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The Need Mapping of Motorcycle Automotive Industry & LSP-P1 Certification: A Collaboration between Professional Certification Institutions Vocational High School (SMK-LSP) to Improve the Competitiveness of TVET Graduates in West Java Province

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ABSTRACT

The motorcycle automotive industry in West Java is growing rapidly. However, there is a gap between the skills of graduates of Vocational High School Teknik dan Bisnis Sepeda Motor (SMK-TBSM) and the specific needs of the motorcycle automotive industry that continues to grow. As a result, it is necessary to map the needs of the industry for graduates of vocational education. The use certification of the Professional Certification Institution (LSP-P1) can help overcome this gap, but it has not been optimized. The cooperation between Vocational High School and LSP-P1 can improve the competitiveness of graduates. In the context of the rapid growth of the automotive industry, the relevance of vocational education to industry needs is becoming increasingly important. The urgency of this research lies in the importance of identifying the competency gap between Vocational High School graduates and industry needs, and the need to improve the competitiveness of Vocational High School graduates. This study aims to map the needs of the motorcycle automotive industry for Vocational High School graduates, analyze the LSP-P1 certification scheme and its potential in improving the competitiveness of Vocational High School graduates, develop an ideal cooperation model between Vocational High School and LSP-P1, and make strategic recommendations to improve the competitiveness of Vocational High School graduates in West Java. This study uses descriptive and exploratory design, the sampling technique is purposive sampling, data collection through in-depth interviews with stakeholders (industry representatives, LSP, vocational education practitioners and vocational schools), and surveys to vocational school alumni who have LSP certification to assess the impact of certification on their competitiveness. The data analysis is done qualitatively.

Keywords: Automotive Industry Needs, LSP-P1 Certification, SMK Cooperation Model, Strategic Recommendations, TVET Competitiveness

INTRODUCTION

The automotive industry is one of the main sectors that requires skilled and qualified workers [1], the need for skills that are in accordance with technological developments and industrial regulations is increasing [2]. Professional certification institutions are key in ensuring that graduates have competency standards recognized by the industry [3]. The cooperation between vocational training institutions (TVET) with Professional Certification Institutions (LSP) and industry is important to align the curriculum with industry needs [4]. The competitive strength of vocational education graduates greatly influences their ability to compete in the increasingly competitive global job market [5].

The importance of technical skills is essential for the modern automotive industry, including skills in the latest technologies such as Electric Vehicles (EVs), autonomous technology, and digitalization of production [6][7]. The role of Professional Certification Institutions (LSP) plays a crucial role in ensuring the quality of the workforce by providing industry-recognized certification, which helps build confidence in the competence of TVET graduates in the eyes of employers [8][9]. The cooperation between TVET, LSP, and Industry has shown its benefits in producing graduates who are more work-ready and have skills that match the needs of the labor market [10][11]. The Competitiveness of Vocational Education Graduates is influenced by the quality of practical learning, cooperation with industry, and adequate policy support [12][13].

Industry needs are required to align the education curriculum with the required graduate competencies, to reduce the skills gap between education and industry. The LSP-P1 certification scheme sets industry-recognized competency standards, building confidence in the quality of TVET graduates. Research on industry needs, LSP certification schemes is still limited, especially related to the collaboration model with TVET. Collaboration between vocational schools, certification bodies and industry allow for the integration of competency standards, the provision of practical training, and the identification of job opportunities, increasing the readiness and competitiveness of graduates. This collaboration is crucial in ensuring that graduates have competencies that are in line with the demands of the labor market, advancing vocational education, and supporting industry growth.

The research process includes identifying relevant concepts and dimensions to determine the level of workforce needs in the industry and the suitability of skills and competencies possessed by TVET graduates, analysis of certification schemes by LSP-P1 to determine the advantages and disadvantages of certification, development of a cooperation model for designing the model, namely developing a detailed work plan including

integrating industry competency standards into the vocational school curriculum, organizing certification training, and collaborating on work practice activities, while the strategic recommendation phase analyzes the findings from research and development, identifying concrete steps that need to be taken by stakeholders so that they can produce strategic recommendations to improve the competitiveness of TVET graduates. Cooperation between industry, vocational schools and LSP-P1 is important to improve the skills and employment opportunities of vocational school graduates [14][15]. Common forms of cooperation are internships, training, certification, and joint curriculum development [16][17].

