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Implementation of Total Quality Management in Improving Quality of Education at SMA Laboratorium Universitas Negeri Malang

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Abstract

This study aims to analyze the implementation of Total Quality Management (TQM) in enhancing the quality of education at SMA Laboratorium Universitas Negeri Malang. TQM is a management approach that emphasizes continuous quality improvement by involving all school elements, the school principal, teachers, staff, students, and parents. This research focuses on the application of core TQM principles, comprising customer focus, total involvement, and continuous improvement in educational management. A qualitative research method with a case study design was employed. Data were obtained through interviews with the school principal, teachers, and students, as well as observations of learning processes and school management policies. Document analysis of quality improvement strategies was also conducted to gain a deeper understanding. The data were qualitatively analyzed through data reduction, data display, and inductive conclusion-drawing techniques. The findings indicate that the implementation of TQM at SMA Laboratorium Universitas Negeri Malang has a positive impact on improving teacher competence, learning effectiveness, as well as students' academic and non-academic achievements. Moreover, the level of stakeholder satisfaction has increased, accompanied by improvements in administrative systems and the optimization of supporting facilities. With a continuously strengthened quality-based school culture, SMA Laboratorium Universitas Negeri Malang has successfully created a more innovative, professional, and competitive educational environment. Therefore, the implementation of TQM can serve as a model for other schools toward the continuous improvement of the quality of education.

Keywords: Total Quality Management (TQM); education quality; school management; student satisfication; SMA Laboratorium Universitas Negeri Malang

Implementasi Total Quality Management (TQM) dalam Meningkatkan Mutu Pendidikan di SMA Laboratorium Universitas Negeri Malang

Abstrak

Penelitian ini bertujuan untuk menganalisis implementasi Total Quality Management (TQM) dalam meningkatkan mutu pendidikan di SMA Laboratorium Universitas Negeri Malang. TQM merupakan pendekatan manajemen yang menitikberatkan pada peningkatan kualitas secara berkelanjutan melalui keterlibatan seluruh elemen sekolah, termasuk kepala sekolah, guru, staf, siswa, dan orang tua. Fokus penelitian ini mencakup penerapan prinsip-prinsip utama TQM, seperti berfokus pada pelanggan, keterlibatan penuh, serta perbaikan berkelanjutan dalam pengelolaan pendidikan. Metode penelitian yang digunakan adalah metode kualitatif dengan jenis studi kasus. Data diperoleh melalui wawancara dengan kepala sekolah, guru, dan siswa, serta observasi terhadap proses pembelajaran dan kebijakan manajemen sekolah. Selain itu, analisis dokumen terkait strategi peningkatan mutu juga dilakukan untuk mendapatkan pemahaman yang lebih mendalam. Data yang terkumpul dianalisis menggunakan teknik reduksi data, penyajian data, serta penarikan kesimpulan secara induktif. Hasil penelitian menunjukkan bahwa penerapan TQM di SMA Laboratorium Universitas Negeri Malang memberikan dampak positif terhadap peningkatan kompetensi guru, efektivitas pembelajaran, serta prestasi akademik dan non-akademik siswa. Selain itu, tingkat kepuasan stakeholder sekolah juga meningkat, seiring

dengan perbaikan sistem administrasi dan optimalisasi fasilitas pendukung. Dengan budaya sekolah berbasis mutu yang terus diperkuat, SMA Laboratorium Universitas Negeri Malang berhasil menciptakan lingkungan pendidikan yang lebih inovatif, profesional, dan berdaya saing tinggi. Oleh karena itu, implementasi TQM dapat menjadi model bagi sekolah lain dalam meningkatkan kualitas pendidikan secara berkelanjutan.

***Kata kunci**: Total Quality Management (TQM); mutu pendidikan; manajemen sekolah; kepuasan siswa; SMA Laboratorium Universitas Negeri Malang.*

INTRODUCTION

Education is a key factor in shaping a high quality and competitive generation (Rustandi et al., 2023). In facing global challenges, schools are required to continuously improve the quality of education in order to meet the current demands. The quality improvement involves both strengthening academic competence and strengthening character, skills, and student readiness for the workforce (Nitte & Kali Boka, 2024). Therefore, an effective educational management approach is needed to ensure an optimal education quality. Total Quality Management (TQM), widely adopted approach in educational management, focuses on continuous improvement and the satisfaction of all stakeholders (Azizah & Witri, 2021; Sholeh et al., 2024).

In education context, TQM emphasizes comprehensive system improvement from school management and the learning process to student-parent satisfaction (Riyadi et al., 2021). This concept is drawn on principles of the stakeholders involvement, effective leadership, data-driven decision making, and continuous improvement. The implementation of TQM in schools enhances learning effectiveness as well as creates a more conducive and professional learning environment (Basuki & Arsyad, 2024). With a quality-oriented organizational culture, schools can be more adaptive in responding to various changes and demands. Thus, the application of TQM has become an important strategy in building an excellent and highly competitive education system (Hadijaya et al., 2024).

SMA Laboratorium Universitas Negeri Malang (SMA Lab UM), as one of the leading schools in Malang, has the responsibility to implement TQM as an effective quality management system to improve the quality of teaching and educational services. In the present global competition, schools must constantly innovate management and instructional processes to produce competent and competitive graduates (Ayu Annisa, 2021; Baihaqi & Yasin, 2024). One approach used by the school to achieve this goal is TQM, which emphasizes continuous quality improvement through the involvement of all stakeholders. Through the implementation of TQM, schools can improve their management systems, enhance teaching effectiveness, and ensure the satisfaction of students, teachers, and parents. Hence, the implementation of TQM serves as a crucial strategy to maintain and enhance the school's reputation as an outstanding educational institution (Nur Budi et al., 2023).

