

IMPLEMENTATION OF TECHNOLOGY AND DIGITAL LITERACY IN THE CONTEXT OF CONTINUOUS IMPROVEMENT: A CASE STUDY OF EDUCATION QUALITY MANAGEMENT AT SMK NEGERI 4 SAMARINDA

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Abstract

Digital transformation in education has become a global phenomenon that is changing the way schools learn and manage. This study examines the implementation of technology and digital literacy in the context of continuous improvement at SMK Negeri 4 Samarinda, with the aim of improving the quality of education. This study uses a qualitative case study approach through in-depth interviews, participatory observations, and document analysis. The results of the study show that SMK Negeri 4 Samarinda has integrated various digital platforms in the learning process, such as Google Classroom, Moodle, and the school's internal LMS, as well as interactive media such as videos, animations, and simulations. The school also implements a digital-based Internal Quality Assurance System (SPMI) to document and manage the education quality assurance process. In addition, schools use data-based management to improve the quality of learning, by relying on data on student learning outcomes, attendance, and teacher performance evaluation. The implementation of the flexible and student-based Independent Curriculum, as well as the use of digital technology in learning, has a significant impact on improving the quality of learning and students' skills. Technology-based evaluation and strengthening technical and soft skills also support students' readiness to enter the digitalized world of work. This research contributes to understanding how technology and digital literacy can strengthen continuous improvement in education quality management in vocational schools, as well as become a model for vocational schools in the era of the Industrial Revolution 4.0.

Keywords: Digital Transformation, Digital Literacy, Education Quality Management, SMK Negeri 4 Samarinda, Independent Curriculum

INTRODUCTION

Digital transformation has become a global phenomenon that is changing the education landscape, with 93% of countries in the world integrating technology into their education systems. At the global level, the COVID-19 pandemic accelerated the adoption of educational technology, increasing the use of digital platforms by 67% in schools. However, the OECD report (2023) shows that only 35% of educational institutions are successfully utilizing technology optimally to improve management quality, while the rest face challenges such as digital literacy and infrastructure gaps. The impact of this transformation is uneven: schools in urban areas tend to be more technologically advanced than rural ones, widening the gap in quality of education. Education has a very important role in shaping the quality of quality human resources, which in turn will contribute to the progress of a nation. According to (Darmuki & Surachmi, 2024) that schools need to work on how to increase the competitiveness of graduates as well as academic products and other services. Therefore, improving the quality of education is one of the main focuses in the education system in Indonesia (Fahmi, Rosid, Nurhadi, Aziz, & Wahid, 2019).

A school can be said to be a quality school referring to the thinking (Sallis, 2012) that identifies the characteristics of a quality school, namely: (1) A customer-focused school; (2) focus on efforts to prevent problems from arising; (3) have investment in its human resources; (4) have a strategy to achieve quality, both at the level of leadership, academic personnel, and administrative personnel; (5) manage or treat complaints as feedback; (6) have policies in planning to achieve quality; (7) seek a process of improvement by involving all people in accordance with their main duties, functions and responsibilities; (8) encouraging people who are seen as having creativity, being able to create quality and stimulating others to work with quality; (9) clarify the roles and responsibilities of each person; (10) have a clear strategy and evaluation criteria; (11) view or place the quality that has been achieved as a way to further improve the quality of service; (12) view quality as an integral part of work culture; and (13) placing continuous quality improvement as a must. The grand theory underlying this research is the Continuous Improvement Theory developed by Deming (1986). This theory emphasizes the importance of iterative processes in improving quality through planning, implementation, evaluation, and improvement actions. In the context of education, this theory has been adapted by many researchers, including Fullan (2016), who emphasized the role of technology as a catalyst in the process of continuous improvement. However, the

evolution of theoretical thinking shows that the implementation of technology in education requires not only infrastructure but also cultural change and capacity building of human resources (Purba, 2024).