Factors that encourage cooperation are the industry's need for skilled workers, the demands of a vocational school curriculum that is relevant to the industry, and the benefits of LSP-P1 certification for vocational school graduates [18] [19]. The benefits of cooperation are to improve the skills and competencies of Vocational High School graduates, increase job opportunities for Vocational High School graduates, increase the relevance of Vocational High School curriculum to industry needs, improve the quality of education in SMK [20][21]. However, there are several challenges including limited resources in SMK, lack of coordination between SMK, LSP-P1 and industry, lack of understanding of the benefits of LSP-P1 certification [22][23]. So it is necessary to map industry needs, certification schemes and TVET cooperation models to increase the expansion of cooperation between Vocational High School and LSP-P1, resources in SMK, coordination between SMK and LSP-P1, and socialization of the benefits of LSP-P1 certification [24][25].

This study highlights the importance of analyzing the industry's needs for TVET graduates, which places emphasis on the integration of current skills and technologies, aiming to ensure that TVET curricula are more responsive to recent changes. This study focuses on the motorcycle automotive industry in West Java, then related to the analysis of the LSP-P1 certification scheme and its potential in improving the competitiveness of Vocational High School graduates and related to the development of an ideal collaboration model between Vocational High School and LSP-P1. This research introduces a new approach to mapping the needs of the motorcycle automotive industry & LSP-P1 Certification and collaboration between SMK-LSP P1.

This comprehensive approach broadens our understanding of the importance of collaboration in preparing more work-ready graduates that include the integration of competency standards, the provision of practical training, and the identification of job opportunities, thereby improving the readiness and competitiveness of graduates, as well as increasing the relevance of

vocational education to the needs of the automotive industry and ensuring graduates have skills that are in line with the demands of the ever-evolving job market. This study aims to map the needs of the motorcycle automotive industry for graduates, analyze the potential of the LSP-P1 certification scheme, and the ideal collaboration model between SMK and LSP-P1 and provide strategic recommendations to improve the competitiveness of TVET graduates.

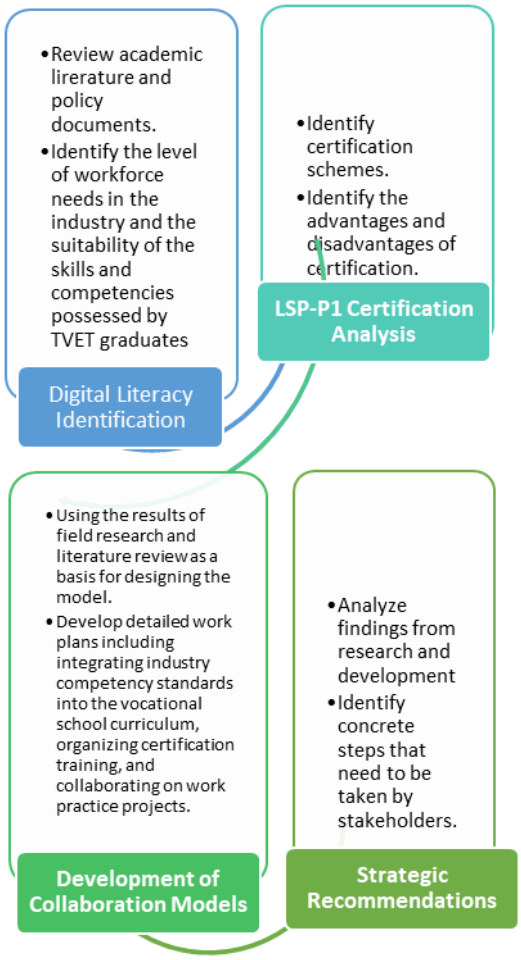

Figure 1. Problem solving approach

RESEARCH METHOD

The approach used is qualitative descriptive, the research was conducted on Vocational High School Motorcycle Engineering and Business (TBSM), LSP-P1, and companies in the automotive motorcycle sector in West Java. The sampling technique was purposive sampling, with the criteria of involvement in the automotive sector and the LSP-P1 certification program. Data collection techniques were in the form of surveys and interviews with vocational education experts, representatives of the automotive industry, and LSP-P1 to understand the needs and challenges. Focus Group Discussion (FGD) involved stakeholders from SMK, LSP-P1, and the automotive industry to design a cooperation model. Literature study was conducted with a literature review of previous research related to competency gaps and certification in the vocational field.