Theoretically, TQM has a strong foundation in quality management principles applied across various sectors, including education (Nur Budi et al., 2023). According to Deming (1986), the principles of continuous improvement and proper quality control can lead to significant institutionalachievements. Meanwhile, Juran (1993) emphasizes the importance of visionary leadership to ensure the successful implementation of a quality management system.

Several previous studies have shown that schools implementing TQM have experienced improvements in academic discipline, teacher engagement, and satisfaction among students and parents (Dalimunthe & Syahbudi, 2023; Anwar, 2020; Miyono, 2024). Moreover, the implementation of TQM in education that aligns with government policies promotes quality improvement through school accreditation and continuous eva-luation. Programs such as School-Based Management (SBM) and Education Quality Assurance share similar principles with TQM in terms of organizational effectiveness and educational service improvement (Nur, 2024). Therefore, this study draws upon these theories to understand the implementation of TQM and its effect on the quality of education at SMA Lab UM.

SMA Lab UM is a senior high school under the auspices of Universitas Negeri Malang. The school functions as an educational laboratory for development, research, and teaching practice for UM students in the field of education (Fahinsa et al., 2024). It is recognized as a reference school with an "A" accreditation, known for implementing various proven academic-based innovations in both teaching and school management. With a conducive learning environment and a strong academic culture, this school has consistently produced outstanding graduates in both academic and non-academic areas (Nurisa & Abdul Ghofur, 2019).

SMA Lab UM applies TQM by involving all members of the school community in the planning, implementation, and evaluation of educational programs. According to the Vice Principal for Curriculum Affairs, Budi Utami, M.Pd., every teacher, student, and educational staff member is encouraged to actively provide input and solutions for improving the quality of educational services. The school implements regular monitoring and evaluation systems to ensure that educational quality standards are consistently met in all aspects of school activities. Furthermore, participative leadership and a continuous improvement work culture form the foundation of TQM implementation at the school. Each working unit in the school has clear and measurable quality targets and is required to conduct regular self-evaluations. Through the implementation of TQM, the school has succeeded in maintaining its reputation as an innovative and stakeholder-oriented reference school.

Research on the implementation of TQM in schools has been widely discussed in previous studies. Five recent studies on this topic include: First, research by Sholeh et al. (2024) examined the implementation of TQM in Islamic educational institutions and its impact on producing graduates with entrepreneurial spirit, highlighting curriculum development, teacher training, and industry partnerships. Using a literature review method, this study explores TQM concepts, theories, and practices within the context of Islamic education to prepare graduates for global challenges.

Second, a study by Azizah & Witri (2021) analyzed TQM implementation in school accreditation programs as an effort to improve educational quality. The research showed that TQM, through continuous improvement, standard setting, and customer satisfaction, can contribute to educational quality enhancement. However, the reliance solely on literature in both studies limits understanding of how TQM is actually practiced in real school settings and lacks insights from direct stakeholder experiences.

Third, Kiromi & Nur (2024) examined TQM implementation at MIN 1 Jombang aimed at improving educational service quality. The study also identified supporting and inhibiting factors in the implementation process. However, the

research did not include any comparison with other institutions implementing TQM, which could have provided a more comprehensive perspective.

Fourth, a study by Nitte & Kali Boka (2024) explored the principal's role as the key leader in implementing TQM to shape student character at SDK St. Yoseph 4 in Kupang. However, the study's narrow focus on character development neglects other critical aspects of educational quality, such as curriculum, teaching methods, and the overall learning environment. Without considering these factors, the study may not present a holistic picture of educational quality at the school.

Fifth, research by Permatasari & Miyono (2024) analyzed the implementation of TQM at Sekolah Murid Merdeka (SMM) to improve education service quality through blended learning. The study aimed to provide a comprehensive analysis of how TQM meets student needs in a modern education system that emphasizes 21st-century skills. However, this research did not address the extent of stakeholder involvement, including parents, which is a crucial aspect, as greater collaboration can enhance the success and sustainability of TQM implementation.

Unlike most previous studies emphasized theoretical reviews through literature studies, partial thematic focuses, and the discussion of specific aspects of TQM in isolation, this study examines the implementation of TQM comprehensively in efforts to improve educational quality at SMA Lab UM. This research does not concentrate solely on managerial aspects or the leadership of the school principal, but also explores the interconnections between core TQM principles, such as customer focus in education, total involvement of all school members, and continuous improvement and teaching practices, curriculum management, the development of a quality-oriented school culture, as well as internal evaluation mechanisms. By employing a case study approach, this study investigates real practices and the direct experiences of school stakeholders, thereby providing a more contextual and empirical understanding of TQM implementation at the secondary education level.

Accordingly, the research gap addressed in this study lies in the limited number of empirical studies that examine the holistic implementation of TQM within secondary educational institutions, particularly those with the distinctive characteristics of a laboratory school. This study contributes by offering a comprehensive portrayal of how TQM principles are operationalized in the daily practices of the school and by identifying internal factors that influence their successful implementation. Therefore, the findings are expected not only to enrich the literature on educational quality management but also to provide a conceptual and practical foundation for the development of contextual and sustainable TQM based strategies for improving educational quality.

The objective of this study is to analyze the implementation of TQM in enhancing the quality of education at SMA Lab UM. This study aims to identify the strategies used by the school in applying TQM principles. Additionally, it seeks to uncover the challenges and obstacles encountered during the implementation process. The results of this study are expected to provide practical recommendations for other schools adopting a similar approach. Thus, this research is anticipated to make a significant contribution to improving the quality of education in Indonesia.

