

## Universitas Negeri Semarang's readiness in carrying out vocational education

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### Abstract

This study aims to analyse (1) the support system in carrying out vocational education, (2) the readiness of faculties and departments to administer vocational education and (3) the suitable implementation model of vocational education for UNNES. The research data were collected through interviews, observations and focus group discussions. The data analysis was obtained in a qualitative interactive manner using data reduction methods, data presentation and drawing conclusions, as well as verification. The results showed that the implementation of vocational education has an internal support system, namely the leadership commitment of UNNES, faculties and departments, the availability of learning facilities and infrastructure, the availability of curriculum, the availability of lecturers and educational staffs and the availability of budget. The external support systems are the link and match policy, for example, opening 100 polytechnics and accepting civil servants from the diploma programme, Universitas Negeri Semarang faculties and departments are quite ready to administer vocational education.

Keywords: Education, diploma, UNNES, vocational;

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## 1. Introduction

The opportunity for a country to have high and sustainable economic growth will be even greater if the country is supported by human resources who have the basic knowledge and ability to adjust to the demands and dynamics of ongoing development, as well as have the skills or expertise needed by the working world (Anwar, 2017; Adam & Negara, 2015; Sugiarto, 2019). To produce qualified human resources, good education is needed (Harbison, 1967; Hdigui, 2006; Prasetyoning Tyas & Wicak Ikhsani, 2015). In reality, Indonesia still faces poor policies in dealing with labour issues, especially related to weaknesses in the arrangement of vocational training centres and vocational education (Waidl et al., 2018).

Based on data from the National Statistics Agency (BPS) in 2011, there are 82.1 million Indonesian workers who are groups of workers who do not have the skills or competencies in their fields (Biro Pusat Statistik, 2011). In 2016, employment was dominated by workers with junior high school educational background and below; the number of workers with low education reach up to 72.70 million (Afrina et al., 2018). While skilled and competent workers in their fields are 20.4 million, the expert workers were only 4.8 million. Until February 2018, Indonesian employment was still dominated by people working with low education (junior high and below), amounting to 75.99 million or 59.80% (BPS, 2018). Meanwhile, the working population who have a secondary education (high school equivalent) are 35.87 million (28.33%). The highly educated working population is 15.21 million (11.97%) including 3.50 million with a diploma education and 11.71 million with university education.

The predominance of a less educated workforce influences the level of human resources competitiveness. In 2019, the Global Talent Competitiveness Index (GTCI) released the position of human resources in ASEAN. In the GTCI, Indonesia ranked sixth with a score of 38.61 (Gerintya, 2019). Indonesian workers are predicted to have hard time in competing with workers from other countries in this global sector, which facilitates the inflow and outflow of foreign workers. The liberalisation of the labour market also threatens Indonesian workers because Indonesian workers' competitiveness is still below Singapore, Malaysia and Thailand (Apresian, 2016). Adawiyah et al.'s (2017) research revealed that education in Indonesia has not been able to make the human resources compete well with other countries that have already advanced through their education. This happens because the educational background of Indonesian workers is still dominated by basic education. Low education also causes limited opportunities to get a job and limited opportunities to get work cause inequality (Afrina et al., 2018).

To overcome this labour problem, vocational education is present (Dahil et al., 2015; Rzepka, 2018; UNESCO, 2014). In accordance with the regulation of the National Education System, vocational education is higher education prepares students to have jobs with certain applied skills (Wibawa, 2017). Vocational education has a very strategic role in preparing the young generation to have superior knowledge, skills and characteristics (Avis, 2019; Caves et al., 2021; Haasler, 2020; Pantea, 2020; Pozo-Llorente & Poza-Vilches, 2020; Wuttke et al., 2020). Thus, vocational school graduates will be well qualified to enter the world of industry and business and even entrepreneurs. Vocational education is designed to prepare individuals for specific jobs that have a direct relationship to the productivity and nation's competitiveness (Cedefop, 2011).

In designing and implementing vocational curriculum, the institutions need to pay attention to the applicable provision in Indonesia so that it is always relevant to the Indonesian National context, but with a global perspective. Competencies that are developed through the learning process must refer to the competencies needed by the industrial world.

