JURNAL UPI

JURNAL ADMINISTRASI PENDIDIKAN

Journal homepage: http://ejournal.upi.edu/index.php/JAPSPs

DIGITAL TRANSFORMATION OF VOCATIONAL SCHOOL MANAGEMENT: INCREASING SCHOOL ACADEMIC SERVICES EFFECTIVELY?

Josephine Halcynon Sinaga [1], Aan Komariah [2], Nugraha Suharto [3]*

Faculty of Educational Science, Universitas Pendidikan Indonesia, Indonesia

Correspondence: *E-mail: jaophine98@upi.edu

A B S T R A C T S

The purpose of this article is to find out how management in Vocational High Schools (SMK) in school academic services is in accordance with the current era. The research method used is the literature study method. Data collection techniques by collecting and analyzing documents related to guidelines, management documents in several SMKs in Sukabumi. The school management aspect has reached digital status, although not all indicators of each aspect of school management are digital-based. Three vocational high school managements can be categorized in the digital transformation process. Like the implementation of MIS (Management Information System - MIS) owned by each school, it is already an initial step for digital transformation in the field of school management. School management and academic services that are based on digital technology are profoundly interconnected and effectively increase school academic services. By automating administrative functions, offering real-time access to academic information, and facilitating personalized learning experiences, digital management systems significantly enhance the provision of academic services. These systems not only boost communication, transparency, and efficiency but also enable data-driven decision-making, tailored support, and ongoing enhancement of both teaching and learning processes.

Keyword: Academic Services, Vocational School(SMK) Management, Digital Transformation.

A R T I C L E I N F O

Article History:
Submitted/Received
First Revised
Accepted
First Available online
Publication Date

1. INTRODUCTION

Digital transformation-based vocational high school management in the current era is very necessary in improving academic services (Fengchaoa and Mingchi, 2023). One of the pillars of Indonesia Emas 2045 is human development and mastery of IPTEK (Ilmu Pengetahuan dan Teknologi – Science and Technology). This pillar is realized by increasing the level of education of the Indonesian people evenly (Bappenas, 2019). This embodiment is realized through formal educational institutions, one of which is Vocational High Schools (SMK –Sekolah Menengah Kejuruan). SMK prepares students to work in certain fields (Sudradjat and Djanegara, 2020). SMK focus more on vocational education which aims to train students to have practical skills and be ready to work after graduating. SMK graduates can also continue their education at the University level.

SMK graduates must have competencies that are integral to the needs of the workforce. The national and international job market has changed, especially changes occurring from digital technology that is moving from 4.0 to 5.0 (Maudisha, 2024). The development of digital technology in the world of work must be integral to the competency of vocational school graduates to participate in the development and equalization of education in Indonesia. Improving graduate competency is one of the results of the goals of effective school management.

The scope of school management studies based on the object of work consists of student management, school personnel management, curriculum management, facilities and infrastructure management, financial management, and public relations and cooperation management (Kurniawan et al., 2019). In managing school management, information is needed on the results of the process of various data that has been collected by the school. School management with accurate data can be used in the decision-making process. The use of Management Information Systems (MIS) in school management has grown rapidly along with the development of the information technology era.

Many journal articles discuss the importance of MIS in school management. As Loryana and Haq (2022) said, the implementation of Management Information Systems during the Covid-19 pandemic has had many positive implications for school institutions, especially in optimizing and improving educational services. Sianturi et al (2023) said that although SIM plays an important role in supporting decision making and improving the quality of education, it requires a combination of theoretical knowledge and experience of the principal as a leader in the unique situation of the school. Sirojuddin et al (2022) revealed that SIM can also be developed to create and analyze various alternatives in solving problems which can then be used as a basis for decision making which is called a decisive supporting system (DSS). Although in the field the use of this system is still limited to certain fields.

Legistia (2022) explains that in terms of academic quality, both in terms of process, content and assessment standards, this SIM application can guarantee quality service satisfaction to students and parents, and help administrators, teachers and students view information. IMD (International Institute for Management Development), which researches digital competitiveness on an international scale, explains that Indonesia is ranked 45th out of 65 countries, with 11th out of 14 countries on the Asia-Pacific scale. Of the three categories reviewed (knowledge, technology, and future readiness), technology factors and Indonesia's future digital readiness have increased over the past 5 years. The digital knowledge factor is Indonesia's weakness, seen from Indonesia's stuck ranking on the international scale.

There are 14,265 vocational schools consisting of public and private schools. In general, vocational schools in Indonesia have various fields of science, engineering and engineering, information and communication technology, health and social work, agribusiness and agrotechnology, energy and mining, maritime, business and management, tourism, also arts and creative industries. This research will focus on three scientific fields with three different vocational schools, namely information and communication technology (ICT) at Pasim Plus Vocational School, Sukabumi City, health and social work at Al Junaediyah IT Vocational School, Sukabumi Regency, and the field of agrotechnology at SMKN 1 Cibadak Sukabumi.

