

# Strategic Collaboration Framework Between Vocational Colleges and Automotive Industry in Peninsular Malaysia

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**Abstract**—This study investigates the main construct and sub construct in forming a strategic collaboration between vocational colleges and automotive industry. Three (3) research questions have been developed to achieve the research objectives. Qualitative and quantitative research approach were used to develop insights into stakeholders' perspectives of vocational colleges and the automotive industry. Semi-structured interviews among the respondents were used to collect the data. The samples of the study required a total of 20 respondents from vocational colleges and 20 respondents from high technology industries and small-medium industries in automotive after-sales services in Malaysia. For quantitative research, a total of 337 respondents were involved. The findings identified the main construct and sub construct in forming the collaboration between vocational colleges and automotive industries. It also identified the best strategic collaboration areas between both parties.

**Keywords**—strategic collaboration, automotive industry, education and training

## I. INTRODUCTION

The concept of collaboration between educational and training institutions and industry is nothing new. Numerous studies have explored the collaboration between educational institutions and industry over the past 30 decades [4]. Along with the development of the 4.0 Industrial Revolution and the latest technology, there are challenges in producing a skilled workforce in line with the needs of the industry. Therefore, the collaboration between educational and training institutions and industry is critical to create a robust and high-impact economic ecosystem [5] [6][8]. It is well-known that strategic collaboration between educational institutions and industry has become a necessity in the education and employment system. The relationship between these two parties is crucial to the growth of both education and industry [1-3] concluded that collaboration between educational and training institutions and industry is an important element towards producing a

competent and competitive workforce. Therefore, a strategic collaboration between them is critical to overcome the shortcomings and failure to produce a competent workforce. Among the key issues that contributed to the need for collaboration are changes in work processes and procedures. Work processes are related to work procedures and technologies used in the world of work. The development of technology has caused work practices and culture to change completely [4-7]. Furthermore, strategic collaboration needs to be formed and constantly improved so that it is practical to be implemented.

## II. BACKGROUND OF THE PROBLEM

### A. Level and Development of Collaboration between Educational and Training Institutions in Malaysia

The Tenth Malaysia Plan Report (10MP) (2011-2015) and Bank Negara Annual Report 2016 have raised several issues focusing on the situation and ecosystem in Malaysia. According to the report, the collaboration between educational institutions and industry is still weak due to the lack of response between the parties involved. The report is in line with the findings of [8], who stated that the formation of collaboration in Malaysia is still in its infancy and not as vigorous as other countries. The Global Competitiveness Index Report for 2015-2016 also reports that educational and industrial institutions in Malaysia are less collaborative compared to Singapore, Japan and other Asia Pacific countries on a scale of 5.5 (12th position). Based on the same report for 2016-2017, Malaysia is ranked 11th with a scale of 5.6. Not many position shifts have taken place while various initiatives and incentives have been undertaken by the government, especially in the 10MP and 11MP towards the formation of collaboration. The issue of weakness and national achievement in the formation of collaboration does not stop there. Malaysian Education Development Plan (Higher Education) (2015-2025)

shows that Malaysia is ranked 25th out of 50 countries in terms of relations in international cooperation and industry. This indicates that the collaboration formed between educational institutions and industry is still low compared to Singapore )5( and Australia )8(.

#### *B. Gap Differences towards Collaborating between Educational and Training Institutions and Industry*

Studies have shown that differences in interests and expectations, as well as work culture between the two organisations, are the factor in the failure of the formation of the planned collaboration. The cultural differences that exist are due to the two organisations having differences in organisational objectives and goals, differences in orientation and scope of work and also differences in the characteristics of both organisations [9-14]. These cause conflicts between interests and expectations towards the direction of collaboration [16-17]. This is because, educational institutions are focusing more on the provision of skills and knowledge while industry focuses on efficient work culture that contributes to increase profits and investment. Differences in the objectives, goals, orientations and characteristics of the organisation have led to the failure to collaborate and resulted in the industry not recognising educational institutions as a good collaborative partner [12, 18-19]. This situation is closely related to the issue of trust and confidence [14, 22-23] as elements of confidence and trust help in building an understanding of the objectives and needs of the organisations.

