

MAPPING OF OCCUPATION IN QUALITY MANAGEMENT WITHIN NATIONAL QUALIFICATION FRAMEWORK TO CLOSE THE GAP BETWEEN EDUCATION AND INDUSTRY NEEDS

Surono^{1*}, Ratih Woro Anggraini²

^{1*} Universitas ASA Indonesia, Indonesia

²CKP-CBT Centre, Indonesia

*e-mail: surono.ckp@gmail.com, woro.ckp@gmail.com

Keywords

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ABSTRACT

In the face of rapid industrial changes and globalization, there is a growing demand for highly skilled professionals in quality management within Indonesia. The Indonesian National Qualifications Framework (IQF) seeks to align vocational education with industry demands by establishing a clear framework of work competency standards. However, discrepancies persist between the competencies taught in vocational programs and those required in the industry, particularly in advanced areas such as data analysis and strategic quality planning. This study undertakes a systematic occupational mapping in the quality management sector to identify these gaps and develop strategies to address them. Utilizing methodologies like the Rapid Assessment Process (RAP), Gall and Borg's educational research methods, and Regional Model Competency Standards (RMCS), the study formulates a comprehensive occupational matrix. This matrix serves as a crucial tool for planning human resources, developing relevant educational and training curricula, and fostering career development aligned with market trends and needs. The research outcomes are aimed at enhancing the alignment of vocational education with industry standards, thereby increasing the employability and effectiveness of graduates in the quality management sector.

INTRODUCTION

In the context of economic globalization and the industrial revolution 4.0, the need for qualified and competent human resources in the quality management industry becomes very important. Indonesia, through the Indonesian National Qualifications Framework (IQF), has sought to provide a framework of work competency standards that are harmonious with industry needs. Wassan et al., (2022) emphasize on ensuring that the competencies required in the quality management industry are well-represented and that they remain relevant and competitive in the face of global economic changes and the demands of the industrial revolution 4.0. Fundin et al., (2020) identify that the strategic adaptation ensures that the competencies developed through the NQF are directly related to real industry needs, making the Indonesian workforce competitive on a global scale. Moreover, Nawaz Wassan et al., (2023) underscore that National Qualification Framework role is highlighted as a

strategic measure to ensure that the workforce is equipped with relevant competencies, thereby addressing the sector's demand for skilled personnel adept at managing quality processes in line with global standards.

This study explores occupational mapping in the quality management sector to identify existing gaps and propose solutions to these discrepancies. Occupational maps are an important tool used to identify, document, and analyze various types of jobs in a sector or industry, as a basis for HR planning, development of education and training curricula that are relevant and in accordance with industry needs, and career development based on market trends and needs. Gremyr et al., (2021) agree that this approach ensures that career development efforts are informed by comprehensive knowledge of sector-specific roles, aiding in the creation of training programs that directly respond to the practical demands of the industry. Negt & Haunschild, (2024) highlight how these maps facilitate human resource planning by detailing job functions and requirements, which aids in developing relevant educational curricula and career development paths based on market trends and industry demands.

The National Qualifications Framework (NQF) such as the Indonesian National Qualifications Framework (IQF) is a system that classifies qualifications based on the set of competency standards required to perform work at various levels, which is used as standardization of qualifications, job mobility, and transparency that facilitates employers in the recruitment and placement process. Allais, (2017) notes that the systematic approach is designed to foster job mobility, standardize qualifications, and enhance transparency, thereby facilitating the recruitment and placement process for employers. Mandal, (2018) observes that the Indian Qualification framework aligns closely with the concept of the IQF, underscoring the NQF's utility in creating a structured, transparent system for recognizing competencies across diverse industries and sectors. Tias et al., (2023) emphasize how the NQF helps align educational outputs with labor market needs, ensuring that educational institutions provide qualifications that are relevant and recognized across different sectors and industries, which in turn aids employers in making informed hiring decisions.

Quality management is a critical aspect in business systems that focuses on improving the quality of products or services produced through a systematic and sustainable approach, to increase customer satisfaction through improving consistency and quality of products or services, operational efficiency, and reputation improvement. Lepistö et al., (2024) highlight how systematic and sustainable approaches to quality management are essential for improving product and service quality, thereby increasing customer satisfaction, operational efficiency, and enhancing the reputation of businesses. Gremyr et al., (2021) discovered that QMS, when utilized beyond mere compliance and integrated into business management and continuous improvement efforts, positively influences management's perception of QMS as cost-effective and strategically important. Balahadia et al., (2022) point out that while employees recognize the role of QMS in enhancing the institution's mission, vision, and objectives, challenges such as a lack of understanding and commitment can hinder effective implementation.