In accordance with the 2018 academic guidelines, UNNES administers three types of education, namely academic education (undergraduate programmes, master's programmes and doctoral programmes), professional education and vocational education (diploma). Almost all faculties have implemented vocational education and now only three faculties are going to organise vocational education. Those are Faculty Language and Arts, Faculty of Social Science and Faculty of Math and Science.

In line with the government policies that give great attention to vocational education, especially polytechnics, UNNES intends to continue with the existing diploma programmes and open four diploma programmes in accordance with market demands and community needs.

This paper will solve three problems, namely (1) how are the internal and external support systems of vocational education? (2) How are the readiness of faculties and departments in carrying out vocational education? and (3) What is the right model in conducting vocational education?

This research is focused on UNNES readiness in conducting vocational education, both diploma three and diploma four, and then examining the right model in the implementation of vocational education at UNNES.

### **1.1 Provision for workers**

The government has a policy to develop an employment system that is able to provide proper employment for workers (ILO, 2018; International Labour Organization, 2019; Organisasi Perburuhan Internasional, 2012). Employment development which is oriented towards the creation and expansion of productive employment can be strived to be well implemented in line with the economic growth. For this reason, the government tries to develop qualified human resources who are expected to have professional, productive, independent, high work ethics and entrepreneurial spirits, so that they can fill, create and expand employment and business opportunities, both domestically and internationally. Building quality human resources can only be achieved through good education and training.

Provision for workers in Indonesia is conducted through education, training and development in the workplace (Nambiar et al., 2019). The educational pathway is pursued through formal (elementary, junior high, high school, vocational and university), non-formal and informal (early childhood education, child care, play groups, kindergartens and community education) education. The training module is taken by vocational training centres and vocational skills courses, as well as by training institutions other than the two. The development path in the workplace is taken through apprenticeship or training at work (Slamet, 2011).

Based on the analysis of the workforce, it is found that many workers do not meet the qualifications and are not suitable for their jobs based on the employment and the latest education that has been completed. Many workers have a level of education that is too high or too low than what is required for a particular job. Positions like managers, professional staffs and professional technicians are appointed as jobs that require high skills and college educational background but many of these positions are filled by those who are not well qualified, whereas jobs such as clerks, service and sales workers, skilled workers in the agricultural sector, traders and production workers who need secondary education are also filled by unqualified workers, except for clerks, many of whom have college education. Therefore, this case can be considered as exceeding the requirements and the statistic of this type of case reaches up to 39%, whereas basic work which can be considered as work that requires low skills can be filled by those who have elementary school background or less. About 22% of the workers in basic work are considered to be exceeding qualifications (Handayani, 2015).

The mismatch or gap between labour demand and supply can also be seen from the open unemployment rate, especially among young people who have more serious problems in Indonesia and in many countries in the world (International Labour Office, 2005; SOS Children's Villages International, 2018). The open unemployment rate of the young population (15–24 years) in Indonesia is high, especially young people with secondary and higher education level. The number of unemployed young people reaches more than 50% and most of them have never worked before. It might also be related to job vacancies that require 'work experience', so young people who have just graduated find it relatively difficult to find work. The opportunities for educated youth in Indonesia to be unemployed are greater than those who are less educated (Handayani, 2015). However, young people with higher educational backgrounds tend to look for work actively, and this may be related to their greater likelihood of meeting job vacancy criteria set by employers in the future. In comparison, in February 2015, around 17.9% of unemployed youth were included in the category and, at the same time, they were also categorised as desperate job seekers. Most unemployed who are in despair have junior high school education or lower. This shows the important role of education for the unemployed population. In general, this situation emphasises the importance of efforts to delay the entry of youth into the labour market and support their participation in the world of education and training that is responsive to the needs of the labour market.

## **1.2 Vocational education as a solution**

According to Law Number 20 of 2003, concerning National Education System Article 15, the type of education includes general, vocational, academic, professional, religious and special education. Colleges can be in the form of academies, polytechnics, high schools, institutes or universities. Higher education can organise academic, professional and/or vocational programmes.

Compared to academic education, vocational education is growing so fast because the type of works also changes rapidly. As said by Winangun (2017), vocational education is an education level that is always dynamic in making changes to the education curriculum in accordance with the growth of the labour market and adapting to the development of science and technology.

