

Research / Review

Competency Suitability to Increase the Effectiveness of Riau Islands Vocational High School Graduates

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Abstract: This study uses a qualitative approach that describes the object studied through the process of exploring facts and data on objects in the field as they are, to achieve these objectives, data is needed that is excavated from an in-depth observation process with the principal, vice principal, head of the welding and metal fabrication engineering expertise program and teachers of productive subjects. Data collection techniques using in-depth interviews with, participant observation, and documentation. Data analysis techniques using data reduction, data presentation and drawing conclusions or verification. Checking the validity of the data using triangulation methods. The results of the study indicate that the suitability of students' technical and non-technical competencies with industry needs greatly determines the success rate of graduates in the workforce. Relevant competencies, such as mastery of modern welding technology and soft skills such as communication and teamwork, are key factors. In addition, it was found that aligning the curriculum with industry standards and the active involvement of industry partners through internship programs contributed significantly to improving the quality of graduates. This study recommends strengthening cooperation between vocational schools and the industrial world and developing training programs based on labor market needs.

Keywords: Competency Suitability, Graduate Effectiveness, Welding Techniques And Metal Fabrication.

1. Introduction

Vocational education has a strategic role in supporting national development, especially in producing skilled workers who are ready to face industrial challenges (Abdillah, 2020). In Indonesia, Vocational High Schools (SMK) are at the forefront of preparing graduates who are able to meet the needs of the workforce, especially in sectors that require technical skills such as welding and metal fabrication techniques. This expertise program is very relevant considering the rapid development of the manufacturing and construction industries, both nationally and globally (Muhammad, 2018).

In the era of globalization in the 21st century, education in Indonesia faces major challenges in all fields of endeavor. This can be seen in the fields of equity, quality improvement, competitiveness, expansion of access, relevance, efficiency of education management, as well as optimization of resources and efforts to realize public image. Mastery of technology is the main key for graduates to be able to compete in the job market. However, many vocational schools in Indonesia still face limitations in terms of access to the latest technology. This is one of the obstacles in increasing the effectiveness of graduates because students do not have the opportunity to practice with devices or systems used in the real industry.

In preparation for the industrial era 4.0, the world of education has a great responsibility, especially in preparing strong human resources so that they are able to live in harmony in the change itself. Education is a form of long-term investment whose results cannot be seen and felt instantly, it is expected that schools as the spearhead in the field must have a long-term development direction that aims for clear achievements and continues to prioritize the demands of current factual problems in society.

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Research conducted by Iis Torisa Utami with the title "Effectiveness of Office Management Automation Expertise Competency Tests on the Competence of SMK PGRI 11 Ciledug Graduates" discusses that office management automation expertise competency tests are effective in improving the competence of SMK PGRI 11 Ciledug graduates, with the note that these results can be influenced by a number of external factors (Utami, 2022).

The research entitled "Effectiveness of SMK Models on Graduate Competence in Bangkalan Regency" conducted by Alifia Hariyani shows that the SMK model implemented in Bangkalan Regency has a positive impact on graduate competence, with the note that this success is highly dependent on proper implementation and support from various parties (Hariyani & Roesminingsih, 2019).

Meanwhile, research conducted by Maman Suherman at all entitled "Effectiveness of the Implementation of the Center of Excellence Vocational School Program (SMK PK) Through the Industrial World and the World of Work (IDUKA) at SMKN PP Cianjur". This article discusses the implementation of the SMK program to create competent graduates according to the needs of the world of work (Suherman, Ma, & Nurani, 2024).