However, in the development of occupational maps within the framework of qualifications, nationally still face several problems, namely: limited occupational standardization and the available data is incomplete or not up-to-date, which makes occupational maps less accurate, Lack of awareness or commitment to quality management at several levels of the organization can hinder effective implementation. Lepistö et al., (2024) recommends structured updates to the occupational map to reflect these shifts, thus maintaining the relevance and competitiveness of the standards in a dynamic industry landscape. Surono et al., (2024) found that there is a congruence between industry needs and educational outcomes in HRM, demonstrating the importance of mapping in strengthening the relationship between industry and educational programs to match the needs of a dynamic job market. The objectives of this study are comprehensively map the occupation in quality management in accordance with IQF. Identify competency needs in the quality management industry that have not been covered in the current vocational education curriculum. Develop recommendations for the development

of vocational education curricula that are more in line with industry needs, reduce educational mismatch, and increase graduate employability.

METHODS

In the development of effective and efficient research, the combination of the Rapid Assessment Process (RAP), Gall and Borg methodology, and the use of Regional Model Competency Standards (RMCS) offers a strong framework for understanding the complex dynamics in vocational education and training and quality management. RAP, developed by James Beebe (2005), is a qualitative research methodology designed to quickly collect and analyze data to develop an initial understanding of a situation from an insider's perspective. The methodology developed by Gall and Borg, which focused on educational research, provides a systematic structure in the development and validation of research instruments. RMCS is a standard that describes the competencies required for various jobs and is used to standardize qualifications in different regions. The combination of these three methods allows researchers to develop research that is not only fast and responsive to immediate needs, but also in-depth and of high standards.

RESULTS

The study formulated a comprehensive occupational matrix for quality management within the IQF. It detailed various roles from Level 1, where foundational skills and tasks such as assisting in quality checks are necessary, up to Level 9, which involves strategic roles like Quality Assurance Directors and Chief Quality Officers who develop and implement organizational quality strategies.

Table 1. Map of Quality Management Occupation Within Indonesian Qualification Framework

IQF	OCCUPATIONAL
IX	<ul style="list-style-type: none"> Quality Assurance Director Chief Quality Officer
VIII	<ul style="list-style-type: none"> Senior Quality Assurance Manager Senior Quality Consultant
VII	<ul style="list-style-type: none"> Quality Assurance Manager/ Quality Manager/ Quality Systems Manager Process Improvement Specialist Lead Assessor ISO 9000/ Lead Auditor for Quality/ QMS Lead Assessor
VI	<ul style="list-style-type: none"> Quality Control Supervisor/ Quality Control Lead/ Quality Supervisor Internal Auditor/ Assessor QMS Data Analyst (Process Control Statistics) Quality Planner QMS Developer Process Improvement Manager, Quality Compliance Manager, Training and Development Coordinator/ Quality Training and Development Specialist.
V	<ul style="list-style-type: none"> QMS Implementer QMS Facilitator Quality Supervisor, Quality Control Lead, Quality Assurance Coordinator/Quality Assurance Technician, QMS Assessor, Junior QMS Developer
IV	<ul style="list-style-type: none"> Quality Control Technician/ Quality Inspection Technician /Quality Assurance Technician: Quality Assurance Analyst, Junior Quality management Assessor
III	<ul style="list-style-type: none"> Quality Inspector Quality Assurance Assistant , Process Monitoring Operator
II	<ul style="list-style-type: none"> Data Entry for Quality Control Quality Control Operator, Sampler officer
I	<ul style="list-style-type: none"> Assistant Quality Checker

Table 2. Occupation map and its competence in the field of Quality Management within IQF level 9

IQF	OCCUPATION/ JOB TITLE	DESCRIPTION	TASK/ COMPETENCE
	Quality Assurance Director	A Quality Assurance Director is responsible for overseeing all quality initiatives and operations within an organization.	<ul style="list-style-type: none"> • Develop and Implement an Organizational Quality Strategy • Oversee Product Testing and Audit • Lead Continuous Improvement Initiatives • Conduct Employee Training and Development for Quality • Managing Quality Assurance Teams
9	Chief Quality Officer	The Chief Quality Officer (CQO) is a leadership position responsible for oversight and assurance of quality standards throughout an organization's operations.	<ul style="list-style-type: none"> • Develop an Organizational Quality Management Strategy • Oversee Compliance with Quality Standards • Conduct Periodic Audits and Follow Up on Findings • Train and Develop Teams in Quality • Manage and Improve Quality Documentation Systems

Table 3. Occupation map and its competence in the field of Quality Management at IQF level 8

IQF level	OCCUPATION/ JOB TITLE	DESCRIPTION	TASK/ COMPETENCE
	Senior Quality Assurance Manager	Senior Quality Assurance Manager is a strategic position responsible for ensuring product or service compliance with established quality standards.	<ul style="list-style-type: none"> • Develop and Improve Quality Systems and Procedures • Supervise Internal and External Audit Implementation • Perform a Cause Analysis of Quality Problems • Managing and Developing Quality Assurance Teams • Coordinate with Suppliers and Vendors for Quality Standards • Prepare Periodic Reports on Quality Status
8	Senior Quality Consultant	Senior Quality Consultant is a professional who provides expertise and strategic guidance in the field of quality management to organizations or companies.	<ul style="list-style-type: none"> • Review and assess the client's quality management system to identify areas of improvement. • Design and implement strategic and tactical plans to improve quality. • Provide training and guidance to client staff in the implementation of quality best practices. • Facilitate audits and assessments to ensure compliance with applicable standards. • Provide data analysis and progress reports to client management. • Maintain communication with key stakeholders during the consultation process.

