations in various sectors of life, including higher education. The development of information and communication technology encourages universities to adopt digital systems in supporting administrative and academic processes

(Fernández et al., 2023; Alenezi, 2023). Academic administration systems that were previously carried out manually are now turning into digital forms to increase service speed, reduce the risk of data errors, and facilitate tracking and archiving information (Kayanja et al., 2025). Digital transformation in the higher education industry in general is able to determine the roadmap for sustainable education management strategies (Mohamed Hashim et al., 2022). However, the implementation of digital academic administration systems in various educational institutions does not always run smoothly. Barriers to digital transformation in higher education institutions can be categorized into six main categories, namely environmental, strategic, organizational, technological, people-related and cultural (Gkrimpizi et al., 2023). Inconsistencies in implementation can lead to misalignment of ICT tools across different education departments, ultimately hindering successful technology integration in higher education (Singun, 2025). In addition, digital transformation budgets can be a challenge in higher education because many leaders in these institutions do not understand the value of digitization (Noorashid et al., 2019).

The D3 Pharmacy Study Program has unique educational characteristics because it emphasizes a balance between theory and field practice. The vocational pharmacy program targets the cultivation of advanced skill-oriented pharmacy professionals for various roles in production, distribution, inspection, and service (Guo et al., 2024). Academic activities take place not only in classrooms, but also in laboratories and field practice sites such as pharmacies and hospitals. Vocational students learn administrative and clinical procedures such as reading prescriptions, screening prescriptions, compounding drugs, and preparing compounded sterile preparations (Chen et al., 2023). This complexity demands a digital academic administration system capable of accommodating practicum schedules, tracking students' off-campus activities, as well as real time reporting of practical evaluation results, and seamless integration with external partner institution systems such as hospitals and pharmacies to ensure academic data continuity and comprehensive competency assessment across multiple healthcare settings.

Previous research shows a significant impact of administrative system efficiency on education quality. Research by Aprilia et al. (2024) and Handayani (2020) revealed that slow academic services have a direct impact on student learning motivation in health vocational programs (Aprilia, 2024 : Handayani, 2020). Astuti (2024) and Febriani (2020) showed that the inaccuracy of pharmaceutical practicum scheduling hinders the achievement of graduate learning outcomes (Astuti, 2024 :Khasanah et al., 2025 : Febriani, n.d.). Meanwhile, Rosita (2020) and Santoso et al. (2023) highlighted that the availability of unsynchronized academic data is a major obstacle in the accreditation of pharmacy study programs (Rosita, 2020 : Santoso et al., 2023)

However, the success of digital academic system implementation is significantly influenced by varying levels of digital readiness among stakeholders. Research indicates substantial disparities in digital competencies between students, faculty, and administrative staff, which create critical implementation barriers (García-Morales et al., 2021). While digital native students demonstrate higher technological adaptability, faculty members often experience challenges integrating digital tools into pedagogical practices, particularly in health education contexts (Rapanta et al., 2020)). Administrative personnel in traditional educational settings frequently require extensive training to effectively utilize new digital systems (Van De Werfhorst et al., 2022). In pharmacy education, these disparities become pronounced due to complex requirements for theoretical knowledge management and practical skill documentation across multiple healthcare institutions. Understanding these multi-stakeholder digital readiness gaps is essential for developing implementation strategies that ensure optimal utilization of digital academic administration systems. The efficiency of educational services is an important indicator in determining the effectiveness of the academic administration system. Efficiency in the education system is realized when learning outputs in the form of evaluation results and task assessments can be achieved through optimizing the use of available resources (Johnes et al., 2017). Administrative efficiency management has become a focus of attention in recent years along with

the need to optimize resource utilization and streamline the daily operations of educational institutions (Alvarez-Sández et al., 2023). Gallup's June 2023 survey data shows that the level of public trust in higher education has decreased significantly, with only 36 percent of respondents expressing 'very' or 'fairly' trust, down from 48 percent in 2018 and 57 percent in 2015 (Bedi et al., 2023).