Table 1. Preparation of research instruments

Instrument	Question Types	Measured Variables
Questioner	Likert Scale questions and answers	Competency gap and perception towards SMK graduates
Interview Guide	Open-ended Questions	Effectiveness of LSP-P1 certification and industry needs
FGD Guide	Trigger questions	Development of SMK-LSP-P1 cooperation model

Qualitative data analysis in the form of data reduction by summarizing data from interviews and FGDs to focus on relevant themes. Furthermore, thematization to

identify major themes, such as competency gaps, industry needs, LSP-P1 effectiveness, and cooperation models. Then the interpretation that gives meaning to qualitative data to formulate cooperation models and strategic recommendations. Describes industry needs and perceptions of vocational high school graduates.

First, this study maps the needs of the automotive industry for vocational high school graduates in West Java by identifying related parties, namely determining motorcycle automotive companies in West Java and relevant vocational education institutions. Survey and interview methods were carried out with automotive companies to identify the skills and competencies desired by vocational high school graduates, and then the data was processed to identify industry needs trends.

Second, this study describes the effectiveness of the LSP-P1 certification scheme to identify respondents of SMK graduates who have participated in the LSP-P1 certification scheme. The survey method was carried out with graduates who have been certified to evaluate the impact of certification on their careers, then data analysis was carried out to evaluate the extent to which LSP-P1 certification improves the competitiveness of SMK graduates.

Third, the study will explain the design of a cooperation model between SMK and LSP-P1, by conducting a literature review to identify cooperation models that have proven effective. The Group Discussion method was held with stakeholders from educational institutions and industry to design an optimal cooperation model. Furthermore, developing a cooperation model that integrates the education curriculum with industry competency standards.

Finally, the study will detail the recommendation design process, by first analyzing the gaps and challenges faced, to identify the gap between current graduate skills and industry needs, identifying the main challenges faced by SMK graduates in entering the automotive industry, evaluating the potential for cooperation between SMK, LSP-P1, and industry in improving graduate readiness, and its impact on competitiveness, identifying needs that must be met to improve graduate readiness, including curriculum improvement, practical training, and skills certification. Discussion methods are carried out with relevant stakeholders, including educational institutions, LSP-P1, automotive companies, to obtain their input and perspectives. Furthermore, strategic recommendations are made to improve the readiness and competitiveness of vocational high school graduates in the motorcycle automotive industry in West Java.

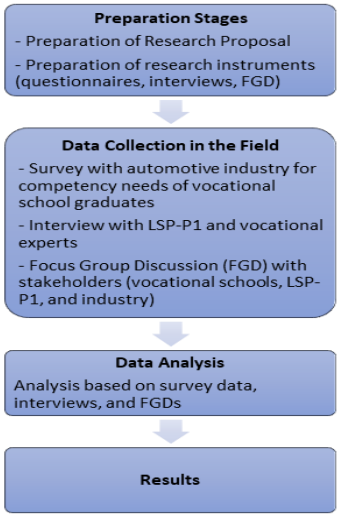

Figure 2. Research flow

RESULT AND DISCUSSION

Recapitulation of Competency Unit Mapping of LSP P1 Competency Test with Jobs (Competency Units) in the Motorcycle Repair Industry:

Table 2. Recapitulation of competency unit mapping of LSP P1 competency test with jobs (Competency Units) in the motorcycle repair industry