In developed countries such as Japan, China, Germany, Austria and the Netherlands, vocational education is significantly developed. In Austria, the number of vocational majors is 78% and in Netherlands it reached 70% (Kemristekdikti, 2017). This is reasonable because vocational education is basically education that is more oriented towards the application of science and practically solves problems in a systematic and measurable way. In Taiwan, vocational education has contributed to Taiwan's economic prosperity. This was driven by the existence of an overseas internship programme (Chang & Wang, 2017). In line with the growth of the market economy, the Chinese government has encouraged the development of vocational education in both high schools and high schools (Guo & Lamb, 2010).

In England, vocational education is divided into two forms, namely vocational education within educational institutions and vocational education which is oriented towards practical learning (Utami et al., 2018). First is vocational education that focuses on learning in institutions, both vocational schools and professional institutions. Through this pathway, students learn more in an educational institution. Second, vocational education focuses on practical learning through an apprenticeship programme. Through the apprenticeship programme, students do more practical learning in the company while taking more theoretical classes at local educational institutions. Through this pathway, students receive work wages from companies. Students usually spend 1 day per week in college studying technical certificates and their remaining time in training or work.

As a country that currently has the blessing of demographics, the largest population of productive age in the world, Indonesia has begun to realise the important role and strategic position of vocational education in responding to the challenges of globalisation, particularly in the field of employment. This is realised by the government's policy in changing the composition number of vocational secondary education (SMK) to general secondary education (SMU) or high school from 40% to 60% or 70% when compared to 30%. At the university level, the government also plans to open 100 new polytechnics of various types of science.

Vocational education is a higher education that is intended for practical purposes, starting from Diploma I, Diploma II, Diploma III, Applied Bachelor, Applied Masters and Applied Doctorate which functions to develop students to have certain applied expertise jobs through vocational programmes in order to achieve national education goals. Vocational education is education that directs students to develop applied skills, adapt to certain occupations and create job opportunities (Billett, 2011). Vocational education is designed to prepare individuals to obtain employment or specific jobs that are directly related to the productivity and competition of a country (Lettmayr, 2011).

Vocational education adheres to an open system (multi-entry–exit system) and multi-meaning which is oriented to culture, empowerment, character formation and personality, as well as various life skills. Vocational education is oriented towards work skills in accordance with the development of applied science and technology and the demands of employment needs. Vocational education is an applied expertise education held in colleges in the form of academies, polytechnics, colleges, institutes and universities. The form of organising vocational education consists of Diploma 1, Diploma 2, Diploma 3 and Diploma 4. The national standard of vocational education is developed based on national and/or international competency standards.

Vocational education in Indonesia is expected to actualise the link and match of universities and industry (Sartono, 2018). Therefore, the vocational education curriculum is expected to contain 30% theory and 70% practice. However, vocational education in Indonesia faces the following challenges and issues. First, vocational education programmes seem to be rigid and less flexible in changing employment needs. Types of study programmes, educational materials, teaching method, learning media, evaluation and certification are more determined by the government; (2) the number and capacity of vocational education in the industrial sector are relatively small compared to the total capacity of the type of education; (3) the quality of industrial vocational education still needs to be improved, especially related to the quality, quantity of practice equipment, lecturers and other supporting infrastructure; and (4) industrial vocational education needs to be more adapted to the real needs of the industrial world and oriented to the changing needs of the job market (Nurwardani et al., 2016).

## **2. Research method**

In 2019, the rector of UNNES set the target of UNNES as an independent year. To welcome the independent year, UNNES conducts academic studies on programmes that can be prepared so that UNNES is substantively ready as an independent higher education. One of them is by reviewing the diploma programme that UNNES is implementing. The research was conducted to answer the following questions: (1) How are the internal and external support systems of vocational education? and (2) How is the readiness of faculties and departments in carrying out vocational education? So, the research method used is qualitative (Creswell, 2014). The third research question, namely what the right model for vocational education is solved by using research and development (R&D) (Sugiyono, 2019) because it will produce a product in a manual. The guidebook is later expected to be a guideline for faculties,

departments and study programmes that the leadership of UNNES will assign to organise vocational education.

This research uses a qualitative approach, so the sampling technique used is purposive sampling. Informants selected as samples are (1) informants who have experience in conducting vocational education and (2) informants who know how to organise vocational education in universities. They are vice rectors at an academic affair, vice deans of the academic affair, study programme coordinators and directors of vocational schools.