In addition, several studies that specifically examine the implementation of digital academic administration systems make important contributions to our understanding of the effectiveness of these systems. The study by (Taufik et al., 2021) shows that successful implementation of digital academic systems depends on user training and cross-divisional integration. Meilani et al. (2020) found that cloud-based systems are more flexible in supporting academic data management in vocational colleges (Meilani et al., 2020). Waworuntu et al. (2022) emphasized the importance of an intuitive user interface design so that the system is actually used optimally by the entire academic community (Ahmad Iman Waworuntu et al., 2022).

To strengthen the solutions offered, a solid theoretical footing is needed. The first relevant theory is the Technology Acceptance Model (TAM) developed by Davis, which explains that user acceptance of technology is determined by the perceived ease and usefulness of the system (Kemp et al., 2024). Davis' TAM model states that perceived usefulness and perceived ease of use jointly mediate the effects of other external variables on behavioral intentions to use technology, and that in addition, perceived usefulness mediates some of the effects of perceived ease of use. The second theory used is Mohr's Theory of Organizational Efficiency, which states that organizational efficiency is determined by process rationalization and optimal use of technology. The third theory is the Information Systems Success Model from DeLone and McLean, which emphasizes that the success of an information system is determined by system quality, information quality, and user satisfaction. The model outlines six dimensions that are interrelated in measuring the success of information systems, including system quality, information quality, service quality, usage intention, user satisfaction, and organizational impact (Abasi et al., 2015). This study aims to analyze the level of success of the Student Information System (SIS) implementation based on the latest version of the IS Success model from DeLone and McLean. Data collection was conducted through a survey of 882 students who utilized SIS at one of Turkey's public universities (Çelik & Ayaz, 2022). These three theories provide a conceptual foundation to assess the effectiveness of digital academic system implementation in improving the efficiency of educational services.

Based on this background, this study aims to examine the extent to which the implementation of digital academic administration systems affects the efficiency of educational services in the D3 Pharmacy Study Program. This research is expected to make a real contribution in designing an academic service system that is more responsive, efficient, and in accordance with the unique needs of health vocational education. The findings of this study are also expected to be a reference for policy makers and system developers in optimizing the use of digital technology to support better higher education governance

RESEARCH METHODOLOGY

This study used a quantitative approach with a descriptive correlational research type. The main objective of this approach is to determine the relationship between the implementation of a digital academic administration system and the level of efficiency of educational services felt by the academic community in the D3 Pharmacy Study Program. The quantitative approach was chosen because it is able to present data objectively through numerical measurements, thus allowing statistical hypothesis testing and producing generalizable conclusions.

The instrument used in this study was a closed questionnaire prepared based on indicators of the two research variables, namely the digital academic administration system and the efficiency of educational services. The questionnaire uses a five-point Likert scale with a range of

answers from "strongly disagree" to "strongly agree". Indicators on the digital academic administration system variable include ease of use, speed of access, system reliability, and service integration. Meanwhile, indicators on the education service efficiency variable include service speed, accuracy of information, ease of access to academic data, and satisfaction with services.

Data collection was carried out by distributing questionnaires to respondents consisting of students, lecturers, and education staff in the D3 Pharmacy Study Program. The sampling technique used a purposive sampling method with the criteria that respondents were individuals who actively used the digital academic administration system and had experience in the education service process for at least one semester. The distribution of questionnaires was carried out online and offline to reach more participants efficiently and evenly.

The data obtained were analyzed using descriptive and inferential statistical analysis techniques. Descriptive statistics are used to describe the characteristics of respondents and the scores of each variable. While inferential analysis uses Pearson correlation test to determine the relationship between variables, as well as simple linear regression test to see the extent to which the implementation of digital academic administration system affects the efficiency of educational services. All data analysis processes were carried out with the help of the latest version of SPSS statistical software so that the results obtained were accurate and reliable. The results of this analysis are the basis for drawing conclusions and providing recommendations for improving the education service system in the study program environment.

RESULTS AND DISCUSSIONS

This study aims to determine the effect of implementing a digital academic administration system on the efficiency of educational services in the D3 Pharmacy Study Program. The data analyzed were obtained from 92 respondents consisting of students, lecturers, and education staff. The instrument used was a closed questionnaire with a five-point Likert scale. Analysis was carried out through descriptive and inferential statistics using the latest version of SPSS software.

