

The Industries Cooperation Of Information Technology Vocational High School

Kiryamosem

College of Business and Management Sciences, Makerere University
Plot 51, Pool Road P.O.Box 7062, Kampala, Uganda. E-mail: kiryamosem@gmail.com

Abstract: The purpose of this study was to ascertain the linkage between vocational high school (SMK) cooperation with industries in the field of information technology in Malang City. This Qualitative research with descriptive approach was conducted in four public vocational high schools selected with a population of 48 people selected through simple random sampling method. Interview, observation methods together with school websites were used in data collection with school management and Information Technology teachers as the subject. The study findings showed that cooperation between vocational high schools with industries exists in several forms namely: internship for both teachers and students, on-job training, student assessment and recruitment as well as curriculum synchronization. The study also revealed some challenges facing vocational education.

Key Words: vocational high school, cooperation, industries, information technology

Abstrak: Tujuan dari penelitian ini adalah untuk mengetahui keterkaitan antara kerja sama SMK dengan industri di bidang teknologi informasi di Kota Malang. Penelitian kualitatif dengan pendekatan deskriptif ini dilakukan di empat SMK Negeri yang dipilih dengan populasi 48 orang yang dipilih melalui metode *simple random sampling*. Wawancara dan metode observasi bersama pada *website* sekolah digunakan dalam pengumpulan data dengan manajemen sekolah dan guru Teknologi Informasi sebagai subjeknya. Temuan penelitian ini menunjukkan bahwa kerja sama antara SMK dengan industri ada dalam beberapa bentuk, yaitu dalam bentuk kerjasama magang baik untuk guru dan siswa, pelatihan di tempat kerja, penilaian siswa, dan rekrutmen serta sinkronisasi kurikulum. Penelitian ini juga mengungkapkan beberapa tantangan yang dihadapi pendidikan kejuruan.

Kata kunci: sekolah menengah kejuruan, kerjasama, industri, teknologi informasi

It is recognized that Education is a basic strategy in developing a civilized society, with intellectual people with knowledge and life skills. According to Law Number 20 Year 2003 Article 1 of the Republic of Indonesia, explains that: “Education is a conscious and planned effort to develop the potential citizens to have spiritual power, self-control, personality, intelligence as well as skills needed by society, nation and state. In this regard, affording the quality human resources has become a demand and necessity for Indonesia. One way to achieve this is to improve the quality of education in which vocational education and training (VET) is the master key. According to the Law no. 20 of 2003 on the National Education System article 15, explains that “Vocational Education is an education system that pre-

pares students to work in a particular field”. It is education intended for graduates of SMK to be ready for work in certain fields of expertise (Azizah, 2015; Perwitasari, 2013).

Also, according to the Government Regulation No. 29 of 1990 states that vocational education is the development of students’ ability to carry out certain types of work with the priority in preparing the students to enter the workforce with a developed professional attitude. Similarly to this, vocational High schools organize educational programs that are tailored to the types of employment or trains people for work (Sonhadji, 2013). Vocational High School Program is a formal secondary education program in the formed with the aim of preparing graduates who do not continue the higher education

gap to be more ready to enter the world of work with competence owned in the field (Azizah, 2015).

Therefore according to these literature review, Vocational High School (VHS/SMK) is education mandated by law to prepare human resources that are ready for work or to enter the labour force and become a productive workforce. Ideally, this means that graduates from vocational high schools are workforce ready to be used in a direct sense of work especially in industries. Kurniasari (2015) said graduates from vocational school are expected to have competitiveness opportunity to enter the business world/industry and expected to be able to prepare ready-made workers in community life (Kurniasari, 2015).