Data were collected using questionnaires, interviews, observations, documentation and focus group discussions (FGDs). Qualitative data were collected openly; images and texts were analysed; and the findings were interpreted (Creswell, 2014); at the same time, the procedure for producing a manual product for the implementation of vocational education is used in the R&D stages, namely identification of potentials and problems, data collection, product design, product design validation and design revision (Sugiyono, 2019). Qualitative data are validated by triangulation of sources, namely comparing data on the implementation of vocational education from various sources such as the deputy dean for academics, study programme coordinators and related parties who are currently and have held vocational education. The research data were analysed qualitatively with the stages of data condensation, data presentation and conclusion drawing and verification (Miles et al., 2014).

### 3. Results and Discussion

#### 3.1 The support system of vocational education

The implementation of vocational education at UNNES is supported by two factors, namely internal and external factors. Internal factors include the commitment of UNNES leaders, as well as faculties and department leaders, the availability of learning facilities and infrastructure, the availability of curriculum, the availability of lecturers and educational staff, the availability of budget and the policies of the leadership of UNNES in supporting vocational education programmes. In addition, the three diploma study programmes held by the faculty have been accredited, namely two study programmes accredited A and one study programme accredited B. Table 1 presents an overview of the accreditation profiles of the three study programmes.

Table 1. Accreditation grades of the UNNES diploma programmes

No.	Study programme	Accreditation	Explanation
1.	Visual Communication Design	A	Very good
2.	Survey and Mapping	B	Good
3.	Applied and Computational Statistics	A	Very good

The other supporting system is the uptake capacity of graduates from the three diploma programmes. The uptake of graduates of the three diploma programmes is quite high at 75% and above. Data on the job market uptake of diploma programme graduates is shown in Figure 1.



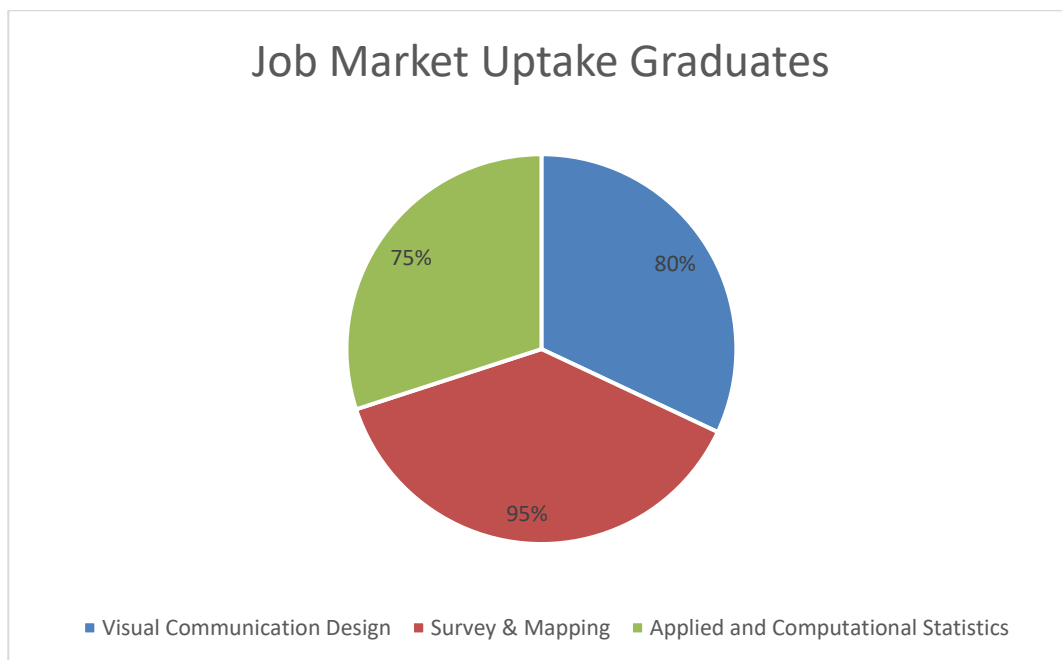


Figure 1. Number of graduates absorbed by the labour market

External factors are the government's policy to open 100 new polytechnics, policies to support link and match activities, as well as the existence of civil servant quota for diploma graduates. The issuance of Permen Ristekdikti Number 54 Year 2018 regarding the Implementation of the Diploma Programme in the Open System at Higher Education establishes the importance of vocational/diploma education. Likewise, the issuance of the Decree of the Director General of Learning and Student Affairs Number 46/B/HK/2019 dated February 22, 2019, in the Name of Study Programmes in Higher Education also shows the government's support for the existence of diploma and applied bachelor programmes.