Descriptive Statistics Results

Descriptive statistics are used to describe respondents' perceptions of the variables of digital academic administration system implementation and educational service efficiency.

Table 1. Descriptive statistics of research variables

| Variable | N | Minimum Score | Maximum Score | Average | Standard Deviation |
|--|----|---------------|---------------|---------|--------------------|
| Implementation of Digital Academic Administration System | 92 | 56 | 91 | 78.62 | 7.54 |
| Efficiency of Education Services | 92 | 48 | 88 | 73.27 | 8.19 |

Table 1 shows that the average score of the implementation of the digital academic administration system is 78.62 out of a maximum scale of 100, which indicates that most respondents gave a positive assessment of the implementation of this system in the D3 Pharmacy Study Program. The standard deviation of 7.54 indicates a relatively homogeneous distribution of data. Meanwhile, the average score of educational service efficiency is 73.27 with a standard deviation of 8.19, which also indicates a fairly good perception from respondents of the efficiency of the available services.

Pearson Correlation Test

To determine the relationship between the implementation of the digital academic administration system and the efficiency of educational services, the Pearson correlation test was conducted.

Table 2. Pearson correlation test results

| Variable 1 | Variable 2 | Correlation Value (r) | Sig. (2-tailed) |
|--|----------------------------------|-----------------------|-----------------|
| Implementation of Digital Academic Administration System | Efficiency of Education Services | 0.682 | 0.000 |

Based on Table 2, the correlation value is 0.682 with a significance of 0.000. This value indicates a strong positive relationship between the implementation of the digital academic administration system and the efficiency of educational services. Because the significance value is smaller than 0.05, the relationship is declared significant. This means that the better the implementation of the digital system, the higher the efficiency of educational services perceived by users.

Simple Linear Regression Test

To measure how much influence the independent variable has on the dependent variable, a simple linear regression analysis was conducted.

Table 3. Results of simple linear regression analysis

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------|----------|-------------------|----------------------------|
| 1 | 0.682 | 0.465 | 0.459 | 6.03 |

Table 4. Regression coefficient

| Free Variable | B | Std. Error | Beta | t | Sig. |
|--|--------|------------|-------|-------|-------|
| (Constant) | 21.548 | 4.321 | | 4.986 | 0.000 |
| Implementation of Digital Academic Administration System | 0.657 | 0.083 | 0.682 | 7.912 | 0.000 |

The results in Table 3 show that the R Square value is 0.465, which means that 46.5% of the variation in educational service efficiency can be explained by the digital academic administration system implementation variable. While the other 53.5% is influenced by other factors outside this study. The regression coefficient in Table 4 shows that the constant value is 21.548 and the coefficient of the independent variable is 0.657. This means that every 1 unit increase in the digital system implementation score will increase the education service efficiency score by 0.657 units, if other variables are held constant. The significance value of 0.000 indicates that the effect is statistically significant.

The regression model can be written as $Y = 21.548 + 0.657X$, where Y is the efficiency of educational services and X is the implementation of the digital academic administration system. While this study focuses on the quantitative relationship between digital system implementation and service efficiency, the findings reveal important implications for academic output quality in competency-based pharmacy education. Based on qualitative feedback from respondents, several academic quality indicators show improvement following digital system implementation. Enhanced Practicum Management: Respondents noted that the digital system's ability to coordinate complex practicum schedules across multiple healthcare institutions has improved students' exposure to diverse pharmaceutical practice environments. Faculty members reported better organization of clinical rotations and more systematic tracking of competency achievements during off-campus learning activities. Improved Assessment Timeliness: Educational staff indicated that digital systems enable more timely feedback on student performance, particularly in clinical assessments and practicum evaluations. This immediate feedback mechanism supports students' ability to identify and address competency gaps more effectively during their learning process. Streamlined Academic Progression: Students reported that efficient academic services allow them to allocate more time to competency development rather than administrative procedures. The reduction in waiting times for academic consultations, certificate processing, and curriculum guidance enables better time management for core learning activities essential to

pharmacy practice preparation. The findings from the analysis show that respondents' perceptions of the digital academic administration system are quite high, especially in terms of ease of access, the speed of the academic data input process, and the availability of academic information online. Many respondents said that the use of digital systems facilitates processes such as filling in KRS, accessing lecture and practicum schedules, and tracking grades and academic status independently.