The contribution of novelty or uniqueness of the research with the title, here are some points that can be used as a basis for stating its originality and differences compared to previous research, namely: To compile the contribution of novelty or uniqueness of the research with the title, here are some points that can be used as a basis for stating its originality and differences compared to previous research, namely: 1) Focus on the local context where this research specifically highlights State Vocational High Schools in the Riau Islands Province, which have unique geographic, social, and economic characteristics. This provides a new perspective that has not been widely discussed in previous research. 2) Integration of competencies with local industry needs where this research can emphasize how student competencies in the field of welding and metal fabrication engineering are adjusted to the specific needs of the local industry in the Riau Islands, which may differ from other regions. 3) Contribution to vocational education policy where this research can provide specific policy recommendations to improve the effectiveness of vocational high school graduates in the field of welding and metal fabrication engineering, which are relevant to vocational education policies in Indonesia. 4) Measuring the effectiveness of graduates in vocational schools, where this research can develop new indicators to measure the effectiveness of graduates, such as the level of technical skills, adaptability in the workplace, or the level of employer satisfaction.

This research is important to do, including: 1) There is continuity of educational outcomes and the world of work, namely there is a gap between the competencies taught in vocational schools and the real needs in the industrial world, especially in the fields of welding and metal fabrication techniques. This study aims to bridge this gap. 2) There is an increase in the quality of graduates in vocational schools who often face challenges in entering the world of work because their skills are not fully relevant. By examining the suitability of competencies, the results can help develop more effective teaching strategies. 3) There is a contribution to education policy where the results of this study are expected to be the basis for policy making, both at the school and local government levels, to improve the quality of vocational education. 4) There is relevance to the local industry, where the Riau Islands have specific industrial characteristics that require skilled workers in the field of welding. This research can be a reference for vocational schools to meet these needs.

2. Preliminaries or Related Work or Literature Review

The Influence of Infrastructure and Learning Quality on Graduate Competence with the title "The Influence of Infrastructure and Learning Quality on the Competence of Welding Graduates at National Vocational High School 1 Pundong Bantul". The object of this study analyzes the influence of infrastructure and learning quality on the competence of welding graduates in vocational high schools, while the research studied discusses the suitability of student competencies and the effectiveness of graduates of the welding and metal fabrication engineering expertise program in vocational high schools. The results of the study are that there is a positive and significant influence between infrastructure and learning quality on graduate competency. Infrastructure contributes 10%, while learning quality is 11% (Pratama & Sugiyono, 2022).

Relevance of Competence and Level of Competitiveness of SMK Graduates with a journal entitled "Relevance of Competence and Level of Competitiveness of SMK Graduates in the World of Work (Case study of Automotive Engineering SMK in four regencies/cities). The object of this study evaluates the relevance of SMK graduates' competencies to the needs

of the world of work and the level of competitiveness of graduates. The research method uses a quantitative approach with univariate analysis of data collected through questionnaires. The results of the study found that only a small number of graduates work according to their competencies, and the waiting time to get a job ranges from 6-12 months (Fakhri & Yufriidawati, 2014).

Competencies are used for a variety of functions such as selection, retention, and development to organizational planning. Most of the above-mentioned definitions of competency mention the underlying characteristics of the individual that are part of the competency. Of course, these underlying characteristics are not visible.

Robert Kreitner said that an organization is a system of activities or forces that are consciously coordinated by two or more people (Kreitner & Kinicki, 2014). Fiedler argued that leadership effectiveness can be increased by changing the leadership situation. Position power, task structure and leader-member relationships can be changed to make the situation more suited to the characteristics of the leader (Mullins, 2016).

According to Richard L. Daft, organizational effectiveness means the extent to which an organization can achieve its stated goals. While organizational efficiency is the amount of resources used to achieve organizational goals (Daft, 2010).

Carbery and Cross argue that for many organizations, one way in which effectiveness is measured is through the achievement, and maintenance, of sustainable competitive advantage. As our competitive advantage is achieved through the work of our employees, organizations must focus on identifying, retaining and developing their key employees to gain a competitive advantage over competitors (Machado, 2018).

Schein in Pabundu Tika states that organizational effectiveness is the ability to survive, adapt, maintain itself and grow, regardless of the specific functions it has (Tika, n.d.). Robbins states that efficiency shows the relationship between input and output by seeking minimum costs, while effectiveness shows the meaning of achieving previously set goals (Robbins & Judge, 2015). Griffin says organizational effectiveness requires that the organization do a good job of procuring resources, managing them appropriately, achieving corporate goals, and satisfying its constituents (Arifin, Saputra, Puteh, & Qamarius, 2019).