The specific problem faced by SMK Negeri 4 Samarinda is the low effectiveness of technology implementation and digital literacy in supporting continuous improvement. According to data from the Ministry of Education, Culture, Research, and Technology (2023), only 40% of vocational schools in Indonesia have a structured digital literacy program. At SMK Negeri 4 Samarinda, the main challenges include lack of teacher training, limited infrastructure, and resistance to change. This results in the use of technology that is not optimal in the learning process and school management. The urgency of solving this problem is even higher considering the demands of the world of work that increasingly prioritizes digital competence. The local context of SMK Negeri 4 Samarinda also has special characteristics that affect the implementation of technology. As one of the leading vocational schools in East Kalimantan, this school has relatively good access to resources compared to other vocational schools in remote areas. However, preliminary research shows that the use of technology is still focused on school administration and has not been fully integrated into the learning process. In addition, student participation in digital literacy programs is still low, with only 35% of students actively using digital platforms to learn (Internal Data of SMK Negeri 4 Samarinda, 2023). This shows the urgent need to develop more effective strategies in integrating technology and digital literacy (Rahmadi & Khairul Tri Anjani, 2021).

The research gap identified in this study is the lack of research that combines aspects of technology, digital literacy, and continuous improvement in the context of education quality management in vocational schools. Most previous research, such as the one conducted by Yusuf et al. (2020), focused more on the impact of technology on student learning outcomes, while research by Suryadi et al. (2022) only discussed aspects of quality management without linking it to digital literacy. In addition, a case study at SMK Negeri 4 Samarinda has never been conducted before, so this research is expected to make a new contribution both theoretically and practically (Nafisah, Permatasari, Dayu, Nurlaily, & Cindy, 2024). The implementation of technology and digital literacy at SMK Negeri 4 Samarinda is expected to increase the effectiveness and efficiency in education quality management. Therefore, this study aims to analyze the implementation of technology and

digital literacy in the context of continuous improvement at SMK Negeri 4 Samarinda and have a positive impact on improving the quality of education in the school.

METHODS

This study uses a qualitative case study approach to analyze the implementation of technology and digital literacy in the context of continuous improvement at SMK Negeri 4 Samarinda. The case study was chosen because it allows for an in-depth exploration of the phenomenon in a real context. The method used in this study is a qualitative method with data collection techniques through in-depth interviews, participatory observation, and document analysis. Interviews were conducted with teachers, students, administrative staff, and external stakeholders to gain a holistic perspective on the implementation of technology and digital literacy. Observations are used to understand day-to-day practices, while document analysis highlights school policies and performance reports. The research subjects include teachers, students, administrative staff, and external stakeholders who play a role in the transformation of technology-based quality management. The data was analyzed using thematic analysis techniques with the help of NVivo software, through the process of coding and identifying the main themes. To maintain validity and reliability, the researcher used triangulation of sources and methods and conducted member checking. The data source consists of primary data (interview results and observations) and secondary data (policy documents and reports), which together strengthen the accuracy and credibility of the research results (Nasution, 2023).

RESULTS

Implementation of Digital Technology in the Education Quality Management System at SMK Negeri 4 Samarinda

The implementation of digital technology at SMK Negeri 4 Samarinda includes the use of various online learning platforms designed to support the teaching and learning process more effectively and efficiently. In this study, it was found that there are several digital platforms used by teachers to support learning activities, especially since the implementation of the blended learning system. Commonly used platforms include Google Classroom, Moodle, and the school's internal LMS.

Table 1. The Use of Online Learning Platforms at SMK Negeri 4 Samarinda

Platform Type	Frequency of Use	Percentage of Teachers Using
Google Classroom	Often	70%
Moodle	Sometimes	20%
The school's internal LMS	Infrequently	10%

