Business & Social Science
IJRBS

# Research in Business & Social Science

***IJRBS VOL 10 NO 7 ISSN: 2147-4478***

Available online at www.ssbfnet.com
Journal homepage: https://www.ssbfnet.com/ojs/index.php/ijrbs

# Integrated solution model to support competitiveness and relevance of vocational education in the era of technological disruption

*Dyah Werdiningsih* [(a)*] *Alfan Zuhairi* [(b)] *Nur Fajar Arief* [(c)] *Zulkifli Osman* [(d)]

[(a,b,c)] *Faculty of Teaching and Education, University Islamic of Malang Indonesia, Indonesia*
[(d)] *Faculty of Language and Comunication, Sultan Idris Education University Malaysia*

ARTICLE INFO

*Article history:*

Received 12 October 2021
Received in rev. form 03 Nov. (2021
Accepted 05 Novemver 2021

*Keywords:*

career development, relevance, solution, vocational education

JEL Classification:
I20, I28

ABSTRACT

*The aspect of relevance becomes an indicator of the success of vocational education. In order for vocational school graduates to be able to compete in the era of technological disruption, Vocational Schools are required to be able to produce graduates who have the alignment of competencies possessed by each graduate with the competencies needed in the world of work. To achieve the relevance of vocational education, the development of an integrated solution model for the preparation of vocational education graduates needs to be based on the need for ICT-assisted career services. In this study, survey design was used to examine the mapping of student/graduate needs, career service managers, and graduate users and development design to design an integrated solution model for the preparation of vocational education graduates. The results of mapping the needs of students/graduates, career service managers, and users are used as the basis for developing an integrated solution model for preparing vocational education graduates. It is hoped that this model can be used to optimize career services for students and vocational school graduates in Indonesia in the era of technological disruption.*



## Introduction

The era of technological disruption and the digital revolution is another term for the industrial revolution 4.0. During Industry 4.0, advances in technology provide more profound obstacles and significant streams of opportunities to decision makers in education (Hacioglu & Sevgilioglu, 2019) Today, the advancement of the world of computer-based Information and Communication Technology (ICT) has developed and become an inseparable part of the world of education (Aoun, 2017). Information and communication technology has great potential to deal with problems in developing countries by providing fast, cost-effective, and quality education. Providing access to career services for vocational students and graduates will have great potential to meet previously unmet needs and have a positive impact on future vocational career services (Mark, 2015).

Vocational education is non-academic education oriented to practices in the fields of carpentry, business, industry, agriculture, transportation, services, and so on (Sukardi, 2011 and Sagala, 2013). The government hopes that the unemployment problem will be solved, but in reality, the unemployment rate for vocational school graduates is the highest compared to other education institutions, at 8.92% of the 6.87 million unemployed in Indonesia (Mutaqin, 2015 and BPS, 2018). Many factors cause the low quality of the implementation of vocational education today so that the challenges faced by Vocational Schools in facing this globalization era are getting tougher. One of the important factors is the preparation of soft skills, self-potential development, and career development that has not been optimal for vocational students.

The success of SMK graduates in entering the world of work is one indicator of learning outcomes and the relevance of SMK for the community. Thus, Vocational Schools are responsible not only for equipping graduates with certain competencies (learning outputs) but also for facilitating and bridging graduates to enter the world of work. The existence of career development programs in

* *Corresponding author.*

*https://doi.org/10.20525/ijrbs.v10i7.1468*

educational institutions reflects the responsibilities and educational services for graduates and students as prospective graduates (Shivoro, 2018). Exploration as the first stage in career development according to Super occurs at the age of 15-24 years (teenage age) or equivalent to the age of vocational school children. At this stage, adolescents recognize and accept their need to make career decisions and obtain relevant information about them. They are aware of their interests and abilities and how they relate to work and opportunities. In addition, besides that they also identify relevant fields and levels of work according to their abilities and interests, they also receive training to develop skills and enter jobs according to their interests and abilities (Theresa, 2015). In addition, the increasingly competitive landscape allows the career service center to return to the guidance space by emphasizing counseling, career planning, and preparation for looking for work (Casella in Dey, 2014). Career guidance services should be able to play a role in developing all students' potential optimally, namely being able to help students/graduates to (1) acquire the knowledge, attitudes, and skills needed in work, (2) choose and determine careers for their future, (3) guiding students to be able to adapt and be creative, and (4) guiding students to have awareness of their potential, so that they are able to compete in the era of globalization independently.

The implementation of a tracer study for SMK graduates is needed to trace the absorption, process, and position of graduates in the world of work. The purpose of the tracer study is to examine (1) the transition period of graduates from higher education to the world of work, recent work situations, and application of competencies in the world of work, (2) self-assessment of mastery and competency acquisition, (3) assessment of the learning process and contribution education in vocational schools on the acquisition of competencies, and (4) extracting socio-biographical information for graduates.

Based on this description, so that career development services and tracer study can play an optimal role and the level of relevance of vocational education is known, this study examines the main research problems that focus on how to model career development and tracer study to improve competitiveness and relevance of vocational education? The implementation of this development model is expected to be able to develop the potential of SMK students to be more competitive and establish work independence and increase the relevance of SMK education. The specific objectives of this research are to examine (1) the mapping of the needs of students/graduates, career service managers, and users of SMK graduates in 58 SMKs in East Java, Indonesia and (2) designing a career development model in the form of an integrated solution model for the preparation of vocational education graduates.

The urgency of this research is based on an important indicator of the success of vocational education, namely the aspect of educational relevance, which implies that Vocational High Schools are required to be able to produce graduates who are competitive and ready to take part in the global era. Career counseling services are important, but do not have a strategic place in schools (Bridgeland & Bruce, 2014). Career development services that are programmed and measured are urgent in developing superior vocational education and ready to compete with other nations in the era of globalization. Vocational High Schools are considered capable of preparing creative students, mastering science and technology, and having competencies that are in accordance with the demands of the world of work (Sutrisno, 2013). For this reason, optimizing the role of career development services is expected to be able to encourage Vocational Schools to create work skills for their graduates who are adaptive to the industrial world and become independent entrepreneurs.