Table 4. Occupation map and its competence in the field of Quality Management within IQF level 7

IQF level	OCCUPATION/ JOB TITLE	DESCRIPTION	TASK/ COMPETENCE
7	Quality Assurance Manager/ Quality Manager/ Quality Systems Manager	A Quality Assurance Manager, also known as a Quality Manager or Quality Systems Manager, is a professional responsible for the supervision and implementation of a quality management system in an organization.	<ul style="list-style-type: none"> • Develop and maintain a quality management system in accordance with international standards and regulations. • Supervise internal and external quality audit processes. • Conduct training and coaching to the team on the principles of quality.

		<ul style="list-style-type: none"> Supervise and evaluate the quality performance of products or services. Coordinate with the product development team to ensure quality specifications are met. Prepare and analyze quality reports for upper management.
Process Improvement Specialist	Process Improvement Specialist is a professional who are responsible for identifying, analyzing, and improving operational processes within an organization to increase efficiency, reduce costs, and improve the quality of products or services.	<ul style="list-style-type: none"> Conduct process analysis to identify potential areas of improvement. Develop and implement improvement plans that focus on efficiency and waste reduction. Train and guide team members in the principles of process improvement. Monitor and report on the progress of improvement initiatives against organizational targets. Coordinate with various departments to ensure effective implementation of the initiative. Assess the effectiveness of improvements that have been implemented and make necessary adjustments.
Lead Asesor ISO 9000/ Lead Auditor for Quality/ QMS Lead Assessor	The ISO 9000 Lead Assessor or Lead Auditor for Quality is the professional responsible for conducting a quality management system (QMS) audit in an organization, ensuring compliance with the ISO 9000 standard as well as continuous improvement in the quality process.	<ul style="list-style-type: none"> Prepare an audit plan and determine the scope of audit activities. Lead the auditor team in conducting external and internal audits. Analyze and assess client quality system procedures and documentation. Prepare detailed audit reports and provide recommendations for improvement. Hold follow-up meetings with clients to discuss audit results and improvement plans. Maintain integrity and standards of professionalism during the audit process.

Table 5. Occupation map and its competence in the field of Quality Management within IQF level 6

IQF level	OCCUPATION/ JOB TITLE	DESCRIPTION	TASK/ COMPETENCE
6	Quality Control Supervisor/ Quality Control Lead/ Quality Supervisor	Quality Control Supervisor or Quality Control Lead is a position responsible for supervising and managing quality control activities on the production floor or in operational units.	<ul style="list-style-type: none"> Supervise the quality control team and daily operations of product inspection. Develop and implement quality control protocols and standards. Conduct an analysis of the causes of quality problems and develop corrective actions. Report to management on quality issues and performance trends. Conduct internal audits and prepare sites for external audits. Manage documentation and quality control records.

Internal Auditor/ Asesor QMS	Internal Auditor or QMS Assessor is a professional in charge of auditing and evaluating the internal quality management procedures and practices of an organization.	<ul style="list-style-type: none"> Plan and conduct regular internal audits to assess compliance and effectiveness of the quality management system. Prepare audit reports and present findings and recommendations to management. Follow up audits to ensure implementation of recommendations. Identify risks and compliance issues in the organization's operations and propose improvements. Coordinate with external auditors and regulators during external audits. Conduct training and briefings to staff on audit practices and quality requirements.
Data Analyst (Process Control Statistics)	Data Analysts in the context of Process Control Statistic is a professional who specialize in collecting, analyzing, and reporting data to monitor and improve operational processes.	<ul style="list-style-type: none"> Collect and process data from various sources to monitor process performance. Perform statistical analysis to identify deviations, trends, and opportunities for improvement. Create detailed periodic reports on analysis findings and recommendations. Develop and calibrate statistical models for performance prediction and process optimization. Coordinate with the operations team for the implementation of analysis-based actions. Keep databases and analysis systems updated and accurate.
Quality Planner	Quality Planner is a professional who is in charge of planning and developing quality management strategies and procedures in an organization.	<ul style="list-style-type: none"> Develop quality plans and standards for each phase of production or product development. Develop and review quality procedures and specifications to ensure compliance with industry standards and regulations. Conduct internal audits of quality management systems and related processes. Coordinate with the product development team to ensure integration of quality needs. Manage and supervise the implementation of quality action plans and monitoring their effectiveness. Report progress and challenges in quality management to senior management.
QMS Developer	QMS Developer is a professional who is responsible for designing, developing, and implementing a Quality Management System (QMS) in an organization.	<ul style="list-style-type: none"> Design frameworks and procedures for QMS that meet industry standards and regulations. Integrate the QMS system with the company's operational processes. Coordinate with the IT department to develop and manage tools and databases that support the QMS. Conduct training and workshops to educate staff about the QMS and their responsibilities in the system. Supervise and evaluate the implementation of the QMS to ensure its effectiveness. Conduct internal audits and prepare for external audits.
Process Improvement Manager	Process Improvement Manager is a professional responsible for leading process improvement initiatives within organizations.	<ul style="list-style-type: none"> Conduct an analysis of existing processes to identify areas of improvement and efficiency. Develop and execute a comprehensive process improvement strategy, including the definition and monitoring of key performance indicators. Lead and manage process improvement projects, including schedule setting and team coordination. Communicate with senior management about the progress and results of improvement initiatives. Provide training and mentorship to team members for process improvement methods. Oversee the implementation of process changes and evaluate their effectiveness.