Source: School Documentation & Teacher Interview Results, 2025

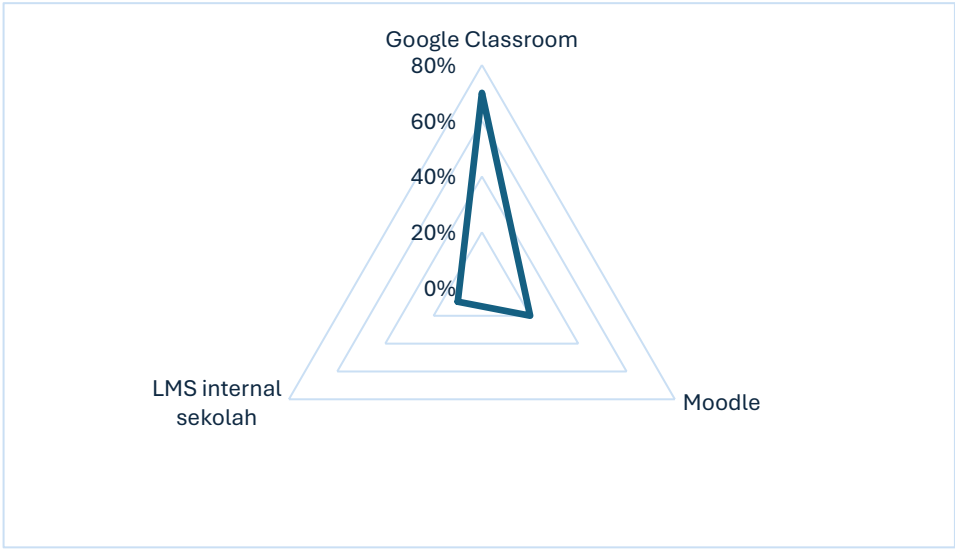


Figure 1. The Use of Online Learning Platforms at SMK Negeri 4 Samarinda

Based on the table above, it can be seen that Google Classroom is the most widely used online learning platform by teachers at SMK Negeri 4 Samarinda, with a usage rate of 70%. This is due to the ease of access, integration with Google accounts commonly owned by teachers and students, and features that support direct management of assignments, quizzes, and assessments. In addition, Google Classroom is considered more practical and does not require additional training for teachers who are not very familiar with information technology. Meanwhile, Moodle and the school's internal LMS are only used by a small percentage of teachers, because according to the interviews, these platforms are considered to have more complex interfaces and require longer adaptation time. However, some teachers who are more tech-savvy still choose Moodle because of its advantages in evaluation systems and integration of competency-based learning. These findings show that the choice of digital platforms is highly dependent on the level of comfort and digital skills of each teacher, as well as the training support provided by the school (Tukiyat, Anggai, Waskita, & Zain, 2024).

In addition to the use of online platforms, teachers at SMK Negeri 4 Samarinda are also actively using interactive media in learning. These media include videos, animations, and simulations that can help students understand the material more visually and contextually. The use of this interactive media is an important part of supporting a digital-based learning quality management system.

Table 2. Types of Interactive Media Used by Teachers

Interactive Media	Frequency of Use	Main Purpose of Use
Learning videos	Often	Material explanation
Learning animations	Sometimes	Concept visualization
Digital simulations/applications	Infrequently	Practice technical skills

Source: Teaching and Learning Activity Observation Report, 2025

Based on the table above, learning videos are the most widely used interactive media by teachers, especially to explain technical and theoretical materials that require repeated explanations and real visualizations. Teachers use videos from YouTube or create their own videos that are tailored to the needs of the curriculum. This shows the initiative of teachers in developing digital content that is relevant to their respective subjects. Meanwhile, learning animations are used to explain abstract concepts that are difficult to explain verbally, such as in physics, mathematics, or electrical engineering subjects. Even though it is used in medium frequencies, this animation is very helpful for students in imagining processes or movements that cannot be seen directly. The simulations and digital applications are used in limited quantities due to the limitations of ICT devices and infrastructure in schools, despite the great potential for the practice of technical skills. These findings reflect the importance of facility support from schools so that the use of interactive media can be more evenly and optimally (Subawa & Nadya Leonita, 2024).

Digital-Based Internal Quality Assurance System (SPMI)

The implementation of a digital-based Internal Quality Assurance System (SPMI) at SMK Negeri 4 Samarinda is an important part of efforts to improve the quality of educational services. The school has integrated technology in the process of planning, implementing, evaluating, and following up on the quality of education. One of the main strategies used is the use of digital applications to document the quality assurance process in a systematic and structured manner.