### 3.2 Faculty and department readiness

At present, the faculties that carry out vocational education programme or diploma are the Faculty of Languages and Arts, the Faculty of Social Sciences and the Faculty of Mathematics and Natural Sciences. From year to year, the three faculties accept students from the UNNES Independent Selection track (SM-UNNES). Public interest in sending their children to study in the diploma programme is still quite high.

In addition to the three faculties, the other five faculties also managed diploma programmes in the 2000s, and some faculties even held a diploma education programme in the 1990s, namely Faculty of Education and Faculty of Sport Science.

Judging from the experience of UNNES, especially faculties that have organised vocational or diploma education, it can be stated that UNNES, in this case the faculty itself, is relatively ready to administer vocational education, both the 3-year diploma programmes and 4-year diploma programmes. This readiness is supported by the commitment of the deans and the vice deans of academic affairs when they are assigned by the rector of UNNES to open a diploma programme. Other readiness is the existing curriculum since several diploma programmes have been administered before and its establishment licence are still valid. Infrastructure, especially classrooms, can still accommodate at least one student

in a single class. Laboratories are also available to facilitate teaching and learning activities as well as student practical activities.

Three diploma programmes that are still active, namely Visual Communication Design in the Faculty Language and Arts, Survey and Mapping in the Faculty of Social Science and Applied and Computational Statistics in the Faculty of Math and Science. These programmes have pretty good enthusiasts, even if it is compared to undergraduate programmes, they are still below. The number of students in the three programmes can be seen in Figure 2.

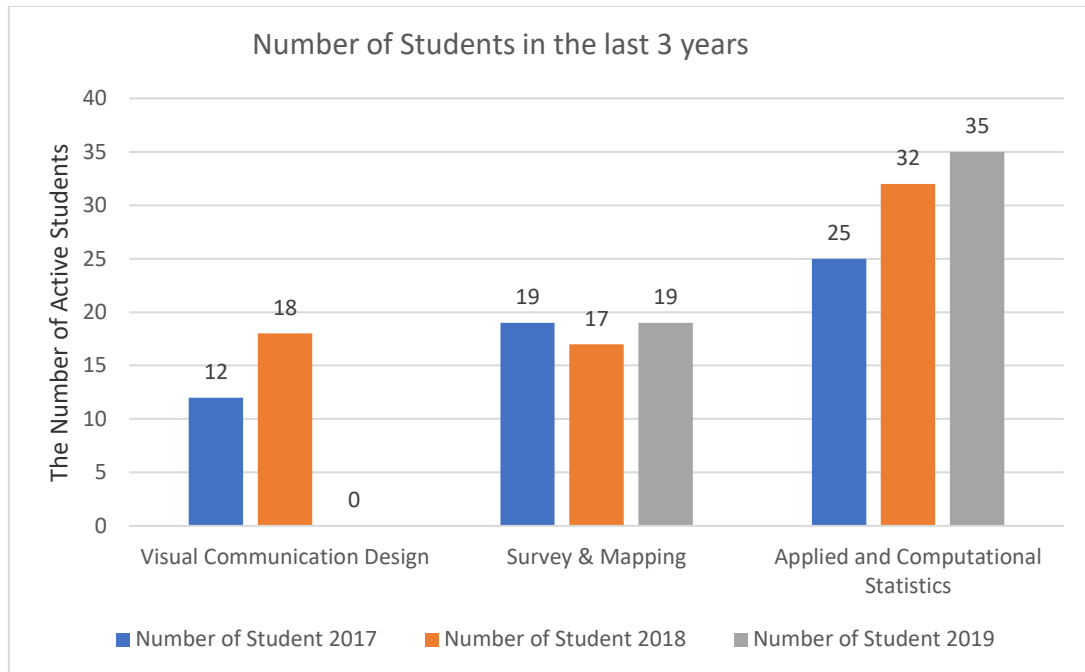


Figure 2. Number of students in the last 3 years

High uptake from the working world in a relatively short period of time justifies that diploma programmes in three faculties are worth maintaining and continuing. The programme's sustainability is not only to meet market demands, but also to implement government policies in producing skilled workers needed by the industrial world, the business world and government agencies.