Quality Compliance Manager	Quality Compliance Manager is a professional who is responsible for ensuring that all processes, products, and operations in an organization comply with established quality standards, including applicable regulations and laws.	<ul style="list-style-type: none"> • Develop and manage quality compliance systems in accordance with industry and legal standards. • Supervise and coordinate internal and external audits. • Ensure proper reporting of compliance issues to senior management and regulators. • Conduct compliance training for employees. • Monitor changes in regulations and industry standards that affect compliance. • Respond to audit findings and ensure corrective actions are implemented effectively.
Training and Development Coordinator/ Quality Training and Development Specialist:	Training and Development Coordinator or Quality Training and Development Specialist is a professional who is responsible for designing, implementing, and monitoring training programs aimed at improving employee competence in quality aspects.	<ul style="list-style-type: none"> • Develop and compile a training curriculum that is in accordance with the company's quality needs. • Coordinate and manage training schedules for all employees. • Conduct training sessions and workshops for new and existing employees. • Assess training effectiveness and make adjustments based on feedback. • Update and modify training materials in accordance with changing standards and quality policies. • Report the progress and effectiveness of the training program to senior management.

Table 6. Occupation map and its competence in the field of Quality Management within IQF level 5

IQF level	OCCUPATION/ JOB TITLE	DESCRIPTION	TASK/ COMPETENCE
5	QMS implementer	QMS implementer is a professional in charge of implementing and maintaining a quality management system in an organization.	<ul style="list-style-type: none"> • Implement and monitor the implementation of the quality management system in accordance with established standards. • Assist in the development and maintenance of QMS documentation. • Conduct internal audits to ensure compliance with the QMS. • Train employees on QMS policies and procedures. • Identify deficiencies and recommend process improvements. • Coordinate with external teams for audits and certifications.
	Facilitator QMS	QMS facilitators is a professional tasked with facilitating the implementation and maintenance of a quality management system in an organization.	<ul style="list-style-type: none"> • Facilitate the implementation and maintenance of QMS across departments. • Coordinate with managers and staff to ensure compliance with QMS procedures. • Lead training sessions and workshops related to QMS to increase staff awareness and competence. • Monitor and report on the progress of QMS implementation. • Identify barriers to QMS implementation and work with teams to overcome those barriers. • Provide support and resources to staff to improve QMS implementation.
	Quality Supervisor	Quality Supervisor is a professional responsible for overseeing activities and teams related to quality control and assurance in production or service provision.	<ul style="list-style-type: none"> • Supervise the quality control team and operational processes related to quality assurance. • Develop and implement quality standards, procedures, and specifications. • Conduct internal audits and prepare units for external audits. • Conduct an analysis of the causes of quality problems and develop a corrective action plan.