Organizational effectiveness refers to the extent to which an organization achieves its goals efficiently and effectively. In this context, organizational effectiveness means the ability of an organization to achieve desired results by optimally utilizing available resources.

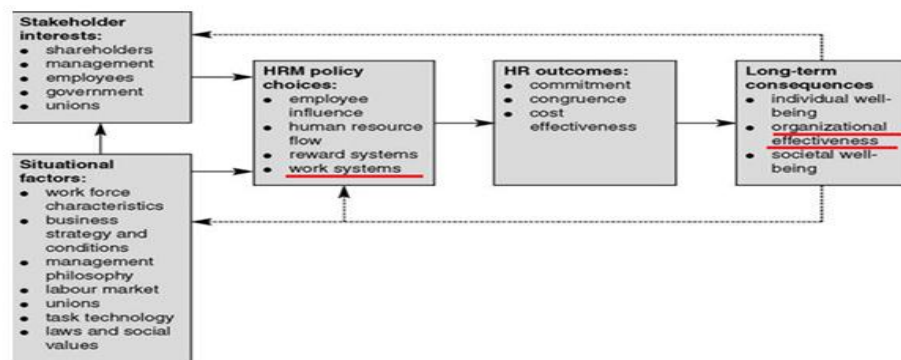


Figure 1 Grand Theory of Research

The suitability of Vocational High Schools (SMK) with the work competencies of the business and industrial world (DU/DI) is often an important topic in discussions about vocational education. SMK is designed to prepare students with the skills and knowledge needed to work in various industrial and business fields (Hidayati, Barr, & Sigit, 2021).

Vocational high school education programs can be directed to produce more productive workers or human resources (HR) and are able to utilize the potential of the regional economy to increase economic turnover so that in the long term it will increase regional independence. Vocational high school education programs are oriented towards preparing students to be able to work in certain fields, therefore the opening of the program must be based on very specific reasons (justification). The justification for opening a vocational high school education program is determined by the real needs felt in the field in the form of workers who need to be educated at vocational high schools. Vocational high schools are not worthy

of being opened if in the field there is no need for workers who need to be educated at vocational high schools (Sujono, 2023).

3. Proposed Method

This research uses an inductive data analysis approach. Qualitative researchers build patterns, categories and themes from the bottom up (inductively), by processing data into more abstract information units (Creswell, 2015). This inductive process illustrates the researcher's efforts to repeatedly process research themes and databases until the researcher succeeds in building a complete series of themes (Arikunto, 2017).

Descriptive qualitative research that reveals, finds and explores information about the Principal's Work System in Increasing the Effectiveness of Graduates of the Welding and Metal Fabrication Engineering Expertise Program in the Riau Islands Province. The purpose of this study is to describe the object being studied through the process of exploring facts and data on objects in the field as they are. To achieve this goal, data is needed that is explored from an in-depth observation process (Hardani et al., 2020). For this reason, researchers do this by using a qualitative approach, where researchers first look for literature and theories related to the research, then compare these theories with conditions in the field where the research is taking place (Creswell, 2012).

The qualitative research method used in this research adopts the post-positivism philosophy as explained by Sugiono, which is used for research in natural object conditions (as opposed to experiments) where the researcher is the key instrument (Sugiyono, 2017). Sampling of data sources was done by purposive sampling, collection techniques with triangulation (combination) between observation with participants, open interviews and documentation. Data analysis is inductive/qualitative, and research results emphasize the meaning and reality that exist from the research subjects that have been determined (Moleong, 2006).