However, from the preliminary research observation conducted in 2016 in nine (10) vocational schools both public and private SMK in Malang city shows that many graduates from SMK do not easily get absorbed by the industries (BNSP 2015). This is because in SMK there is (1) Skills gap due to mismatch in SMK programs and industries' needs and demands, (2) weaknesses in curriculum, (3) incompetent teachers with limited industrial training and experience, (4) large number of annual graduates leading to high competition among graduates, and (5) inadequate learning facilities and infrastructure in vocational schools (SMK) and (6) limited information flow to SMK graduates about labour market trends due to technological changes. Due to these educational challenges that are generally related to equipment and facilities, little practices, and the learning environment that does not conform to the world of work reduces the quality and competence of vocational graduates as a potential workforce.

Basing on the data from the National Labour Force Survey (Sakernas) shows that the number of unemployment in February 2016 reached more than 7 million people with highest unemployment rate by level of education being dominated by the graduates of general high school (22%) and followed by SMK (19.19%), junior high (18.70%), elementary (17.35%), while for University (9.90%) and Diploma 3: 30%). Referring to this data, the rate of absorption of vocational graduates in the workforce is still relatively low.

From this survey, unemployment rate of SMK graduates (19.19%) is still very high with respect to the main objective and purpose of vocational schools in Indonesia of preparing students ready for work. And if the survey results above still indicates that even vocational education graduates faces the same problem just like other graduates from general secondary

education then it pauses serious question in vocational education sector that requires more immediate attention and answer (*why is it so?*).

According to Sumarna Abdurrahman the head of the National Board for Professional Certification (BNSP) said; "Although, it is assumed that technical and vocational education and training (TVET) or SMK programs are designed to prepare learners to profit and progress through it however, one of the problem facing TVET in Indonesia is the curricula failure to reflect the actual needs of industries". According to the National Board for Professional Certification (BNSP), the quality and competitiveness of vocational high school (SMK) graduates is still low. BNSP head Sumarna Abdurrahman says "our workforce is not much absorbed by the industry" because the quality of the workforce is influenced by different learning experience during the internship program and finally faced at the real work. However, Sumarna expects the government to adjust SMK curriculum with standards developed by industry seeing partnership between SMK and industry as essential" (BNSP, 2015)

Furthermore, in the Jakarta Post 2016 in Press Reader.com (PressReader.com, Jakarta Post, 2016) it is reported that every year 1.3 million SMK graduate students from over 12,000 vocational schools across the archipelago. Meanwhile, the population of SMK graduates according to Malang Education head office report 2016, is about 8,937 students who graduate every year which rises the competition for few job vacancies available in the industries hence many graduates end up without work. This is supported by the official data from BPS that shows that the unemployment rate of SMK graduates is higher than that of graduates of all other educational institutions. The Central Bureau of Statistics (BPS) (INAPEN, 2015) August 2015 reported that, 12.65 percent of vocational school graduates were unemployed.

In summary, it is clearly noted SMK graduates face challenges that can be summarized as follows; Skills gap (mismatch or link and match) between SMK curriculum and the industry needs, lack of field experiences by teachers, inadequate update learning facilities especially the equipment for school practices and stiff competition. Therefore, in order for SMK to improve the competence and quality of its graduates, SMK / VHS should establish and implement cooperative relationship with Industries (DU/DI). It is believed that the principal of SMK/VHS graduates in the real workforce that improves the quality of vocational high schools (Azizah, 2015).

From the above reviews, the purpose of this research paper is to investigate and understand the nature of linkage between vocational high school cooperation with industries with the following research variables (i) school infrastructure and facilities, (ii) teacher competence and skills and (iii) student competence and skills (iv) SMK–industry cooperation. In summary this research seeks to answer the following questions.

Firstly, how does the industry support vocational high schools in terms of Infrastructure & Facilities as a link to cooperation?; *Secondly*, how does the industry support the school in improving teacher's competence and Skills in IT as a link to cooperation?; *Thirdly*, how does vocational high schools get industrial support in terms of improving Student's competence and skills in IT as a link of cooperation?; and *Fourthly*, what forms of cooperation exists between this school with industries in the department of information technology and what is the cooperation process?