METHOD

This study employed a qualitative method with a case study design to understand the implementation of TQM in improving the quality of education at SMA Lab UM. Data collection techniques were conducted through in-depth interviews with the principal, teachers, and educational staff to obtain direct perspectives on the implementation of TQM. The principal was selected due to his or her strategic role as a policy maker and as the key decision maker guiding the direction of TQM implementation at the school's managerial level. Teachers were chosen because they are directly involved in the teaching and learning process and serve as the main actors in applying TQM principles in the pedagogical domain, while educational staff (administrative staff, library staff, and laboratory assistants) were selected because they play a crucial role in supporting administrative systems, services, and the school's quality culture at the operational level. Observations were conducted by examining school activities, learning processes, and quality management practices implemented within the educational environment. In addition, documentation was used to gather data from school archives, educational policies, and relevant quality evaluation reports.

The collected data were analyzed thematically through data reduction, data presentation, and conclusion drawing based on field findings. Data validity was ensured through triangulation techniques by comparing the results of interviews, observations, and documentation to verify the accuracy of the information.

In this study, the researcher utilized NVivo 15 Pro software to conduct the coding process of data obtained from interviews, observations, and documentation. The use of NVivo facilitated efficient data management and accelerated the organization process, enabling the data to be systematically and coherently arranged. Through this approach, the study is expected to provide an in-depth overview of the effectiveness of TQM implementation in enhancing the quality of education at SMA Lab UM.

RESULTS AND DISCUSSION

Based on the research data that have been analyzed, this study identifies several key findings related to the implementation TQM in improving educational quality. The research findings are organized into three main components, namely the application of TQM principles, TQM implementation strategies, and the impacts of TQM implementation on educational quality at SMA Lab UM. Each component was

analyzed using an Nvivo based thematic approach, enabling TQM implementation process to be clearly visualized, including the key terms identified in the findings and the main themes that frequently emerged from the informants.

Figure 1. visualization of frequently occurring words. Source: Data processed by the researcher using NVivo.

The NVivo word cloud analysis reveals the dominance of key terms such as *student*, *satisfaction*, *TQM*, *teacher*, *academic*, *learning*, *parent*, *facilities*, *culture*, and *involvement*. This pattern confirms that the implementation of TQM at SMA Lab UM is strongly oriented toward student satisfaction as the primary customer of educational services. The terms

teacher, *academic*, and *learning* indicates that quality improvement efforts are focused on strengthening teacher professionalism and enhancing the quality of the teaching learning process. Meanwhile, the emergence of the terms *parent* and *involvement* reflects the active participation of stakeholders in supporting a school wide quality culture. The terms *facilities* and *culture* further reinforce the finding that adequate infrastructure support and the development of a quality oriented organizational culture are essential elements in sustaining continuous educational quality improvement.

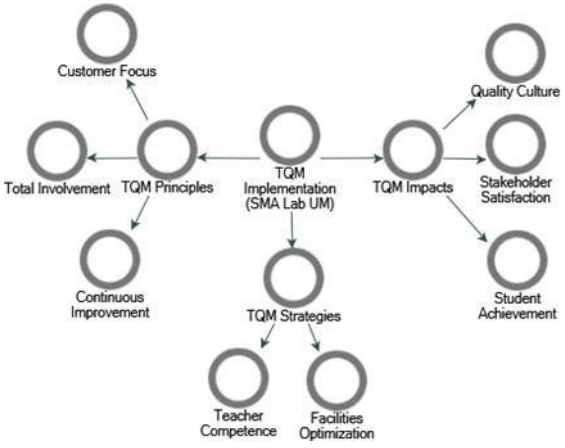


Figure 2. project map of TQM implementation at SMA Lab UM. Source: Data processed by the researcher using Nvivo.

The NVivo visualization in the form of a hierarchical structure illustrates that the implementation of TQM at SMA Lab UM is systematically organized into three main clusters: TQM Principles, TQM Strategies, and TQM Impacts. Within the TQM Principles cluster, the principle of Customer Focus is elaborated into several concrete practices, including the implementation of satisfaction surveys, intensive communication with parents, counseling services, management of extracurricular activities, and the utilization of learning technologies. This structure emphasizes that the school's quality orientation is grounded in fulfilling the needs and satisfaction of students and parents as the primary customers of educational services. The principle of Total Involvement is reflected through the active participation of teachers, educational staff, and students in various decision-making processes and capacity building efforts. Meanwhile, the principle of Continuous Improvement is represented by nodes related to routine evaluation, academic digitalization, and learning innovation, which indicate the presence of a continuous quality improvement cycle.

In the TQM Strategies cluster, the NVivo visualization shows that enhancing teacher competence serves as a key strategy in TQM implementtation. This is reflected in the interconnected practices of professional training, academic supervision, teacher mentoring, and curriculum development. In addition, the optimization of facilities and infrastructure emerges as an important supporting strategy, as indicated by the development of IT based facilities, digital libraries, and academic information systems. This structure demonstrates that quality improvement is not solely dependent on human resources but is also strongly supported by adequate infrastructure.

Furthermore, the TQM Impacts clustered in the NVivo visualization highlights the tangible effects of TQM implementation on school educational quality. The impacts include improvements in students' achievement, both academic and non-academic, as indicated in UTBK-SNBT scores and competition achievements. Additionally, stakeholder satisfaction, particularly among students and parents, emerges as a significant outcome, reinforcing the successful application of the customer focus principle. Another notable impact is the

establishment of a quality-oriented school culture, characterized by profe-sssional discipline, active student engagement, and a collaborative working culture. Overall, the hierar-chical structure in NVivo demonstrates a logical interrelationship among TQM principles, strategies, and impacts in enhancing educational quality at SMA Lab UM.