Digital transformation plays a crucial role in enhancing academic services across various fields such as IT, health, and agrotechnology. Research indicates that the successful management of digital transformation in schools involves key aspects such as strategy and leadership, digital competencies, culture, and the integration of information technology into education (Martina et al., 2022; Pata et al., 2021; Fengchao and Mingchi, 2023). The process includes implementing digital technologies for information management, automating tasks, and fostering electronic communication systems (Aceto et al., 2019). Furthermore, the era of Internet education emphasizes the importance of school leaders promoting digital transformation, integrating technology into teaching, and innovating educational management mechanisms to improve service levels and learning environments (Fengchaoa and Mingchi, 2023). By embracing digitalization, schools can offer improved access to education, integrate modern technologies into teaching, and enhance decision-making processes, ultimately contributing to economic growth and sustainable development (Bitchikashvili et al., 2023).

This research aims to explain how Vocational High School (SMK) management is based on digital transformation in improving academic services in the scientific fields of ICT, health and agrotechnology in accordance with the current era. The novelty of this research lies in the discussion of school management in the scientific fields of ICT, health and agrotechnology in three schools in the city and district of Sukabumi. To move towards an Indonesia Emas 2045, schools as the front guard in human development and mastery of science and technology need to establish digital-based school management. School management includes the school's vision, mission and goals, strategic plans, curriculum, learning, educators and education staff, students, finance, DU/DI (Dunia Usaha/Dunia Industri – Business World/Industrial World), and facilities and infrastructure. In digital transformation school management is not only in terms of facilities and infrastructure, but schools must be able to manage human resources so that they have digital literacy and mindset.

2. RESEARCH METHODS

2.1. Research Design and Context

This research uses a qualitative method with a descriptive approach by capturing current events and the researcher tries to describe them as they are. This method was chosen because it allows researchers to explore the “how”, “what”, or “when” of a phenomenon making it valuable in uncovering deep insights. Qualitative approaches emphasize quality by focusing on the subject's processes, meaning, and conceptual details, which are important in capturing the richness and complexity of human experience and perspective.

This research was conducted at three vocational high schools in Sukabumi, West Java, Indonesia. The schools chosen were SMKS Pasim Plus Sukabumi, SMKN 1 Cibadak Sukabumi, and SMKS IT Al Junaediyah. These three schools were chosen based on the different scientific fields between the three schools. Apart from that, the three schools also have "A" accreditation (recognized to be of very good standard in Indonesia), which means researchers hope that management in these schools will be digital-based.

2.2. Partisipant

This research involved several individuals. The selection of informants was carried out using a purposive sampling technique (based on a consideration, such as the characteristics or nature of a population). The selection of participants was based on the major that the researcher took as an illustration of the school being researched, with the hope that the individual selected was the person who best knew what the researcher hoped for. So the sources of data collection in this research were the deputy principal, head teacher of the department, and students from the same department as the head teacher. The informants used in this research are described in detail in **Table 1** below.

Table 1. Description of Participants for Research

Origin of School	Department	Participant	Code
SMKN 1 Cibadak Sukabumi	Agricultural Product Technology	Vice Principal for Curriculum	VP (R04)
		Head Teacher of Department	HT (R01)
		Student	ST (K01)
SMKS Pasim Plus Sukabumi	Software and Game Development	Vice Principal for Curriculum	VP (R05)
		Head Teacher of Department	HT (R02)
		Student	ST (K02)
SMKS IT Al Junaediyah	Nurse Assistant	Vice Principal for Curriculum	VP (R06)
		Head Teacher of Department	HT (R03)
		Student	ST (K03)
Number of participants			**9 Participant**

2.3. Data Collection

Data collection was carried out through interviews and direct observation at school. The instrument used was an interview sheet containing a list of questions, then a voice recording device to assist researchers in completing unwritten answers. The list of questions was developed based on aspects and indicators of digital transformation-based school management and school academic services.

Aspects of school management consist of policies, curriculum, human resources, infrastructure, student and school achievements, the absorption capacity of continuing graduates, as well as DU/DI (Business World/Industrial World). The aspect of digital transformation-based school management that is researched is how schools adopt technology and integrate it into every aspect of school management. Of course, school academic services cannot be separated from school management. Aspects of school academic services can be seen from KPI (Key Performance Indicator) which consists of academic performance, student progress, stakeholder satisfaction, facilities and infrastructure, administrative efficiency, professional development and support, extracurricular activities, post-graduate results, security and welfare, innovation and improvement sustainability, and

budget management. Through the key performance indicators owned by each school, the effectiveness of various aspects in the delivery of education can be seen. Schools that have systems capable of adopting technology in operational system management and integrating technology in teaching and learning strategies will have an impact on improving school academic services. Observations were carried out by observing the situation that occurred in the field, what was observed was the learning process using digital technology, the digital infrastructure in the school, the school website, and the MIS (Information and Management System) owned by the school.