Current State of Vocational High School Education in Indonesia

Over the last decade of development of TVE, Vocational education and training at the secondary level has been increasingly expanding in Indonesia (Prayono, 2011, p. 124) as cited in (Helmy, 2014). This has been noticed from increase in the enrolment of senior secondary level in vocational education by 158% between 2001 and 2010 (Helmy, 2014). This has made the government to focus on this sector as a key strategy for economic development although there is still a challenge of link and match of the students' skills to current and future economic demands (OECD /ADB, 2015).

The government of Indonesia recognizes that Technical and Vocational Education (SMK) plays a vital role in human resource development of the country through creating skilled manpower, enhancing industrial productivity and improving the quality of life. The Indonesian government through the Ministry of Education and Culture is efforts of attaining complete transition of students' enrolment ratio of general high school (SMA) to vocational high school (SMK) from 70:30 to 30:70 respectively implying that currently the government values more of vocational education to general education with the purpose of improving their human resource development with quality skills and knowledge. According to (Maskan, 2014) says Vocational high schools in Indonesia are mandated to preparing

students to be ready for workers and developing their professional attitude which could achieved through dual education system as a public policy in the form of professional skill education.

As noted earlier in the introduction, SMK in Malang still faces same challenges as discussed above. Therefore, it is significant for SMK to develop strategic means of mitigating those challenges especially through cooperation with industries in their related school programs. In addition, the success of effective vocational education and training is the engine of the curriculum, upgrading teachers' skills with work opportunities to interface more closeness with industries, oversight of industry in student's assessment, and ensuring SMK facilities and tools keep the pace with the latest technological developments of industry (Helmy, 2014) (OECD/ADB, 2015).

As stated from employer/employee survey (2008) reported in (Helmy, 2014; OECD/ADB, 2015) on the quality of graduates from vocational senior secondary schools (SMKs) revealed that SMK students have inadequate understanding of the curriculum which is not industry-specific. This criticism reflects the quality of the vocational education and training (VET) teachers employed and their qualifications. Also, Employers report that the curriculum of vocational schools is not based on some of the skills they provide (OECD/ADB, 2015)

SMK education is poorly coordinated with labour market demands due to the following reasons; ineffective co-operation between the school with industry in planning and developing the curriculum as the majority of SMK do not involve industry in curriculum planning; few industries co-operate with SMK in the provision of facilities and equipment; SMK graduates have limited access to labour market information; and inadequate number of teachers with both teaching and work experience in their area of specializations which makes them less relevant in comparison that the workplace requires.

Also, OECD/ADB research indicates that teachers in SMKs have limited exposure to the workplace this is because they often return to their schools they graduated from after qualifying. Also, the in-service training provided by VET training centres is weakly linked with industry, and there is a low turnover of teachers, as the majority of the staff interviewed had taught at their school for decades. It is also confirmed by findings of the literature that there is no way of managing or removing underperforming teachers (Helmy, 2014; OECD/ADB, 2015). The quality and

qualifications of teachers are important if students are to learn successfully.

The Indonesian government also recognizes that the strength and success of vocational high school education lies in entirely in the nature of their cooperation with industries that is why it introduce the “*Link and Match policy*” with efforts to improve the quality of vocational education. This is supported by Ghost who said that “to ensure the relevance of learning in school education, educators need to understand how workplace skills are continually changing” (Watters, 2013). This means that the schools should know the current trends in the industries especially in workplace skills and dispositions while industries should know school activities and how to contribute to skill development thus requiring knowledge sharing. Therefore this makes school-industry cooperation very important.

According to Rediyono as cited in (Purwanto, 2013) says “Cooperation between the schools with industry is very essential and necessary in connection to technological development in the industry. Due to this rapid change means that the school would be far behind if it is not cooperating with the industry because the school is not possible to provide all the equipment in accordance with the needs of industry in the learning process in schools. In addition, cooperation with industry will also assist in distributing school graduates because the industry already know the extent of competences of the graduates of the school who have been cooperating with the industries concerned”.