1. Implementation of Total Quality Management (TQM) Principles at SMA Laboratorium Universitas Negeri Malang

Customer Focus

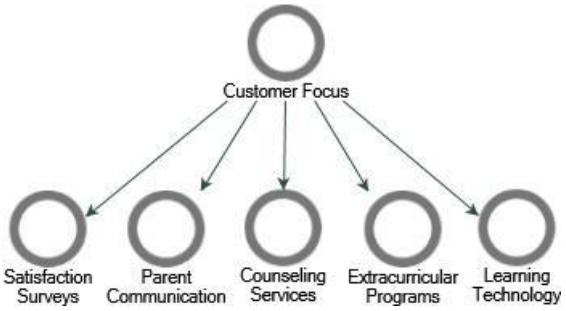


Figure 3. project map of customer focus implementation. Source: Data processed by the researcher using NVivo.

Based on the findings at SMA Lab UM, the implementation of the *customer focus* principle in TQM is reflected through various programs involving students and parents as the primary customers. Each semester, the school regularly conducts satisfaction surveys for students and parents to measure the quality of educational services provided. Moreover, the school utilizes data from the government-issued education report card as supplementary evaluation material. The results of these surveys and evaluations serve as the basis for policy improvements in learning, infrastruc-ture development, and both academic and non-academic services. One key innovation is the formation of a WhatsApp parenting group comprising parents, homeroom teachers, and the school management team to facilitate open and responsive communication in addressing various student issues and needs.

Furthermore, the school provides guidance and counseling services based on student needs, with scheduled academic, social, and emotional support programs. Every student receives guidance starting from Grade 10 regarding major selection and career planning, continuing through preparation for university entrance in Grade 12. In the non-academic domain, SMA Lab UM manages a variety of extracurricular activities, such as the English Club, IT Club, Scouts, and Scientific Writing Club (KIR), that are regularly evaluated to ensure alignment with student interests. Enhancing learning facilities is also a priority, demonstrated by the use of technology in learning through digital libraries, e-learning platforms, and IT laboratories. All these efforts aim to create an educational system that is responsive to the needs and expectations of students and parents, which is evidenced by increased customer satisfaction and academic achievement at the school.

The discussion of these findings indicates that SMA Lab UM has effectively applied the *customer focus* principle of TQM, as described by Goetsch & Davis (2014), who state that a high-quality organization must place customers at the center of attention and base decision-making on their needs. Involving students and parents through satisfaction surveys and online communication forums such as the parenting WhatsApp group is a tangible example of a participatory strategy that supports the delivery of educational services aligned with customer expectations. This approach also reflects the concept of *customer-driven quality* as proposed by Tjiptono & Diana (2019), in which customers

are actively engaged in providing feedback for continuous improvement.

Concurrently, SMA Lab UM's personalized counseling system aligns with the *customer focus* principle in TQM as defined by Oakland (2014), who argues that organizations must continuously understand and meet customer needs. In the context of a school, students are not merely recipients of educational services but individuals with diverse academic, emotional, and social needs that must be systematically accommodated. The school's career guidance program from early on through to college entrance preparation exemplifies responsive services to the aspirations of both students and parents, ultimately contributing to increased customer satisfaction.

The importance of involving all stakeholders in TQM implementation is also emphasized by Goetsch & Davis (2014), who assert that an organization's success is greatly determined by the active participation of all components, including leadership, teachers, staff, and students. Findings from SMA Lab UM, which reveal intensive collaboration among teachers, educational personnel, guidance counselors, and parents in supporting student development, are consistent with this concept. Sofyan et al. (2023) further emphasize that a participatory work culture forms the foundation for successful TQM implementation in educational institutions, as shared responsibility among all parties is essential in creating a quality learning environment.

In terms of extracurricular program development, the application of TQM at SMA Lab UM aligns with Tjiptono & Diana's (2019) theory that organizations must deliver quality services in all aspects, including non-academic services, to achieve overall customer satisfaction. The management of extracurricular activities based on evaluation and student interests demonstrates that the school not only prioritizes academic achievement but also focuses on character building and talent development. Customer involvement in deciding the type and implementation of extracurricular activities is a critical factor in ensuring relevance to their needs.

Improvements in physical facilities and learning infrastructure at SMA Lab UM also reinforce the *customer focus* principle, as highlighted by Oakland (2014), who notes that a comfortable, safe, and modern learning environment is an integral part of quality service. The use of technology in teaching and the enhancement of physical facilities such as IT laboratories, classrooms, and sports facilities are concrete efforts to meet customer needs for adequate educational resources. Taroreh et al. (2022) affirm that modern and supportive educational facilities can boost student motivation, which ultimately has a positive impact on learning outcomes.

In conclusion, the implementation of the *customer focus* principle in TQM at SMA Lab UM has resulted in a more responsive, adaptive, and customer-oriented education system. In line with the views of Goetsch & Davis (2014), this strategy plays a crucial role in enhancing customer loyalty, strengthening the institution's image, and ensuring the sustainability of quality educational services. This success is closely tied to the school's consistency in listening to customer aspirations, innovating its services, and fostering harmonious collaboration among the school, students, and parents to create a conducive and high-quality learning environment.