Table 3. SPMI Components and the Use of Digital Applications

SPMI Components	Application/Digital Used	Platform	Frequency of Utilization
School self-evaluation	Sispena SMK Online		Often
Preparation of quality documents	Google Docs / Microsoft Word Online		Often
Monitoring and follow-up	Excel Online / Spreadsheet		Sometimes

Source: School documentation & interview with the Vice-Principal for Curriculum, 2025

Based on the table above, it appears that school self-evaluation is routinely carried out through the Online Vocational School System, which is a quality assurance system provided by the Directorate of Vocational Schools to assess the extent to which quality indicators are met. This system assists schools in conducting independent assessments of educational quality achievements based on eight National Education Standards (SNPs). With this online system, the evaluation process becomes faster, more accurate, and well-documented. As for the preparation of quality documents such as work plans and quality improvement programs, teachers and school management prefer to use Google Docs or Microsoft Word Online, as it allows real-time collaboration between quality team members. The use of this technology supports the effectiveness of teamwork as well as time efficiency in compiling and revising documents. Meanwhile, for monitoring and follow-up activities, schools still use spreadsheet formats from both Google and Microsoft, although the use is not as intense as the previous two components. This is because the follow-up process is often still carried out offline, especially in work meetings or field supervision activities (Wijasena & Haq, 2021).

The application of digital technology in SPMI shows that SMK Negeri 4 Samarinda has adapted to a new paradigm of education quality management that demands efficiency, transparency, and accountability. Although there are still some challenges in terms of equitable distribution of teachers' digital competencies and supporting infrastructure, the school shows a commitment to continue developing a quality assurance system that is adaptive to technological developments. This is an important foundation for continuous improvement of the quality of education.

Data-Based Management Strategies for Improving Learning Quality

Data-based management is an approach used by SMK Negeri 4 Samarinda in formulating policies and strategic decision-making in the academic field. This approach allows schools to respond to various learning challenges more accurately based on the results of systematic data analysis, both in the form of student learning outcome data, attendance, and teacher performance evaluation. Data is used as a basis for consideration in the preparation of quality improvement programs, both in the short and long term.

Table 4. Types of Data Used and Strategic Follow-Up

Types of Data	Education	Data Collection Sources	Strategic Follow-Up
Student learning outcomes score		E-Rapor Application	Remedial & enrichment programs
Student attendance		Digital Attendance (SIDRA & WA Group)	Parent call & BK guidance
Teacher performance evaluation		Class observation & Google Form	Pedagogic training & peer supervision

Source: Academic documentation & interview of the head of the expertise program, 2025

Based on the table above, it can be seen that SMK Negeri 4 Samarinda utilizes various types of data to improve the quality of learning as a whole. For example, data on student learning outcomes collected through the E-Rapor application is used to design remedial programs for students who have not reached the Minimum Completeness Criteria (KKM) as well as enrichment programs for students who have high achievements. This shows that the school is not only oriented towards average achievement, but also pays attention to the individual needs of students to support the principle of differentiated learning. Meanwhile, student attendance data is collected through a digital attendance system, either through official applications such as SIDRA and manual reports from homeroom teachers through WhatsApp groups. When students are found to be absent, the school will immediately call parents to clarify and develop coaching steps through Counseling Guidance (BK). This is important as a form of early intervention against potential disciplinary problems and indications of personal problems that affect student attendance (Cahyarini, 2021).

Finally, evaluation of teacher performance is carried out routinely with two approaches, namely direct observation to the classroom by the principal and Google Form-based assessment by fellow teachers (peer evaluation). The results of this evaluation were used to develop pedagogic training programs, such as workshops on active learning strategies and classroom management, as well as supervision activities between teachers. Thus, teachers are not only required to teach, but also continue to improve their competence in creating quality learning.

Implementation of the Independent Curriculum and Digitalization of Learning at SMK Negeri 4 Samarinda

SMK Negeri 4 Samarinda as a vocational education institution always strives to adapt to the development of the curriculum that applies in Indonesia. One of the significant steps taken is the implementation of the Independent Curriculum, which is designed to provide flexibility to teachers and students in designing a more flexible learning process based on student needs. This curriculum allows the strengthening of technical skills and soft skills relevant to the industrial world, in line with the vision of vocational schools to produce a ready-to-use workforce. In addition, to support the implementation of the Independent Curriculum, the digitization of learning is a very important element. SMK Negeri 4 Samarinda has integrated technology in the teaching and learning process with various e-learning platforms and digital tools. This approach not only supports face-to-face learning, but also gives students access to independent learning with more material options accessible anytime and anywhere.