In line with this background, the research problems are (1) how is the intensity of the career service needs of students/graduates, managers, and users of vocational school graduates in East Java, Indonesia? and (2) what is the integrated career development model that is relevant to the results of mapping the needs of students/graduates, managers, and users of SMK graduates in the form of an integrated solution model for preparing SMK graduates that will be implemented effectively, efficiently, and attractively? The implementation of this model is expected to be able to develop the potential of vocational students to be more competitive and to form independence and increase the relevance of vocational education.

The research objectives are (1) to examine the mapping of the career service needs of students/graduates, managers, and users of vocational graduates in East Java, Indonesia and (2) to develop an integrated career development model that is relevant to the results of mapping the needs of students/graduates, managers, and users of graduates. SMK in the form of an integrated solution model for preparing SMK graduates to be developed and implemented in the field.

## Research and Methodology

To achieve the objectives of the study, survey design and development research were used. With the survey design, the steps taken are (1) formulating hypotheses, (2) determining the population and target respondents, (3) compiling instruments, (4) collecting data, (5) analyzing the data that has been obtained, (6) test hypotheses, and (7) formulate conclusions. The results of the survey on the career service needs of students/graduates, managers, and users of SMK graduates in East Java are used as the basis for developing a relevant integrated career service model.

The hypothesis of this research is that students/graduates, managers, and users of SMK graduates have high-intensity career service needs. The population of this research is all students/graduates, managers of career services (Special Work Exchange (BKK)), and users of SMK graduate in East Java. The determination of respondents is based on the criteria for SMKs that have a Special Job Exchange unit (BKK) and are active in the East Java Vocational High School BKK forum activities, and are willing to be respondents and participate in Focus Group Discussions (FGD) to discuss the results of mapping the career service needs for vocational students/graduates. Based on these criteria, the respondents obtained a total of 1061 students/graduates of BKK, 58 managers of BKK, and 58 users of SMK graduates in East Java.

The instrument of this research is a questionnaire that contains questions to explore data about the need for career services for students/vocational graduates addressed to respondents. The respondents of this study were students/graduates of SMK, managers of BKK, and users of SMK graduates in East Java. Data collection techniques were carried out by distributing online questionnaires. The questionnaires were distributed online through the links (1) http://bit.ly/-Instrumen_siswa_lulusan, (2) http://bit.ly/Instrumen_pengelola, (3) http://bit.ly/Pengguna-_lulusan.

The data analysis technique is carried out by quantifying the results of filling out the questionnaire using a score scale of 1-5 on the level of vocational career service needs, namely a score of 1 is not needed, a score of 2 is not needed, a score of 3 is quite needed, a score of 4 is needed, and a score of 5 is very much needed. Furthermore, the conclusion that the level of vocational career service needs in each component is based on 3 (three) categories, namely (1) low if the average level of need is between 1-2.44, (2) moderate if the average level of need is between 2.45-3.44 , and (3) high when the average level of need is 3.45-5.00.

This questionnaire also included several things to provide more personal information, namely the respondent's name, address, telephone number, and the respondent's position, and suggestions. The distribution of this online questionnaire is carried out so that (1) data collection can be carried out simultaneously to respondents, (2) makes it easier for respondents to fill out answers, and (3) facilitates data analysis and accurate results are obtained.

Based on the results of the mapping of career service needs for vocational students/graduates, the researchers developed a career service model and tracer study for vocational students/graduates as shown in the following chart.

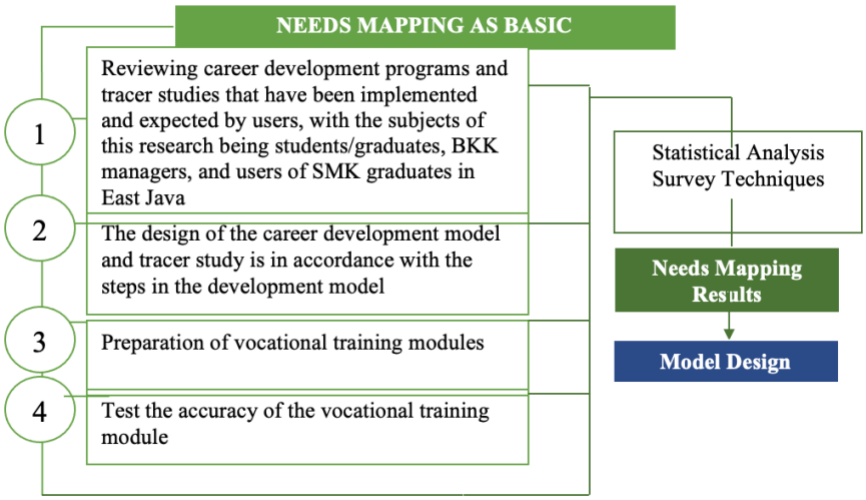


**Figure 1:** Procedure for Designing a Career Development Model and Tracer Study for Vocational High School

Based on the chart, the development of a career development model and tracer study for SMK graduates is carried out in the following steps, namely (1) reviewing the career development and tracer study programs that have been implemented, and which are expected by students/graduates, SMK managers, and graduate users. in East Java, (2) designing a career development model and tracer study in accordance with the steps in the development model, (3) compiling vocational training modules, and (4) testing the accuracy of vocational service modules.

## Result and Discussion

### Results of Analysis of Vocational Career Service Needs

The purpose of career services is to provide students with an understanding of careers that can be chosen according to students' abilities. Given the importance of this, this study aims to optimize career services in vocational schools. Based on the questionnaire on vocational career service needs that have been filled out by the three target user groups of respondents, data obtained on the level of vocational service needs in East Java Province, which is divided into 4 components as follows (1) the name of the management unit, consisting of 2 questions, (2) the program that has been implemented, consists of 7 questions, (3) the required program, consists of 12 questions, and (4) supports the implementation of the Vocational Career Service Program, consisting of 6 questions.

