

# Implementation of Partnership Management Model of SMK (Vocational High School) with Existing Industries in Mechanical Engineering Expertise in Central Java

*by Wirawan Sumbodo*

---

**Submission date:** 18-Jan-2022 09:42AM (UTC+0700)

**Submission ID:** 1743278318

**File name:** dustries\_in\_Mechanical\_Engineering\_Expertise\_in\_Central\_Java.pdf (650.77K)

**Word count:** 6946

**Character count:** 37741

# Implementation of Partnership Management Model of SMK (Vocational High School) with Existing Industries in Mechanical Engineering Expertise in Central Java

Wirawan Sumbodo<sup>1,a</sup>, Pardjono<sup>2</sup>, Samsudi<sup>3</sup>, Winarno Dwi Rahadjo<sup>4</sup>

<sup>1,3,4</sup> Department of Mechanical Engineering, Universitas Negeri Semarang, Gunungpati, Semarang, 50229, Indonesia

<sup>2</sup> Department of Mechanical Engineering, Universitas Negeri Yogyakarta, 55281 Indonesia

<sup>a</sup>Corresponding author: wsumbodo2@yahoo.com

**Abstract.** This study aims to determine the existing conditions of implementation of partnership management model of SMK with the industry on the mechanical engineering expertise in Central Java. The method used is descriptive analysis. The research result shows that the implementation of partnership management model of SMK based on new existing industry produces ready graduates of 62.5% which belongs to low category, although the partnership program of SMK with the industry is done well with the average score of 3.17. As many as 37.5% of SMK graduates of Mechanical Engineering Expertise Program choose to continue their studies or to be an entrepreneur. It is expected that the partnership model of SMK with the industry can be developed into a reference for government policy in developing SMK that is able to produce graduates who are ready to work according to the needs of partner industry.

## INTRODUCTION

Indonesia has approximately 170,000 elementary schools, 35,000 junior high schools, 20,000 general senior secondary schools, and 6,000 vocational senior secondary schools. These schools serve around 30,000,000 students in elementary school, 10,000,000 students in junior secondary school, 4,300,000 students in general senior secondary school, and 2,300,000 students in vocational secondary school. The number of schools has increased 4.2 times during the last 35 years. Through this development, the net enrolment ratio (NER) has already achieved 94.30% for elementary schools, 62.06% for junior secondary schools, and 42.64% for general and vocational senior secondary schools<sup>1</sup>. In Central Java the number of public SMA 503 and private as 961. While the number of public vocational schools a number of 163 and private a number of 910<sup>2</sup>.

The number of Vocational High School (SMK) has increased quite rapidly, since the Government proclaimed a program that the number of SMK compared with the number of Senior High School (SMA) is 70:30. One of the government's efforts, among others, is to facilitate the establishment of new SMKs or to change the existing SMA to SMK. In Central Java prioritize the physical construction of schools that as many as 47.06 percent of SMK<sup>3</sup>. They do not put in mind of developing the quality of education.

The main purpose of vocational education is to make the individuals gain knowledge, ability, and practice sufficiency which are needed for particular occupation. On the other hand the main function is to make the individual provide financial income and with this be useful to society at social and economic ways. Vocational and technical education has great affection power at development of country's economy with human labor qualities. For this reason, in the developed countries vocational and technical education has special importance. In the developed countries; for more strong economy and more rapid social development, more qualified work labor is need to be provided. With this purpose, an effort is made to develop vocational and technical education<sup>4</sup>.

The development of Vocational High School requires a conceptual framework are evident in meet objectives effectively efficiently, and meaningful. Conceptual framework pattern civilizing vocational values in vocational high

school in each of the different regions of the each other because each region in Indonesia has a sociocultural characteristics unique, the potential of different regions, different local advantages policy political and economic differently<sup>5</sup>. According to the Head of Education Office of Central Java, Nur Hadi Amyanto (2016) stated that the establishment of new SMK has not been well managed, so that many graduates are not well absorbed in working world. There needs to be a deep study on the management of SMK especially on the partnerships management of SMK that should be oriented to the needs of the industry, so that the graduates can work directly on the partner industry.

Sharing knowledge is a two-way process in which schools and industries create and adapt knowledge for the workplace including specific content, skills, and dispositions<sup>6</sup>. Partner industry is in need of SMK's role in fulfilling human resource's needs which has always been innovating according to needs of business world which is always dynamic in fulfilling consumer's requirement. Management of SMK that is not oriented to the needs of industry will potentially produce graduates who are not ready for work or become unemployed. This is in accordance with a report from the Head of the Statistics Central Bureau (BPS), Suryamin, that the Open Unemployment Rate (TPT) in February 2016 was recorded at 5.50 percent. It means that, if there are 100 work force, about 5-6 people are unemployed. TPT for SMK graduates occupies the highest position compared to the others that is at 9.84 percent.

This fact shows that SMK graduates have not been absorbed entirely by the industry even though the actual needs of labor is increasing, in line with the development of automotive industry in Indonesia. The Association of Indonesian Automotive Industries (Gaikindo) predicts that this year car sales will reach 1.25 million units. In 2013, car sales reached 1,229,903 units, penetrating the sales target of Gaikindo that is 1.1 million units. The increasing production of automotive industry in Indonesia needs to be supported by the quality of human resources (HR) quality which some of them are graduates of SMK.

According to the Law of National Education System, article 15, National Education Department (2004)<sup>7</sup> it is mentioned that "Vocational education is a secondary education that prepares learners primarily to work in a particular field". From the description, it can be concluded that in essence, SMK graduates should be designed to produce ready-to-work graduates. SMK should have a function to prepare graduates who master science and technology relevant to industry needs. However, in reality, SMK has limitations such as limited facilities and infrastructure, limited resources of teachers who master the development of science and technology, and also bureaucratic obstacles. On the other hand, the industry also has limitations in training prospective employees. Therefore, a mutually beneficial partnership between SMK and industry is needed to overcome these limitations.

Values education in vocational high schools is indispensable in order to develop human existence popularize vocational education, cultural competence in the livelihood of the local dimension, national, regional, and global. In order to improve the bargaining position, the vocational high school in the future should look for and find an approach to build and offer a curriculum, teaching and learning activities that focus not only on vocational competence, economic capacity and management skills but also on human values. Values local knowledge is knowledge that has been tested applicable in the local context and an accumulation of local communities<sup>8</sup>.