		<ul style="list-style-type: none"> • Monitor and report quality performance to management. • Provide training and support to staff on the implementation of quality policies.
Quality Control Lead,	Quality Control Lead is a professional who leads the quality control team in conducting product inspections, tests, and process assessments to ensure that all products meet the established quality standards before being delivered to customers.	<ul style="list-style-type: none"> • Supervise and coordinate the activities of the quality control team. • Carry out periodic inspections, product testing, and process audits. • Compile quality reports and analyze data to find patterns or issues. • Develop, revise, and maintain quality control documentation such as SOPs and test protocols. • Communicate with plant management and production teams to discuss quality issues and recommendations. • Train new staff in quality control procedures and standards.
Quality Assurance Coordinator/ Quality Assurance Technician	Quality Assurance Coordinator or Quality Assurance Technician is a professional who is in charge of coordinating and conducting quality testing activities to ensure products or services meet established standards.	<ul style="list-style-type: none"> • Coordinate and carry out product testing in accordance with established standards. • Document test results and compile quality reports. • Oversee compliance with quality protocols throughout the production process. • Identify deviations from quality standards and coordinate investigations of their causes. • Participate in the development and revision of quality procedures. • Conduct internal audits to ensure compliance with quality standards.
QMS Assessor,	QMS Assessor is a professional in charge of auditing and evaluating an organization's Quality Management System (QMS) to ensure compliance with applicable standards and regulations, such as ISO 9001.	<ul style="list-style-type: none"> • Conduct internal and external audits of QMS practices in the organization. • Assess compliance with international and national quality standards. • Prepare and present detailed audit reports, including improvement recommendations. • Provide guidance and training to the organization on how to implement improvements. • Follow up on corrective actions that have been agreed after the audit. • Update audit procedures based on changes in regulations or industry standards.
Junior QMS Developer	Junior QMS Developer is a professional tasked with assisting in the development, implementation, and maintenance of a Quality Management System (QMS) under the guidance of a senior.	<ul style="list-style-type: none"> • Assist in the development and documentation of QMS procedures. • Perform administrative tasks that support the implementation and maintenance of the QMS. • Participate in team meetings to discuss progress and issues in the QMS. • Assist in internal auditing and preparation for external audits. • Collect and analyze data for quality reports. • Support employee training in aspects of the QMS.

Table 7. Occupation map and its competence in the field of Quality Management within IQF level 4

IQF level	OCCUPATION/ JOB TITLE	DESCRIPTION	TASK/ COMPETENCE
4	Quality Control Technician/ Quality Inspection Technician /Quality Assurance Technician	Quality Control Technician, Quality Inspection Technician, or Quality Assurance Technician is a professional who is responsible for carrying out product inspections, tests, and analysis to ensure that all products meet established quality standards.	<ul style="list-style-type: none"> • Conduct inspection and testing of raw materials and final products. • Record and analyze data from tests and inspections. • Set up and calibrate testing equipment before use.

			<ul style="list-style-type: none"> Identify defective products and report quality problems to supervisors. Ensure the cleanliness and maintenance of the test area. Follow and ensure safety procedures in the laboratory or production area.
Quality Assurance Analyst	Quality Assurance Analyst is a professionals who are responsible for analyzing and evaluating processes and products to ensure that they meet established quality standards.		<ul style="list-style-type: none"> Perform data analysis to assess the quality of a product or process. Prepare and report analysis results to the team and management. Identify, analyze, and address nonconformities in product or process quality. Develop recommendations for improvement based on data analysis. Coordinate with production or development teams for the implementation of improvements. Maintain accurate quality analysis documentation and records.
Junior Quality management Assessor	Junior Quality Management Assessor is a professional who assists in the assessment and internal audit of the quality management system in an organization.		<ul style="list-style-type: none"> Assist in the preparation and execution of internal and external audits. Document audit findings and assist in compiling reports. Monitor corrective actions resulting from audit findings. Follow and document the audit process in accordance with established guidelines. Interact with staff and management to collect necessary data and information. Maintain the accuracy and integrity of audit data.

Table 8. Occupation map and its competence in the field of Quality Management within IQF level 3

IQF level	OCCUPATION/ JOB TITLE	DESCRIPTION	TASK/ COMPETENCE
3	Quality Inspector	Quality Inspector is a professional in charge of inspecting and evaluating products and production processes to ensure that all specifications and quality standards are met.	<ul style="list-style-type: none"> Perform visual inspections and physical measurements on products in accordance with specifications. Using measuring instruments and testing equipment to test product samples. Record inspection findings and report nonconformities. Work closely with the production department to discuss and solve quality problems. Supervise the production process to ensure the implementation of quality standards. Maintain the cleanliness and order of the inspection work area.
	Quality Assurance Assistant	Quality Assurance Assistant is a support position in the quality assurance team that assists in the implementation and	<ul style="list-style-type: none"> Assist in the implementation of tests and quality testing of products or services. Compile and store documentation related to quality assurance activities.

		maintenance of a quality management system.	<ul style="list-style-type: none"> Collect and analyze data from testing to discuss with the QA team. Report any nonconformities or quality issues to supervisors. Prepare samples and testing equipment in accordance with established protocols. Follow and support internal and external quality audits.
Process Monitoring Operator	Process Monitoring Operator is a worker who is in charge of monitoring and controlling the production process to ensure that operations run according to set parameters and meet quality standards.		<ul style="list-style-type: none"> Monitor process parameters through the control dashboard and ensure operations run according to standards. Adjust settings on machinery and equipment to maintain production quality. Record production and quality data for analysis and reporting. Identify and report technical or quality problems to supervisors. Perform regular maintenance and inspection of equipment to ensure optimal functioning. Maintain the cleanliness and safety of the work area.