2.4. Data Anaysis

Data analysis in this research was carried out using atlas.ti software. Atlas.ti is software that can help organize, code and analyze research data in an efficient and structured manner. *First*, the results of the interview are in the form of document transcripts which are imported into the atlas.ti software. Then the answers to interview questions that are deemed necessary to be used as quotations are marked into a code. *Second*, categorize aspects of school management based on digital transformation and school academic services then enter these aspects into group codes. *Third*, the code that has been marked at the beginning of the quotation is connected to the aspects concerned into a code group. Codes that are relevant to (code groups) are given the same color, while codes that are not relevant will form new findings from the research. *Fourth*, these categories are organized into three titles: digital transformation-based school management, school academic services, and findings. Categorization is made into a network to create a chart like a concept map. The concept map in question is the relationship between categorization or findings that have been made and explained which states that there is a meaningful path between categorization concepts.

3. RESULTS AND DISSCUSION

3.1 Results

The results of this research consist of 3 points, namely school management based on digital transformation, school academic services, and school management based on digital transformation in improving academic services.

3.1.1. School Management

Based on the insights gathered from the conducted interviews, the informant's responses are illustrated in accordance with the aspects of school management, as shown in the following Atlas.ti figures below (**Figures 1 and 2**).

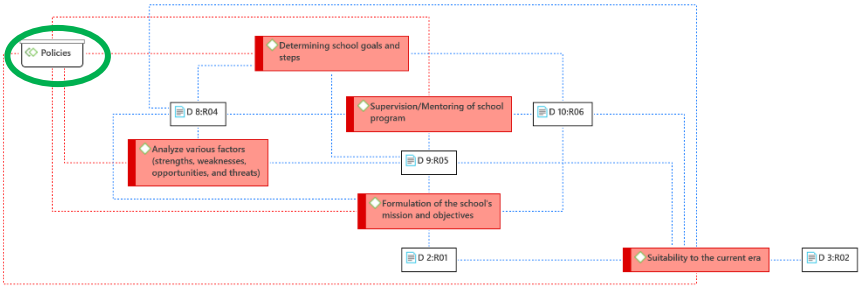

Figure 1. Policies Aspect (Source : Author, create by atlas.ti)

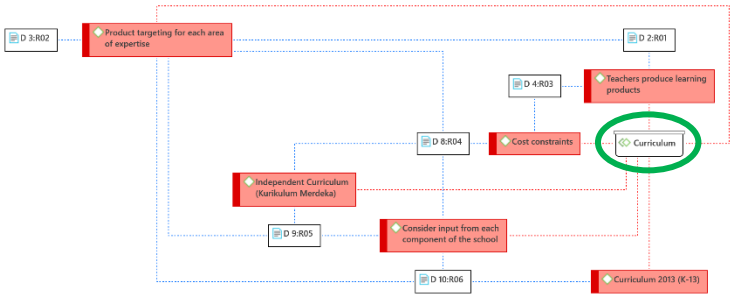

Figure 2. Curriculum Aspect (Source : Author, create by atlas.ti)

There are 5 policy aspects, namely (1) Suitability to the current era; (2) Formulation of the school's mission and objectives; (3) Determining school goals and steps; (4) Analyze various factors (strengths, weaknesses, opportunities, and threats); (5) Supervision/Mentoring of school programs. In **Figure 1**, there are five policy aspects owned by 3 vice principals and 2 Head Teachers of Department. Only the Head Teacher of Nurse Assistant Department does not have a policy aspect.

There are 5 curriculum aspects, namely (1) Curriculum 2013 (K-13) or Independent Curriculum (Kurikulum Merdeka); (2) Cost constraints; (3) Product targeting for each area of expertise; (4) Consider input from each component of the school; (5) Teachers produce learning products. In Figure 2, SMKS IT Al Junaediyah is the only school that uses the 2013 curriculum (K-13). While the other 2 schools use the Independent Curriculum. The Cost Constraint Aspect owned by SMKS IT Al Junaediyah and SMKN 1 Cibadak Sukabumi. Meanwhile, for the aspect of teachers producing learning products, the Head Teacher of the Software and Game Development Department does not yet have one.

The next aspect is Human Resources and Infrastructure as shown in **Figures 3 and 4** below.

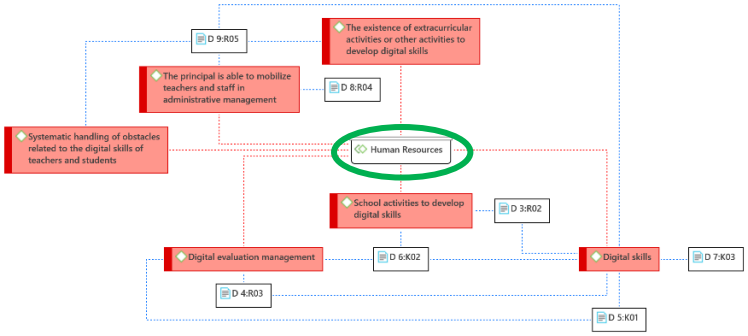

Figure 3. Human Resources Aspect (Source : Author, create by atlas.ti)