A partnership is an agreement to do something together that will benefit all involved, bringing results that could not be achieved by a single partner operating alone, and reducing duplication of efforts. A successful partnership enhances the impact and effectiveness of action through combined and more efficient use of resources; promotes innovation; and is distinguished by a strong commitment from each partner<sup>9</sup>. Collaboration is the process of working together for a mutual goal. Partnership is also a process of working together but includes shared risk and reward. Another term commonly used to define a relationship between organizations is alliance. Further distinguished as strategic or social, like collaborations and partnerships, alliances serve the needs of both (or several) organizations. Strategic alliances advance economic or political agendas or priorities. Social alliances are characterized as having both for-profit and nonprofit organizations in the relationship and will have non-economic objectives<sup>10</sup>.

The implementation of partnerships between SMK and industry needs to be supported by the availability of institutions that deal specifically in partnership between SMK and industry in various fields. The absence of institutions authorized to specifically deal with partnership of SMK with industry has impacted to the condition that the partnership program being implemented is not yet optimal. Therefore, it is necessary to conduct in-depth study on how to develop the management model of SMK partnership with the most effective and efficient industries in order to produce ready-to-work graduates.

## METHOD

This research is a descriptive research. The results obtained are used to describe the condition of the implementation of partnership management model of SMK with existing industry. This study does not manipulate or alter the free variables, but describes a condition as it is. Data is collected by using observation, interviews, questionnaires and documentation techniques.

Development of partnership management model of SMK with industry to produce Ready-To-Work graduates refers to the partnership model oriented to the increase of competence of SMK graduates relevant to industry needs. Management model of SMK with the industry that has been applied needs to be developed to improve the competency of SMK graduates effectively and efficiently. The weakness of Management model of SMK with industry that has been implemented in engineering and technology of SMK needs to be improved by doing the following stages: (1) finding applied industry-based SMK partnership model, (2) developing SMK-based industry partnership model to become more effective and efficient in improving the competence of graduates as required by industry needs. Thus the focus of the development of partnership management model of SMK with industry to produce graduates who are ready to work is in accordance with the needs of partner industry. The development of a more effective and efficient partnership management model is also due to improve the competence of graduates that match the industry needs.

## RESULT AND DISCUSSION

The research was conducted at SMK in Central Java which have Mechanical Engineering expertise. The subjects of the implementation of industrial-based partnership model of SMK to produce graduates who are ready to work are SMK Negeri 4 Semarang, SMK 6 Semarang, SMK Negeri 7 Semarang, SMK Negeri Jawa Tengah, SMK Islam Al Hikmah Jepara, SMK N Windusari, SMK Nasional Berbah Sleman Yogya and SMK Negeri 2 Salatiga, and some industries involved, among others, PT. Triangle Motorindo (VIAR).

Validity test is performed with bivariate correlation formula with IBM SPSS Statistics tool version 20.0. The questionnaire item in the validity test is said to be valid if the price  $r_{count} > r_{table}$  at a significance value of 5%. Based on the calculation and r table, then the indicator is said to be valid because the value exceeds r table that is 0,532. The reliability test is performed by using an alpha formula. Significance test performed at the level  $\alpha = 5\%$ . Instrument can be said reliable if the alpha value is greater than r table.

Based on the calculation result with the assistance of SPSS 20.0, indicator is reliable because it has bigger value than r table that is 0,954. Out of the eleven arguments or laws that become the basis of SMK industry partnership, there are 30 statements. Data analysis is more focused during the on-site process along with data collection. Data analysis is conducted during and after data collection is completed. In analyzing the data, the researcher uses descriptive data analysis, which the data obtained through the research is reported as it is, then analyzed descriptively to get a picture of the existing facts.

Quantitative descriptive analysis in this research is used to explain the data in the form of score achievement of the implementation of industrial-based partnership model obtained from the results of research. The scoring guidance on each indicator is as follows: (1) Score 1 - 4 is given by looking at the actualization achieved. Actualization is obtained based on the criteria met from one indicator; (2) Scores of each indicator are then summed and made average on each evaluated aspect resulting in an average score of all schools; (3) The determination of the application predicate of industrial-based partnership management model of SMK is presented in Table 1.

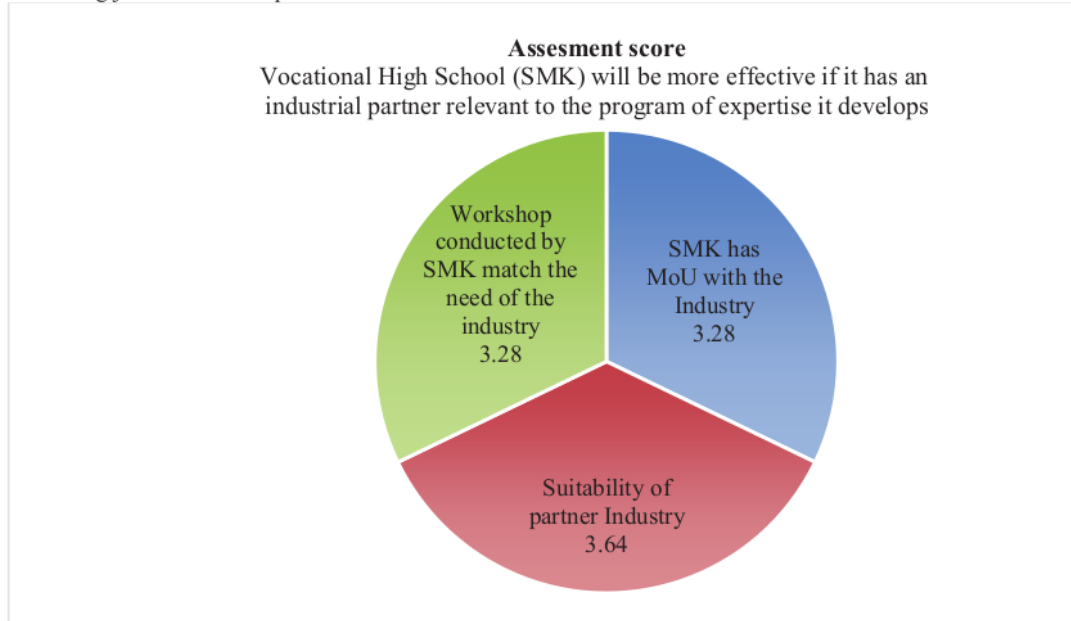
**TABLE 1.** Predicate Determination of implementation of industrial-based partnership management model of SMK.

No.	Predicate	Score
1.	Very Good	3.26 – 4.00
2.	Good	2.51 – 3.25
4.	Less Good	2.01 – 2.50
5	Not Good	1.25 – 2.00

The implementation of industrial-based partnership management model of SMK refers to the implementation of 11 theories/propositions of SMK partnership with Industry that have been found previously. Furthermore, the discussion of 11 theories/propositions about the importance of industrial-based partnership management model of SMK is carried on. The first proposition is that "*Vocational High School (SMK) will be more effective if it has an*

industry partner relevant to the program of expertise it develops." The indicators include: (a) the suitability of partner industry; (b) the type of work in the industry, and (c) the existence of the MoU.