The following describes the results of filling out instruments from respondents based on the level of vocational service needs in East Java. In this item, 12 questions were asked to the respondents. The purpose of these questions is to understand the level of need for career services in vocational schools throughout East Java. As with the item Name of the Management Unit, in this item there are also three types of respondents, namely, (1) students/graduates totalling 835 students/graduates from SMK in East Java. (2) Managers, namely teachers, who come from 58 SMK both public and private. (3) Graduate users are 60 respondents. The results of the questionnaire from the three types of respondents regarding the required program will be presented as follows.

***Program Data Required by Students/Graduates***

Several programs that are urgently needed to improve career services in vocational schools are (1) assessment services 48.5% (405 respondents), (2) seminars and career training 47.7% (396 respondents), (3) job information 72.2 % (603 respondents), (4) cooperation with the business world 65.6% (548 respondents), (5) information on training and job distribution 59.6% (498 respondents), (6) information on apprenticeship and distribution 54, 4% (454 respondents), (7) recruiting and selecting prospective workers 58.3% (487 respondents), (8) Developing networks with successful alumni 51.7% (432 respondents), (9) Conducting tracer studies and user survey 42.6% (356 respondents), (10) Career development 46.3% (387 respondents), (11) HR development (soft skills and hard skills) 53.4% (446 respondents), and (l2) Entrepreneurship training 56.3% (470 respondents).

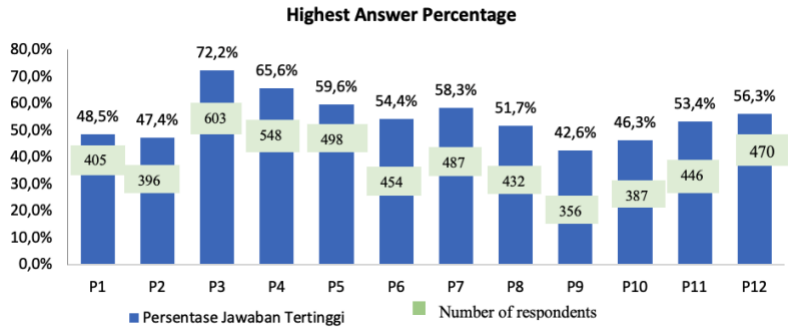


**Figure 2:** Percentage of Programs Required by Students/Graduates

In order, the programs needed by students are (1) job information, (2) cooperation with the business world, (3) information on training and job distribution, (4) recruitment and selection of prospective workers, (5) entrepreneurship training, (6) information on apprenticeships and distribution, (7) HR development, (8) network development with successful alumni, (9) career development, (10) assessment services, (11) seminars and career training, and (12) tracer studies and surveys user. So it can be concluded that the highest program needed by students/graduates is job information to students/graduates.

***Program Data Required by Manager***

Several programs that are urgently needed to improve career services in SMK include (1) assessment services 44.8% (26 respondents); (2) seminars and career training 48.3% (28 respondents); (3) work information 74.1% (43 respondents); (4) cooperation with the business world 77.6% (45 respondents); (5) information on training and job distribution 61.2% (36 respondents); (6) information on apprenticeship and distribution 59.9% (33 respondents); (7) carry out the recruitment and selection of prospective workers 65.5% (38 respondents); (8) Develop networks with successful alumni 62.1% (36 respondents); (9) Carry out tracer studies and user surveys 58.6% (34 respondents); (10) Career development 48.3% (28 respondents); (11) Human resource development (soft skills and hard skills) 56.9% (33 respondents); (12) Entrepreneurship training 55.2% (32 respondents).

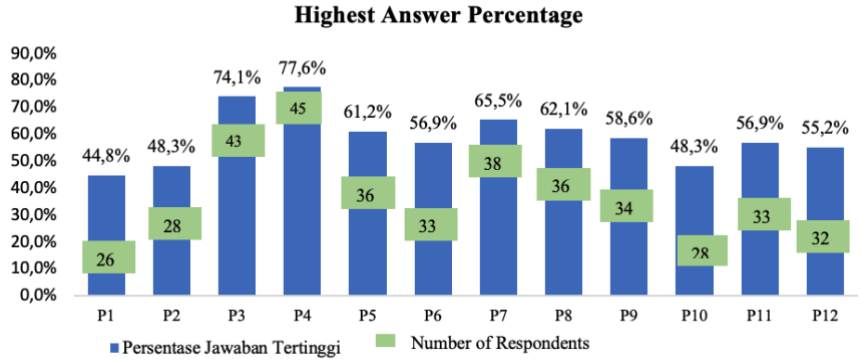


**Figure 3:** Percentage of Programs Required by Managers

In order from the category of urgently needed - needed, the programs needed by SMK managers are (1) cooperation with the business world, (2) seminars and career training, (3) carrying out recruitment and selection of prospective workers, (4) developing networks with alumni who success, (5) information on training and job distribution, (6) conducting tracer studies and user surveys, (7) information on apprenticeship and distribution, (8) human resource development (soft skills and hard skills), (9) entrepreneurship training, (10) seminars and career training, (11) career development, and (12) assessment services.

From the results of the manager's needs questionnaire regarding the program needed, it can be concluded that the highest program needed by the manager is cooperation with the business world.

***Program Data Required By Graduate Users***

Several programs that are needed and urgently needed to improve career services in Vocational Schools include assessment services for 53.3% (32 respondents); (2) seminars and career training 48.3% (29 respondents); (3) job information 76.7% (46 respondents), (4) cooperation with the business world 75% (45 respondents; (5) information about training and job distribution 76.7% (46 respondents); (6) information about apprenticeship and distribution 70% (42 respondents); (7) carry out recruitment and selection of prospective workers 68.3% (41 respondents); (8) develop networks with successful alumni 68.3% (41 respondents); (9) Implement tracer study and user survey 53.3% (32 respondents) (10) Career development 58.3% (35 respondents) (11) HR development (soft skills and hard skills) 65% (39 respondents) (12) Entrepreneurship training 60% (36 respondents).