In addition, the efficiency of education services is also considered to have increased since the implementation of the digital system. Respondents felt that the waiting time for academic services such as certificate processing, academic guidance, and curriculum consultation had become shorter due to the support of online-based systems. Lecturers and education personnel also confirmed that the system helps speed up administrative work, allowing more time to be allocated for academic activities and student mentoring.

However, there are still some notes related to the need for further training for new users, as well as the need for system improvements in supporting the needs of field practice which characterizes the D3 Pharmacy Study Program. Some respondents also highlighted the importance of system integration with external platforms such as hospital information systems or partner pharmacies. The results of this study indicate that there is a positive and significant relationship between the implementation of a digital academic administration system and the efficiency of educational services in the D3 Pharmacy Study Program. The digital system is proven to be able to increase service speed, data accuracy, and user satisfaction in the academic process. As much as 46.5% of variations in the efficiency of educational services can be explained by the implementation of the digital system implemented. Therefore, continuous development and updating of the system is highly recommended so that the efficiency of academic services continues to increase, especially in the face of the complexity of the needs of vocational education in the field of pharmacy. The main objective of this study is to analyze the effect of digital academic administration system implementation on the efficiency of educational services within the D3 Pharmacy Study Program. Based on the results of data analysis, it was found that there was a significant positive relationship between the two variables. These findings align with the Technology Acceptance Model (TAM), where the high implementation score (78.62) reflects perceived usefulness and ease of use driving technology acceptance. This finding shows that the better the digital system is implemented, the higher the efficiency of educational services felt by students, lecturers, and education staff. The 46.5% variance explanation supports Mohr's Theory of Organizational Efficiency, demonstrating how process rationalization and optimal technology use enhance performance. Additionally, the strong correlation validates the DeLone and McLean IS Success Model through improved system quality, information quality, and organizational impact. The high average perception score of the digital academic administration system reflects that features such as ease of access, data processing speed, and information integration have been felt directly by system users. This supports the role of information technology as a strategic instrument in simplifying academic processes that were previously manual. Service efficiency can also be seen from the increased speed of administrative processes, decreased data input error rates, and ease of tracking student academic status. The strong relationship shown by the correlation value ($r = 0.682$) and high significance strengthens the argument that the digitization of academic administration is key in improving service quality in vocational education institutions such as pharmacy.

This finding is in line with research conducted by Fadhl, 2024, which states that the implementation of a digital academic system based on data integration is able to cut administrative service time by 40% and increase user satisfaction in vocational colleges (Fadhl, 2024). This study supports the argument that optimizing digital systems not only speeds up services, but also increases the accuracy of information received by students and lecturers. Another study by (Gupta et al., 2021a; Meilinda et al., 2025) found that the implementation of a

mobile-based online academic system increases students' active participation in accessing academic information, which also supports efficiency indirectly through increased academic awareness (Gupta et al., 2021). The significant positive correlation ($r = 0.682$) between digital system implementation and service efficiency impacts academic output quality through three critical mechanisms in pharmacy education. First, efficient services optimize learning time allocation, enabling students to focus on competency development rather than administrative procedures. This additional time is crucial for hands-on skills like pharmaceutical compounding, prescription analysis, and patient counseling that require extensive practice to achieve professional proficiency. Second, enhanced data accuracy and real-time tracking improve assessment quality and competency measurement precision. Unlike traditional manual systems that caused delayed feedback and assessment discrepancies, the digital infrastructure enables systematic competency monitoring aligned with national pharmaceutical practice standards and regulatory requirements. Third, efficient administration facilitates superior integration with industry partners and external practice sites. The system's capability to coordinate complex practicum schedules across multiple healthcare institutions ensures comprehensive exposure to diverse pharmaceutical environments, producing graduates with enhanced professional adaptation and competency achievement.