Table 9. Occupation map and its competence in the field of Quality Management within IQF level 2

IQF level	OCCUPATION/ JOB TITLE	DESCRIPTION	TASK/ COMPETENCE
2	Operators of Data Entry for Quality Control	Operator of Data Entry for Quality Control is a worker who is responsible for entering data related to quality control into the company's database system.	<ul style="list-style-type: none"> Input quality data from production or test results into the system. Ensure the accuracy and integrity of the data entered. Store, archive, and retrieve data as needed. Conduct periodic data audits to ensure database accuracy. Report discrepancies or problems in data to supervisors. Maintain data confidentiality and security.
	Quality Control Operator,	Quality Control Operator is a worker who is responsible for carrying out quality control tasks in the production process.	<ul style="list-style-type: none"> Conduct regular checks and tests on manufactured products to ensure compliance with quality specifications. Using measuring instruments and testing equipment to assess product quality. Document test results and compile reports on findings. Identify and report quality problems to supervisors or managers. Calibrate and maintain testing and measurement equipment to ensure continuous accuracy. Maintain cleanliness and order in the work area.
	Sampler officer	Sampler Officer is a worker in charge of taking samples of products or raw materials at various stages of production for quality analysis.	<ul style="list-style-type: none"> Take samples of products or raw materials in accordance with established protocols. Mark and document samples taken for testing. Transmit samples to the laboratory in a manner that maintains the integrity of the samples. Report any nonconformities or problems during sampling. Monitor sample storage conditions if needed. Maintain the cleanliness and order of the sampling area.

Table 10. Occupation map and its competence in the field of Quality Management within IQF level 1

IQF level	OCCUPATION/ JOB TITLE	DESCRIPTION	TASK/ COMPETENCE
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1	Assistant Quality Checker Assistant Quality Checker is a worker who assist in product quality inspection activities or production processes under the direct supervision of a more senior Quality Evaluator.	<ul style="list-style-type: none"> • Conduct visual inspection and basic measurements of products according to the instructions. • Record the results of the examination in a predefined format. • Submit findings that do not meet specifications to the Quality Checker or supervisor. • Assist in the maintenance and calibration of testing equipment. • Follow safety and hygiene protocols in the workplace. • Ensure the work area remains neat and organized.
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The formulation of a comprehensive work matrix for quality management within the Indonesian Qualification Framework (IQF) presents several pivotal areas for discussion and further development. These areas include: identifying and bridging competency gaps, engaging stakeholders effectively, implementing international standards, formulating recommendations for educational institutions, and ensuring continuous improvement and monitoring. Each of these components is critical for aligning the educational outputs with the dynamic demands of the quality management sector.

Gap Identification and Bridging Strategies

The research highlighted specific competencies that are currently absent from the vocational education curriculum. For example, advanced data analysis and strategic quality planning are significantly underrepresented in educational programs. McGrath & Yamada, (2023) advocates for a constructivist approach in skill development, urging educational reforms that involve direct engagement with industry stakeholders to ensure relevance and applicability. Suharno et al., (2020) emphasize the urgent need for curriculum reforms to include these advanced skills, aiming to align vocational education more closely with industry requirements and enhance student employability in a competitive global environment. Anna Cecilia et al., (2023) note that many vocational education programs, especially those in advanced data analysis and strategic quality planning, fail to meet industry competency demands. Consequently, the study recommends curriculum enhancements to integrate these missing competencies, ensuring that graduates are better equipped to meet industry demands.

Stakeholder Engagement

One of the critical strategies involved engaging industry stakeholders in the curriculum development process to validate the relevance and applicability of the proposed educational content. This approach ensures that the training provided aligns closely with real-world requirements. Lu & Wang, (2023) support a systematic approach where vocational institutions not only align their educational objectives and curriculum with industry needs but also incorporate feedback from these stakeholders to enhance educational quality and relevance, thereby ensuring the training provided is directly applicable to the workforce demands. Chen et al., (2021) emphasize the need for vocational institutions to integrate stakeholder feedback to enhance the educational quality and relevance, ensuring that training meets workforce demands effectively. Yang et al., (2023) highlight that cooperation helps ensure that VET programs are attractive and relevant, thus addressing the competency gaps in the current vocational education framework by incorporating digital competencies and other modern skills demanded by the industry.

Implementation of International Standards

The occupational mapping also considered international standards, comparing the IQF with other global qualification frameworks to ensure the competencies developed are globally competitive and relevant. Chen et al., 2021 note that the approach aligns with international standards by incorporating a broad and adaptable framework that can be applied to various national contexts, ensuring that the educational content meets global relevance and competitiveness criteria. Gessler et al., (2021) highlight that the Implementation of International Standards approach ensures that VET programs not only meet local industry needs but also align with global labor market demands, making the competencies developed through these programs universally applicable and competitive. Furthermore, Li & Pilz, (2023) suggest that the successful international transfer of VET systems involves more than merely replicating systems; it requires adapting them to the specific educational, economic, and cultural contexts of the receiving country.