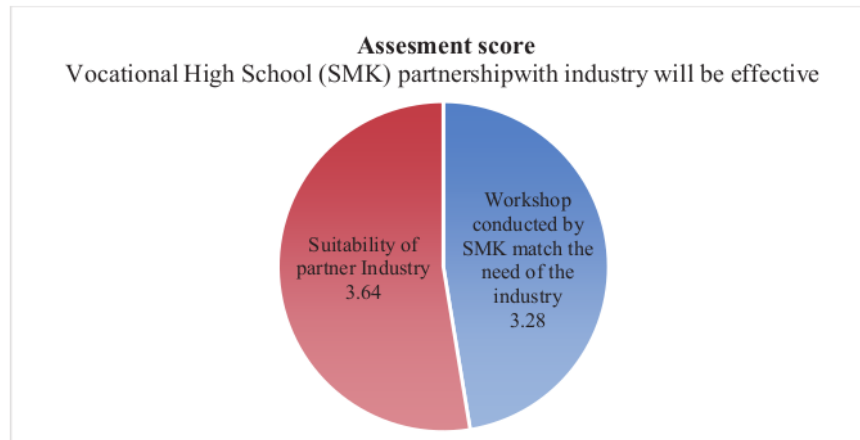
Based on Fig. 1, the indicator score of industry suitability is 3.6, workshop conducted by SMK is 3.28 and about SMK having MoU is 3.28. This means that it has a **very good** predicate based on the establishment of Table 3. The implementation of the Principles of Management Education which are responsible in practice, one of its implementation is about partnership. It means partnerships with a wide range of stakeholders (businesses, other schools and organizations) Joint projects are often linked to conducting joint research or organized events as well as conducting joint educational processes<sup>11</sup>.



**FIGURE 1.** The average score of Vocational School Vocational (SMK) will be more effective if it has an industry partner relevant to the program of expertise it develops

Cooperation is a fundamental requirement for vocational schools to follow up productive aspects of learning as a hallmark of vocational schools. The development of cooperation between vocational schools and the industrial world makes it possible for schools to provide the widest possible opportunity for students to be provided with productive skills that meet the needs of the community. The process of organizing educational activities involves resources through cooperative efforts to achieve goals effectively and efficiently<sup>12</sup>.

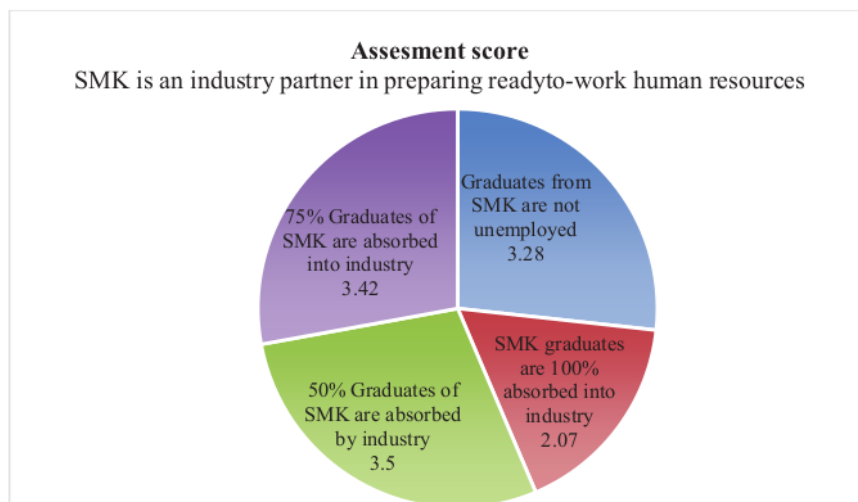
The second proposition, "*SMK partnerships with industry will be effective if it is oriented to industry needs*". The indicators include: (a) All the needs of workers' competence in the partner industry has been met by SMK; (b) the timing of apprenticeship implementation. Based on Fig. 2, the scores indicated that (a) the workers' competence needs in the partner industry met by SMK is 3.64 and it can be said to be **very good**; and (b) the timing of apprenticeship implementation is 2.82, which can be said as **less good**. The ideal apprenticeship implementation time according to the respondent is 6 months, to enable the learners to improve their competence to be READY-TO-WORK after graduation. Poetke (2003) states that education should support the industry, otherwise the education will be in vain<sup>13</sup>.



**FIGURE 2.** The average score of SMK partnerships with industry will be effective if it is oriented to industry needs

The third proposition, "*SMK is a partner of industry in preparing human resources, therefore SMK will be more effective when it only prepares graduates who are ready to work*". This is similar to the statement the series of training courses and programs in has organized to strengthen the work skills of workforce in work place<sup>14</sup>. The indicators include: (a) 50% Graduates of SMK are absorbed by industry, (b) 75% Graduates of SMK are absorbed into industry, while others continue their study, and do entrepreneurship; (c) SMK graduates are 100% absorbed into industry; (d) Graduates from SMK are not unemployed.

Based on Fig. 3, the score of indicator on indicator, while others go to college and do entrepreneurship is 3.5, with a very good predicate; 75% Graduates of SMK are absorbed into industry 75%, while others continue their study, and do entrepreneurship is 3.42, with very good predicate; 100% absorbed graduates received a score of 2.07, with bad predicate, No graduates are unemployed is at 3, 28, with a very good predicate. Based on the data obtained, it shows that the industrial-based partnership management model of SMK has been applied very well and is able to produce graduates who are ready to work, around 50%-75%, and the rest continue to study and to do entrepreneurship.