#### *C. Impact of Failure and Lack of Collaboration between Educational and Training Institutions and Industry*

Failure to form an effective collaboration will affect the current job market. It will lead to issues of career mismatch and skills )skill mismatch(, the issue of students not being competent in basic knowledge and skills as well as weak generic skills and general knowledge as required by the industry. )8[ stated that skills mismatch, weakness in having key skills and generic skills among students and new employees are challenges for the industry in realising the development of skilled manpower in Malaysia.

#### *D. Issues in the Industrial Revolution 4.0*

The outbreak of the Industrial Revolution 4.0 has caused technology to develop rapidly and requires a competent workforce in the use of technology in line with the current needs of the industry reported by White Revolution Skills Development Report White Paper 4.0 in 2016. Apart from this, revolution requires a highly skilled and multi-skilled workforce so that competitiveness can be strengthened and enhanced. It demands the use and application of computer technology and automation )24[. The Industrial Revolution Framework 4.0 Policy Report 2017 states that low collaboration between educational and training institutions caused the development of Industrial Revolution 4.0 in Malaysia to move slowly because most educational and training institutions were able to produce innovation but failed to introduce it into the industry.

### III. LITERATURE REVIEW

Rapid economic development has resulted in various forms of operations and the scope of work needed to be implemented to produce complex, innovative products and quality service delivery to meet customer needs. To achieve this target, the industry needs to collaborate with educational and training institutions to obtain a skilled workforce [25-26]. Collaboration between educational and training institutions and the industry is needed today when the country needs a quality workforce to boost the economy. Collaboration between educational and training institutions and industry is able to help both parties achieve the goals of their organisation because they are not able to achieve their respective goals alone, especially in producing a workforce that can meet the demands of the industry [25-27].

Collaboration is a complex relationship because it requires robust resources. It will be smoother and easier to achieve the desired goals and objectives with enough resources and commitment. Collaboration between educational institutions and industry is indispensable to develop skills and knowledge in the world of work and education [28]. Therefore, to implement it, it is necessary to know the appropriate categories, needs and methods so that the objectives and goals can be realized. Studies explain that there are five )5( strategies that can be applied in collaborating between educational and training institutions with industry, namely through formal meetings and conferences, consulting and research services, technology sharing and the fifth is the provision of training and conducting joint research.

In ensuring the successful formation of collaboration between educational and training institutions and industry, effective strategies need to be implemented so that such collaboration can last for a long time and benefit the educational and industrial ecosystems. Based on )3[, five strategies can be implemented to form an effective collaboration: 1( Establishing a network of relations and holding bilateral meetings between educational institutions and industry. 2( Elements of communication, 3( Training, 4( Mobility of employees, and 5( The provision of employment. )3[ proposed holding conferences, workshops, seminars, )communication( two-way interaction, publishing, providing training to students and teaching staff, joint curriculum development, placing industry representatives as teaching staff and providing employment opportunities to graduate students.

To ensure that collaborations can be realized clearly and correctly, both parties require an understanding of organisational culture, policies, selection and evaluation of organisations, willingness to transfer knowledge and technology and funding )seed funding(.

)8[ identified several practices that need to be implemented in a collaboration between educational and training institutions and industry. Five )5( best practices that have been identified, i.e. the organisations involved are willing to share the same goals and mission in creating collaboration. Both organisations need to create a good environment especially in the elements of

transparency and trust, the formation of clear action policies, setting targets and key benchmarks )KPIs( for the collaboration and willingness to share information. The five elements require high levels of commitment and readiness, as both parties have different work policies and objectives.

**IV. RESEARCH METHODOLOGY**

The objective of this study is to build a strategic collaboration framework between vocational colleges and the automotive industry. The researcher used a mixed-method design, specifically the Sequential Exploratory Mixed Methods Design. Mixed-method design involves qualitative and quantitative methods. It involves the procedure of collecting, analysing and combining qualitative and quantitative methods in one study to understand the problems of the study [29-30]. According to [30-32], a study involving a combination of these two methods will provide an accurate and in-depth understanding of the problems studied rather than using only one method. The design of this study involves two main phases that combine qualitative and quantitative methods.