Meanwhile, a study from (Butarbutar, 2022) emphasized that the successful implementation of digital administration systems in health education depends on the suitability of the system design to the characteristics of the study program. The study found that special features such as practice scheduling, online logbook systems, and clinical practice evaluation reporting were instrumental in supporting service efficiency (Khalafi et al., 2023). This finding is relevant to the context of the D3 Pharmacy Study Program which also has complex administrative needs due to field practice and cooperation with external agencies such as pharmacies and hospitals.

Furthermore, research from (Setyorini, 2025) shows that the adoption of cloud-based digital academic systems can improve communication efficiency across academic work units. This finding provides an additional perspective that efficiency is not only related to direct services to students, but also involves the effectiveness of internal coordination between divisions in educational institutions. The online connected system allows each unit to access and process the same data simultaneously, thus accelerating the validation and decision-making process (Candra et al., 2025).

Support for the findings of this study is also obtained from the results of a study by (Rifai et al., 2025), which states that the successful implementation of a digital academic administration system is also influenced by the capabilities of human resources in operating the system. In institutions that provide regular training to system users, service efficiency tends to be higher than institutions that rely on users to learn independently. This provides an understanding that the development of digital systems must be accompanied by an active user involvement strategy so that the system is actually used optimally (Yulanda & Adnan, 2023). The relationship between service efficiency and academic quality in D3 Pharmacy programs demonstrates unique characteristics due to its competency-based framework requiring mastery of clinical assessment, pharmaceutical calculations, drug interaction analysis, and patient communication skills. Efficient academic services directly support these learning outcomes by ensuring seamless coordination between classroom instruction and clinical practice sites across community pharmacies, hospitals, and pharmaceutical industries. The digital system's real-time practicum scheduling and progress tracking enable systematic competency documentation that aligns with professional accreditation standards. Additionally, students' familiarity with digital academic systems translates directly to professional competency in modern pharmacy practice environments that increasingly rely on electronic health records, automated dispensing systems, and digital prescription processing. However, pharmacy education's unique requirements for both efficiency and precision create specific challenges. The complexity of pharmaceutical regulations and critical nature of patient

safety demand that efficient services maintain rigorous quality control measures, requiring continuous system refinement aligned with professional pharmacy practice standards.

When compared to the five previous studies, this research has a novelty contribution in two aspects. First, the focus of this research is on the context of pharmacy vocational education, which has higher service complexity than ordinary academic programs. Practicum, competency-based assessment, and external involvement make the need for efficiency very specific and challenging. Second, this study uses a linear regression-based empirical approach to quantitatively measure the level of influence of digital systems on service efficiency, so that the results are more measurable and can be used as the basis for institutional policy.

Digital academic administration systems cannot stand alone as a solution, but must be part of an integrated management strategy. Service efficiency depends not only on technology, but also on organizational readiness to adopt changes, technical training, and periodic evaluation of system performance. Therefore, the role of academic leaders is crucial in ensuring that digitization is aligned with the real needs of users and institutional goals.

The implications of this research are quite broad, especially for managers of vocational education such as the D3 Pharmacy Study Program. The results of this study provide an empirical basis that investment in the development and maintenance of digital academic administration systems can have a positive impact on the operational efficiency of educational services. Proper system implementation will help speed up the academic service process, reduce the burden of manual administration, and increase the transparency of academic information to students and lecturers. This research can also be used as a reference for other educational institutions that want to develop similar systems, especially in the context of health education. As a suggestion for future research, it is recommended to develop an evaluation model for digital academic administration systems that considers external factors such as institutional partnerships with industry and external information systems such as hospital or pharmacy information systems. In addition, longitudinal studies can also be conducted to see the long-term impact of digital systems on the quality of graduates and the accreditation process of study programs. Further research should also expand the research population to various levels of vocational education to get a more comprehensive picture of the effectiveness of digital systems in improving the efficiency of education services nationally.

CONCLUSION

Based on the results of the research conducted, it can be concluded that the implementation of a digital academic administration system in the D3 Pharmacy Study Program has a significant effect on increasing the efficiency of educational services. The implemented digital system is assessed by users, both students, lecturers, and education staff, to be able to simplify administrative processes that were previously manual, increase service speed, and provide real-time and transparent access to academic information. Correlation analysis showed a strong positive relationship between the quality of digital system implementation and the level of efficiency of education services, with a correlation coefficient of 0.682 and a high level of significance. This finding is reinforced by the simple linear regression analysis which shows that 46.5% of the variation in the efficiency of educational services can be explained by the implementation of digital academic administration systems. This means that the better the implementation of the digital system, the higher the efficiency achieved by the institution, especially in managing daily academic services.