Visual Communication Design diploma graduates can be accepted to work in advertising, publishing, television stations, SOEs and ministries (Kemenkumham and Kemenpar). There are also those who work in NGOs and as freelancers, such as making logos and web designers, freelance illustrators, cover designers, animators and video makers using Fiverr applications, upwork and others. The waiting period for Visual Communication Design graduates is relatively short, i.e., 2–3 months. Survey and Mapping diploma graduates can work as mapping consultants, surveyors at BPN/ATR and at PT Perkebunan Kelapa Sawit. Like Visual Communication Design graduates, intermediate experts from Survey and Mapping have a waiting period of 2–3 months. Applied and Computational Statistics diploma graduates can work in statistical offices, PT KAI, Gramedia, Suara Merdeka, Animation Studies, Industry and Trade Services and others. The maximum waiting period for Applied and Computational Statistics graduates is 5 months.

The collaboration between the faculties and DUDI gives an indication that the existing vocational education is feasible to be continued and the diploma programme that has already been opened can



still be reopened, considering that in the next few years the government has great attention to the vocational programme.

### 3.3 Implementation of the vocational education model

Based on data obtained from focused discussions with diploma programme managers and faculty managers, as well as benchmarking to Universitas Pendidikan Indonesia (UPI) Bandung, the implementation of vocational education or diploma at UNNES is more appropriate if it is not held at the faculty, but is managed by a separate institution directly responsible to the rector, namely in vocational school.

Most respondents who were asked to give opinions about the need for vocational schools to manage vocational education said that the diploma/vocational programme should be handled separately by an institution called the vocational school. Figure 3 shows that 84.62% of the respondents agreed that the provision of vocational education was specifically managed by a separate institution – the vocational school.

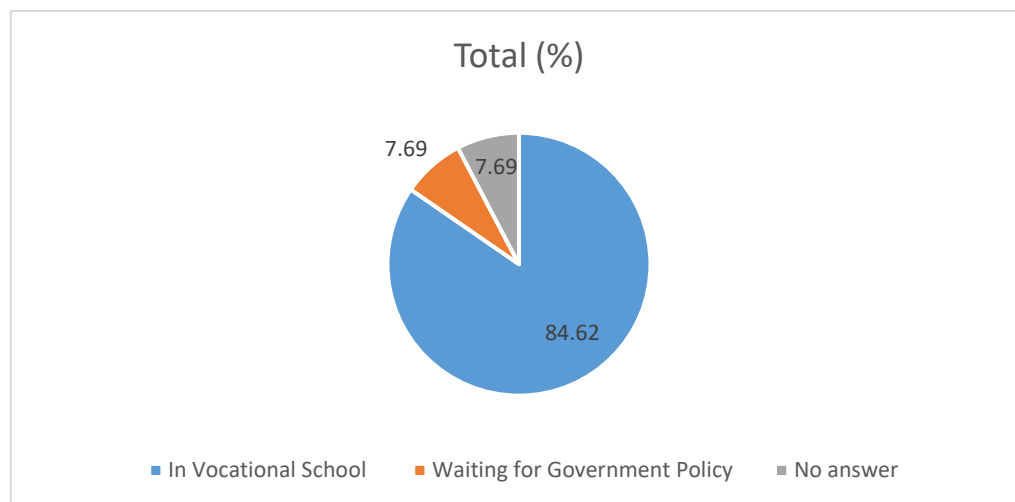


Figure 3. Opinion of respondents on the implementation of vocational education

Furthermore, from the results of FGDs with the stakeholders of vocational education at UNNES and benchmarking at UPI, the model of organising vocational education at UNNES can be conducted centrally by an institution called the vocational school. Study programmes that will open vocational education must meet the requirements, such as public interest, HR availability, availability of infrastructure, budget availability, organiser commitment, continuous collaboration with the business and industrial world (DUDI), and market needs workforce. In order for vocational education to run well, quality must be maintained by the Quality Assurance Agency (BPM), UNNES. The model of organising vocational education at UNNES can be seen in the chart shown in Figure 4.