In the first phase, the researcher collects and analyses data involving interviews and document analysis from vocational colleges and the automotive industry. The findings from the interview assist the researcher in the construction of the questionnaire items which are implemented in the next phase. In the Second Phase )Quantitative Method(, the researcher distributes the questionnaire to the selected respondents. According to [30,32], the process of study method based on Sequential Exploratory Mixed Methods Design can help explain and explain the findings obtained from Phase One )Qualitative Method( effectively.

A preliminary study is an initial data collection activity carried out before the main study is conducted. The purpose of the initial study was to see and know the real scenario that occurs related to the collaboration between vocational colleges and the automotive industry. These findings are important to support the process of formulating problem statements needed to meet the needs of this study. This study also obtains a general view related to the collaboration between vocational colleges and industry. This general view covers the implementation elements of collaboration in vocational colleges that touch on aspects of collaboration, the needs of the industry and vocational colleges, the benefits of collaboration, and the weaknesses of collaboration that exist in addition to collaboration implementation procedures. The results of this preliminary study offer a true picture of the collaboration implemented in vocational colleges. The information from this initial study is very useful to complete the interview questions, questionnaire items, as well as improving the way the questions are presented. In this preliminary study, the researcher conducted interviews with ten vocational college automotive lecturers and five automotive industry employers to obtain information related to collaboration between the two parties, which, in turn, could help researchers identify issues that exist.

**A. Population**

The first group of the study population is a vocational college which offers Automotive Technology courses in the Department of Mechanical Engineering Technology and Manufacturing in Malaysia according to the vocational college zone set by the Division of Vocational Technical Education and Training )BPLTV(, Ministry of Education Malaysia. The second group of the study population is from the after-sales automotive services industry. The automotive industry involved in this study is divided into the large-scale and high-tech industry and private industry. The large-scale and high-tech automotive industry )National and International Automotive Enterprises( is an industry that carries out vehicle service activities )after-sales activities(. Meanwhile, the private industry is enterprises and businesses registered under the Companies Commission of Malaysia and local authorities that carry out service and vehicle repair activities. The two selected industry categories have similar job activities but running different practices and standard operating procedures )S.O.P(. In addition, the industries involved are in the category of maintenance and repair of motor vehicles based on the Malaysian Standard Industrial Classification, 2008.

TABLE I. THE SAMPLING INVOLVED IN THE STUDY

<b>Qualitative Respondents</b>	
Vocational College	20
Automotive Industry	20
<b>Quantitative Respondents</b>	
Vocational College	213
Automotive Industry	124

The data obtained were analysed using AMOSS for quantitative data and NVivo for qualitative findings.

**V. RESULTS AND DISCUSSION**

The findings of the qualitative study show that the formation of strategic collaboration involves three )3( components namely strategic orientation, design needs and implementation. For the phase of collaborative formation, the qualitative findings reveal that the three main phases in the formation of collaboration are the formation phase, the operational phase and the evaluation phase. The results of the study for the assessment of collaboration also display the need for formation evaluation, process evaluation and operational evaluation.

Figure 1 shows the results of the study findings for the formation of collaboration constructs.

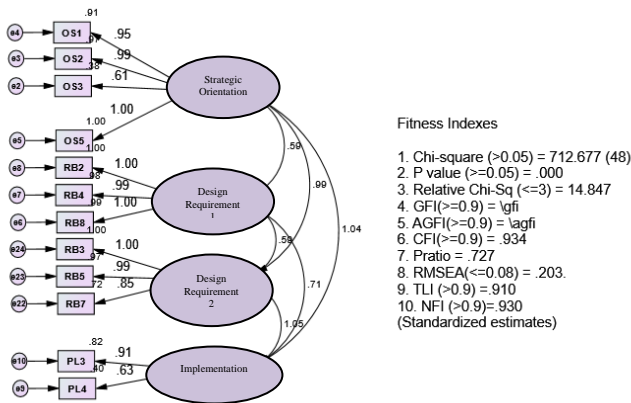


Fig. 1. Diagram development of collaboration.