Recommendations for Educational Institutions

The study emphasized the need for educational institutions to continuously update and adapt their curricula to incorporate emerging quality management techniques and technologies as the industry evolves. Miring'u & Pius Muasa, n.d., (2023) support this approach, highlighting that it bridges the gap between theoretical knowledge and practical application, thus enhancing the effectiveness of educational programs and their alignment with professional standards. Similarly, Ozsen et al., (2023) contend that curricular adjustments are crucial to ensure that educational content remains relevant and prepares students for both current and future industry demands, underscoring the importance of a proactive approach to curriculum development in response to technological and methodological advancements in quality management. Fomba et al., (2023) also acknowledge that this strategy effectively bridges the gap between educational outcomes and industry requirements, making the educational content more pertinent and applicable to current and future needs.

Continuous Improvement and Monitoring

The study underscored the necessity of ongoing monitoring and evaluation of occupational standards to ensure they remain up-to-date with industry advancements. It recommends a structured process for regularly updating the occupational map to reflect changes in technology, market demands, and regulatory requirements. Rogala & Wawak, (2021) note that this type of approach is crucial for maintaining the relevance and competitiveness of standards in a dynamically changing environment. Similarly, Endalamaw et al., (2024) highlights the importance of a structured approach to regularly updating the occupational map to reflect technological advancements, market demands, and changes in regulatory requirements.

CONCLUSION

The research aimed at mapping occupations within the Indonesian Qualification Framework (IQF) for the Quality Management sector reveals significant findings and suggestions that are essential for bridging the gap between vocational education and industry needs. The study meticulously outlined the range of competencies required across different levels, from foundational tasks at the entry levels to strategic management roles at the higher echelons of the industry. Comprehensive Occupational Mapping the study successfully established a detailed occupational matrix within the IQF, clearly defining the competencies required at each level. This matrix is crucial for identifying roles and the specific skills needed at varying levels of expertise, ensuring that all quality management aspects are covered. Identification of Competency Gaps: The research identified key areas where current vocational training programs fall short. Notably, competencies such as advanced data analysis and strategic quality planning were found to be underrepresented, highlighting the need for curriculum reforms to include these crucial skills. Stakeholder Engagement: The study emphasized the importance of involving industry stakeholders in the curriculum development process. This approach ensures that the educational offerings are aligned with real-world demands and that the training provided is both relevant and applicable to current industry standards. Adherence to International Standards: The occupational mapping considered global qualification frameworks to ensure that the competencies developed are internationally relevant and competitive. This comparison helps to position the IQF in line with global standards, promoting international recognition and validity. Recommendations for Continuous Improvement: It recommended regular updates to the curriculum and occupational standards based on technological advancements and market changes. This ongoing revision is vital to maintaining the relevance and efficacy of vocational education in quality management. Proposals for Educational Institutions: The study suggests that educational institutions should continuously update and adapt their programs to reflect the latest quality management techniques and technologies. This adaptation is critical for staying current with industry evolution and meeting the needs of the marketplace effectively.