Table 5. Implementation of the Independent Curriculum and Digitalization of Learning

Components of the Independent Curriculum	Deployment Strategy	Technology Used
Project-Based Learning	Industry & entrepreneur-based projects	Google Classroom, Canva, Edmodo
Strengthening Students' Skills	Internship in partner industry	Video Conference, Zoom, Google Meet
Self-Paced Learning	Independent learning activities	Moodle, Kahoot, Quizizz

Source: Academic Documentation & Principal Interviews, 2025

Based on the table above, it can be seen that the implementation of the Independent Curriculum at SMK Negeri 4 Samarinda involves various main components that focus on strengthening students' practical skills. For example, project-based learning is carried out by inviting entrepreneurs or industry practitioners as direct mentors and mentors. This provides students with the opportunity to interact with the industrial world directly, which is very relevant to the goal of the Merdeka Curriculum to produce a workforce that is ready to face global challenges. Not only that, the digitization of learning also supports this process. Platforms like Google Classroom are used as a place for the distribution of materials and assignments, while Canva and Edmodo support the creation and collaboration of more creative learning content. For internship activities, SMK Negeri 4 Samarinda collaborates with various partner industries, and through communication applications such as Zoom or Google Meet, students can take part in mentoring sessions or discussions from industry experts without being limited by distance. The Merdeka Curriculum also prioritizes independent learning, where students are given the freedom to choose the material they want to learn in more depth. In this case, the use of platforms such as Moodle, Kahoot, and Quizizz not only increases interactivity in the classroom, but also allows students to hone their skills in a fun and engaging way. Along with that, teachers can monitor students' learning progress through the data generated by the system, ensuring that each student has an optimal learning experience. Thus, SMK Negeri 4 Samarinda not only implements the Independent Curriculum within the framework of face-to-face learning, but also enriches students' learning experiences through deep and applicable digitalization. This shows the school's commitment to preparing its graduates to become a competitive workforce in the industrial era 4.0 (Sugiarto & Farid, 2023).

Evaluation and Strengthening of Learning Quality at SMK Negeri 4 Samarinda

Evaluation and strengthening the quality of learning is an important aspect in ensuring that the Independent Curriculum and the digitalization of learning implemented at SMK Negeri 4 Samarinda can achieve the expected goals. Every year, the school conducts a learning outcome-based evaluation that not only measures students' technical skills, but also their social skills and creativity. This evaluation aims to see the extent to which students can apply the theory they have learned in the real world of work. To support this evaluation process, SMK Negeri 4 Samarinda uses various technology-based evaluation

methods, such as online assessments and digital portfolio assessments that allow teachers to monitor student progress more accurately (Demmanggasa Yultan et al., 2023). The results of this evaluation are then used to reflect and improve the curriculum and teaching methods, to ensure more effective learning and relevant to the needs of the industry.

Table 6. Learning Evaluation System and Quality Strengthening at SMK Negeri 4 Samarinda

Evaluation Aspects	Implementation Strategy	Technology Used
Evaluation of Learning Outcomes	Online Exams and Digital Assignments	Google Forms, Kahoot, Moodle
Strengthening Practical Skills	Simulations and Industrial Projects	Virtual Simulation, VR, AR
Soft Skills Development	Industrial Workshops and Training	Webinar, Zoom, Google Meet