Thus in conclusion, in order for vocational high schools to improve the employability skills and competences of their graduates to be ready to provide workforce in the labour market upon graduation, they must build a strong linkage of cooperation with industries since industries are potential employers of school products. Therefore, all these challenges facing the school community can be well addressed if there is a strong linkage between SMK cooperation with industries.

METHOD

This research is qualitative with descriptive approach intended to gain knowledge over the perceptions of the research respondents on the idea of SMK–industry cooperation (Helmy, 2014). The research population was 48 people from four public vocational high schools with program study of computer technology and networking (TKJ), software engineering (RPL), and multimedia (MM). Board of school management and I.T teachers in these public SMK in

Malang City were the research subject. Simple random sampling method was used in sample selection (Sugiyono, 2011 & 2012) & Creswell (2014) with a sample size of 48 respondents with 12 participants from each SMK because the sample was less than 100 people.

The study used both primary and secondary data sources where Primary data was collected through interviews, observation method. While secondary data was obtained through school documentations, school websites as well as relevant existing literatures on this research topic.

The analysis and interpretation of the empirical results was based on the theory(ies) in relation to the research study. This was done in three ways (i) data reduction (summarizing of data), (ii) data presentation and (iii) drawing conclusions and verifications (Azizah 2015). Before the instrument were used to collect data, validity and reliability tests were conducted such as construct validity test of the questionnaire was carried out through consultations with the supervisor regarding the suitability of each indicator used in the instrument.

RESULTS

The Table 1 summarizes the forms of cooperation that exist between vocational schools with industries. It also indicates the number of industries (small, moderate and large industries) that participate in the vocational school activities. Data findings from face to face interview with the respondents supported by secondary data sources, shows that school-industry cooperation exists highly in two research variables that is to say: teacher competence and skills (variable 2; in form of on-job training, teacher internship and workshops); and in terms of student competence and skills (variable 3; inform of student internship, assessment and recruitment, curriculum synchronization and guest lectures); while there is a lesser linkage in school infrastructure and facilities (variable 3), although respondents had a general agreement that cooperation with industries in this aspect is also important because all schools accepted that they received some facilities one time from industries (though not routine and many items) were received.

This study took a keen consideration of results of the existing related literature in comparison with its findings. The findings of this study concedes with already existing results in variables of students’ competence and skills, teacher competence and skills where through interviews all responded that there was cooperation between their schools with industries while

Table 1. SMK Activities and The Number of Industries Involved

Kind of SMK activity involvement	Number of Industries Involved in the SMK activities			
	SMK N 2 Malang	SMK N 3 Malang	SMK N 8 Malang	SMK N 10 Malang
Curriculum synchronization	10	13	12	11
Guest lectures (per semester)	5	3	4	2
Student internship (Prakerin)	30	35	35	30
Competence assessment	4	6	3	5
Students job recruitment	13	13	13	13
Teacher training				
1. On-job training	7	5	7	8
2. Workshops	5	4	6	5
3. Teacher internship	6	5	7	6
Teaching factory	5	-	-	12
Infrastructure (<i>Buildings, Laboratories and libraries</i>)	-	-	-	-
Facilities (<i>computer hardware and software, computer accessories</i>)	2	3	2	4

in infrastructure and facilities, there was less cooperation as most of the infrastructure are provided with government support.

DISCUSSION

The findings of this study indicates that; for cooperation to exist, the school management through their head teacher first analyses the school needs, the potential and capability of each industry they want to cooperate with. This is done by visiting the industry websites. After this step the head teacher writes a letter requesting for cooperation with the identified potential industries through the industry manager who later on gives their reply to the school after the analysis of their potential in fulfilling the school needs.

When the industry consents with the school request, they write a memorandum of understanding which spells out all the roles and responsibilities of each partner (school and industries) in a mutually beneficial manner. The findings revealed that in reality there was little industry support to these schools since these schools established their infrastructure with the support from government (Education Regulation of Indonesia No 20 year 2003 & No 19 year 2005). For instance, the respondents accepted that one time they got some facility support only in terms of computer hardware and software which was not given to them on routine basis which was a boost to their I.T department only. Also, respondents in this study consented that there an increasing linkage between SMK cooperation with industries in terms of improving teacher competence and skills especially in form of on-job training, teacher internship, workshops which supports

the findings already existing literature (Azizah, 2015).