1	The Competency Test Material used by LSP P1 Motorcycle Engineering, still refers to SKKNI No. 95 of 2005 whose status was revoked in July 2019, replaced with SKKNI No. 147 of 2019.
2	SKKNI in the field of Motorcycle Engineering No. 95 of 2005 has been revoked and replaced with SKKNI No. 147 of 2019 which came into effect on July 17, 2019.
3	The number of SKKNI Units No. 95 of 2005 used for the Competency Test is 47 Units, while SKKNI No. 147 of 2019 has 55 Competency Units (adjusted)
4	The perception of LSP P1 competency assessors regarding the indicators and descriptions of each Competency Unit in MUK referring to SKKNI No. 95 of 2005 is still not the same, resulting in different Competency Test assessment results.
5	The description of the competency unit in the Performance Criteria (KUK) in SKKNI is still general, while the competency unit in motorcycle repair shop work is more specific. As in the competency unit code: OTO.SM02.008.01 and OTO.SM02.009.01. This causes a difference in perception among LSP P1 assessors in describing MUK (Competency Test Material)
6	The MUK Competency Test does not yet reflect the competency of a Motorcycle Workshop Mechanic, considering that there are still several competency units in the MUK that do not meet the needs of the industry, in this case Motorcycle Workshops.

Identification of desired skills and competencies from vocational school graduates

The quality of graduates of SMK Motorcycle Engineering and Business currently in general is still not in accordance with the expectations of the industry, especially in terms of attitudes and behaviors shown at work, such as: discipline, responsibility, communication, and cooperation. In addition to attitudes and behavior, it turns out that in terms of technical competence, there are still problems, especially related to operational standards for technical work and work speed which is still below expectations.

Graduates of SMK Motorcycle Engineering and Business should have two competencies, namely Technical and Non-Technical Competence. Technical Competence relates to the ability to carry out motorcycle maintenance and repairs and Non-Technical Competence relates to the ability to provide the best service or service

excellence to consumers who come to the workshop or have soft skills.

A novice mechanic who graduated from SMK is usually given the trust to do oil changes, service/tune ups according to standards, and carry out fast-moving spare part replacement work, such as: replacing headlight bulbs, replacing brake pads, replacing tires and wheel bearings, replacing suspension oil, replacing radiator water, replacing drive belts, and other jobs that can be done relatively quickly (fast moving).

Service/tune up includes periodic motorcycle maintenance work whose competency units refer to the repair manual issued by ATPM. Usually grouped into three parts, namely engine maintenance, chassis maintenance, and electrical maintenance, details can be seen in the repair manual.

The implementation of UKK by LSP P1 regarding the competency units tested consists of four clusters, namely: 1) periodic motorcycle maintenance, 2) Motorcycle engine repair, 3) Motorcycle electrical repair, and 4) Motorcycle chassis repair. Each cluster consists of several competency units as stated in the UKK guide by LSP P1 issued by BNSP.

Currently, the competency test material that is made still refers to the 2005 SKKNI for motorcycle engineering and the SKKNI is no longer valid, but BNSP has not issued a UKK guide that is in accordance with the latest SKKNI in 2019. Therefore, it is possible that there are still several competency units that do not match the demands of the work in the industry.

The UKK LSP P1 Assessors who are tasked with conducting the tests mostly come from internal SMK, although there are several other SMK LSP P1 that involve Assessors from external SMK.

The most important technical skills of a SMK graduate when joining a motorcycle automotive company/industry include motorcycle engine maintenance and repair, motorcycle electronic system diagnostics and troubleshooting, knowledge of fuel injection systems, the ability to read and understand technical manuals, operation of modern mechanical and diagnostic tools, knowledge of the latest technology in the automotive industry.

The most expected non-technical skills from a vocational high school graduate are communication skills, teamwork, time management, ability to adapt to technological changes, problem-solving skills, and strong work ethic. These non-technical skills in determining the success of vocational high school graduates in companies/industry are very important. The most important technical skills to be possessed by vocational high school graduates who work in the automotive motorcycle sector are mastery of basic techniques (component names, functions, how they work, component positions on motorcycles, use and reading of measuring instruments, cable colors, wiring systems), SOP Periodic maintenance, handling trouble

shooting engine chassis and electrical repairs, engineering management, industrial culture, motor skills supported by the ability to think in solving problems encountered in the field, Product knowledge, Mastery of K3 and 5S, maintenance & repair, basic competencies. The latest technology or system in the automotive industry that is important for vocational high school graduates to master is Electric vehicles, regarding the workflow of electric motors, robotic skills, autotronics or automatic control systems in the automotive sector.