Source: Academic Documentation & Principal Interviews, 2025

Based on the table above, the evaluation of learning outcomes at SMK Negeri 4 Samarinda is carried out using various digital methods that allow for more objective and measurable measurements. Online exams and digital assignments conducted through platforms such as Google Forms, Kahoot, and Moodle make it easy for teachers to correct and provide feedback quickly. In addition, the evaluation of learning outcomes also includes the assessment of students' practical skills through virtual simulations integrated with Virtual Reality (VR) and Augmented Reality (AR) technologies. This allows students to face industry challenges in a more realistic, yet controlled, environment. In addition, SMK Negeri 4 Samarinda also holds workshops and industrial training to strengthen students' soft skills, such as communication, teamwork, and problem-solving. These trainings often involve industry practitioners who provide students with hands-on insight into the skills needed in the workforce. Webinars and virtual training sessions conducted using apps such as Zoom and Google Meet provide flexibility for students to attend training even in remote conditions, and ensure that soft skills development can continue despite geographical limitations (A. Aziz & Zakir, 2022).

This evaluation process does not only depend on the final results of the exam, but rather on a holistic learning process, which includes students' ability to solve problems, think creatively, as well as their ability to adapt to technology and the industrial world. With continuous and data-based evaluation, SMK Negeri 4 Samarinda can make adjustments to

the curriculum and learning strategies to improve the quality of education and prepare students to become a competitive workforce. With the continuous evaluation and strengthening of the quality of learning, SMK Negeri 4 Samarinda ensures that its graduates not only have strong knowledge, but also practical skills and soft skills that are needed by the industry. This is in line with the school's vision to produce graduates who are ready to face the challenges of the world of work in the digital era (Firdausi, Mardikawati, Huda, Riztya, & Rahmani, 2023).

DISCUSSION

The application of technology in education at SMK Negeri 4 Samarinda shows a strategic step in answering the challenges of the Industrial Revolution 4.0. This school has successfully utilized various digital platforms as a learning medium that is not only effective, but also interesting and relevant to the needs of the times. Various applications such as Google Classroom, Edmodo, and other digital learning systems have become an integral part of the teaching and learning process. This digital transformation has a positive impact, both for students and educators, in creating a more dynamic, flexible, and technology-integrated learning environment. The use of advanced technologies such as Virtual Reality (VR) and Augmented Reality (AR) in the learning process enriches students' learning experiences (Alim & Ibrahim, 2024). This technology allows students to see and experience real simulations of the industrial world, so they can understand the material in a more concrete and contextual way. This approach not only makes it easier for students to understand technical concepts, but also increases their interest and motivation in learning. On the other hand, this approach supports experiential learning that is highly suited to the needs of vocational education. The digital transformation implemented at SMK Negeri 4 Samarinda is not only limited to infrastructure or hardware, but also touches on aspects of learning culture. Students are encouraged to be more independent in seeking information, developing their potential, and building critical thinking skills. Learning activities are not only centered in the classroom, but also penetrate the virtual world, making the learning process more flexible and adaptive. This creates a generation of students who are not only dependent on teachers, but also active and creative in managing knowledge (Puspasari, 2023).

The Independent Curriculum implemented in this school provides space for freedom and creativity for teachers in designing learning processes that suit the characteristics and needs of students. This curriculum allows for differentiation of learning, so that students can learn according to their own pace and learning style. At SMK Negeri 4 Samarinda, the Independent Curriculum has become a strong foundation in supporting educational personalization and strengthening the relevance of learning to the world of work. This flexibility also allows for the development of more meaningful cross-subject learning projects. In supporting the implementation of the Independent Curriculum and digital transformation, SMK Negeri 4 Samarinda adopts the principles of Total Quality Management (TQM) and the Plan-Do-Check-Act (PDCA) cycle. This managerial approach provides a clear and systematic framework for ensuring the quality of education. With PDCA, every educational activity is carefully planned, carried out consistently, evaluated periodically, and refined based on the results of the evaluation. This creates a culture of quality that is sustainable and oriented towards continuous improvement (Khairun, Syafitri, Wulandari, Sugesti, & Indria, 2023).

The impact of the implementation of this strategy is very significant on improving the quality of graduates. Students not only master technical competencies according to their areas of expertise, but also have strong soft skills such as communication skills, teamwork, critical thinking, and problem-solving. These skills are urgently needed in the modern world of work and are an added value for graduates of SMK Negeri 4 Samarinda in entering the labor market. Digital literacy is one of the main competencies developed at SMK Negeri 4 Samarinda. Students are not only taught how to use technology, but also how to be smart and responsible digital users. Material on digital security, social media ethics, and the use of technology for productivity are important parts of the curriculum. Digital literacy education is very relevant in the midst of a challenging information era, especially related to hoaxes, cyberbullying, and misuse of technology (Evita & Mukhaer, 2022).