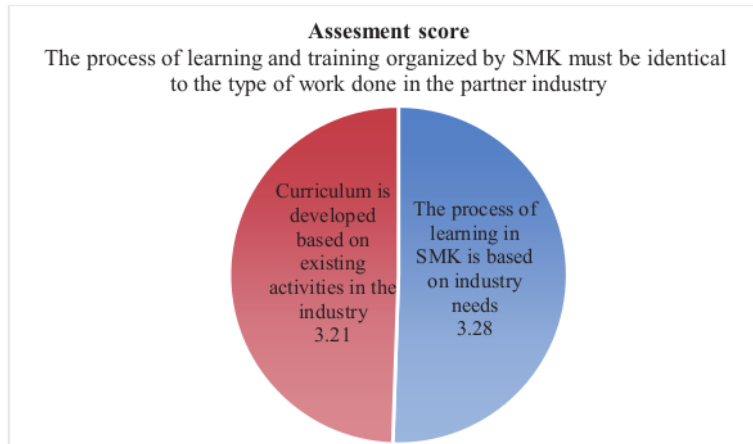
**FIGURE 3.** The average score of SMK will be more effective when it only prepares graduates who are ready to work

The fourth proposition, "*The process of learning and training organized by SMK must be identical to the type of work done in the partner industry*". The indicators include: (a) Curriculum is developed based on existing activities

in the partner industry; (b) The process of learning in SMK is based on industry needs. A significant aspect is the curriculum structure in which students have access to the subjects at different levels, namely the subject of school readiness, general subjects and vocational education packages. Important aspects of understanding the roles of students, workflow practices and industrial culture are derived through industrial apprenticeship programs<sup>15</sup>.

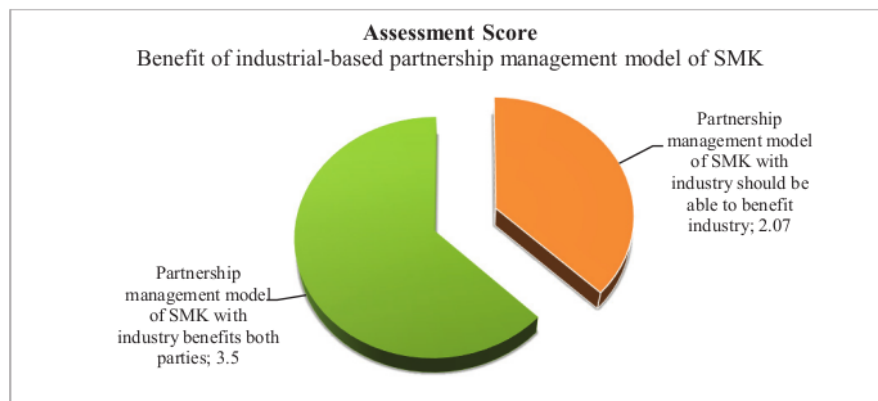
Based on Fig. 4, the scores of indicators on curriculum developed based on existing activities in the partner industry obtained a score of 3.21 with a good predicate, and the process of learning in SMK based on industry needs scored 3.21 with a **very good** predicate.

The fifth proposition, "SMK partnership with the industry will be meaningful if it is able to sustain industrial growth in the global era". The indicator is that the benefit of SMK partnership with industry can be felt by the industry, which is to get skilled and economic labor. Based on the research results, the indicator got a score of 3 which is a **good** predicate.



**FIGURE 4.** The average score of The process of learning and training organized by SMK must be identical to the type of work done in the partner industry

The sixth proposition, "SMK partnership with industry will continue if it has the benefits gained by the partnered parties". The indicators are (a) Partnership management model of SMK with industry should be able to benefit industry; (b) Partnership management model of SMK with industry benefits both parties.



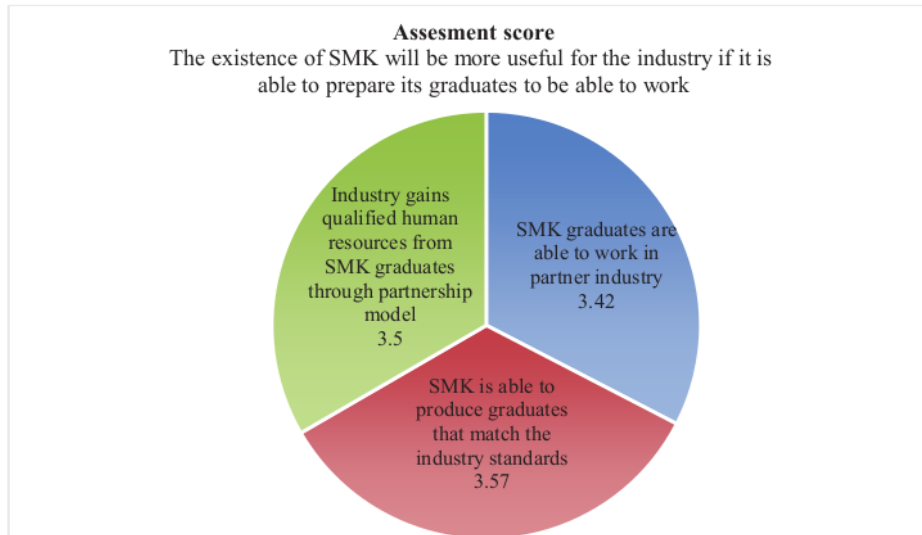
**FIGURE 5.** The average score of Benefit of industrial-based partnership management model of SMK

Based on Fig. 5, an indicator score of the benefits derived from the industrial-based SMK partnership management model is obtained. The indicator of industrial-based SMK partnership management model benefits the industry got a

score of 2.07 which is **less good**, while the indicator of industrial-based SMK partnership management model benefits both SMK and industry earns a score of 3.5 which is **very good**. That means the implementation of partnership management model will be very beneficial for both parties.

The seventh proposition, "*Benefits that can perpetuate SMK partnership with Industry, among others: benefits of human resource development, benefits of access, benefits of product quality, and efficiency*". The indicator in the proposition is the development of Science and Technology (IPTEK) obtained by the industry at the time of learning. Score obtained is 3.35 which is **very good**.

The eighth proposition, "*The existence of SMK will be more useful for the industry if it is able to prepare its graduates to be able to work in certain job fields as required by partner industry*". Indicators in the proposition are (a) industrial human resources can be fulfilled by qualified SMK graduates; (b) SMK is able to produce graduates that match the industry standards; (c) SMK graduates are able to work in partner industry.



**FIGURE 6.**The average of benefits of industrial-based partnership management model of SMK

Based on the assessment result, it shows that the indicator of industry gets qualified human resources from SMK graduates with partnership model earned a score of 3.5 which is **very good**. Through the partnership, SMK will be able to produce graduates that match the industry standard earned a score of 3,57 which is **very good**, and SMK graduates able to work on industry partner earned a score 3,48 which is **very good**, which can be seen in detail in Fig. 6.

The ninth proposition, "*SMK partnership with industry requires mutually agreed agreements*". The indicators are as follows: (a) The existance of agreement between SMK and Industry; (b) agreement points shall be agreed upon by both parties. Based on the data,the indicator of SMK and Industry do an agreement to produce SMK graduates who are ready to work scored 3.42 which is **very good**, and agreement made by SMK and industry approved by both parties scored 3,71 which is **very good**. Details can be seen in Fig. 7.