Non-technical skills that are very much needed by vocational high school graduates include discipline, attitude, communication, mentality, work culture, adaptation, communication, loyalty, creativity, ability to work in a team, initiative, able to receive feedback from others, problem solving, ability to adapt to new environments. Certification from LSP-P1 has an influence on employee recruitment decisions in automotive companies/industries including competency certification such as repair & maintenance, K3, 5S. The need for adjustments or development of training programs in vocational high schools to be more in line with current industry needs.

The recommendations for vocational schools in preparing their graduates to be better prepared to work in the automotive industry: Preparing physically and mentally, the existence of industrial or vocational training, learning is adjusted to the needs of the industry, more dynamic, consistent so that it links and matches, Collaboration with the Work Industry is included in the learning process and getting used to the industrial environment, ther needs of an industrial standard curriculum applied in school learning.

Automotive companies play a very important role in supporting the improvement of the quality of vocational school graduates in the implementation of link & match programs between schools & industry to prepare students to achieve competence in their fields, because the automotive industry will use graduates, so that the industry becomes a partner institution for educational units in the learning process, supporting teacher skill up, sharing technology, and as a place for industrial work practices.

The optimal collaboration model between SMK, LSP-P1, and Industry to improve graduate competitiveness (input from related stakeholders):

Industry Needs

The main technical and non-technical skills expected by the automotive industry from SMK graduates are being able to analyze vehicle damage (analytical), executing vehicle damage repairs (mechanical technical), responsive communication, negotiation skills, honesty, creativity, initiative, adaptiveness, loyalty. The curriculum taught in SMKs currently with the competency needs in the automotive industry is not fully relevant,

especially schools that have not implemented an industrial curriculum, also need adjustments to follow technological developments.

Challenges in Collaboration

The main challenges faced in establishing cooperation between SMK, LSP-P1 and Industry include link and match, optimization of practical knowledge, students' desires and abilities, commitment and consistency from SMK, communication and socialization, unification of vision and mission and mutually beneficial cooperation for all parties, SMK graduates who have received LSP certificates still find it difficult to get jobs. Companies still look down on the profession they have. Certificate holders are not immediately accepted by the industry, they still have to take tests like those who graduate without a certificate from LSP. Obstacles in aligning SMK curriculum with industry competency standards can be overcome through cooperation, frequent communication, joint sitting activities between industry and SMK. Challenges and obstacles in aligning SMK curriculum with industry competency standards cannot be separated from the behavior of the organization itself. Strong leadership and good communication will be very helpful in facing the challenges and obstacles that exist to achieve common goals.

LSP-P1 Certification:

The Role of Certification in Graduate Competitiveness

The role of LSP-P1 certification in improving the competitiveness of vocational high school graduates in the market is very helpful and collaboration between LSP and industry is needed, especially in the assessment aspect so that a link and match can be established, although the industry's trust in vocational education units is still not optimal, but with LSP-P1 certification, graduates will understand industry quality standards and applicable laws and regulations. Increase company productivity because graduates understand good work standards according to their fields.

The Standards of Development and Alignment

The most effective way to ensure that competency standards in LSP-P1 certification continue to be relevant to technological developments and industry needs is to provide the latest up-to-date technological knowledge and insights, collaboration and synchronization between LSP and Industry, related to competency standards and assessment methods, upgrading competency standards periodically, continuing to communicate and sit together to formulate competency units needed by SMK graduates with industry.

Development of Cooperation Model:

Design of Cooperation Model

Components that should be included in the cooperation model between SMK and LSP-P1 to ensure curriculum integration with industry competency standards are the

involvement of the Business World and Industry World (DUDI) in implementing competency tests, determining basic learning materials according to industry concepts, synchronizing the curriculum, being open to each other and maintaining trust in each other. The role of each party (SMK, LSP-P1, and automotive companies) in the cooperation model, SMK as a provider of graduates and standardizing facilities according to industry needs, LSP-P1 as a certifier, implementing competency certification and creating assessment tools according to industry needs.

Automotive companies support LSP in synchronizing assessments that are in accordance with industry needs, providing feedback for SMK & LSP-P1 on the required graduate profile standards.

Implementation and Evaluation

The strategy to implement this collaboration model in vocational schools effectively is by standardizing competencies, ongoing collaboration, synchronization between vocational schools and industry, understanding of goals for all elements, there are teachers in vocational schools who are industry people, consistent, frequent communication and sitting together to discuss the implementation of links & matches. Evaluation of the success of this collaboration must be carried out, measured, monitored, reviewed and analyzed for continuous improvement, based on the results of the curriculum set for students as a benchmark for the future, by making an MoU, measuring how much students are absorbed in the industrial world.