Strengthening relations with the industrial world is also a major concern. The school actively partners with various companies and institutions to conduct training, workshops, and internship programs for students. This activity provides students with real work experience, as well as a hands-on understanding of the demands and dynamics of the world of work. This collaboration strengthens the principle of link and match between vocational education and industrial needs. On the other hand, teacher capacity

development also received serious attention. Teachers at SMK Negeri 4 Samarinda routinely participate in training on technology integration in learning, curriculum development, and project-based learning. The role of teachers has shifted from being just teachers to facilitators and innovators of learning, adapting their approach to the needs of students in the digital age. School policy support and visionary leadership are also key success factors. The principal encourages the creation of an innovative and collaborative culture in the school environment. Through a quality-based management approach and transformational leadership, all elements of the school move in one direction to realize an educational vision that is adaptive to the changing times (N. Aziz, Muslim, & Ilmi, 2024).

Students' motivation to learn also increases because they feel that the learning applied is relevant to the reality of their lives and future. They no longer feel that they are learning just for grades, but to equip themselves with useful skills in the world of work and society. This shows that the educational transformation carried out has changed the paradigm of student learning as a whole. Overall, the implementation of technology, the Independent Curriculum, and quality-based management at SMK Negeri 4 Samarinda have resulted in major positive changes. This school not only succeeds in improving the quality of learning, but also prepares students to become human beings who are ready to face global challenges. This achievement makes SMK Negeri 4 Samarinda a model of superior vocational school in the digital era that is worthy of imitation by other schools in Indonesia. The success of SMK Negeri 4 Samarinda is also inseparable from the support of parents and the surrounding community (Sumbaryani, Sutanara, & Ranahcita, 2023). The school opens a wide space for participation through program socialization activities, parental involvement in learning evaluation, and community involvement in supporting student character development. This collaboration creates a healthy and inclusive education ecosystem, where every stakeholder has a role in supporting the growth and development of students. Active involvement from various parties makes the educational process more comprehensive, sustainable, and has a wide impact outside the school environment. With all these achievements, SMK Negeri 4 Samarinda shows that the transformation of technology-based education and quality management is not something impossible to implement in public schools. In fact, with strong commitment, policy support, and synergy from all parties, schools are able to create educational innovations that answer the challenges of the times. This success is clear proof that vocational education can adapt and

even become a pioneer in integrating technology to produce a generation that is competent, competitive, and ready to build the nation's future (Yusuf et al., 2022).

CONCLUSION

The implementation of technology and digital literacy at SMK Negeri 4 Samarinda has been proven to encourage continuous improvement in the education process, through the integration of Total Quality Management (TQM) principles and the implementation of the Plan-Do-Check-Act (PDCA) cycle. This approach not only strengthens the school's internal quality management, but also creates a culture of systematic innovation and evaluation. This makes SMK Negeri 4 Samarinda one of the relevant adaptive learning models in facing educational transformation in the era of the Industrial Revolution 4.0. The results of the analysis show that the implementation of the Independent Curriculum and digitalization of learning has had a significant impact on improving the quality of the teaching and learning process. Through the use of modern technologies such as digital learning platforms, virtual reality (VR), and augmented reality (AR), students gain a more immersive and contextual learning experience in accordance with the dynamics of current industry needs. Evaluation of learning that is carried out digitally and continuously also provides fast and accurate feedback, making it easier for teachers to develop more effective learning strategies. In addition, the Independent Curriculum provides greater flexibility in the learning process, allowing students to explore their interests and talents independently and in a targeted manner. Strengthening technical skills and soft skills is also carried out through various project-based trainings, cooperation with industry, and contextual learning in the field. Thus, the students are not only academically prepared, but also mentally and skillfully prepared to enter the increasingly competitive and digitized world of work.

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