Lastly, the study findings indicates that industries supports SMK with student's internship placement, recruitment, curriculum synchronization, guest lectures, and student's assessment as one form of improving student's competence and skills. This implies that there is significant and positive linkage between SMK cooperation with industries in terms of improving student competence and skills.

CONCLUSIONS

From this research results, it can be noticed that school–industries cooperation is essential for both institutions (the schools and industries) because it enables the industry to get the competent and knowledgeable workforce at reduced costs since industry without knowledge cannot thrive to live, improving its public reputation as well improving industry's corporate social responsibilities (CSR).

To the school, it enables the school to produce quality, competent output with quality skills corresponding to industry needs and demands, having updated curriculum based on the industry needs, internship placements for both teachers and students becomes easier since knowledge without application is valueless.

The research findings of this study indicated a good relationship between vocational high schools cooperation with industries in variables like teacher's and student's competence and skills (variable 2 and 3) from the respondents' answers although there was a linkage of cooperation in terms of infrastructure and facilities (variable 1) but the relationship was very low because

all respondents' answers on this variable indicated that "they got little support from industries once in a while" therefore vocational schools should maintain and improve their cooperation with industries especially in the field of information technology due to rapid changes in technology in the real world of work,

Also, this study has helped to promote the understanding of the importance of vocational high school cooperation with industries from the vocational education's perspective view.

The common forms of SMK–industry cooperation shown by the research results were: student's internship, curriculum synchronization, student assessment and recruitment, guest lectures, on-job training, teacher internship and workshops.

Generally, the study credits the initial efforts of implementing vocational high schools cooperation with industries that has existed successfully since they have tried to successfully yield some fruits as far as improving and maintaining the quality of vocation education system although more efforts are needed to mitigate the still existing challenges of vocational education in Malang city and Indonesia in general.

According to data findings of this research study obtained through the questionnaire method, the researcher has the following recommendations as given below.

Firstly, the researcher suggests that teaching factory for information technology department should be established in all other vocational high schools which have not yet established for example among the four vocational high schools in which this research took place it is only SMK N 10 Malang that has an established teaching factory operating in the department of information technology that is why the percentage rate of employed graduates is higher than other schools that participated in this research study.

Secondly, the researcher also suggests that the duration of dual education system in form internship placement of students in industries should be increased from 3-6 months to at least minimum of one (1) year during the period of their programs.

Another suggestion put forward by the researcher is that vocational high schools should also seek cooperation with international factories or industries that operate internationally to widen the employability opportunities of their graduates in the global market.

Furthermore, the research recommends the application of different methodologies and instruments

of research in order to generate a more holistic information on the linkage between vocational high school cooperation with the industries in the field of information technology.

It is also recommendable that future study on a similar and related research should cover a wider geographical area that extends the boundaries of Malang city in comparison with the size and number of vocational institutions for more accuracy and clear perspective of the cooperation partners.

More so, the research recommends future study to incorporate (include) even Private vocational high schools in either Malang or across the boundaries of Malang city since this study only considered public vocational high schools in Malang city.

To continue, it is also recommended that research study should be carried out on this similar topic that will include Industries, vocational institutions, students as well as the government perspectives as stakeholders of vocational education system in Indonesia.