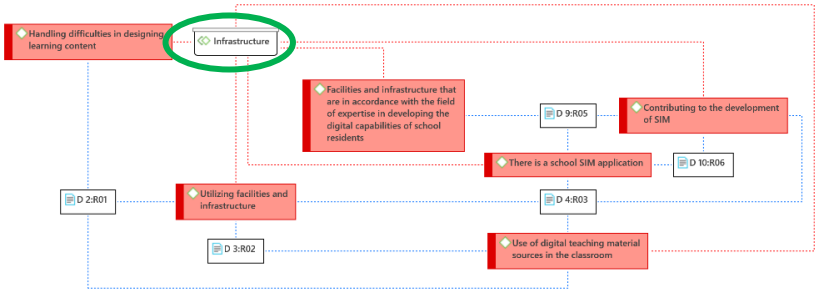

Figure 4. Infrastructure Aspect (Source : Author, create by atlas.ti)

There are 6 aspects of Human Resources that are expected to be possessed by SMK teachers and students, namely (1) Digital skills; (2) School activities to develop digital skills; (3) Digital evaluation management; (4) The principal is able to mobilize teachers and staff in administrative management; (5) Systematic handling of obstacles related to the digital skills of teachers and students; (6) The existence of extracurricular activities or other activities to develop digital skills. In **Figure 3**, all student respondents have digital skills, while the Head Teacher of Agricultural Product Technology Department respondent explained that students from his department have better digital skills. The vice principal of SMKS Pasim Plus Sukabumi is the most dominant in having human resource aspects related to digital compared to the other two schools.

For the Infrastructure aspect, there are 6 aspects, namely (1) Facilities and infrastructure that are in accordance with the field of expertise in developing the digital capabilities of school residents; (2) There is a school driving license application; (3) Utilizing facilities and infrastructure; (4) Contributing to the development of SIM; (5) Use of digital teaching material sources in the classroom; (6) Handling difficulties in designing learning content. In **Figure 4**, the Facilities and infrastructure aspect that is in accordance with the field of expertise in developing the digital capabilities of school residents is only owned by SMKS Pasim Plus Sukabumi. However, the other two schools have aspects of handling difficulties in designing learning content, which SMKS Pasim Plus Sukabumi does not yet have.

The next aspect is Student and School Achievements as shown in **Figure 5** below.

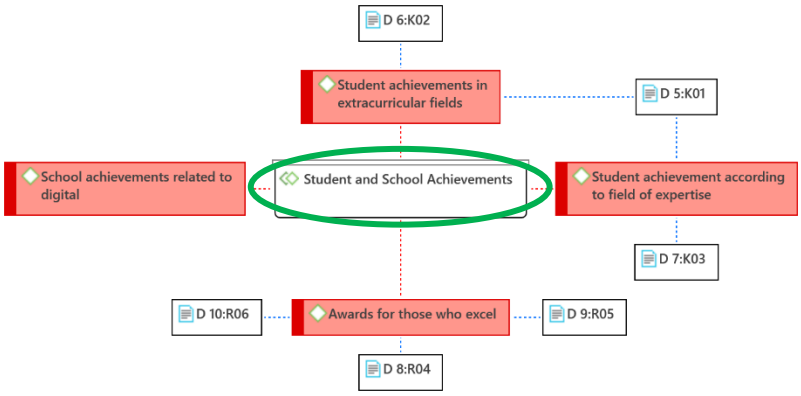

Figure 5. Student and School Achievements Aspect (Source: Author, create by atlas.ti)

The aspect of Student and School Achievement, there are 4 aspects, namely (1) Student achievement according to the field of expertise; (2) Student achievement in extracurricular fields; (3) Awards for achievers; (4) School achievements related to digital. In **Figure 5**, all schools provide awards for achievers. However, no school has achievements related to digital skills. The achievements of the school are related to student achievements according to the field of expertise or/and extracurricular fields.

The next aspect is The Absorption Capacity of Continuing Graduates as shown in **Figure 6** below.

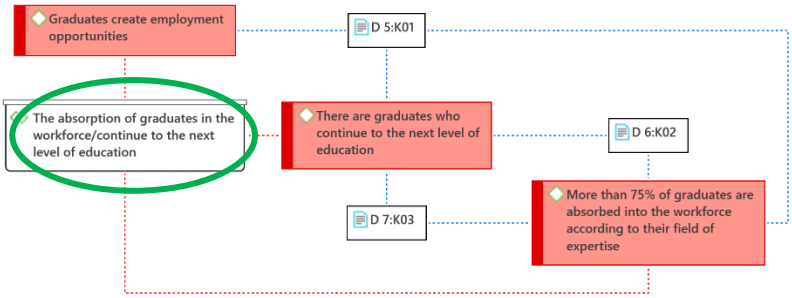

Figure 6. The Absorption Capacity of Continuing Graduates Aspect (Source : Author, create by atlas.ti)

There are 3 aspects in the Graduate Absorption Capacity Aspect, namely (1) Graduates create jobs; (2) More than 75% of graduates are absorbed by the workforce according to their field of expertise; (3) There are graduates who continue to the next level of education. In **Figure 6**, students of the Agricultural Product Technology Department fulfill all aspects of graduate absorption capacity. For students of the Software and Game Development Department and the Nursing Assistant Department, the aspect of the graduates creating jobs has not been fulfilled.