Total Involvement

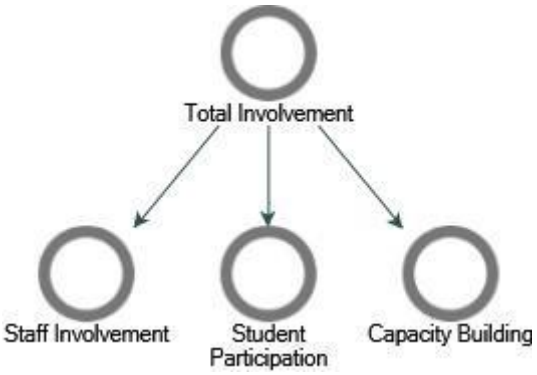


Figure 4. project map of total involvement implementation. Source: Data processed by the researcher using NVivo.

The principle of total involvement is optimally implemented at SMA Lab UM through the active participation of all school components in managing the quality of education. The school routinely holds coordination meetings involving the principal, vice principals, teachers, administrative staff, and student representatives to discuss academic and non-academic policies. Every policy to be implemented is first reviewed collectively, taking into account input from various stakeholders directly involved in the educational process. Teachers are granted the autonomy to develop learning strategies tailored to student characteristics, while students are given space to express their aspirations regarding learning methods, extracurricular activities, and school services through student forums and suggestion boxes provided on campus.

In addition, SMA Lab UM actively conducts training and capacity-building programs for teachers and educational staff as part of its efforts to enhance the quality of educational services. According to school documentation, workshops, seminars, and training sessions are held every semester focusing on the development of pedagogical competencies, educational technology, and soft skills such as communication, classroom management, and evaluation techniques. Teachers who participate in these trainings are required to conduct knowledge-sharing sessions within the school so that the acquired knowledge can be collectively applied. These sessions also serve as platforms for collaborative discussions to design more relevant learning innovations aligned with current developments and student needs.

Student involvement in quality management is also a major focus at SMA Lab UM. The research found that students are actively involved in various school programs through the Student Council (OSIS), student forums, and special teams for both academic and non-academic activities. Students contribute input on extracurricular schedules, character development programs, and learning outcome evaluation systems. Moreover, the school facilitates open discussion programs with the principal and guidance counselors to address academic and social issues faced by students. This involvement has been proven to enhance students' motivation and their sense of responsibility for the educational process at school.

The findings show that the implementation of the total involvement principle at SMA Lab UM is in line with the TQM concept proposed by Goetsch & Davis (2014), which emphasizes the importance of active participation from all individuals in the organization to achieve sustainable quality goals. Goetsch & Davis assert that the involvement of all stakeholders, from leaders to students, creates a participatory and collaborative work environment, enabling decision-making processes to be more open and grounded in real needs from the field. Khurniawan et al. (2020) also state that educational organizations that implement total involvement can foster a strong culture of collaboration and encourage every organizational component to feel responsible for the quality of educational services.

Furthermore, the continuous teacher training programs at SMA Lab UM demonstrate that total involvement is not merely about participation in policy-making, but also includes the development of individual capacities within the organization. This aligns with the view of Tjiptono & Diana (2019), who argue that active involvement in TQM must include continuous improvement efforts for human resource competencies to respond to the dynamics of education. Jamalludin et al. (2021) also support the notion that student involvement in school management positively contributes to learning motivation, student satisfaction, and the creation of a more adaptive and responsive education system that meets internal customer needs. Therefore, the total involvement principle at SMA Lab UM serves as an effective model of TQM implementation to comprehensively improve the quality of education.

Continuous Improvement

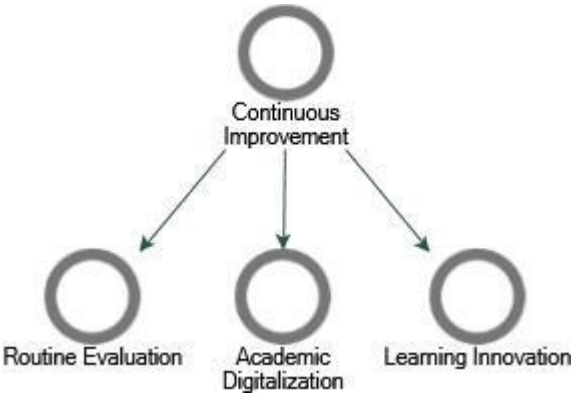


Figure 5. project map of continuous improvement implementation. Source: Data processed by the researcher using NVivo.

The research findings at SMA Lab UM indicate that the principle of continuous improvement is consistently implemented across various aspects of school management, both in administration and in the learning process. The school routinely conducts internal evaluations through weekly, monthly, quarterly, and semester-based meetings involving teachers, staff, and school leadership. Each meeting serves as a forum to discuss obstacles encountered in the teaching process, administrative services, and extracurricular activities, while simultaneously designing actionable solutions and improvements. A concrete example of this principle in action is the school's adjustment to its digital academic administration system to expedite services for students and parents. Every issue that arises is promptly identified, followed up with appropriate action, and the results are evaluated to ensure the long-term effectiveness of the improvements.

In addition to administration, SMA Lab UM continuously innovates technology -based learning to improve the effectiveness of teaching and learning activities. The school provides various training programs for teachers to utilize digital learning media such as interactive videos, online simulations, and e-learning platforms. Based on observations and school documentation, the majority of teachers have integrated digital technology into their classroom teaching strategies. The implementation of digital learning media aims to help students better understand the material and to encourage them to engage in independent learning outside of class hours. The school also facilitates teacher discussion forums to share best practices in using educational technology, thereby promoting ongoing innovation aligned with the needs of the digital generation.

The implementation of continuous improvement at SMA Lab UM aligns with the theory proposed by Tjiptono & Diana (2019), which states that continuous improvement is a key element of TQM, requiring organizations to consistently evaluate and

enhance the quality of all service aspects. The routine evaluations and internal meetings conducted at SMA Lab UM demonstrate a concrete application of this concept within an educational environment. Singh (2024) also asserts that the success of continuous improvement is strongly influenced by how quickly an organization responds to emerging issues, followed by the implementation of small, incremental changes. This is evident in how the school rapidly adjusted its digital administration system when problems arose and subsequently evaluated the effectiveness of the changes.