The social situation in this scientific dissertation study is contextualized to Vocational High Schools (SMK) with Welding and Metal Fabrication Engineering Expertise Programs in the Riau Islands Province as follows:

From the SMK targeted by the Riau Islands Province Education Office above, there are only three SMKs that meet the criteria as SMKs with Welding and Metal Fabrication Engineering Expertise Programs, namely SMKN 3 Tanjung Pinang, Bintan Regency, SMKN 1 Karimun Regency and SMKN 1 Batam, Batam City. The informants in the study were the head of the madrasah as the key informant, the deputy head of the madrasah, administrative staff and teachers as secondary or additional informants.

In this study, the author took primary data obtained directly in the field when the research was ongoing in the form of information about the work system of the SMK principal in improving the effectiveness of the SMK Welding and Metal Fabrication Engineering Expertise Program in the Riau Islands Province. Primary data in this study were in the form of interviews and observations developed through data collection instruments regarding the study (Satori, 2012): (a) Work System of the Head of SMK in Riau Islands Province. (b) Effectiveness of Graduates of Welding and Metal Fabrication Engineering Expertise Program in Riau Islands Province. (c) Work System of SMK Heads in Increasing the Effectiveness of Graduates of Welding and Metal Fabrication Engineering Expertise Program in Riau Islands Province.

Secondary data is data that researchers do not attempt to collect themselves, for example from statistics bureaus, magazines, newspapers, information or other publications (Aan Komariah & Satori, 2013). Secondary data can be in the form of written documentation found in the field which includes work programs, implementation guidelines, announcements, meeting minutes, decrees, monthly, quarterly, annual reports, from SMK Welding and Metal Fabrication Engineering Expertise Programs in the Riau Islands Province. Usually this data is first collected and reported by people outside the investigator himself indirectly even though the data is original data, if obtained indirectly from the source, then the data is secondary data or supporting research

4. Results and Discussion

Performance of Vocational High School Principals and Effectiveness of Graduates of Welding and Metal Fabrication Engineering Expertise Programs in the Riau Islands.

The performance of vocational high school principals has not been optimal in increasing the effectiveness of graduates of the Welding and Metal Fabrication Engineering Expertise

Program in the Riau Islands Province. Several factors that can influence this include: 1) Cooperation with industry is very important in running the PRAKERIN program for students, presenting guest teachers from industry, and organizing teacher internships and cooperation with production units. 2) The quality of education provided by vocational high schools in the field of Welding and Metal Fabrication Engineering can affect the effectiveness of graduates. Integrated learning with adequate facilities and infrastructure as well as competent educators who have nationally recognized expertise certification can improve the professionalism of graduates. 3) The role of the principal in improving teacher performance and graduate effectiveness is very important. Strategic principal leadership, including fostering discipline and providing motivation to teachers, can contribute to improving teacher performance and the quality of graduates. 4) The curriculum structure and expertise competencies in the Welding and Metal Fabrication Engineering Expertise Program can also affect the effectiveness of graduates. Perdirjen Dikdasmen No. 06/D.D5/KK/2018 of 2018 concerning the Vocational High School Expertise Spectrum regulates subjects for each expertise competency.

The Role of Leadership The Principal of Vocational High School has a great responsibility in ensuring that the school's vision and mission are achieved. According to research, effective leadership can improve the quality of vocational education by creating a conducive learning environment. The Principal of Vocational High School has a strategic role in determining the direction and policies of the school, including in terms of curriculum development and involvement with industry, including Curriculum development: The Principal of Vocational High School plays a role in designing a curriculum that is in accordance with industry needs. By understanding trends and technological developments in the field of welding and metal fabrication engineering, the principal can ensure that the expertise program meets the competency standards expected by the job market. The performance of a good Principal of Vocational High School also includes the ability to lead staff, plan educational activities, and manage resources efficiently. This creates a learning environment that supports students to develop (Suhartono, Arsyad, & Amelia, 2020). In addition, the Head of Vocational Schools must establish close cooperation with local industries in terms of internships, apprenticeships, or development of training programs in order to ensure that students gain relevant practical experience (Bachtiar, Zahroh, & Rahman, 2023).