The results of this study reveal that the ease of filling KRS, accessing grades, scheduling lectures and practicums, as well as other academic service requests becomes more efficient through digital systems. This has a direct impact on increasing user satisfaction, improving coordination between academic divisions, and reducing the administrative burden on education personnel. In competency-based pharmacy education, service efficiency directly translates to

enhanced academic output quality through optimized learning time allocation for critical pharmaceutical skills, improved real-time competency tracking aligned with professional standards, and better integration with clinical practice sites that ensures comprehensive professional preparation. The digital systems help maintain consistency in reporting and evaluating student activities while facilitating systematic competency achievement monitoring.

Digitalization of academic administration is an effective strategy to improve the operational efficiency of education, especially in study programs that have high service complexity. The findings are expected to serve as a reference for the development of academic information system policies in other vocational education environments, while encouraging the strengthening of digital infrastructure oriented towards fast, precise, and adaptive services to user needs. Based on these findings, concrete institutional policy recommendations include: (1) establishing dedicated budget allocation for system development and maintenance, (2) implementing structured digital competency training for all stakeholders, (3) developing formal integration protocols with industry partners, (4) establishing quarterly performance evaluations with measurable KPIs, and (5) adopting phased implementation strategies with clear timelines and milestones. These operational guidelines provide actionable frameworks that institutions can adapt for systematic digital transformation in vocational pharmacy education programs.

References

- Abasi, N., Azad, N., & Hafashjani, K. F. (2015). Information systems success: The quest for the dependent variable. *Uncertain Supply Chain Management*, 3(2). <https://doi.org/10.5267/j.uscm.2014.12.002>
- Ahmad Iman Waworuntu, Al Imran, & Satria Gunawan Zain. (2022). Pengembangan Sistem Informasi Manajemen Akademik Berbasis Google Workspace Di SMA PERGIS YAPKI Maros. *Information Technology Education Journal*, 1(3). <https://doi.org/10.59562/intec.v1i3.245>
- Alenezi, M. (2023). Digital Learning and Digital Institution in Higher Education. *Education Sciences*, 13(1). <https://doi.org/10.3390/educsci13010088>
- Alvarez-Sánchez, D., Velázquez-Victorica, K., Mungaray-Moctezuma, A., & López-Guerrero, A. (2023). Administrative Processes Efficiency Measurement in Higher Education Institutions: A Scoping Review. In *Education Sciences* (Vol. 13, Issue 9). <https://doi.org/10.3390/educsci13090855>
- Aprilia, G. (2024). Persepsi Mahasiswa Melalui Dialog Prodi Terhadap Peningkatan Kualitas Pelayanan Pendidikan. *Journal of Comprehensive Science*, 3(11 SE-Articles), 5165-5179. <https://doi.org/10.59188/jcs.v3i11.2888>
- Astuti, F. (n.d.). *PERANGKAT PEMBELAJARAN PIO 2024*.
- Bedi, P., Bowen, S., Fritz, J., & Lightfoot, C. (2023). 2024 EDUCAUSE Top 10# 6: Meeting Students Where They Are. *EDUCAUSE Review (Online)*.
- Butarbutar, S. V. (2022). E-Logbook Sebagai Aktivitas Pembuktian Kegiatan Klinis Perawat Melalui Rekam Medik Elektronik: Tinjauan Literatur. *Jurnal Ilmu Kesehatan Insan Sehat*, 10(1), 34-38. <https://doi.org/10.54004/jikis.v10i1.44>
- Candra, A., Maghfira, M., & Anisa, A. (2025). Pemanfaatan Teknologi Cloud Computing Untuk Efisiensi Proses Pengolahan Data Informasi Di Institut Teknologi Dan Bisnis Bina Adinata Bulukumba. *RIGGS: Journal of Artificial Intelligence and Digital Business*, 4(2), 4172-4177.
- Çelik, K., & Ayaz, A. (2022). Validation of the Delone and McLean information systems success model: a study on student information system. *Education and Information Technologies*, 27(4). <https://doi.org/10.1007/s10639-021-10798-4>
- Chen, E. Y. H., Forrester, C., McEvoy, A. M., & Singleton, J. (2023). Pharmacy students' perceptions on environmental sustainability in pharmacy education and practice. *Exploratory Research in Clinical and Social Pharmacy*, 12. <https://doi.org/10.1016/j.rcsop.2023.100366>
- Fadhl, S. M. (2024). *Digitalisasi berbasis Sistem Informasi dan Administrasi Guru Agama (SIAGA) dalam upaya meningkatkan layanan administrasi guru agama: Studi kasus di Kementerian Agama Kota Pasuruan*. Universitas Islam Negeri Maulana Malik Ibrahim.
- Febriani, A. (n.d.). *BUKU AJAR PENGANTAR ILMU FARMASI*.
- Fernández, A., Gómez, B., Binjaku, K., & Meçe, E. K. (2023). Digital transformation initiatives in higher education institutions: A multivocal literature review. *Education and Information Technologies*, 28(10).