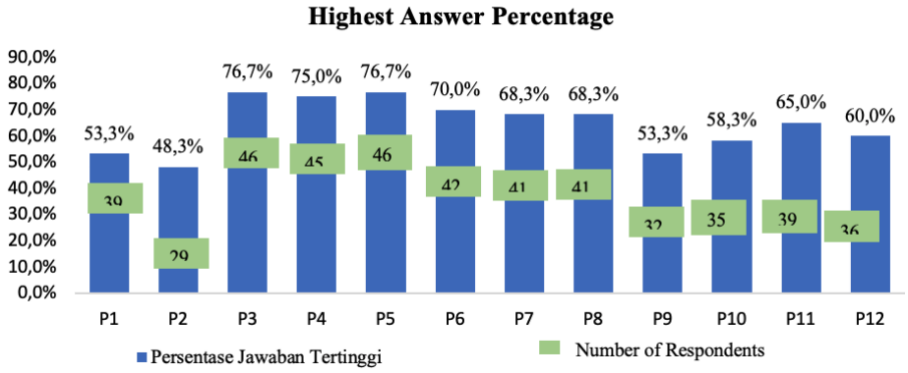


**Figure 4:** Percentage of Programs Required by Graduate Users

If sorted by program required by graduate users, it can be sorted (1) job information 76.7% (46 respondents), (2) information on training and job distribution, (3) cooperation with the world, (4) information on apprenticeship and distribution , (5) carry out recruitment and selection of prospective workers, (6) Develop networks with successful alumni, (7) human resource development (soft skills and hard skills), (8) entrepreneurship training, (9) career development, (10) tracer studies and user surveys, (11) assessment services, and (12) seminars and career training. From the results of the questionnaire on the program requirements needed by users, it can be concluded that the highest programs needed by graduate users are job information to students/graduates and job training information and its distribution.

Based on the explanation above, the needs of the three types of respondents regarding the programs needed for career services can be concluded that job information for students/graduates, cooperation with the business world, job training information and its distribution are the most needed programs.

Career service support programs in the form of job information need to be held to support the BKK program in SMK. The Ministry of Manpower and Transmigration (2012) stated that the organizational structure and management of the BKK consisted of leadership, registration and vacancies, job market information and company visits, job guidance counselling, job analysis and BKK administration. Therefore, career services in the form of information on job vacancies should indeed need to be established according to the organizational structure and management of the BKK as conveyed by the Ministry of Manpower and Transmigration.

The revitalization of vocational schools is expected to improve the quality of SMK with two new orientation pillars. First, strengthening the relationship of SMK with business and industry in the 21st century. Second, pushing local advantages into global advantages (Baitullah and Wagiran, 2019). Furthermore, Wibowo (2016) suggested that schools through the BKK should cooperate with the industrial world so that the industry is willing to become a place for graduates to work. With this, cooperation with the business world is one of the programs needed by Vocational Schools to improve the quality of the workforce which is still below average and as a way to distribute graduates.

According to Rahajo (2009) service is an activity needed to receive, process, deliver, and fulfil customer orders and to follow up on any activities that contain errors. So that a good service is able to establish communication smoothly, so that information on the needs of workers from the industrial world to alumni. Furthermore, Raharjo (2019) stated that SMK through BKK has a role as a service and distribution of graduates who are ready to work, while industry acts as a recruiter and user of graduates. The existence of this reciprocal relationship actually makes it easier for BKK services to collect information and distribute graduates to be informed to students/graduates. Therefore, the existence of information services and job distribution is needed to convey job information from the industry and job information and its distribution can be obtained if the SMK is able to establish cooperation with the industrial world.

**Support for the Implementation of Career Service Programs**

Support for the implementation of the career service program is proposed to understand the level of need for the implementation of the vocational career service program. By understanding the level of need, the right solution can be given to improve the right career

services in SMK. The following will present the results of the questionnaire related to supporting the implementation of the career service program based on three types of respondents.

**Supporting Data for the Implementation of Career Service Programs by Students/Graduates**

Based on the results of filling out the questionnaire, according to students/graduates supporting the implementation of careers that are needed and urgently needed by Vocational Schools in East Java include (1) career service reference books 44.9% (375 respondents), (2) websites and social media as a means of socializing services career SMK 44.9% (375 respondents), (3) Online Tracer Study 48.6% (406 respondents), (4) user survey (user survey) 48.3% (403 respondents), (5) cooperation with industry for human resource development 59% (493 respondents), and (6) cooperation with industry for training and entrepreneurship development 57.5% (480 respondents).

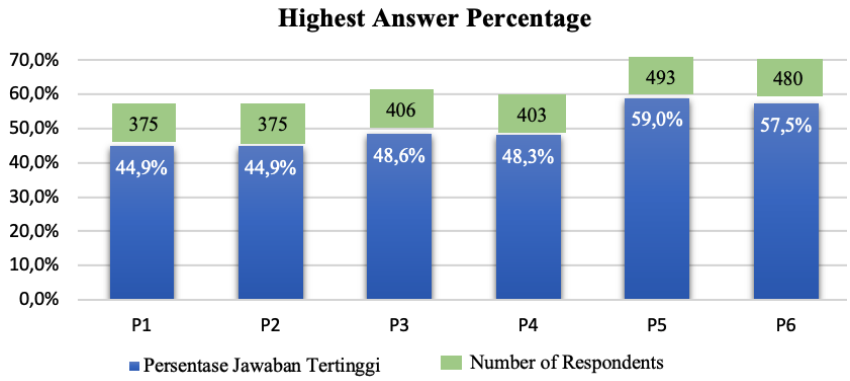


**Figure 5:** Percentage of Supporters for the Implementation of Career Service Programs by Students/Graduates

In order, the supporting programs needed by students are (1) cooperation with industry for development, (2) cooperation with industry for training and entrepreneurship development, (3) Online Tracer Study, (4) user survey, ( 5) career service reference book, (6) website and social media as a means of socializing vocational career services. It can be concluded that the support for the implementation of career service programs that are most needed by students/graduates is collaboration with the industrial world for training and entrepreneurship development.