The good performance of the vocational school principal directly contributes to the effectiveness of graduates, including the relationship between the quality of education, where a principal who is proactive in updating the curriculum and creating relevant programs will produce more competitive graduates. Research shows that the positive relationship between good leadership and the quality of education has a significant impact on graduate performance. Support in real work practices is also needed because with the support of the vocational school principal in creating partnership pathways with industry, students will get the opportunity to apply the skills they learn in real situations, which is very valuable for them when entering the job market.

The performance of the vocational school principal who is effective and responsive to industry needs plays an important role in increasing the effectiveness of graduates of the Welding and Metal Fabrication Engineering Expertise Program in the Riau Islands. This happens through the development of a relevant curriculum, efficient resource management, and close cooperation with industry. Thus, graduates not only get quality education, but are also ready to contribute to the industrial world.

Strategies and Innovations in Educational Programs to Improve Competency of Students in Welding and Metal Fabrication Engineering Expertise Programs.

To improve the suitability of student competencies in the Welding and Metal Fabrication Engineering expertise program and to increase the effectiveness of graduates in facing the challenges of the metal industry, there are several strategies and innovations that can be applied in the education program, including: 1) Building close cooperation with the metal industry can help strengthen student skills. This can be done through internship programs, industry visits, or collaboration in curriculum development. This collaboration allows students to gain practical experience and a deeper understanding of the needs of the metal industry. 2) Integrating basic vocational subjects with other subjects in the Welding and Metal Fabrication Engineering expertise program can help students gain a strong foundation of competencies. Integrated learning can also help students develop the technical and non-technical skills needed in the metal industry. 3) Improving the quality of education in the

Welding and Metal Fabrication Engineering expertise program through adequate facilities and infrastructure as well as competent educators who have nationally recognized expertise certification. Thus, students will get more effective learning that is relevant to the needs of the metal industry. 4) Developing a curriculum that is in line with the development of the metal industry can help students gain relevant competencies. A curriculum that is up-to-date and oriented to the needs of the metal industry will prepare students with the skills needed to face challenges in the metal industry. 5) Utilizing technology in learning can increase the effectiveness and attractiveness of the Welding and Fabrication Engineering expertise program. To improve the suitability of student competencies in the Welding and Metal Fabrication Engineering expertise program, as well as increase the effectiveness of graduates.

Competency alignment refers to how well the skills and knowledge taught in schools match those required by industry. In the context of welding and metal fabrication engineering, technical skills and an understanding of the latest tools and technologies are essential. This alignment is important so that vocational school graduates can quickly enter the workforce and contribute effectively. Collaboration with other industries by building strong relationships with local industries to gain input on the skills needed. By involving industry practitioners in curriculum development, vocational schools can ensure that educational programs remain relevant and up-to-date. Hold internship programs for students at companies engaged in welding and metal fabrication, so that students gain hands-on experience and apply the skills learned in class. Update the curriculum to include the use of the latest technology in welding engineering, such as the use of robotics and CAD (Computer-Aided Design) design software. This will help students understand and use technology that is widely used in industry. Developing a Competency-Based Curriculum: The curriculum should be designed with a competency-based approach, which means that each subject must have clear competency objectives and can be measured through practical activities.

Can implement project-based learning that involves students in real projects. For example, students can work on metal fabrication projects that will be exhibited or used in the community, so they learn to work in teams and apply their technical skills. And can apply active learning methods such as group discussions, case studies, and simulations to increase student engagement. With this technique, students not only learn theory, but are also able to apply it in practical situations.

Strategy and innovation in educational programs are needed to improve the suitability of student competencies in the Welding and Metal Fabrication Engineering Expertise Program. With strong collaboration with industry, curriculum updates, innovation in teaching methods, and continuous evaluation, schools can produce graduates who are not only ready to face challenges, but also contribute significantly to the world of work.

Effectiveness of Graduates of Welding and Metal Fabrication Engineering Expertise Program in Riau Islands Province.