The next aspect is DU/DI (Dunia Usaha/Dunia Industri – Business World/Industrial World) Program as shown in **Figure 7** below.

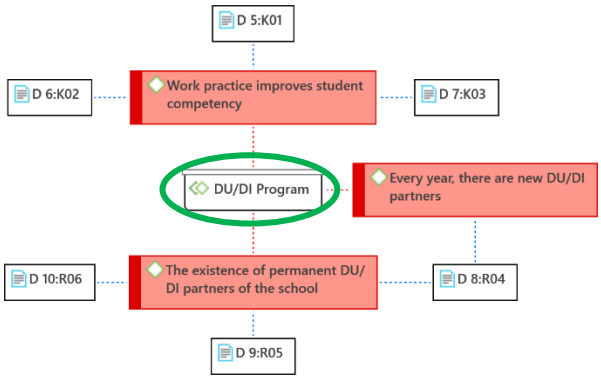

Figure 7. DU/DI Program Aspect (Source : Author, create by atlas.ti)

There are 3 aspects of the DU/DI program, namely (1) Work practices improve student competency; (2) Every year there are new DU/DI partners; (3) The existence of permanent DU/DI school partners. In **Figure 7**, all schools carry out work practices to improve student competency and all schools have permanent partners for the DU/DI program. However, only SMKN 1 Cibadak Sukabumi always has prospective partners who want to collaborate every year.

3.1.2. School Academic Services

There are several aspects of school academic services, including curriculum and study plan, assessment and evaluation, work practice and internship programs, guidance and counseling, teacher training and development, facilities and extracurricular activities. In the field of school academic services, five distinct dimensions are evident in all aspects of these services, specifically tangible elements, reliability, responsiveness, assurance, and empathy. The following illustrates the results of interviews with informants using Atlas.ti. For each dimension of the curriculum & study plan and guidance & counseling aspects are depicted in **Figure 8** below.

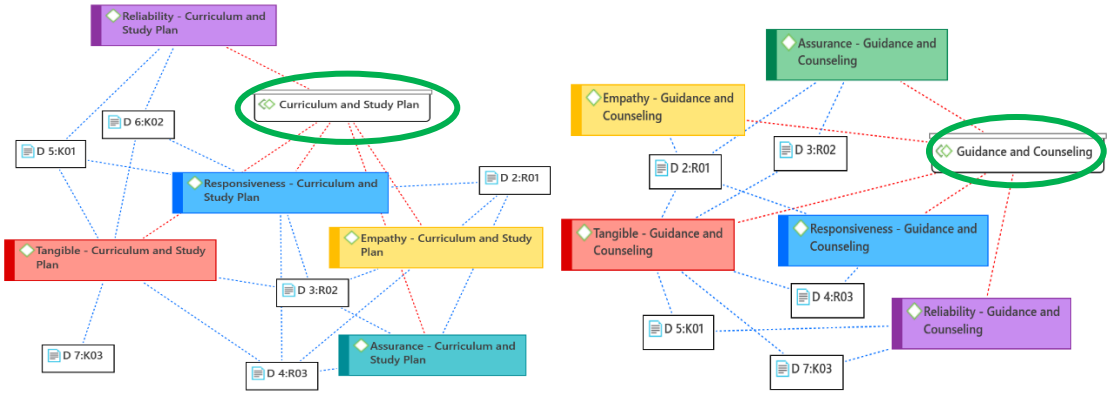

Figure 8. Curriculum & Study Plan and Guidance & Counseling Aspects (Source : Author, create by atlas.ti)

When viewed from **Figure 8**, for the Curriculum and Study Plan aspects, the reliability dimension is only owned by 2 students. While for the tangible dimension, it is felt by student and teacher respondents from all schools. In the Guidance and Counseling aspect, the empathy dimension is only felt by 1 student, namely from SMKN 1 Cibadak Sukabumi. While the tangible dimension is felt by all respondents except students from SMKS Pasim Plus Sukabumi.

Vocational schools have different assessment and evaluation from high schools. Vocational schools have additional aspects, namely work practice and internship programs. Both aspects with five dimensions are depicted in **Figure 9** below.

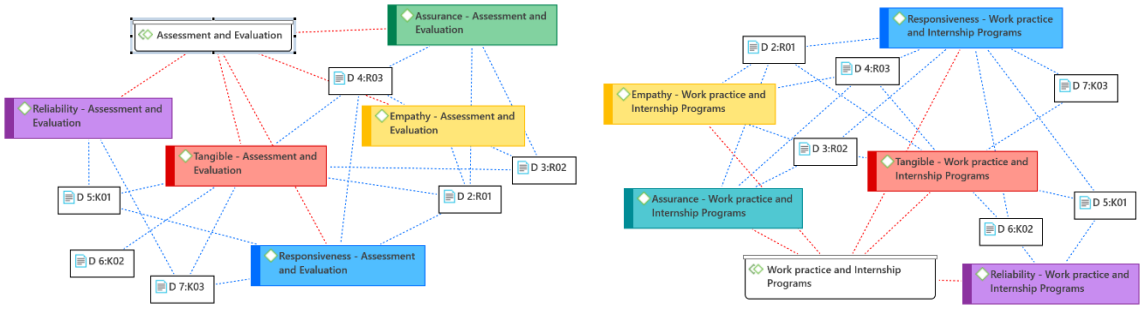

Figure 9. Work Practice & Internship Programs and Guidance & Counseling Aspects (Source : Author, create by atlas.ti)