Supporting Data for the Implementation of Career Service Programs by Managers

Based on the results of the study, supporters of the implementation of careers that are urgently needed by Vocational Schools in East Java include:

(1)Reference book for career services 43.1% (25 respondents); (2) Website and social media as a means of socializing vocational career services 68.3% (37 respondents); (3) Tracer Study Online 62.1% (36 respondents); (4) 48.3% user survey (28 respondents); (5) Cooperation with industry for human resource development 67.2% (39 respondents); (6) Cooperation with industry for entrepreneurship training and coaching 60.3% (35 respondents).

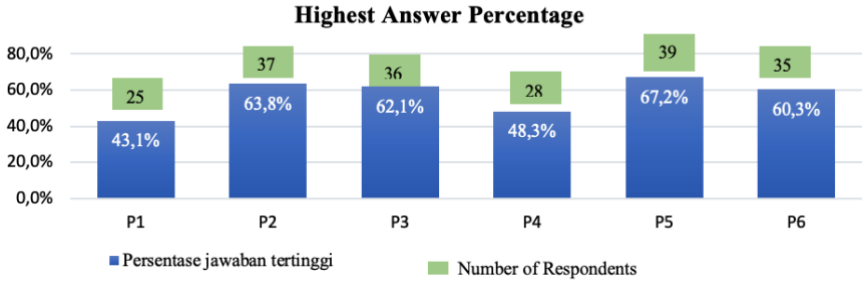


**Figure 6:** Percentage of Supporters for the Implementation of Career Service Programs by Managers

If sorted in order, the career service support programs needed by managers are (1) cooperation with industry for human resource development, (2) websites and social media as a means of socializing vocational career services, (3) online tracer study, (4) collaboration with the industrial world. For training and coaching entrepreneurship, (5) user surveys, and (6) career service reference books. From the results of the questionnaire on the needs of managers to support the implementation of career service programs, it can be concluded that the program most needed by respondents is cooperation with industry for human resource development.

**Supporting Data for the Implementation of Career Service Programs by Users**

Based on the results of the research, the support for the implementation of careers that are needed and urgently needed by Vocational Schools in East Java include:

(1) 50% career service reference book (30 respondents); (2) Website and social media as a means of socializing vocational career services 55% (33 respondents); (3) Tracer Study Online 50% (30 respondents); (4) 45% user survey (27 respondents); (5) Cooperation with industry for human resource development 70% (42 respondents); (6) Cooperation with industry for entrepreneurship training and coaching 66.7% (40 respondents)

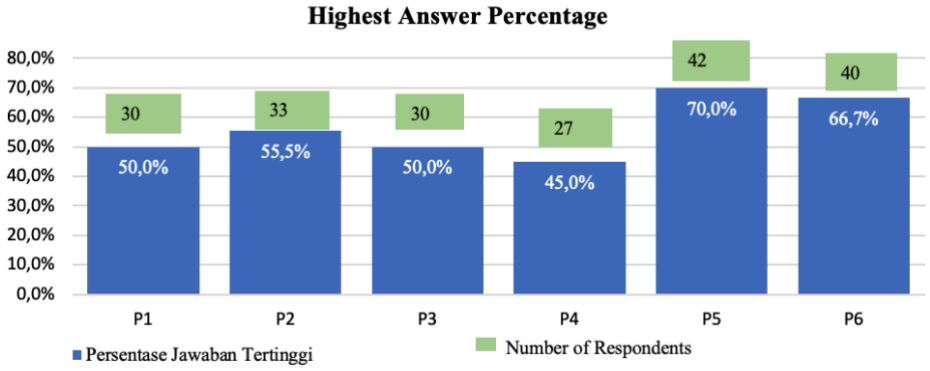


**Figure 7:** Percentage of Supporters for the Implementation of Career Service Programs by Graduate Users

The sequence of supporting programs most needed by graduate users are; (1) cooperation with industry for human resource development, (2) cooperation with industry for entrepreneurship training and development, (3) website and social media as a means of socializing vocational career services, (4) career service reference book, (5) tracer Online Study, (6) user survey. From the elaboration of the questionnaire results of the analysis of graduate user needs for supporters of the implementation of career service programs, it can be concluded that the support program that is very much needed by users is collaboration with the industrial world for training and entrepreneurship development.

Based on the assessment of the three types of respondents regarding the support for the implementation of the career service program, it can be concluded that the supporting programs needed by the three groups of respondents are (1) cooperation with the industry for training, (2) entrepreneurship development, and (3) cooperation with industry for human resource development. .

Cooperation with the industry for this training is necessary because according to research by Velde (2009) employers as an industry party have low expectations of the types of skills that new employees will have at the initial level of vocational education. Employers consider certain skills to be important for all entry-level employees because there is a stark difference between employer expectations and employees' initial competencies (Ju, Dalun Zhang, Jacqueline Pacha, 2011). Therefore, Vocational High Schools need to optimize cooperation with the industrial world for job training.

Entrepreneurship coaching also needs to be done in vocational education. Effective entrepreneurship coaching/training is very important for students because when they go to the world outside of work, they will be very successful. It will also help fight unemployment, poverty and over-reliance on white-collar government jobs that are not available in society. (Nweze, Okolie and Ituma, 2014). Entrepreneurship training is also possible if carried out in SMK as Okolie and Ogbaekirigwe (2014) stated that the aim of the training is to equip students with skills that can become responsible citizens, develop businesses and creative ideas to earn a livelihood. Therefore, there is a need for entrepreneurship development for Vocational High Schools in East Java to provide skills to students, especially to reduce unemployment in East Java.

Cooperation with industry for human resource development also needs to be implemented because of the different needs and viewpoints between vocational schools and industries that are oriented towards training and the formation of human resources with business-oriented parties to pursue profits so that there is a difference between the value system and the needs of vocational schools and industry (AR) (Usman, and Azizah, 2016). The industry is still considering the implementation of the vocational student internship/collaboration program, because it is a burden for the industry. This makes the industry pay extra if they accept street vendors, because their skills are still lacking or can be said to be zero. Doubts from the industry must be overcome with good communication from the parties involved, especially the school that works together (Marsono, et al., 2019). With this collaboration, it is important for schools to develop partnerships with industry to turn their students/graduates into quality human resources.