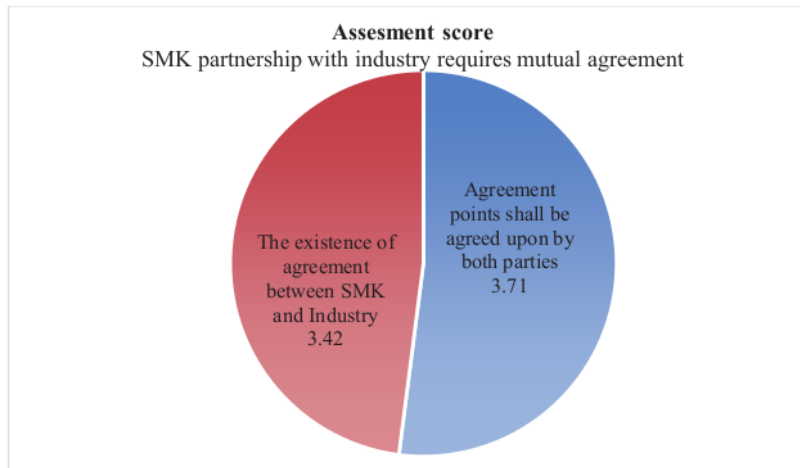


FIGURE 7. The average score of SMK partnership with industry requires mutual agreement

The tenth proposition, "SMK partnership with industry allows some of the learning/training process to be conducted in the industry, therefore schools and industries need to allocate partnership funds". The indicators are as follows: (a) The existence of learning process in the industry; (b) The existence of work types that can be done by SMK students; and (c) joint monitoring and evaluation by SMK and industry to find out how far the effectiveness, innovation and efficiency of production have taken place.

Based on the real data, the indicator of the existence of learning process in the industry scored 3.28 which is **very good**, the existence of work types that can be done by SMK students is 3.35 which is **very good**, and the joint monitoring and evaluation by SMK and industry scored 3.28 which is **very good**. From the results, it means that SMK partnership with industry allows some of the learning/training process to be conducted in the industry, therefore schools and industries need to allocate partnership funds. The details of score of tenth proposition can be seen in Fig. 8.

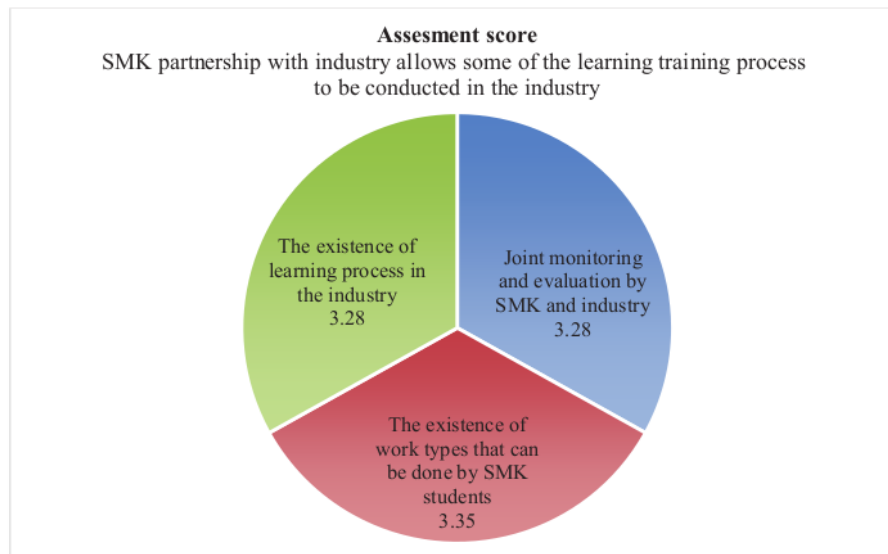


FIGURE 8. The average score of SMK partnership with industry allows some of the learning/training process to be conducted in the industry

The eleven proposition, "Optimal utilization of SMK partnership with industry information system can streamline the planning, implementation, and evaluation of partnership program". The indicators are: (a) The existence of information systems that help SMK partnership program with industry scored 3.21 which is **good**; (b) The existence of an effective information system to monitor the implementation of SMK partnership with industry scored 3.5 which is **very good**, which in detail is described in Fig. 9.

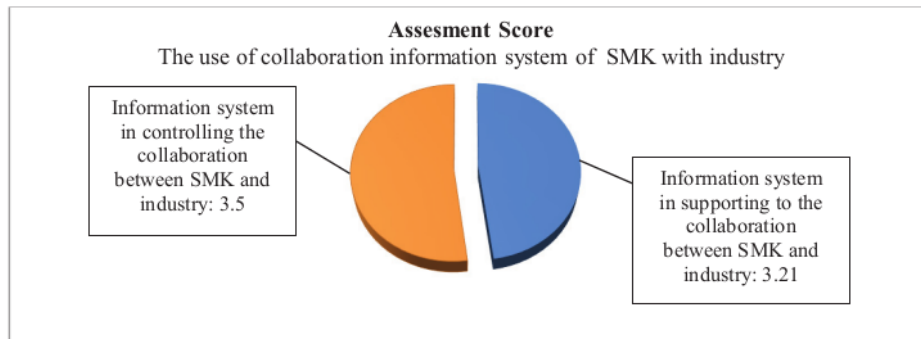


FIGURE 9. The average score of assessment of utilization of SMK partnership with industry information system

The management of industrial-based SMK covers eleven aspects (proposition), namely (a) Vocational High School (SMK) will be more effective if it has industry partners relevant with the skills program it develops; (b) SMK partnerships with industry will be effective if it is oriented to industry needs; (c) SMK is an industrial partner in preparing human resources, therefore SMK will be more effective when only preparing graduates who are ready to work; (d) The process of learning and training organized by SMK must be identical to the work type applied in the partner industry; (e) SMK partnerships with industry will be meaningful if they can support industrial growth in the global era; (f) SMK partnership with industry will continue if it has benefits gained by the partnered parties; (g) Benefits that can perpetuate SMK partnerships with Industry, among others: benefits of human resource development, benefits of access, benefits of product quality, and efficiency; (h) The existence of SMK will be more useful for the industry if it is able to prepare its graduates to be able to work in certain field of work as required by the partner industry; (i) SMK partnership with industry requires mutually agreed agreements; (j) SMK partnership with industry allows some learning/training process to be implemented in industry, therefore schools and industries need to allocate partnership funds; (k) Optimal utilization of SMK partnerships with industry information system can streamline the planning, implementation, and evaluation of partnership program.