On the other hand, the technological innovations in teaching methods implemented at SMA Lab UM are consistent with the perspective of Goetsch & Davis (2014), who state that continuous improvement in education requires schools to constantly innovate and leverage technology to meet the needs of internal customers, namely, the students. Oakland (2014) adds that structured academic supervision is a tangible form of evaluation and process improvement in teaching and provides opportunities for teachers to enhance their instructional skills. Through routine supervision, feedback provision, and involving students in evaluating teaching methods, SMA Lab UM has succeeded in establishing a systematic and adaptive continuous improvement system that keeps pace with the times and student needs. This approach ensures that the quality of education at the school is consistently and sustainably enhanced.

2. TQM Implementation Strategies of Education Quality Improvement at SMA Laboratorium Universitas Negeri Malang

Enhancing Teacher Competence

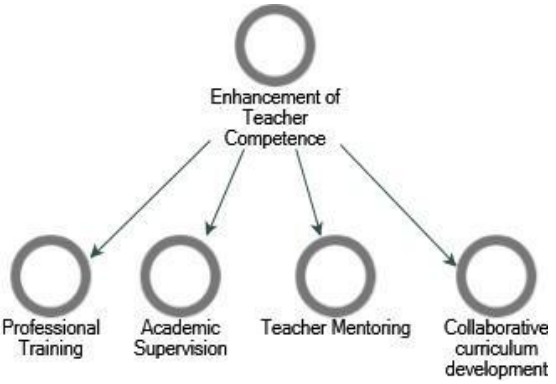


Figure 6. project map of teacher competence implementation. Source: Data processed by the researcher using NVivo.

Research findings at SMA Lab UM show that enhancing teacher competence is one of the main strategies in implementing TQM to improve the quality of education at the school. The school regularly conducts various professional development programs such as workshops, seminars, and training sessions tailored to teachers' needs in facing the dynamics of modern education. Based on interviews with the principal and teachers, the training includes mastery of educational technology, project-based learning strategies, and the application of differentiated instruction methods. These activities are held at least twice per semester and are attended by all teachers from various subject areas. As a result, teachers at SMA Lab UM are considered more adaptive to curriculum changes and capable of applying more effective and innovative teaching methods.

In addition to formal training, the school also optimizes academic supervision and mentoring programs as part of continuous quality monitoring. Based on observations, each teacher at SMA Lab UM is scheduled for at least one supervision session per semester, conducted by the principal or vice principal for academics. Beyond direct classroom observation, the supervision process includes a reflective discussion to

address the strengths and weaknesses of the teaching process. The school also implements a mentoring system where senior teachers serve as mentors for new teachers in designing and evaluating lessons. Evaluation results show that this approach effectively helps teachers identify teaching challenges and find practical solutions to improve the quality of classroom instruction.

This strategy aligns with the theory proposed by Goetsch & Davis (2014), who emphasize that sustainable human resource development is a crucial component in implementing TQM in the education sector. From the TQM perspective, teachers are not only curriculum implementers but also key actors in creating a high quality learning environment. Tjiptono & Diana (2019) also highlight the importance of supervision and mentoring in maintaining consistent educational quality standards in schools. Through structured academic supervision and continuous mentoring, SMA Lab UM has succeeded in fostering a quality culture that encourages teachers to continuously improve their teaching practices.

Furthermore, Oakland (2014) states that in implementing TQM, improving teacher competence must be accompanied by regular curriculum reviews to ensure alignment with scientific advancements and students' needs. This is reflected in SMA Lab UM's policy of collaboratively developing and revising the curriculum by involving teachers, the principal, and relevant stakeholders (Hayati et al., 2023). The implemented curriculum not only focuses on academic aspects but also emphasizes character development, mastery of 21st-century skills, and readiness for the workforce or further education. With this strategy, teachers at SMA Lab UM play a dual role as educators and facilitators, tasked with helping students develop their full potential in accordance with the demands of the times.

Optimization of Facilities and Infrastructure

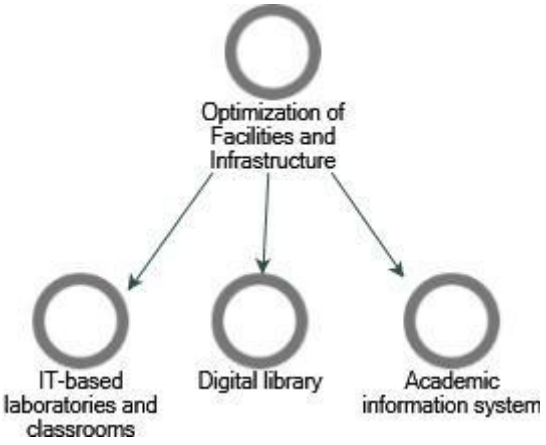


Figure 7. project map of facilities optimization implementation. Source: Data processed by the researcher using NVivo.

Research findings at SMA Lab UM indicate that the optimization of facilities and infrastructure is a key strategy in the implementation of TQM to enhance the quality of educational services. The school actively procures and upgrades learning facilities, such as well-equipped science laboratories, a digital library with access to thousands of e-books and international journals, and air-conditioned classrooms that provide a comfortable learning environment for students. Observational data show that all laboratories at the school are equipped with modern tools that support student experiments, particularly in Physics, Chemistry, and Biology subjects. Additionally, the digital library, accessible via the school network and an Android-based application, is regularly used by students for finding references and learning materials.