As seen from **Figure 9**, for the Curriculum and Study Plan aspects, the reliability dimension is only owned by 2 students. While for the tangible dimension, it is felt by student and teacher respondents from all schools. In the Guidance and Counseling aspect, the reliability dimension is only owned by 2 students. While for the tangible and responsiveness dimensions, it is felt by student and teacher respondents from all schools.

Facilities and extracurricular activities of vocational schools are expected to improve social and professional skills development focused on expertise and practical skills. the five dimensions for the facilities and extracurricular activities aspects studied are depicted in **Figure 10** below.

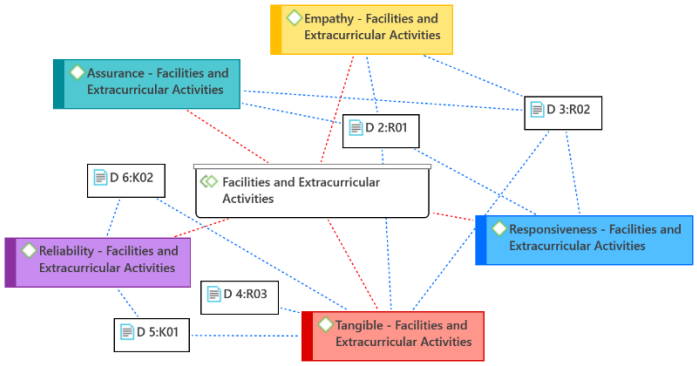

Figure 10. Facilities and Extracurricular Activities Aspect (Source : Author, create by atlas.ti)

It can be seen from Figure 10 that only the tangible dimension is felt by all schools (except one respondent student from SMKS IT Al Junaediyah). Meanwhile, for the other four dimensions, only two schools have them for the facilities and extracurricular activities aspect.

3.1.3. School Management Based on Digital Transformation in Improving Academic Services

Overall, the school management aspect has reached digital status. Where the digital aspect has existed in policies, curriculum, human resources, infrastructure, student and school achievements, the absorption capacity of continuing graduates, as well as DU/DI (Business World/Industrial World). Although not all indicators of each aspect of school management are digital-based, from interviews and observations conducted, the three school managements can be categorized in the digital transformation process. Like the implementation of SIM (Management Information System - MIS) owned by each school, it is already an initial step for digital transformation in the field of school management. Where MIS is a school academic service that is accessed by every school member.

Of course, to implement school management based on digital transformation requires careful planning related to human resources, facilities, and sufficient funds. Funding constraints are the most common thing found by school stakeholders in achieving the expected digital transformation-based school management. Like SMKN 1 Sukabumi, which said that the digital parking design in collaboration with a university had to be postponed due to insufficient funds in implementing the design.

In essence, school management and academic services that are based on digital technology are profoundly interconnected. By automating administrative functions, offering real-time access to academic information, and facilitating personalized learning experiences, digital management systems significantly enhance the provision of academic services. These systems not only boost communication, transparency, and efficiency but also enable data-driven decision-making, tailored support, and ongoing enhancement of both teaching and learning processes. In today's digital era, educational institutions that adopt these technologies are more effectively equipped to address the changing needs of students and ensure a high standard of education.

3.2. Disscusion

Digital transformation in school management is crucial for enhancing academic services in vocational schools. It facilitates improved educational quality, operational efficiency, and better resource allocation, ultimately leading to a more effective learning environment. Digital transformation optimizes educational resources, fostering innovation

and meeting social needs (Yu, 2024). The implementation of Management Information Systems (MIS) has shown to enhance educational administration and decision-making, leading to high user satisfaction and effectiveness (Idroes et al., 2023).

Other aspects such as automation of routine tasks and the establishment of electronic communication systems streamline school management processes (Ibrahim et al., 2020). The use of knowledge graphs in vocational education has demonstrated a significant reduction in error rates and improved student performance, indicating a more personalized learning experience (Ning et al., 2024). Successful digital transformation requires the involvement of all stakeholders, including school management and teachers, to ensure effective communication and collaboration (Rauseo et al., 2022). Conversely, while digital transformation offers numerous benefits, challenges such as resistance to change and the need for adequate training can hinder its implementation. Addressing these issues is essential for maximizing the potential of digital tools in vocational education.