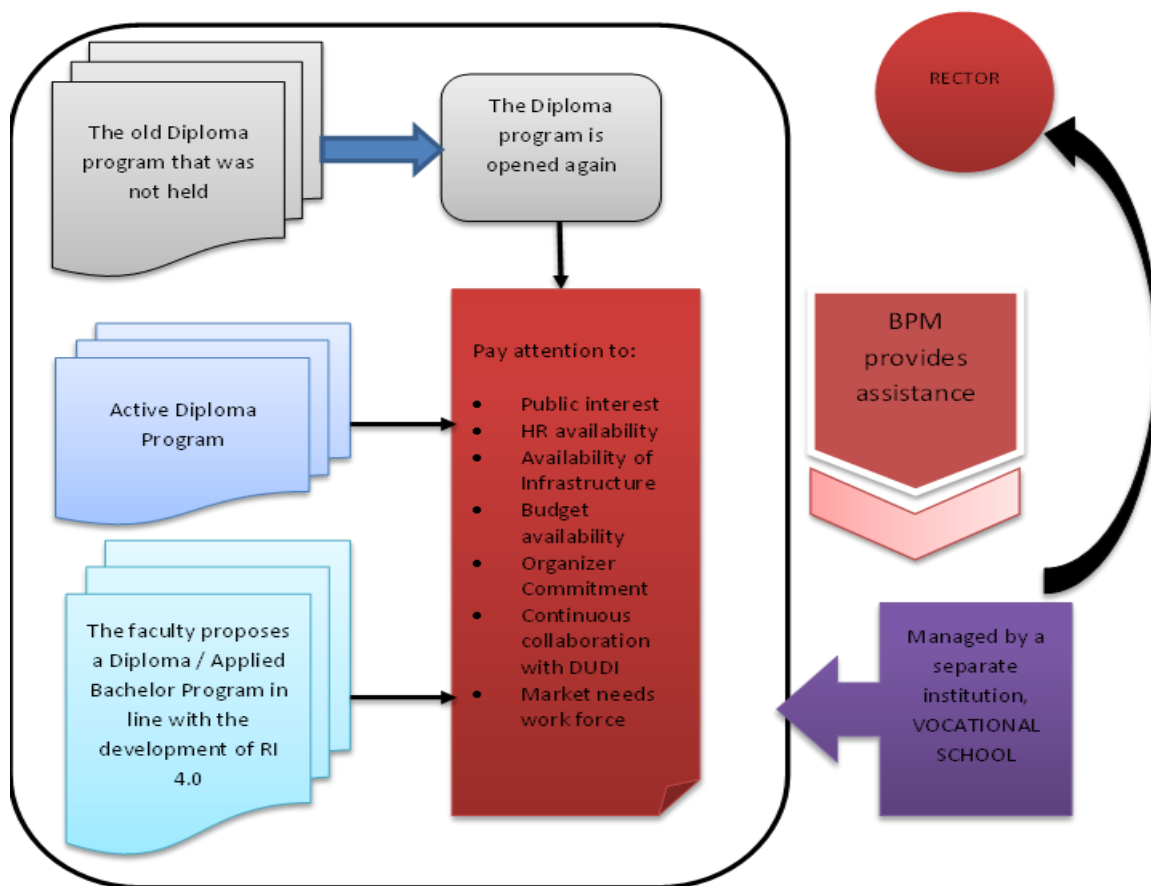


Figure 4. Vocational education implementation model

This research has produced a model for implementing vocational education, as shown in Figure 4, but this model may not be applicable in other universities. Apart from the fact that the place of research at UNNES is limited to the three study programmes studied, it is also the objective of the research to examine the readiness of UNNES more specifically in conducting vocational education.

### 3.4 Discussion

Vocational education becomes a necessity for UNNES, in particular, and the government, in general, because in the next few years, Indonesia needs skilled workers to fill the job market in the industrial and business world, even some government agencies still need diploma programme graduates for technical jobs. For this reason, the government through Ristekdikti gives great attention to vocational education which is expected to produce skilled graduates who are needed by working world. Patdono, Director General of the Institute of Science and Technology, Kemenristekdikti said that polytechnic graduates at the end of 2019 should not be unemployed (Neneng, 2017). To achieve this goal, the government has cooperated with the industrial world to develop vocational education. Patdono explained, for

companies that are already large scale, they will be encouraged to establish a polytechnic (Neneng, 2017). Kemenristekdikti will also intervene by helping to develop curriculum, providing lecturers through recognition prior learning and mentoring when preparing proposals. England as a developed country in vocational education also encourages industries to invest in quality vocational education in higher education (Burnett & Thrift, 2013).