Several areas of collaboration have been identified as suitable for implementation between vocational colleges and the automotive industry, as presented in Table 2.

The results of the analysis conducted using AMOSS show that there are similarities in the results of the study with previous researchers and further support the results of the study conducted by the researcher. According to [9,10,18,33], effective collaboration should have three main components namely collaboration requirements, collaboration design and implementation methods. These three components are the main components that need to be considered before the formation to ensure the success of the collaboration formed. Therefore, the results of this study have proven that careful preparation and awareness of vocational colleges and industry are very necessary to ensure that the collaboration formed achieves the desired objectives and direction.

TABLE II. COLLABORATION FIELD

Collaboration Field	Min	Standard Deviation	Ranking
Technical Consultation	4.86	0.62	1
Provision of Training Needs	4.79	0.68	2
Training Placement/ attachment	4.77	0.73	3
Knowledge Sharing	4.76	0.74	4
Curriculum Development	4.76	0.65	5
Expertise Sharing	4.76	0.74	6
Technology Transfer	4.73	0.66	7

The priority area in this collaboration is the field of technical consultation with a mean value of 4.86. It is followed by the provision of training need, training placement/attachment. In contrast, less priority was awarded to technology transfer.

The overall findings offer a strategic collaboration framework for vocational colleges and the automotive industry in Malaysia. The conclusions obtained involve the collaboration formation construct, the formation phase construct and the collaboration evaluation construct.

The findings of this study are in line with the statements issued by [34,35] which states that technical consultation, provision of training need and placement for training purposes are areas which are a priority in effective collaboration

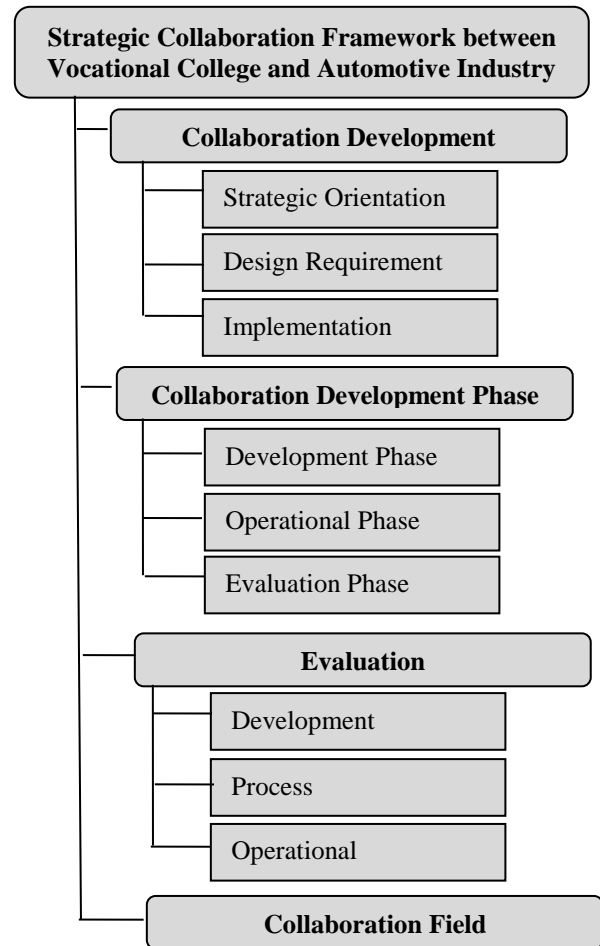


Fig. 2. Strategic collaboration framework between vocational college and automotive industry.

VI. CONCLUSION

Studies have shown that the formation of collaboration between vocational colleges and industry in Malaysia is still moderate. Also, measures to improve and review certain procedures need to be implemented. The application of the framework that has been obtained needs to be implemented and refined so that the collaboration achieves the desired objectives. It will indirectly improve the quality of vocational education and techniques at the vocational college level covering aspects of delivery and implementation.

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