**Level of Need for Vocational Career Services**

The level of vocational service needs provides an illustration that the most career service management units in Vocational Schools are BKK (Special Job Exchange Units), while the programs that have been implemented by the majority of Vocational High Schools are 1) Data collection on work interests, 2) Debriefing for class XII students, 3) Apprenticeship (PKL), 4) Conducting recruitment. So the important programs needed for vocational schools in East Java to achieve the relevance of their graduates to the world of work

include several things, including (1) providing assessment services; (2) providing career seminars and career training; (3) provide job information to students/graduates; (4) Develop cooperation with the business world; (5) provide information on job training and distribution; (6) provide information on apprenticeship and distribution; 7) carry out recruitment and selection of prospective workers; 8) develop networks with successful alumni; 9) conducting tracer studies and user surveys; 10) increasing the role of career development for students/alumni; 11) conduct HR development activities (Soft Skill and Hard Skill), and 12) conduct entrepreneurship training.

All of these programs require supporting aspects which include: (1) a career service reference book, (2) the use of websites and social media as a means of socializing vocational career services, (3) an online tracer study program, (4) a user survey program (user survey) SMK graduates, (5) Cooperation with industry for human resource development, and (6) Cooperation with industry for training and entrepreneurship development. The highest supporting programs needed are collaboration with the industry for training and entrepreneurship development and collaboration with industry for human resource development.

**Model Integrated Solution**

Based on the description, it is known that the most career service management units in SMK are BKK, the programs that have been implemented by the majority of SMKs are (1) collecting data on work interests, (2) debriefing for class XII students, (3) Apprenticeship (PKL), (4) conduct recruitment. The important programs needed for vocational schools in East Java to achieve the relevance of their graduates to the world of work include 12 programs. The supporting aspects needed are shown in the following chart.

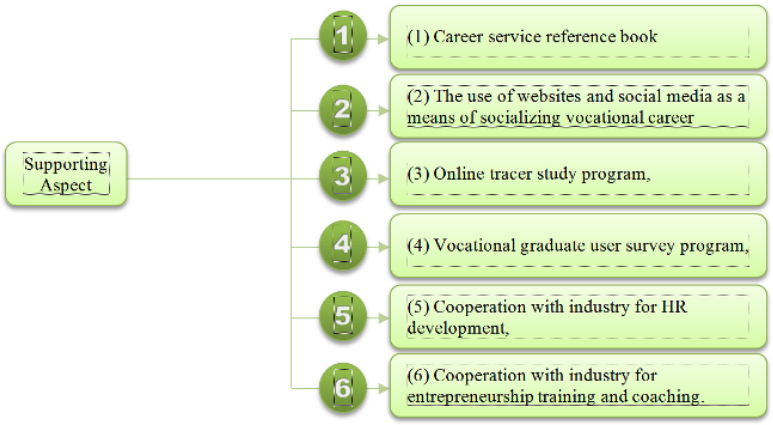


**Figure 8:** Supporting Aspects of Vocational Career Services

In line with the findings of the analysis of the needs of students/graduates, managers, and users and based on an important indicator of the success of vocational education is the aspect of relevance, so that Vocational High Schools are required to be able to produce graduates who are competitive and ready to take part in the global era. Career counselling services are important, but do not have a strategic place in schools (Abubakar, Sitti Rahmaniar, 2011; Abdullah-Al-Mamun, 2012; Bridgeland & Bruce, 2014; Baitullah, Muh. Juandi Arif, and Wagiran, 2019). Career development services that are programmed and measured are urgent in developing superior vocational education and ready to compete with other nations in the era of globalization. Vocational schools are considered capable of preparing creative students, mastering science and technology, and having competencies that are in accordance with the demands of the world of work (Sutrisno, 2013; Indriaturrahmi, 2016; Marsono. et., al., 2019; and Mihaela, and Cristina, 2015). .). For this reason, optimizing the role of career development services is expected to be able to encourage Vocational Schools to create work skills for their graduates who are adaptive to the industrial world and become independent entrepreneurs.

To optimize the competitiveness of SMK graduates, it is necessary to develop an integrated career service program according to the needs of students/graduates, managers, and users of graduates in the following chart.


**Figure 9:** The Digitalization Model of the Integrated Career Service Program for Vocational High Schools

In accordance with the chart, an integrated solution model for vocational career services is in the form of 1) student competency mapping program, 2) career training program, 3) entrepreneurship preparation program, and 4) job placement program with student/graduate career development applications and industrial partners, all of which are carried out by applying information and communication technology (ICT). Utilization of ICT is a must to support the birth of vocational graduates in the era of technology deruption (Munir, 2008 and 2011; Natakusumah, 2002).

The model is also in line with the Guidelines for the Implementation of the Curriculum Alignment Assessment Program with Parents (Directorate of Partnership and Alignment of Dudi, Directorate General of Vocational Education, Ministry of Education and Culture, 2020; Dey, Farouk. Christine Y. Cruzvegara, 2014; and Schelfhout, Stijn. et al. , 2019), this research product is targeted to provide career services in vocational schools, namely facilitating the mapping and alignment of the needs of the world of work with the competencies that vocational schools must prepare for their graduates, and making it easier to create critical problem solving skills and the work ability of graduates who are adaptive to the industrial world and become independent entrepreneur (Apindo, 2015; Chettiar, 2017; and Mark L. Savickas).

## Conclusion

Based on the research objectives, namely mapping the career service needs of students/graduates, managers, and users of SMK graduates in East Java, the following conclusions can be drawn. First, the majority of SMKs in East Java use the BKK unit as a career service program. Second, Vocational Schools in East Java have carried out several programs which include (1) collecting data on work interests, (2) debriefing for class XII students, (3) apprenticeships (PKL), (4) recruitment by companies. The quality of career services according to students/graduates, managers, and a user of graduates is in the sufficient category. It is recommended to improve the quality of career services in vocational schools so that they are more adequate and optimal. Third, the programs needed for career services in East Java Vocational Schools are (1) providing assessment services; (2) providing career seminars and career training; (3) provide job information to students/graduates, (4) develop cooperation with the business world, (5) provide information on job training and distribution, (6) provide information on apprenticeships and distribution, (7) carry out recruitment and selection of prospective workers , (8) develop networks with successful alumni, (9) conduct tracer studies and user surveys, (10) increase the role of career development for students/alumni, (11) conduct HR development activities (Soft Skills and Hard Skills), and 12) conducting entrepreneurship training, with the highest level of program needs successively being job information programs for students/graduates, collaboration with the business world, and job training information and its distribution. Fourth, the supporting programs needed are (1) a career service reference book, (2) the use of websites and social media as a means of socializing vocational career services, (3) an online tracer study program, (4) a user survey program (user survey). survey) SMK graduates, (5) Cooperation with industry for human resource development, and (6) Cooperation with industry for training and entrepreneurship development, with the highest level of need being a cooperation program with industry for training, entrepreneurship development and collaboration with industry for human resource development.