In order to get skilled workers, the government also empowers 10 state polytechnics by facilitating the polytechnics to collaborate with industry partners. As a concrete manifestation of the implementation of the vocational higher education revitalisation programme, 10 state polytechnics signed cooperation with industrial partners in the fields of energy, food security and transportation. The signing of the collaboration was conducted in conjunction with the National Work Meeting of Kemenristekdikti in 2017 at UGM Yogyakarta. Some cooperation with the industrial partners, for example, in the energy sector cooperation signed an agreement between Surabaya State Electronics Polytechnic (PENS) with PT LEN Industri (Persero) and Banjarmasin State Polytechnic with PT Trakindo Utama. In the field of food security, the cooperation agreement was signed between the Pangkep State Agricultural Polytechnic with PT Nusa Indah Kalimantan Plantations, the State Polytechnic of Jember with PT Benih Citra Asia and the Malang State Polytechnic with PT Labtech International Ltd. This shows the great support of the Indonesian government for vocational education (Suryadarma & Jones, 2013).

The focus of the policy directed by the government on vocational education can be considered as appropriate from the perspective of policy theory since the vocational education policy is employed with the aim of meeting the interests of the people, namely the need for skilled workers that can be immediately absorbed by working world (Hamdi, 2014). The government's way to strengthen vocational education by giving great attention to polytechnics and diploma programmes organised by universities in the perspective of an institutionalism approach is appropriate because all policies that have a major impact on society must be taken up by the government. This is in line with the statism model in public policy, wherein the state is an autonomous actor who has the capacity to plan and carry out his own goals and does not always have to respond to pressures or demands from dominant groups in society (Hamdi, 2014).

Vocational education with a focus on practical learning and internships in industry will provide great benefits for graduates. They will be quickly and easily accepted by the job market. Employment for vocational education graduates is the main focus, not the diploma certificate (Suharno et al., 2020). Work is important and has become the main target for most people's lives. Work not only gives people the means to meet basic needs, such as food, clothing and shelter, but also the type of work done by individuals and groups has a large impact on their self-confidence, social status and standard of living (Mulder, 2017). Vocational education or vocational is related to 'applied learning', with the acquisition of knowledge and skills for the working world to increase productive employment opportunities, sustainable livelihoods, personal empowerment and socio-economic development (Mulder, 2017). The problem is not the benefits of vocational education, but how vocational education is prioritised in the administration of higher education, especially in universities because in Indonesia the allocation of education is still inadequate. The presence of the government through regulations and facilitation, as well as gathering the industrial world, needs to be supported so that education in universities can be provided with the needed labour. The provision of good and organised vocational education will be able to produce the necessary resources that can enter a decent labour market for humans (McGrath et al., 2018; Ministry of Labour Relations and Foreign Employment and International Labour Office, 2006).

#### 4. Conclusion

Based on the results of research and discussion, it can be concluded that the implementation of vocational education had an internal and external support system. Internal support system from UNNES which had experience implementing vocational education and external support system related to government policies that focused on vocational education as a means of producing workers who are ready to work, (2) all faculties at UNNES are ready to organise vocational education. The readiness is marked by commitment from the faculty leaders, availability of curriculum, infrastructure, laboratories, and collaboration with The Business World and the Industrial World (DUDI); and (3) the implementation of vocational education at Universitas Negeri Semarang should be managed by a separate institution which is centralised under the rector, i.e., in the form of a vocational school.

Based on the results and discussion of research, the following matters can be suggested: (a) Universitas Negeri Semarang needs to prepare thoroughly for carrying out vocational schools, including reformulating the UNNES statute that accommodates vocational schools, preparing practice-based vocational education curricula, lecturer and educational staff resources, vocational school building infrastructure, laboratory/workshop/studio, the availability of library books and work practice manuals, as well as collaboration with the industrial and the business world and (b) Universitas Negeri Semarang needs to immediately establish Professional Certification Institute (LSP) and Competency Test Place (TUK) to equip graduates of diploma or applied undergraduate programmes with certificates of competence needed by graduates to enter the workforce.

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