- <https://doi.org/10.1007/s10639-022-11544-0>
- García-Morales, V. J., Garrido-Moreno, A., & Martín-Rojas, R. (2021). The transformation of higher education after the COVID disruption: Emerging challenges in an online learning scenario. *Frontiers in Psychology*, 12, 616059.
- Gkrimpizi, T., Peristeras, V., & Magnisalis, I. (2023). Classification of Barriers to Digital Transformation in Higher Education Institutions: Systematic Literature Review. In *Education Sciences* (Vol. 13, Issue 7). <https://doi.org/10.3390/educsci13070746>
- Guo, L., Li, P., Mao, S., Zhong, H., Zhang, Q., Zhang, R., Yan, R., & Liu, Y. (2024). Innovation and evaluation of vocational pharmaceutical education system under the 1 + X certificate system in China. *Currents in Pharmacy Teaching and Learning*, 16(7), 102090. <https://doi.org/https://doi.org/10.1016/j.cptl.2024.04.006>
- Gupta, Y., Khan, F. M., & Agarwal, S. (2021a). Exploring factors influencing mobile learning in higher education-A systematic review. *International Journal of Interactive Mobile Technologies*, 15(12). <https://doi.org/10.3991/ijim.v15i12.22503>
- Gupta, Y., Khan, F. M., & Agarwal, S. (2021b). Exploring Factors Influencing Mobile Learning in Higher Education - A Systematic Review. *International Journal of Interactive Mobile Technologies*, 15(12). <https://doi.org/10.3991/ijim.v15i12.22503>
- Handayani, S. (2020). Tingkat Kepuasan Mahasiswa Terhadap Pembelajaran Dan Layanan Akademik Di Akper Giri Satria Husada Wonogiri. *Jurnal Keperawatan GSH*, 9(2).
- Johnes, J., Portela, M., & Thanassoulis, E. (2017). Efficiency in education. *Journal of the Operational Research Society*, 68(4). <https://doi.org/10.1057/s41274-016-0109-z>
- Kayanja, W., Kyambade, M., & Kiggundu, T. (2025). Exploring digital transformation in higher education setting: the shift to fully automated and paperless systems. *Cogent Education*, 12(1), 2489800. <https://doi.org/10.1080/2331186X.2025.2489800>
- Kemp, A., Palmer, E., Strelan, P., & Thompson, H. (2024). Testing a novel extended educational technology acceptance model using student attitudes towards virtual classrooms. *British Journal of Educational Technology*, 55(5). <https://doi.org/10.1111/bjet.13440>
- Khalafi, A., Jamshidi, N., Khajeali, N., & Ghanbari, S. (2023). Effect of a smartphone-based online electronic logbook to evaluate the clinical skills of nurse anesthesia students in Iran: a randomized controlled study. *Journal of Educational Evaluation for Health Professions*, 20. <https://doi.org/10.3352/jeehp.2023.20.10>
- Khasanah, K., Ananta, I. G. B. T., Herlina, N., Yulianita, Y., Ambarwati, R., Sri, T., Wulandari, A., & Wahyuningrum, C. (2025). *Buku Ajar Pengantar Ilmu Farmasi*. PT. Sonpedia Publishing Indonesia.
- Meilani, L., Suroso, A. I., & Yuliati, L. N. (2020). Evaluasi Keberhasilan Sistem Informasi Akademik dengan Pendekatan Model DeLone dan McLean. *JURNAL SISTEM INFORMASI BISNIS*, 10(2). <https://doi.org/10.21456/vol10iss2pp137-144>
- Meilinda, V., Pasha, C., & Zuhriyah, N. F. (2025). The Impact of E-Learning Platforms on Student Engagement and Academic Achievement: Dampak Platform E-Learning terhadap Keterlibatan Siswa dan Prestasi Akademik. *Jurnal MENTARI: Manajemen, Pendidikan Dan Teknologi Informasi*, 3(2), 157-167.
- Mohamed Hashim, M. A., Tlemsani, I., & Matthews, R. (2022). Higher education strategy in digital transformation. *Education and Information Technologies*, 27(3), 3171-3195. <https://doi.org/10.1007/s10639-021-10739-1>
- Noorashid, N. A., Pendidikan, F., & Sosial, S. (2019). REVOLUSI INDUSTRI 4.0: IMPAK TERHADAP PERKEMBANGAN PENDIDIKAN TINGGI DI MALAYSIA. In *Journal of Sciences and Management Research*.
- Rapanta, C., Botturi, L., Goodyear, P., Guàrdia, L., & Koole, M. (2020). Online university teaching during and after the Covid-19 crisis: Refocusing teacher presence and learning activity. *Postdigital Science and Education*, 2(3), 923-945.
- Rifai, A., Hayat, H., & Anadza, H. (2025). Kualitas Pelayanan Administrasi Terpadu Kecamatan dalam Optimalisasi Pelayanan Publik:(Studi pada Kantor Kecamatan Kalidawir, Kabupaten Tulungagung). *JOURNAL OF ADMINISTRATIVE AND SOCIAL SCIENCE*, 6(2), 269-285. <https://doi.org/10.55606/jass.v6i2.2044>
- Rosita, L. (2020). *Analisis Strategi Persiapan APT 3.0 dan Sertifikasi AUN-QA di Universitas Ciputra Surabaya*. Institut Teknologi Sepuluh Nopember.
- Santoso, S., Nurjaman, J., Saepul, N., & Rahmad, A. (2023). Pengembangan Sistem Informasi Manajemen Rumah Sakit Jiwa dan Ketergantungan Obat Engku Haji Daud Tanjung Uban Provinsi Kepulauan Riau.