The effectiveness of graduates of the Welding and Metal Fabrication Engineering Expertise Program in the Riau Islands Province can be seen from several aspects as follows: 1) The Welding and Metal Fabrication Engineering Expertise Program aims to produce graduates who are skilled, knowledgeable, and have superior character as prospective workers in the field of welding engineering planning and implementation as well as certified welders. Graduates are prepared to have high technical competence in welding and metal fabrication, which is in accordance with industry standards. The program focuses not only on technical skills but also on character development, so that graduates are not only technically proficient but also have the work ethic and professional attitude needed in the industry. 2) Welding Engineering expertise competency has collaborated with industry to run the PRAKERIN program for students, guest teachers from industry, teacher internships, and production unit cooperation. 3) An integrated learning system with adequate facilities and infrastructure is the school's commitment to producing skilled and professional graduates in the field of welding engineering and metal fabrication. 4) Educators in the Welding Engineering Expertise Program environment are competent and have nationally recognized expertise certification.

In the context of vocational education in the Riau Islands. The Riau Islands Province has significant industrial potential, especially in the welding and metal fabrication sector due to its strategic location and proximity to international trade routes. Therefore, good vocational education is very important to produce graduates who are ready to work (Iskandar et al., 2020). This expertise program aims to provide the technical skills and knowledge needed to enter the workforce and meet industry demand.

One of the main indicators is the level of graduate absorption in the labor market. Graduates who successfully get jobs according to their expertise indicate that the education program is effective. Effectiveness can also be measured through the competencies possessed by graduates in terms of technical and non-technical skills. The suitability of graduate skills to industry needs is the main key in determining the effectiveness of the program. Feedback from employers is also an important indicator. If the company states that graduates are ready to work and meet their expectations, then the education program can be considered effective.

Having a relevant and up-to-date curriculum greatly influences the performance of graduates. Programs that integrate the latest technology in welding and metal fabrication will further enhance the readiness of graduates. Practical experience through internship programs and training in the industry has a major impact on the work readiness of graduates. Direct involvement in the field helps students apply the skills learned and build networks with the industry. The quality of teaching provided by instructors also determines the effectiveness of graduates. Teachers who have up-to-date knowledge and industry experience can provide better guidance to students.

Despite various efforts to improve the effectiveness of graduates, there are still challenges faced, including: 1) Skills Mismatch: There is often a gap between the skills taught and the needs of the industry. Therefore, closer collaboration between vocational schools and industrial companies is needed to reduce this gap. 2) Technological Development: With rapid technological advances, educational programs need to be continuously updated to ensure that graduates gain relevant skills.

The effectiveness of graduates of the Welding and Metal Fabrication Engineering Expertise Program in the Riau Islands Province can be improved through the integration of practices, curriculum quality, and industry involvement. Assessments based on various indicators show that graduates who have relevant skills and practical experience are better prepared to enter the workforce. Programs that are responsive to industrial and technological developments will help create graduates who are not only ready to work, but also have the competencies needed to contribute to the industrial sector in the region.

5. Conclusions

The conclusion of this study is that the suitability of student competencies with the needs of the industrial world, especially in the welding and metal fabrication engineering expertise program in vocational schools, plays an important role in increasing the effectiveness of graduates who are ready to work, where research shows that synergy between competency-based curriculum, partnerships with local industries, provision of adequate educational facilities, and implementation of practice-based learning methods can directly improve technical skills and graduates' adaptability in the world of work, which not only helps vocational school graduates to meet specific workforce standards but also contributes to reducing unemployment rates, strengthening the local economy, and accelerating vocational skills-based development, so that the relevance of vocational education that is in line with the development of modern industry must continue to be improved through innovative vocational education strategies that are oriented towards market needs, to ensure that graduates not only have academic competencies but also applicable work skills, which ultimately can create competent, productive graduates who are ready to face global challenges in the welding and metal fabrication engineering employment sector.

Meanwhile, the implication of this study is that aligning the competencies of vocational school students with the needs of the industrial world can improve the quality of graduates who are ready to work, strengthen the competitiveness of the local workforce, and support the development of a vocational-based economy in the related region.

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