Sustainable Collaboration

To maintain and strengthen cooperation between SMK, LSP-P1, and industry in the long term by continuing to collaborate and clearly stated in the MoU link & match. Important points that need to be considered in developing a cooperation model include a mature concept, knowing the strengths, weaknesses, opportunities, threats in cooperation, control and evaluation, each task and role must be detailed, clear, have the same vision and mission, in developing a cooperation model must include a clear cooperation clause and MoU. Additional recommendations or suggestions to improve the quality of cooperation between Vocational High School and LSP-P1 are renewal, assessment and certification as the legality of competence, socialized by involving DUDI more actively, the place of competency testing should be in the Industry to maintain the trust of prospective users of graduates.

The Gap Analysis and Challenges for Vocational High School Graduates:

Skills Gap

The most significant skills gap between current vocational high school graduates and the needs of the automotive industry is up-to-date technology, lack of tools for practicum, skills are not updated, the number of graduates with industry needs, the gap

between what is taught in schools and the actual needs of the industry. The best way to overcome this gap is by collaborating with the industry, providing a place of practice that is in accordance with the industry, opening up job opportunities, alignment of vocational high school curriculum needs to be updated regularly so that students can gain relevant skills and in accordance with current labor market demand.

Challenges Faced by Graduates

The main challenges faced by vocational high school graduates in finding work in the automotive sector include limited job opportunities, good and relevant workplaces, mental readiness, limitations of the industry in terms of accepting new employees, very rapid changes in technology, skills gaps, limited formal education, global competition. The way to overcome this is by sharing information and being up to date, strengthening attitudes, mentality and morals, cooperation with the industry, strict education, motivation, updating their skills to suit market demands, requiring an understanding of global trends and the ability to adapt quickly.

Potential for Cooperation between SMK, LSP-P1, and Industry:

Role and Potential for Cooperation

The role of each party (SMK, LSP-P1, industry) is very important in improving the work readiness of graduates. The potential benefits of closer cooperation between SMK and LSP-P1 with the automotive industry are to produce quality resources, competencies according to expectations, make it easier to find jobs in the automotive industry, make it easier for the industry when it needs workers and will produce SMK graduates who are accepted in the world of work or industry.

Integration of Curriculum and Competency Standards

To ensure that the SMK curriculum is in accordance with the competency standards applied by the automotive industry, what needs to be done includes aligning the curriculum with DUDI, updating the curriculum, there must be standardization, using the Industrial curriculum without reducing the service curriculum, curriculum preparation involving DUDI, there needs to be continuous synchronization of the curriculum between Vocational High School and industry. Practical training and skills certification can be integrated into the SMK curriculum with implemented curriculum adjustments.

Strategies to Improve Graduate Readiness and Competitiveness

Curriculum Improvement

To update the vocational high school curriculum to be more relevant to the needs of the automotive industry, including by updating competencies and materials, increasing practicum hours, there is cooperation between vocational high schools and industry, schools must actively ask for assistance from industry, ask for updates to industry, upgrade the curriculum

periodically, each vocational high school implements the super link & match concept (8+i). Ways to ensure that students get the technical and non-technical skills needed by the job market include intensive information sharing with DUDI, determining the standardization of each industry, internships, UKK and UKK questions in collaboration with industry, the presence of teachers from industry, teachers participating in training in industry, industry and schools working together in the learning process, it is necessary to carry out gradual & continuous evaluations by involving LSP-P1 and industry.

Strategic Recommendations

The main recommendations to improve cooperation between Vocational High School, LSP-P1, and the automotive industry include the initial stage is the need for a memorandum of understanding between the 3 institutions, conducting link and match in all fields, ongoing cooperation and communication, one vision and mission, then establishing mutually beneficial cooperation for all parties supported by the policies of the authorities. Concrete steps that can be taken to implement the proposed strategies in improving graduate readiness include standardization and alignment, providing sufficient time for Field Work Practices to increase student experience, increasing attitude skill knowledge, teachers participating in industrial work experience activities, the quality of learning in schools must be good so as to maintain industry trust, curriculum synchronization, guest teachers, teacher internships, student and teacher certification by industry.