REFERENCES

- Azizah, Murniati, AR., Khairuddin. (2015). Strategi Kerjasama Sekolah Dengan Dunia Usaha Dan Dunia Industri (Du/Di) Dalam Meningkatkan Kompetensi Lulusan Pada SMK Negeri 3 Banda Aceh. *Jurnal Administrasi Pendidikan: Program Pascasarjana Unsyiah*, 3(2), 148–158.
- Perwitasari, D. (2014). Relations in the School Facilities TKJ Practicum, Conformity Prakerin place, and Competence TKJ Students with Skills Competency Test Results. *Jurnal Pendidikan Sains*, 1(4), 425–430.
- Sonhadji. (2013). *Manusia, Teknologi dan Pendidikan Menuju Peradaban Baru*. Malang: UM Press.
- Kurniasari, D., & Isnani, G. (2015). Analysis of Implementation of the World Cooperation SMK Enterprises/ Analisis Pelaksanaan Kerjasama SMK dengan Dunia Usaha. *Jurnal Pendidikan Bisnis dan Manajemen*, 1(1), 24–33.
- BNSP. (2015). *Kualitas Tenaga Lulusan SMK Belum Sesuai yang Diharapkan Industri*. Retrieved from <http://www.beritasatu.com/pendidikan/312762-bnsp-kualitas-tenaga-lulusan-smk-belum-sesuai-yang-diharapkan-industri.html>.
- BNSP. (2015). *Quality of SMK Graduates is Below Industry's Expectation*. Retrieved from www.acdp-indonesia.org/.../bnsp-quality-of-smk-graduates-is-below-industrys-expect.

- The Jakarta Post. (2016). *SMK graduates lose shine over skills gap*. Retrieved from <https://www.pressreader.com/>.
- INAPEN. (2015). *AEC will begin, the graduates of Vocational High School must be ready to compete*. Retrieved from <http://www.inapen.ac.id/read/article/11/aec-will-begin-the-graduates-of-vocational-high-school-must-be-ready-to-compete/en>.
- Helmy, A. (2014). *VET Training and Industry Partnerships: a Study in East Java, Indonesia* (Doctoral dissertation, Victoria University).
- OECD/Asian Development Bank. (2015). *Education in Indonesia: Rising the Challenge*. Retrieved from <https://www.adb.org/sites/default/files/.../education-indonesia-rising-challenge.pdf> downloaded on 25/1/2017.
- OECD/ADB. (2015). *Reviews of National Policies for Education: Education in Indonesia Rising to the challenge*. Retrieved from <https://www.adb.org/publications/reviews-national-policies-education-indonesia-rising-challenge>.
- Maskan, M., Suparlan, H. B., Utaminingsih, A., & Djajanto, L. (2014). Paired Industrial Role in the Implementation of Dual System Education to Shape the Work Adapt-ability of Vocational High School Students in Greater Malang. In *Prosiding International Conference on Integration for Regional Public Management (ICPM)*. Atlantis Press. Retrieved from http://www.atlantis-press.com/php/download_paper.php.
- Watters, J.J., Hay, S.D., Neil, & Pillay, H. (2013) School industry partnerships: An innovative strategy for vocational education. In Gessler, Michael, Deitmer, Ludger, & Manning, Sabine (Eds.) *Proceedings of the ECER VETNET Conference 2013*, WIFO, Istanbul, Turkey.
- Purwanto, D. (2013). *Manajemen Kerjasama Antara Sekolah Menengah Kejuruan Dengan Industri (Studi Kasus di SMKN 1 Program Keahlian Alat Berat Singosari Malang)*. Retrieved from <http://www.vedcmalang.com/pppstkboemlg/index.php/menuutama/edukasi/488-manajemen-kerjasama-antara-sekolah-menengah-kejuruan-dengan-industri-studi-kasus-di-smkn-1-program-keahlian-alat-berat-singosari-malang>.
- Sugiyono. (2011). *Educational Research Methods*. Bandung: Alfabeta.
- Sugiyono. (2012). *Statistics for Research*. Bandung: Alfabeta.
- Creswell, J.W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- Law Number 20 Year 2003 on National Education System. (2003). Jakarta: Sinar Grafika Offset.
- Depdiknas. (2008b). *Enclosure of Ministerial Decree No 40 Year 2008 regarding standard of facilities and infrastructure of SMK / MAK*. Jakarta: Ministry of National Education.
- Government Regulation Number 19 Year 2005 on National Standards of Education. (2005). Jakarta: Sinar Grafika Offset.