Based on the research result, each score for industrial-based SMK partnership implementation AS SEEN IN Fig. 10 as follows:

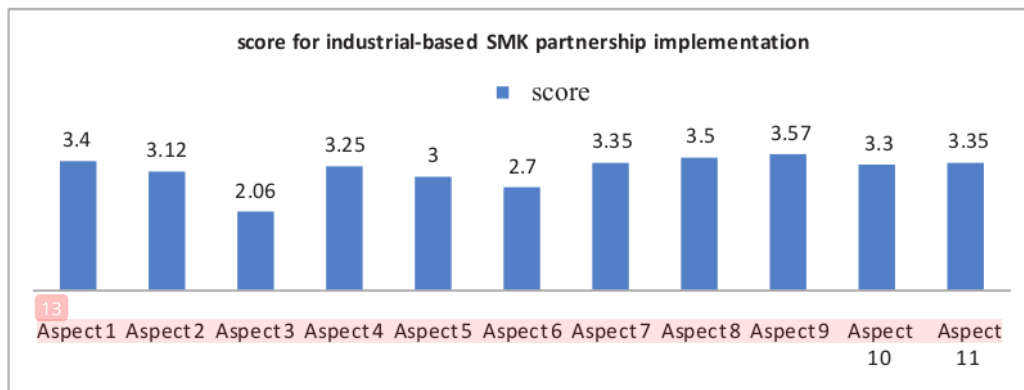
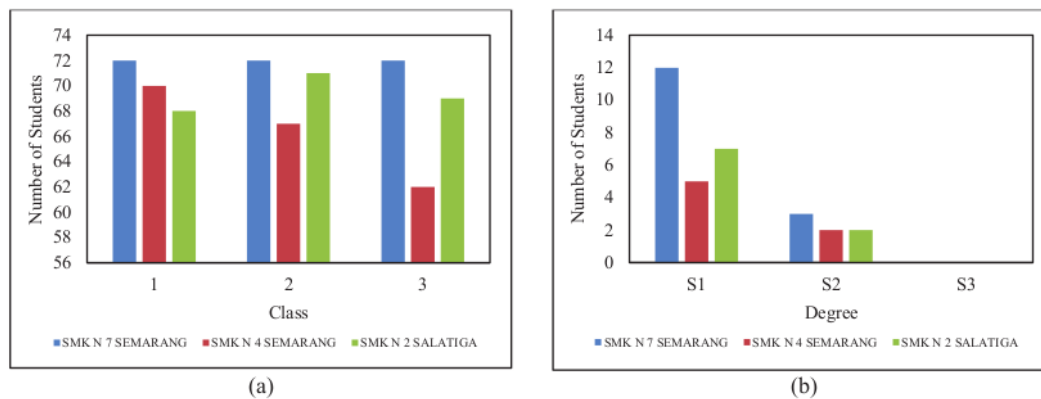


FIGURE 10. The average score of industrial-based SMK partnership implementation

Based on data taken by school and industry respondents, it stated that they agree about the law/proposition of SMK partnership with industry so that SMK can produce ready-to-work graduates in partner industry. Respondents agreed because students will interact directly with the real skill use condition in the industry, SMK education is focused on industry needs since the students will do real practice for several months followed by materials and examinations, thus students will really know what are the requirements in the industry or to become a teacher.

In addition to the eleven aspects industrial-based partnership management model of SMK, there is also data of research results in the form of student data, teacher data, industry data and management model used in the implementation of SMK partnerships with industry. In detail, the results of the studies that have been done are described in Fig. 11.



**FIGURE 11.** (a) Data of number of students of Mechanical Engineering expertise; (b) Data of number of teacher of Mechanical Engineering expertise

One of activities implemented during industrial apprenticeship is debriefing. Debriefing is conducted as the beginning of material presentation to students so that during the industrial apprenticeship, they will have early knowledge about this industrial apprenticeship. Based on the data, study result of 2013 curriculum support the implementation of industrial apprenticeship. The types of work implemented in the industry are: (1) CNC Operator; (2) *Welding Assy*; (3) Mechanical maintenance; (4) Mechanical equipment operational related to maintenance; (5) Finishing of mechanical works.

This industrial apprenticeship is a very effective way to produce ready-to-work SMK graduates. That is because the students will already have working experience in the partner industry. Based on the study, the implementation of industrial apprenticeship is able to increase student's competency up to 40%-80%.

Based on the interview with Heru Sugiarto as the HRD manager of PT. VIAR, Heru stated that SMK that produce ready-to-work graduates will have several factors, which are: (1) schools can become more innovative and creative; (2) curriculum flexibility (developing the existing curriculum to become a better one); (3) schools have broad networks; (4) SMK is able to create a product called Efficient Technology/Teknologi Tepat Guna (TTG) for the society. Further description of the factors above is as follow. SMK will be well-known and will attract the society's interest when the SMK is able to become innovative and creative. The school shall able to develop new breakthroughs and innovations that can overcome existing problems in the industry and society.

Based on the current curriculum, the implementation of industrial apprenticeship period in the industry is 3 months or within the time period determined by the school, in order to transfer knowledge and good work experience. Knowledge transfer is a learning process when a person learns to use previously acquired knowledge/skills/competencies/expertise in a new situation<sup>13</sup>. To accomplish this, there are multiple transfer phases: (a) extract relevant knowledge from the previous context, (b) understand new situations (c) identify what knowledge/skills are relevant, (d) turn them into new situations, and (e) integrate them with knowledge/skills. However, the transfer of knowledge between school and industry is not only a horizontal process whereby an expert in one domain applies his knowledge to a new domain.

SMK curriculum must be changed or has to be flexible to match the requirements of the industry. Industrial apprenticeship should be conducted within 9 months continuously in order to transfer the knowledge, from the industry to the students. If the industrial apprenticeship is longer, students will be better prepared to work after they graduate,

both in terms of mental or material or skill. By conducting industrial apprenticeship continuously, the industry is delighted and benefited because the industrial interns are considered as economical labors. Internship and training is one way to provide the knowledge, tools, experience to solve actual engineering problems subject to social, economic, and social constrains. Interaction with job market would provide the experience of solving problems in actual settings<sup>16</sup>.

Furthermore, based on the data, school and industry respondents stated that they agree on the law/proposition regarding partnership of SMK with industry so that SMK can produce ready-to-work graduates in partner industry. Respondents stated that SMK would become more effective if they have industry partners that are relevant with the skill program they are developing because students will be directly in contact with the real condition of skill used in the industry. SMK with industrial partners will benefit as a place of industrial apprenticeship, as well as a place for manpower recruitment. For example, Mechanical engineering major of SMKN 2 Salatiga has industrial partners among others; PT. SIS, PT. Formulatrik, PT. ICON, PT Atamora, PT. Ultimax Mitra Agung, etc.