- Jurnal Teknologi Dan Sistem Informasi*, 14(02), 11-15.
- Setyorini, S. (2025). Implementasi Sistem Informasi Akademik Berbasis Cloud untuk Meningkatkan Efisiensi Administrasi Akademik. *JATISI (Jurnal Teknik Informatika Dan Sistem Informasi)*, 12(2). <https://doi.org/10.35957/jatisi.v12i2.9227>
- Singun, A. J. (2025). Unveiling the barriers to digital transformation in higher education institutions: a systematic literature review. *Discover Education*, 4(1), 37. <https://doi.org/10.1007/s44217-025-00430-9>
- Taufik, A., Budiyantra, A., & Husain, T. (2021). Pelatihan Manajemen Administrasi Pendidikan Dan Sistem Informasi Akademik Kepada Tenaga Kependidikan Di Direktorat Pendidikan Idrisiyyah Tasikmalaya. *Jurnal Pusat Pengabdian Kepada Masyarakat*), 5(2).
- Van De Werfhorst, H. G., Kessenich, E., & Geven, S. (2022). The digital divide in online education: Inequality in digital readiness of students and schools. *Computers and Education Open*, 3, 100100.
- Yulanda, A., & Adnan, M. F. (2023). Transformasi digital: Meningkatkan efisiensi pelayanan publik ditinjau dari perspektif administrasi publik. *Jurnal Ilmu Sosial Dan Humaniora*, 1(3), 103-110.