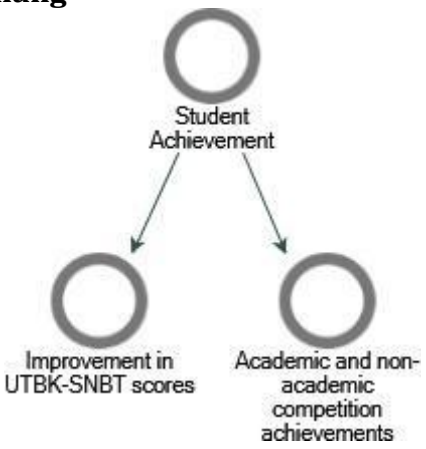
Beyond physical infrastructure, SMA Lab UM has also implemented information technology (IT) based

classrooms to support interactive learning. Based on interviews with teachers and students, each classroom is equipped with a projector, stable internet connection, and other multimedia devices. These facilities enable teachers to utilize various digital learning media, such as educational videos, interactive simulations, and online learning platforms. The availability of such tools has made the teaching methods at the school more varied, engaging, and relevant to the characteristics of today's learners. The implementation of IT based facilities has proven to increase student enthusiasm for learning and help teachers deliver abstract or complex subject matter more effectively.

This strategy of optimizing facilities and infrastructure aligns with the views of Tjiptono & Diana (2019), who emphasize that in the TQM concept, adequate educational facilities are a crucial element in delivering high quality education services. Modern and comprehensive infrastructure not only supports students' learning comfort but also enhances the effectiveness of the teaching and learning process. Goetsch & Davis (2014) add that the application of the principle of continuous improvement in TQM requires educational institutions to continuously upgrade their learning support facilities. At SMA Lab UM, the commitment to this principle is evident through ongoing improvements to both digital and physical facilities to meet the demands of the times and the needs of students in the digital era.

Furthermore, Oakland (2014) explains that the digitalization of school administration is part of a total quality management effort aimed at increasing efficiency, effectiveness, and transparency in academic services. This is reflected in the implementation of a school information management system at SMA Lab UM, which allows teachers, students, and parents to access academic data in real time, including exam scores, class schedules, and student progress. The system also supports reduced paper usage in school administration, making it more environmentally friendly and efficient. Through the digitalization of administrative services, the school not only improves the quality of academic services but also strengthens its image as an educational institution that is adaptive to technological developments and the needs of modern society.

3. The Impact of TQM Implementation on the Quality of Education at the Laboratory Senior High School of Universitas Negeri Malang



Improvement in Academic and Non-Academic Achievement

Figure 8. project map of student achievement implementation. Source: Data processed by the researcher using NVivo.

Research at SMA Lab UM shows that the consistent implementation of TQM has had a significant impact on improving both academic and non-academic achievements. Over the past five years, students' UTBK-SNBT scores have demonstrated a steady

upward trend, reflected in the increasing average scores and the growing number of students accepted into top public universities. The school has achieved outstanding results in various national and international competitions, such as science olympiads, debate tournaments, and scientific writing contests. According to an interview with the Vice Principal for Curriculum Affairs, Budi Utami, M.Pd., these achievements were supported by regular teacher training programs, innovative teaching methods, intensive academic coaching, and the provision of comprehensive learning facilities. Through a structured learning system based on continuous evaluation, students are increasingly well-prepared to face academic challenges and compete in various fields.

These academic and non-academic accomplishments conforms to the principle stated by Goetsch & Davis (2014), that one of the main goals of implementing TQM in educational institutions is to create comprehensive and continuous quality improvements across all aspects of the school. SMA Lab UM applies various quality enhancement strategies through strengthening teacher competencies, improving instructional systems, and developing academic and extracurricular guidance programs based on students' interests and talents. These efforts not only focus on academic performance but also aim to shape students' character and critical thinking abilities through diverse competitive activities. By applying the principle of continuous improvement, the school has managed to create a learning environment that is both adaptive to modern developments and productive in producing high quality graduates.

In line with this, Oakland (2014) asserts that the success of educational institutions in implementing TQM is reflected in student achievement and the competitiveness of graduates who can thrive in leading higher education institutions. The positive impact of TQM implementation at SMA Lab UM is evident not only in the school's rising reputation at local and national levels but also in the increasing opportunities for students to be accepted into prestigious universities, both domestically and internationally. The application of total quality management provides a strategic advantage for the school in building an educational system that is effective, transparent, and results oriented. Thus, graduates of SMA Lab UM not only excel in academic and non-academic fields but also possess the social and intellectual competencies needed to compete in the global arena.

Stakeholder Satisfaction

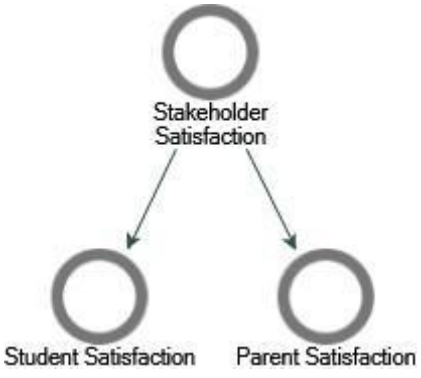


Figure 9. project map of stakeholder satisfaction implementation. Source: Data processed by the researcher using NVivo.

Research at SMA Lab UM indicates that the implementation of TQM has had a positive impact on increasing stakeholder satisfaction, particularly among students and parents. Based on internal surveys conducted over the past three years, the satisfaction levels regarding teaching quality, learning facilities, and the school's administrative system were categorized as highly satisfactory.