Partnership of SMK with industry will be effective if it is oriented on what is required by the industry. For example, SMK Negeri 2 Salatiga cooperated with PT SIS in a 6 month's apprenticeship, followed by school learning, and after third level exam, it is continued with a recruitment process of prospective workers that match the industry needs.

SMK is an industrial partner in preparing human resources, therefore SMK will be more effective when they focus only on preparing graduates who are ready to work. SMK is a medium-level educational institution that conceptually is to prepare candidates for middle-skilled workforce. When SMK output cannot fulfill the need of workforce required by the industry, then it will be the same case as creating unemployment.

The learning and training process organized by SMK must be identical with the type of work applied in partner industry because SMK should be able to prepare ready-to-use workers. For example, Mechanical Engineering major of SMKN 2 Salatiga is in partnership with PT. Atamora which is engaged in distribution of machine tools. In this program that is designed in the form of lathe assembly, the school is assigned to make lathe components that can be done in the school workshop by the students, by giving a lathe to be re-assembled but with finishing some machine parts in school. This program is in the process of working on component inventory stage which can be done in the school workshop.

Fulfillment of industry needs based on the school development with the partnership program of SMK with Industry will be meaningful when it can make schools grow and the industry to get the human resources that match the industry standard.

Partnership of SMK with the industry will continue the benefits also reach by the partnering parties, for example, it is not only profitable for industries but it must also profitable for SMK. At least, the interns shall earn some honorarium. Another example is that SMK Negeri 2 Salatiga has been in cooperation with PT. Astra Daihatsu from 2003 – current time, with a mutually beneficial partnership.

Benefits that can make partnership of SMK with Industry long-lasting are, among others: the benefits of human resource development, access benefits, product quality benefits, and efficiency. The existence of SMK will be more useful for the industry if it is able to prepare its graduates to be able to work in certain job field as required by partner industry. Mechanical Engineering is one of the majors in SMK N 2 Salatiga which cooperates with PT. SIS, a company engaged in mining industry which is developed to prepare the workforce for Heavy Equipment mechanics.

Partnership of SMK with industry allows some learning/training process to be conducted in industry, therefore schools and industries need to allocate partnership funding, for example, as a part of corporate CSR. Besides PT. SIS, Mechanical Engineering program also partner with PT. ICON Surakarta which is engaged in preparing the prospective workers for Engineering design. Students are given special engineering design materials by instructors from PT ICON for about 2 months or 20 meetings. Once the program is completed, PT. ICON will look for industries that accept the prospective workforce. This program has been running for 3 years. Partnership program with PT. SIS in second grade students of semester 4 is the 6 months' apprenticeship which the operational cost is borne by partner industry. School spends for student module, monitoring etc.

Furthermore, the optimal use of partnership information system of SMK with industry can streamline the planning, implementation, and evaluation of partnership program. For example, industrial apprenticeship scheduling and industrial needs should take precedence. The apprenticeship program is carried out by the public relations and industrial relations department together with mechanical engineering programs in either planning, implementation or evaluation.

The management model of industry-based SMK has three main elements: planning, implementation and evaluation. Planning includes industrial apprenticeship debriefing, school scheduling on industrial apprenticeship, MoU with industry. The briefing conducted for two hours presents work ethics and work discipline, as well as 1-2 briefing materials from the industry.

In the implementation, SMK will be more effective when it has industry partners relevant to the developed skills program. In industrial apprenticeship activities, the industry participates in examining Class 4 students. In the implementation of industrial apprenticeship, students' skills can be upgraded according to the needs of the industry as well as the school. Partnership of SMK with industry allows some learning/training process to be implemented in industry, therefore schools and industries need to allocate partnership funds. For example, PT SAPTA INDERA cooperates in preparing curriculum with SMK. Students are taught of heavy equipment maintenance then they work in partner industry

In addition, the optimal use of partnership information system of SMK with industry can streamline planning, implementation and evaluation of partnership program. In the implementation, information system is used to negotiate the schedule of industrial apprenticeship through emails.

Evaluation of industrial apprenticeship management consists of (1) final project making; (2) recruitment; (3) Students' adapting skill, presence, and work relationship between students and the partner industry's workers; (4) Recruitment selection process after industrial apprenticeship, which are (1) selected directly by the industry, for certain cases; (2) Overall selection based on Skill Competency Exam/Ujian Kompetensi Keahlian (UKK) and competency exam.

## CONCLUSION

To establish SMK partnerships with industry, several factors are needed; (a) the existence of MoU; (b) curriculum that is relevant with the needs of partner industry; (c) industrial work practices; and (d) information systems.

Industrial-based SMK management will be more effective and efficient if it refers to the eleven theories of SMK partnership with Industry, which are (a) Vocational High School (SMK) will be more effective if it has industry partners relevant with the skills program it develops; (b) SMK partnerships with industry will be effective if it is oriented to industry needs; (c) SMK is an industrial partner in preparing human resources, therefore SMK will be more effective when only preparing graduates who are ready to work; (d) The process of learning and training organized by SMK must be identical to the work type applied in the partner industry; (e) SMK partnerships with industry will be meaningful if they can support industrial growth in the global era; (f) SMK partnership with industry will continue if it has benefits gained by the partnered parties; (g) Benefits that can perpetuate SMK partnerships with Industry, among others: benefits of human resource development, benefits of access, benefits of product quality, and efficiency; (h) The existence of SMK will be more useful for the industry if it is able to prepare its graduates to be able to work in certain field of work as required by the partner industry; (i) SMK partnership with industry requires mutually agreed agreements; (j) SMK partnership with industry allows some learning/training process to be implemented in industry, therefore schools and industries need to allocate partnership funds; (k) Optimal utilization of SMK partnerships with industry information system can streamline the planning, implementation, and evaluation of partnership program. Implementation of the existing industrial-based partnership management model of SMK on mechanical engineering expertise has only produced 62,5% ready-to-work graduates which belongs to low category.

The industrial-based partnership management model of SMK with existing industry on mechanical engineering expertise have been well implemented with the average score of 3,17. The development of industrial-based partnership management model of SMK needs to be done so that the absorption of SMK graduates of mechanical engineering expertise can reach up to 100%.