Previous research achievements related to the problems of industry needs, professional certification, cooperation between vocational high schools and LSP-P1 and the competitiveness of TVET graduates were first carried out in 2022 with a study of industry needs for TVET graduates [26]. Furthermore, a study has been conducted related to the obstacles to implementing LSP-P1 professional certification [27]. Furthermore, in the same year, research examined the technical skills and soft skills possessed by graduates [28], a mutually beneficial and sustainable TVET cooperation model [29]. Furthermore, in 2023, research on the relevance of the vocational high school curriculum to industry needs [30], the needs of the automotive industry related to workers with qualified technical skills and soft skills [31][32], research on the competitiveness of TVET graduates in the job market, job opportunities for TVET graduates [33]. Lastly, this year the research team conducted research related to the mapping of industrial needs, professional certification schemes and TVET cooperation to improve the competitiveness of graduates.

CONCLUSION

Mapping the Needs of the Motorcycle Automotive Industry for SMK Graduates: understanding the skills and competency

needs required. Analyzing automotive industry trends, current technologies, and the latest regulations that affect workforce needs. Identifying the gap between the skills taught in Vocational High School and the needs desired by the automotive industry. Analyzing the LSP-P1 Certification Scheme and Its Potential: Reviewing the LSP-P1 certification scheme to understand the competency standards proposed in the automotive industry. Identifying the advantages and disadvantages of LSP-P1 certification in improving the competitiveness of SMK graduates. Analyzing the extent to which LSP-P1 certification can cover the specific needs of the motorcycle automotive industry in West Java.

Developing an Ideal Cooperation Model between SMK and LSP-P1: Designing a cooperation framework between Vocational High School and LSP-P1 that allows for good integration between school curriculum and industry competency standards. Developing training and certification programs that are in accordance with the needs of the motorcycle automotive industry. Holding regular meetings between SMK, LSP-P1, and automotive companies to ensure the suitability of the curriculum and certification with industry needs.

Making Strategic Recommendations to Improve the Competitiveness of Vocational High School Graduates in West Java: Propose improvements to the Vocational High School curriculum by including the latest materials and practices relevant to the automotive industry. Encourage Vocational High Schools to facilitate students in obtaining LSP-P1 certification throughout their education. Develop internship and collaboration programs with automotive companies to provide practical experience to Vocational High School students. Promote the development of soft skills such as communication skills, leadership, and teamwork through extracurricular activities in Vocational High Schools.

Mapping industry needs is essential to understand industry needs, allowing educational institutions to develop curricula that are relevant to the skills needed in the job market, so that graduates have the capabilities that match industry demands. With proper mapping, the gap between the skills taught in educational institutions and industry needs can be reduced, increasing employment opportunities and career mobility for graduates.

The LSP-P1 certification scheme is important because it sets industry-recognized competency standards, ensuring that graduates have independently verified qualifications that are relevant to industry needs. LSP-P1 certification helps build confidence among employers in the quality of TVET graduates, increasing their competitiveness in the job market.

Collaboration between vocational schools and industry enables the integration of industry competency standards into the

curriculum, ensuring that graduates have skills that are in line with the needs of the job market.

Collaboration with industry provides vocational school students with access to training and work experience, broadening their practical experience and improving their job readiness. Collaboration with industry also helps identify available job opportunities and prepares graduates to enter the industry more smoothly, increasing their competitiveness. Research has resulted in a deeper understanding of the needs of the motorcycle automotive industry, including the technical and soft skills required by vocational school graduates. This allows educational institutions to align their curriculum with the needs of the job market.

Research has provided further recognition of the importance of LSP professional certification in improving the quality and competitiveness of vocational school graduates. This strengthens industry confidence in the skills of certified graduates.

Research has identified key factors that support an effective collaboration model between vocational schools and LSPs, including collaboration in curriculum development, practical training, and job placement.

Through the implementation of effective collaboration models and the application of LSP certification, there has been a significant increase in the competitiveness of vocational school graduates in the motorcycle automotive industry. Graduates who are more work-ready and have skills relevant to industry needs have been able to compete better in the job market.

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