Students feel more comfortable and motivated in the learning process, supported by competent teachers and a conducive school environment. Meanwhile, parents show a high level of trust in the school's educational system, as evidenced by increased participation in school activities and quality evaluation forums. The school actively involves parents in the planning and strategic decision-making processes related to educational services, creating a strong synergy between the school, students, and parents.

The high level of stakeholder satisfaction corresponds to the view of Goetsch & Davis (2014), who state that the success of TQM implementation in educational institutions can be measured by the level of customer satisfaction, in this case, students and parents, with the services provided. SMA Lab UM has successfully implemented various quality service improvement programs through regular discussion forums, educational consultations, and an online academic information system that allows parents to monitor their children's learning progress in real time. Additionally, open communication between teachers, students, and parents fosters a more effective learning environment that is responsive to the needs of the learners. This effort makes the educational process at SMA Lab UM more adaptive, participative, and focused on the satisfaction of all parties involved.

In line with this, Tjiptono & Diana (2019) explain that one of the main goals of TQM in education is to build supportive relationships among stakeholders to achieve common objectives. This is reinforced by Singh (2024), who states that active stakeholder involvement is an indicator of the success of quality management in education based on TQM. The high level of satisfaction at SMA Lab UM has a direct impact on increasing the motivation of the entire school community to maintain and improve the quality of educational services. Students feel valued and supported throughout their learning process, teachers are more motivated to develop their professional competencies, and parents feel more involved in determining the direction of school policies. This condition creates an inclusive, open, and continuously improving educational environment.

Quality Based School Culture

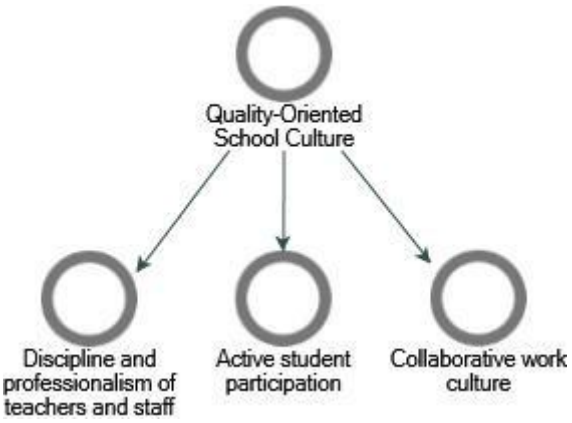


Figure 10. project map of quality culture implementation. Source: Data processed by the researcher using NVivo.

The implementation of TQM at SMA Lab UM has proven to have a significant impact on shaping a quality-based school culture. Observations and interviews with school stakeholders indicate that educators and educational staff have experienced improvements in discipline, responsibility, and professionalism in carrying out their respective duties. The Deputy Head of School for Curriculum, Budi Utami, M.Pd., mentioned that this quality culture is reflected not only in the classroom learning process but also in administrative management, counseling services, and public services to students and parents. Each teacher strives to apply more innovative and relevant teaching methods, while

administrative staff focuses on accuracy and the speed of service. This consistent work culture directly creates synergy among the school's elements in achieving quality educational goals.

In addition, the implementation of this quality culture has also impacted student behavior and character. Based on documentation of school activities, SMA Lab UM students have become more active, independent, and concerned about the quality of themselves and their school environment. Extracurricular activities, student organizations, and self development programs are carried out with a spirit of togetherness and commitment to achieving the best results. Students are directly involved in various school quality improvement programs, ranging from environmental clean-up activities, literacy programs, to student leadership training. This student involvement shows that the quality based school culture has permeated the entire school community, fostering a positive, competitive, and productive learning environment.

In line with these research findings, Deming (1986) states that a strong organizational culture is one of the key pillars in implementing TQM because it creates a conducive work environment focused on continuous improvement. The disciplined, collaborative, and responsible work culture formed at SMA Lab UM is a manifestation of this concept. Not only teachers and staff but all members of the school, including students, are involved in maintaining educational quality through a structured work system and continuous evaluation. Thus, the quality culture is not merely a slogan but has become a shared value internalized in the daily behavior of the school community.

Furthermore, Tjiptono & Diana (2019) emphasize that the implementation of TQM in education must be able to create an organizational culture that is responsive to changes in the external environment. This is proven at SMA Lab UM, which has successfully adapted to various demands of the times through administrative digitalization, innovation in teaching methods, and strengthening student character development programs. Goetsch & Davis (2014) also add that the success of TQM is determined by the involvement of all school components in creating a sustainable quality culture. With a strong quality based organizational culture, SMA Lab UM has successfully built a competitive, adaptive, and productive educational atmosphere, which has a direct positive impact on the overall improvement of educational quality.

CONCLUSION

This study makes a significant empirical contribution by broadening the understanding of TQM implementtation in the context of secondary education through an in depth, practice-based inquiry. Rather than merely reaffirming the effectiveness of TQM, this research demonstrates how TQM principles are translated into everyday institutional practices, particularly in decision-making, human resource management, and the development of a quality-oriented work culture within schools. From a theoretical perspective, this study contributes to the advancement of TQM discourse in education by reaffirming TQM's position as a philosophical and cultural framework, rather than merely a managerial instrument. It conceptualizes TQM as a holistic approach that integrates leadership, pedagogy, and organizational culture into a unified and sustainable quality system. Accordingly, this study extends the theoretical framework of TQM by emphasizing the importance of contextualization and

internalization of quality values within the school environment. This contribution opens avenues for the development of more responsive conceptual models of TQM tailored to the characteristics of educational institutions and encourages further research to examine the relevance and sustainability of the TQM approach across diverse educational contexts.

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