## REFERENCES

1. Ministry of National Education. Indonesia educational statistics in brief 2005/2006. (Ministry of National Education, Jakarta., 2006).
2. Universitas Muhammadiyah Malang. *SMA and SMK data of Central Java Province*. <http://www.umm.ac.id/id/pages/jawa-tengah.html> (2017)
3. Samsudi. APTEKINDO 7<sup>th</sup> FPTK Universitas Pendidikan Indonesia, Bandung, 13-14 November (2014).
4. Z. Polat, S. Uzmanoglu, N. Ç. Isgören, A. Çinar, N. Tektas, B. Oral, G. Büyükpehlivan, L. Ulusman, and D. Öznaz. Internship education analysis of vocational school students, *Procedia Social Behavioral Sciences* 2, (Elsevier, Amsterdam, Netherlands, 2010), pp. 3452–3456.
5. J. W. Rojewski. *A Conceptual Framework for Technical and Vocational Education and Training; in Rupert Maclean, David Wilson, Chris Chini; International Handbook of*

- Education for the Changing World of Work, Bridging Academic and Vocational Learning* (Springer Science+Business Media, Berlin, Germany, 2009).
6. A. Capasso, G. B. Dagnino, and A. Lanza. *Strategic capabilities and knowledge transfer within and between organizations* (Edward Elgar, Cheltenham, UK, 2005)
  7. Ministry of Education. Undang-Undang RI Number 20 Year 2003 about National Education System. (Ministry of National Education, Jakarta, 2003).
  8. P. Iswanto, C. R. Prihantoro, and R. A. Avianti. *International Journal of Vocational Education and Training Research* 1(1), 1- 4 (2015).
  9. M. Förchner. Successful Partnerships. [www.oecd.org/cfe/leed/forum/partnership](http://www.oecd.org/cfe/leed/forum/partnership) (2017)
  10. B. Nevidjon. *Seminars in Oncology Nursing* 32(2), 164-171 (2016).
  11. A. Stachowicz-stanusch, *Journal of Intercultural Management* 3(2). 241–257. (2011)
  12. Poetke and Wolfgang. Interview Freiberg University Jerman, Freiberg Jerman (2003).
  13. M. Y. A. Hadi, R. Hassan, A. R. A. Razzaq, and M. Z. Mustafa. Application of thinking skills in career: A Survey on Technical and Vocational Education Training (TVET) qualification semiprofessional job duties. *Procedia Social Behavioral Sciences* 211, (Elsevier, Amsterdam, Netherlands, 2015), pp. 1163 – 1170.
  14. J. Donnelly, *Stud Sci Educ.* 45(2), 225-254 (2009).
  15. Watters, J. James, Hay, Stephen, Dempster, Neil, Pillay, and Hitendra. School industry partnerships : An innovative strategy for vocational education. In Gessler, Michael, Deitmer, Ludger, & Manning, Sabine (Eds.) *Proceedings of the ECER VETNET Conference (WIFO, Istanbul, Turkey, 2013)*. pp 1-14.
  16. A. A. Hanicha, S. AbdElall, P. Krajnkc, and A. Hasan. Industry-Academia Partnership for Sustainable Development in Palestine. *Procedia CIRP* 26. (Elsevier, Amsterdam, Netherlands,2015), pp. 109 – 114.

# Implementation of Partnership Management Model of SMK (Vocational High School) with Existing Industries in Mechanical Engineering Expertise in Central Java

## ORIGINALITY REPORT

11%

SIMILARITY INDEX

11%

INTERNET SOURCES

7%

PUBLICATIONS

6%

STUDENT PAPERS

## PRIMARY SOURCES

1	<a href="http://avesis.marmara.edu.tr">avesis.marmara.edu.tr</a> Internet Source	2%
2	<a href="http://coek.info">coek.info</a> Internet Source	1%
3	Submitted to Universiteit van Amsterdam Student Paper	1%
4	<a href="http://macha.itc.griffith.edu.au">macha.itc.griffith.edu.au</a> Internet Source	1%
5	<a href="http://uir.unisa.ac.za">uir.unisa.ac.za</a> Internet Source	1%
6	<a href="http://home.hiroshima-u.ac.jp">home.hiroshima-u.ac.jp</a> Internet Source	1%
7	<a href="http://text-id.123dok.com">text-id.123dok.com</a> Internet Source	1%
8	Submitted to Southern Luzon State University Student Paper	<1%

[journal.uny.ac.id](http://journal.uny.ac.id)

9

Internet Source

&lt;1 %

10

[hdl.handle.net](https://hdl.handle.net)

Internet Source

&lt;1 %

11

A Maharani, Darhim, J Sabandar, T Herman.  
"PBL-team teaching on developing vocational  
mathematics textbook", Journal of Physics:  
Conference Series, 2019

Publication

&lt;1 %

12

[jonuns.com](http://jonuns.com)

Internet Source

&lt;1 %

13

[docplayer.net](http://docplayer.net)

Internet Source

&lt;1 %

14

[purl.org](http://purl.org)

Internet Source

&lt;1 %

15

Mohd Yusop Ab. Hadi, Razali Hassan, Abdul  
Rashid Abdul Razzaq, Mohamad Zaid Mustafa.  
"Application of Thinking Skills in Career: A  
Survey on Technical and Vocational Education  
Training (TVET) Qualification Semi-  
professional Job Duties", Procedia - Social and  
Behavioral Sciences, 2015

Publication

&lt;1 %

16

[www.iaeng.org](http://www.iaeng.org)

Internet Source

&lt;1 %

[www.ryerson.ca](http://www.ryerson.ca)



17

Internet Source

<1 %

18

Amani Said Hassan, Ayham A.M. Jaaron. "Total quality management for enhancing organizational performance: The mediating role of green manufacturing practices", *Journal of Cleaner Production*, 2021

Publication

<1 %

19

[download.atlantis-press.com](http://download.atlantis-press.com)

Internet Source

<1 %

20

[core.ac.uk](http://core.ac.uk)

Internet Source

<1 %

21

[eprints.uny.ac.id](http://eprints.uny.ac.id)

Internet Source

<1 %

22

[id.wikipedia.org](http://id.wikipedia.org)

Internet Source

<1 %

23

Ahmed Abu Hanieh, Sadiq AbdElall, Peter Krajnik, Afif Hasan. "Industry-Academia Partnership for Sustainable Development in Palestine", *Procedia CIRP*, 2015

Publication

<1 %

Exclude quotes Off

Exclude matches Off

Exclude bibliography Off

# Implementation of Partnership Management Model of SMK (Vocational High School) with Existing Industries in Mechanical Engineering Expertise in Central Java

---

GRADEMARK REPORT

---

FINAL GRADE

**/10**

GENERAL COMMENTS

**Instructor**

---

PAGE 1

---

PAGE 2

---

PAGE 3

---

PAGE 4

---

PAGE 5

---

PAGE 6

---

PAGE 7

---

PAGE 8

---

PAGE 9

---

PAGE 10

---

PAGE 11

---

PAGE 12

---

PAGE 13

---