Based on the mapping of career service needs, the recommended research results are to provide solutions to problems by producing vocational career service product developments in the form of 1) student competency mapping programs, 2) career training programs, 3) entrepreneurship preparation programs, and 4) programs work placements with student/graduate career development applications and industry partners. With this development product, it is targeted to provide several positive things for the development of career services in vocational schools, namely facilitating mapping and aligning the needs of the world of work with competencies that must be prepared by vocational schools for graduates, and making it easier to create work skills for graduates who are adaptive to the industrial world and become entrepreneurs independent.

## References

Abdullah-Al-Mamun, M. (2012). The Soft Skills Education for the Vocational Graduate: Value as Work Readiness Skills. *Journal of Education, Society and Behavioural Science*, 326-338.

Abubakar, Sitti Rahmaniar. (2011). Pelaksanaan Bimbingan Karier Bagi Siswa SMA sebagai Persiapan Awal Memasuki Dunia Kerja. *Selami IPS.* 34(1) ISSN 1410-2323 137.

Aoun, J.E. (2017. Robot-proof: higher education in the age of artificial intelligence. US: MIT Press.

Apindo. (2015. Pedoman untuk Pengusaha Program Pemagangan di Indonesia: Meyiapkan Kaum Muda sebagai Tenaga kerja. Copyright © Organisasi Perburuhan Internasional 2015. http://www.ilo.org/wcmsp5/groups/public/---asia/---robangkok/---ilojakarta/documents/publication/wcms_371766.pdf

Ar, Murniati, Nasir Usman, dan Azizah. (2016). Vocational School-Industry Partnership In Improving Graduate Competency. *Jurnal Ilmiah Peuradeun*. Vol. 4, No. 3, September 2016). http://www.scadindependent.org/2016/09/peuradeun-30860.92800.htm

Badan Pusat Statistik Jawa Barat. (2018). *Keadaan Ketenagakerjaan Jawa Barat Tahun 2018*. Bandung: BPS Jawa Barat.

Baitullah, Muh. Juandi Arif. Dan Wagiran. (2019). Cooperation Between Vocational High School and World of Work: a Case Study at SMK Taman Karya Madya Tamansiswa. *Jurnal Pendidikan Vokasi*. 9(3) (280-293) http://journal.uny.ac.id/index.php/jpv

Borg & Gall. (2003. *Education Research*. New York : Allyn and Bacon.

Bridgeland, J., & Bruce, M. (2014). National survey of school counselors. College Board National Office for School Counselor Advocacy. Retrieved from http://www.civicenterprises.net/MediaLibrary/Docs/counseling_at_a crossroads.pdf

Chankseliani, Maia. and Aizuddin Mohamed Anuar. (2019). Cross-country comparison of engagement in apprenticeships. A conceptual analysis of incentives for individuals and firms. *International Journal for Research in Vocational Education and Training (IJRVET)* 6(3), 261-283. Htpps://doi.org/10.13152/IJRVET.6.3.4

Chettiar, Kannan. (2017. Critical Skills for Industry 4.0. https://www.avvanz.co

Clemens, E. V., Milsom, A., & Cashwell, C. S. (2009). Using leader–member exchange theory to examine principal– school counselor relationships, school counselors' roles, job satisfaction, and turnover intentions. Professional School Counseling, 13, 75–85.

Creswell, J.W. (2014. *Research Design Pendekatan Kualitatif, Kuantitatif, dan Mixed*. Yogyakarta: Pustaka Pelajar

Dey, Farouk. Christine Y. Cruzvegara. (2014. Evolution of Career Service in Higher Education. New Deriction for Student Service. No. 148. (2014.

Direktorat Kemitraan dan Penyelarasan Dudi, Direktorat Jenderal Pendidikan Vokasi Kementerian Pendidikan dan Kebudayaan. (2020). *Pedoman Pelaksanaan Program Asesmen Keselarasan Kurikulum dengan Iduka.* https://assets.mitrasdudi.id/program/32/1597823865.pdf. diakses 19 Mei 2021.

Direktorat Pembinaan Sekolah Menengah Kejuruan. (2017. *Pedoman Praktik Kerja Lapangan (PKL).* Direktorat Pembinaan Sekolah Menengah Kejuruan.

Fatahillah, Al. dan Mochamad Bruri Triyono. (2019). Graduates' Perception On The Importance Of Special Job Market In State Vocational High Schools In Langsa City. *Jurnal Pendidikan Vokasi.* 9(2),197-206. Http://Journal.Uny.Ac.Id/Index.Php/Jpv

Hacioglu, U., & Sevgilioglu, G. (2019). The evolving role of automated systems and its cyber-security issue for global business operations in Industry 4.0. International Journal of Business Ecosystem & Strategy (2687-2293), 1(1), 01–11. https://doi.org/10.36096/ijbes.v1i1.105

Indriaturrahmi. (2016). Peran Dunia Usaha dan Dunia Industri dala Penyelenggaraan SMK Berbasis Kearifan Lokal di Kota Mataram. *Junal Pendidikan Vokasi*. 6(2),162-172. Online: http://journal.uny.ac.id/index.php./jpv'

Ju, Song, Dalun Zhang, Jacqueline Pacha. (2011. Employability Skills Valued by Employers as Important for Entry-Level Employees With and Without Disabilities. *Career Development and Transition for Exceptional Individuals*. 35(1), 29-38. First Published November 22, 2011

Juwitaningrum, Ita. (2013. Program Bimbingan Karier untuk Meningkatkan Kematangan Karier Siswa SMK Career Counseling Program to Improve Career Maturity Students of SMK. *Psikopedagogia Jumal Bimbingan dan Konseling*, Program Studi Bimbingan dan Konseling FKIP UAD 2013, 2(2), 132.