School management at SMK Pertanian Negeri 1 Sumedangis based on digital transformation. Smart farming utilizes IoT for real-time monitoring and control, enhancing productivity and efficiency in agriculture (Halawa, 2024). The adoption of smart farming technologies can attract younger generations to agriculture, fostering innovation and entrepreneurship in the sector (Halawa, 2024). Apart from Smart Farming Implementation, there is also Digital Marketing Education. Programs aimed at improving digital marketing skills among students have shown positive results, with a notable increase in proficiency post-training (Nofitasari et al., 2023). Digital marketing empowers students to effectively promote agricultural products, expanding market access and enhancing economic opportunities (Nofitasari et al., 2023). Despite the potential benefits, challenges such as resistance to change and the need for comprehensive training programs persist. Addressing these issues is crucial for successful digital transformation in agricultural education (Prasetyaningtyas et al., 2022).

School management at SMK Kesehatan Cahaya Bangsa Indonesia is based on digital transformation. Nursing programs must incorporate informatics and digital health technologies to prepare graduates for modern healthcare systems (Kunkel et al., 2023). Digital Health Competencies have been developed to guide nursing educators in embedding these competencies into curricula, ensuring that students acquire necessary skills (Kunkel et al., 2023). Digital Health Competencies have been developed to guide nursing educators in embedding these competencies into curricula, ensuring that students acquire necessary skills (Kunkel et al., 2023). Apart from Digital Health Competencies, there are aspects such as Innovative Educational Models. The Merdeka Belajar curriculum promotes partnerships between vocational schools and industries, emphasizing co-designed curricula and dual apprenticeship programs (Ahmad et al., 2024). These models enhance practical skills and real-world project integration, which are essential for nursing students to thrive in a digital environment (Ahmad et al., 2024). Despite the potential benefits, there are challenges in faculty knowledge and the rapid evolution of technology in healthcare (Kunkel et al., 2023). Addressing these gaps through targeted faculty development initiatives is essential for successful digital transformation in nursing education (Wang, 2023). While the focus on digital transformation is vital, it is equally important to consider the potential resistance from educators and institutions that may be hesitant to adopt new technologies and teaching methods. This resistance can hinder the overall effectiveness of the transformation efforts.

Digital-based school management is important for improving the academic services of vocational schools. Things that have been achieved such as (1) Administrative Efficiency; (2) Better Academic Data Management; (3) Increasing Student Access and Involvement; (4) Personalization of Learning; (5) Innovation in Extracurricular and Skills Development. What respondents want to achieve in this digital transformation-based school management is further Integration with Industry and the world of work and provision of digital certification and accreditation. One of the important elements of vocational education is to provide students with skills that are recognized in the world of work. Digital-based school management allows the issuance of digital certificates or even accreditation from related institutions that can help students prove their skills to prospective employers.

4. CONCLUSION

The school management of each school studied has adopted and integrated digital technology into its operational systems and teaching and learning strategies to improve the overall quality of education. The school's academic services provide education and training that prepares students to enter the workforce with their technical and professional skills.

Digital transformation-based school management in vocational schools is essential to support operational efficiency, improve teaching quality, and strengthen relationships with industry and the world of work. By utilizing technology, vocational schools can provide more modern, relevant, and responsive academic services to student needs and industry developments. In addition, digital transformation also allows schools to optimize resource use, accelerate decision-making, and increase student engagement in learning.

5. SUGGESTIONS

This study does have some limitations. Firstly, the school under examination is relatively small and subject to ongoing changes. Secondly, while Atlas.ti software is utilized for data processing, it has its drawbacks; it serves merely as a basic tool for straightforward tasks and does not conduct in-depth analysis, which necessitates researchers to possess a substantial vocabulary for coding. Thirdly, subsequent research concerning digital transformation in school management should employ a mixed-method approach, encompassing a broader range of schools and utilizing more comprehensive research instruments. This would enable the outcomes derived from interviews, observations, and documentation to more accurately reflect the genuine circumstances of digitally transformed school management. Are there additional factors beyond digital transformation in school management that could enhance academic services, or are there effective strategies for school management that can also improve academic services? Thus, further investigation into school academic services is essential to identify other barriers within digital transformation in school management, as well as to determine if there are further challenges that schools face in achieving effective digital transformation management.

6. REFERENCES

Aceto, G., Persico, V., & Pescapé, A. (2019). A survey on information and communication technologies for industry 4.0: State-of-the-art, taxonomies, perspectives, and challenges. *IEEE Communications Surveys & Tutorials*, *21*(4), 3467-3501.

Ahmad, D., Mahir, I., & Prihantono, C. R. (2024). Innovative models for SMK and industry partnerships aligned with the merdeka belajar curriculum. *Journal of Pedagogi*, *1*(3), 49-60.

BAPPENAS. (2019). *PPt Ringkasa Eksekutif Visi Indonesia 2045*, Perpustakaan BAPPENAS [Online]. Available: https://perpustakaan.bappenas.go.id/e-library/file_upload/koleksi/migrasi-data-publikasi/file/Policy_Paper/Ringkasan%20Eksekutif%20Visi%20Indonesia%202045_Final.pdf [accessed on April 28th 2024].

Bitchikashvili, T., Petriashvili, L., & Jang, L. K. (2023). Digitalization of management of a higher educational institution, national and international challenges and ways of solution. *World science*, *3* (81), 12-19.