REFERENCES

- Allais, S. (2017). Labour market outcomes of national qualifications frameworks in six countries. *Journal of Education and Work*, 30(5), 457–470. <https://doi.org/10.1080/13639080.2016.1243232>
- Anna Cecilia, R., Agneta, K., & Smeplass, E. (2023). Bridging gaps in vocational education and training systems in Norway. *Journal of Vocational Education and Training*. <https://doi.org/10.1080/13636820.2023.2255992>
- Balahadia, F., Dalugdog, W., & Cabiente, J. (2022). Awareness and Challenges of ISO 9001:2015 Implementation in Higher Education. *International Journal of Academe and Industry Research*, 3(2). <https://doi.org/10.53378/352894>
- Chen, P., Goncharova, A., Pilz, M., Frommberger, D., Li, J., Romanova, O., & Lin, Y. (2021). International curriculum comparison in vocational education and training: A collaborative development of an analysis instrument. *International Journal for Research in Vocational Education and Training*, 8(4), 16–43. <https://doi.org/10.13152/IJRVET.8.4.2>
- Endalamaw, A., Khatri, R. B., Mengistu, T. S., Erku, D., Wolka, E., Zewdie, A., & Assefa, Y. (2024). A scoping review of continuous quality improvement in healthcare system: conceptualization, models and tools, barriers and facilitators, and impact. *BMC Health Services Research*, 24(1). <https://doi.org/10.1186/s12913-024-10828-0>
- Fomba, B. K., Talla, D. N. D. F., & Ningaye, P. (2023). Institutional Quality and Education Quality in Developing Countries: Effects and Transmission Channels. *Journal of the Knowledge Economy*, 14(1), 86–115. <https://doi.org/10.1007/s13132-021-00869-9>
- Fundin, A., Lilja, J., Lagrosen, Y., & Bergquist, B. (2020). Quality 2030: quality management for the future. *Total Quality Management and Business Excellence*. <https://doi.org/10.1080/14783363.2020.1863778>
- Gessler, M., Bohlinger, S., & Zlatkin-Troitschanskaia, O. (2021). International Vocational Education and Training research: An introduction to the special issue. In *International Journal for Research in Vocational Education and Training* (Vol. 8, Issue 4, pp. 1–15). European Research Network Vocational Education and Training. <https://doi.org/10.13152/IJRVET.8.4.1>
- Gremyr, I., Lenning, J., Elg, M., & Martin, J. (2021). Increasing the value of quality management systems. *International Journal of Quality and Service Sciences*, 13(3), 381–394. <https://doi.org/10.1108/IJQSS-10-2020-0170>
- Lepistö, K., Saunila, M., & Ukko, J. (2024). Enhancing customer satisfaction, personnel satisfaction and company reputation with total quality management: combining traditional and new views. *Benchmarking*, 31(1), 75–97. <https://doi.org/10.1108/BIJ-12-2021-0749>
- Li, J., & Pilz, M. (2023). International transfer of vocational education and training: a literature review. *Journal of Vocational Education and Training*, 75(2), 185–218. <https://doi.org/10.1080/13636820.2020.1847566>
- Lu, Y., & Wang, T. (2023). Quality Evaluation Model of Vocational Education in China: A Qualitative Study Based on Grounded Theory. *Education Sciences*, 13(8). <https://doi.org/10.3390/educsci13080819>
- Mandal, S. (2018). Emerging National Qualification Framework in India: A Journey of Dilemmas. *Social Change*, 48(4), 589–600. <https://doi.org/10.1177/0049085718801471>
- McGrath, S., & Yamada, S. (2023). Skills for development and vocational education and training: Current and emergent trends. *International Journal of Educational Development*, 102. <https://doi.org/10.1016/j.ijedudev.2023.102853>
- Miring'u, M. N., & Pius Muasa, W. (n.d.). *Exploration of Psychological Stressors Faced by Parents Living with their Children during COVID-19 Lockdown in Langata Constituency, Nairobi County, Kenya*. <https://doi.org/10.47772/IJRISS>
- Nawaz Wassan, A., Memon, M. S., Mari, S. I., & Kalwar, M. A. (2023). Identifying the critical success factors of total quality management implementation in manufacturing industry of Pakistan: an

exploratory factor analysis. *Journal of Applied Research in Technology & Engineering*, 4(1), 55–68.
<https://doi.org/10.4995/jarte.2023.17969>

- Negt, P., & Haunschuld, A. (2024). Exploring the gap between research and practice in human resource management (HRM): a scoping review and agenda for future research. *Management Review Quarterly*. <https://doi.org/10.1007/s11301-023-00397-7>
- Ozsen, T., Uslu, B., & Aypay, A. (2023). Strategy adaptation for sustainable quality management in universities: a systematic literature review. *Tertiary Education and Management*, 29(4), 447–469. <https://doi.org/10.1007/s11233-022-09098-4>
- Rogala, P., & Wawak, S. (2021). Quality of the ISO 9000 series of standards-perceptions of quality management experts. *International Journal of Quality and Service Sciences*, 13(4), 509–525. <https://doi.org/10.1108/IJQSS-04-2020-0065>
- Suharno, Pambudi, N. A., & Harjanto, B. (2020). Vocational education in Indonesia: History, development, opportunities, and challenges. In *Children and Youth Services Review* (Vol. 115). Elsevier Ltd. <https://doi.org/10.1016/j.childyouth.2020.105092>
- Surono, S., Pratama, D., & Budiono, A. (2024). Study on Mapping of Qualification, Occupation, and Competence in Human Resources Management to Improve Link and Match Between Industry and Education Program. In *Asian Journal of Engineering, Social and Health* (Vol. 3, Issue 4).
- Tias, S. A., Tongjean, W., & Win, S. S. (2023). *National Qualification Framework (NQF) to Promote Quality in Higher Education: Perspectives of English Educators in ASEAN Countries* (pp. 661–671). https://doi.org/10.2991/978-2-38476-008-4_71
- Wassan, A. N., Memon, M. S., Mari, S. I., & Kalwar, M. A. (2022). Impact of Total Quality Management (TQM) practices on Sustainability and Organisational Performance. *Journal of Applied Research in Technology & Engineering*, 3(2), 93–102. <https://doi.org/10.4995/jarte.2022.17408>
- Yang, C., Kaiser, F., Tang, H., Chen, P., & Diao, J. (2023). Sustaining the Quality Development of German Vocational Education and Training in the Age of Digitalization: Challenges and Strategies. *Sustainability (Switzerland)*, 15(4). <https://doi.org/10.3390/su15043845>

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