Kementerian Pendidikan dan Kebudayaan Direktorat Jenderal Pendidikan Tinggi Direktorat Pembelajaran dan Kemahasiswaan. (2012. *Buku Panduan Sistem Layanan Karir*. Jakarta: Kementerian Pendidikan dan Kebudayaan Direktorat Jenderal Pendidikan Tinggi Direktorat Pembelajaran dan Kemahasiswaan.

Mark L. Savickas. The relation of career maturity to personality type and social adjustment. Journal of Career Assessment., 10 (1), 24-41. http://www.sagepub.com/upmdata/2903_2JCA02.pdf. Tanggal akses: 2 Juni 2015.

Marsono. et., al. (2019). School and Industries Collaboration on Implementing Vocational Education Internship Program: Best Practice in Indonesia. *Advances in Social Science, Education and Humanities Research*, volume 379

Mihaela, N, A. and Cristina Ilie Goga. (2015). A Research the Educational Counceling and Career guidance in Romania. *Europan Scientifik Journal*. V. 2

Mikkonen, Susanna. Laura Pylväs. Heta Rintala. et al. (2017). Guiding Workplace Learning in Vocational Education and Training: a Literature Review. *Empirical Res Voc Ed* Train 9, 9 https://doi.org/10.1186/s40461-017-0053-4.

Munir. (2008). Kurikulum Berbasis teknologi Informasi dan Komunikasi. Bandung: Alfabeta

Munir, (2011).Pembelajaran Jarak Jauh berbasis Teknologi Informasi dan Komunikasi. Alfabeta : Bandung

Muslihudin, dkk. (2004). *Bimbingan dan Konseling* (Makalah). Bandung: LPMP Jawa Barat.

Mutaqin, Muhammad K. A., Wowo S. Kusnawa, Sriyono. (2015. Studi Eksplorasi Keterserapan Lulusan Sekolah Menengah Kejuruan Negeri di Kota Bandung Pada Industri Otomotif. *Journal of Mechanical Engineering Education*, 2(2) .

Mwilima, Fred J. (2010). *Employment patterns of UNAM graduates: an assessment of the employability of the media studies graduates of the University of Namibia*. Global Media Journal African Edition 4(2). http://globalmedia.journals.ac.za/pub/article/viewFile/5/6

Natakusumah, E.K, (2002). Perkembangan Teknologi Informasi di Indonesia, Pusat penelitian Informatika-LIPI.

Nweze1, Tina. Ugochukwu Chinonso Okolie and Afam Ituma. (2014). Entrepreneurship Training In Global Economic Crisis: The Nigerian Experience. *IOSR Journal of Business and Management (IOSR-JBM)*. 16(8) 57-61.

Okolie1, Ugochukwu Chinonso. and Charles Ogbaekirigwe. (2014). Entrepreneurship Development through Vocational Education Training: Issues and Roles in Skills Acquisition and Manpower Development in a Developing Economy. *Journal of Educational Policy and Entrepreneurial Research (JEPER)*. www.iiste.org 1(2), 151-157.

Oxford, R.L. (2011. *Teaching Researching Learning Strategies*. Harlow, UK: Pearson Education.

Rahajo, R. Setyo. (2009. Kualitas Layanan Bursa Kerja Khusus dan Persepsi Alumni SMK se-Kabupaten Kendal Jawa Tengah. *Teknologi dan Kejuruan*. 32 (1)25-36.

Schelfhout, Stijn. et al.. (2019). The effects of vocational interest on study results: Student person – environment fit and program interest diversity. *PLoS ONE* 14(4): e0214618. https://doi.org/10.1371/journal.pone.0214618

Schomburg, Harald. (2003. *Handbook for Graduate Tracer Studies: Centre for Research on Higher Education and Work*. University of Kassel, Germany. http://www.qtafi.de/handbook_v2.pdf

*Shivoro, R.S., R.K. Shalyefu, N. Kadhila*. (2018. Perspectives on Graduate Employability Attributes for Management Sciences Graduates.

Su, Rong. (2012. The Power Of Vocational Interests and Interest Congruence in Predicting Career Success. *Disertasion*. Submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Psychology in the Graduate College of the University of Illinois at Urbana-Champaign, 2012

Sukardi, T., Yatin Ngadiyono, dan Paryanto. (2011. *Pengembangan Model Bimbingan Kejuruan pada SMK*. Laporan Penelitian Jurusan Mesin Di Provinsi DIY. Dibiayai: DIPA BLU Universitas Negeri Yogyakarta.

Sutrisno, Budi. (2013. Perencanaan Karier Siswa (Sebuah Model Berbasis Pengembangan Soft-Skills). Jurnal Varia Pendidikan ISSN, No.0852-0976. 25(1), 2013: 1 – 14

Theresa, Lawer Dede. (2015. Factor that Inform Students Choice of Study and Career. *Journal of Education and Practice*. 6(27). 2015

Velde, C. (2009. Employers' Perceptions of Graduate Competencies and Future Trends in Higher Vocational Education in China. *Journal of Vocational Education and Training*, 61, 1. 35-51

Werdiningsih, Dyah dan S.N. Hasana, 2018. *Perbandingan Kompetensi Lulusan Hasil Tracer Study* Universitas Islam Malang 2015—2017. *Seminar Nasional pada Indonesia Career Center Network (ICCN) Summit 21—23 September 2018*

Wibowo, Nugroho. (2016). Upaya Memperkecil Kesenjangan Kompetensi Lulusan Sekolah Menengah Kejuruan dengan Tuntutan Dunia Industri. *Jurnal Pendidikan Teknologi dan Kerja Sama*. 23(1) 2016).

***Publisher's Note:*** SSBFNET stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.