Fengchao, X., and Mingchi, J. (2023). School leadership and management innovation in the internet education era. *International Journal of New Developments in Education, 5*(12), 28-34.

Halawa, D. N. (2024). Peran teknologi pertanian cerdas (smart farming) untuk generasi pertanian Indonesia. *Jurnal Kridatama Sains dan Teknologi*, *6*(2), 502-512.

Haq, M. S. (2022). Implementasi sistem informasi manajemen dalam meningkatkan pelayanan pendidikan sekolah di masa pandemi covid-19. *Jurnal Inspirasi Manajemen Pendidikan*, *9*(5), 1221-1235.

Ibrahim, F., Susanto, H., Haghi, P. K., & Setiana, D. (2020). Shifting paradigm of education landscape in time of the COVID-19 pandemic: Revealing of a digital education management information system. *Applied System Innovation*, *3*(4), 49.

Idroes, R., Subianto, M., Zahriah, Z., Afidh, R. P. F., Irvanizam, I., Noviandy, T. R., ... & Sufriani, S. (2023). Digital Transformations in Vocational High School: A Case Study of Management Information System Implementation in Banda Aceh, Indonesia. *Journal of Educational Management and Learning*, *1*(2), 48-54.

IMD World Competitiveness Center. (2023). *IMD World Digital Competitiveness Ranking 2023 Report*. https://www.imd.org/wp-content/uploads/2023/12/Digital_2023.pdf

Kunkel, D.E., Tietze, M. F., Wilson, M., Fant, C. T., Rivard, M. J., Belchez, C. A., Forman, T. M., Husson, N. M. (2024). Creating Case Studies for Digital Health and Technology Competency in Nursing. *Nurse Educ, 49*(1):31-35.

Kurniawan, Y. I., Rahmawati, A., Chasanah, N., and Hanifa, A. (2019). Application for determining the modality preference of student learning. *Journal of Physics: Conference Series, 1367*(1), 1–11.

Legistia, Y. T., Daniati, N., & Ahmad, A. (2022). Utilization of Management Information Systems in Ensuring The Academic Quality of Vocational School. *Al-Ishlah: Jurnal Pendidikan*, *14*(4), 7117-7122.

Maudisha. (2024). *Pasar Kerja di Era Digital Butuh SDM Gesit dan berpikir Kritis*, Berita Universitas Indonesia, 2024, [Online]. Available: https://www.ui.ac.id/pasar-kerja-di-era-digital-butuh-sdm-yang-gesit-dan-berpikir-kritis [accesse on April 28th 2024].

Ning, J., Zhi, G., & Sun, Z. (2023). Research on digital transformation of vocational education in the era of big data. *Applied Mathematics and Nonlinear Sciences*, *9*(1).

Nofitasari, R., Sihombing, V. U., & Siahaan, H. N. (2023). Pemberdayaan siswa dalam implementasi digital marketing pada produk pertanian. *ABDIMASKU: Jurnal Pengabdian Masyarakat*, *6*(3), 1023-1032.

Pata, K., Tammets, K., Väljataga, T., Kori, K., Laanpere, M., & Rõbtsenkov, R. (2022). The patterns of school improvement in digitally innovative schools. *Technology, Knowledge and Learning*, *27*(3), 823-841.

Prasetyaningtyas, S. W., Ananda, A., Meliala, J, S., and Prasetya, P. (2023). A soft system approach for the digital transformation in vocational school: Case from Indonesia. *In Proceedings of the 2022 5th International Conference on Education Technology Management (ICETM '22)*. 159–164.

Rasyid, H., & Ningsih, G. M. (2024). The role of digital technology in the transformation of agriculture toward smart farming. *Journal of World Science*, *3*(1), 1-7.

Rauseo, M., Harder, A., Glassey-Previdoli, D., Cattaneo, A., Schumann, S., & Imboden, S. (2023). Same, but different? Digital transformation in Swiss vocational schools from the perspectives of school management and teachers. *Technology, knowledge and learning*, *28*(1), 407-427.

Sianturi, R., Annisa, R., & Humaero, Z. (2023). Peran sistem informasi manajemen dalam pengelolaan peningkatan mutu pendidikan di TK Al Istiqomah. *Jurnal Penelitian dan Pengembangan Pendidikan Anak Usia Dini, 10*(2), 119-126.

Sirojuddin, A., Amirullah, K., Rofiq, M. H., & Kartiko, A. (2022). Peran Sistem Informasi Manajemen dalam Pengambilan Keputusan di Madrasah Ibtidaiyah Darussalam Pacet Mojokerto. *ZAHRA: Research and Tought Elementary School of Islam Journal*, *3*(1), 19-33.

Sudradjat, S., and Djanegara, M.S. PKM uji kompetensi bidang keahlian akuntansi di SMK Bina Sejahtera Kota Bogor. *Jurnal Abdimas Dedikasi Kesatuan, 1*(1), 21-28.

Yu, W. A. N. G. (2024). Research on the Development of Vocational Education Standard System in the Guangdong-Hong Kong-Macao Greater Bay Area. *US-China Education Review*, *14*(5), 307-318.