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Students' perceptions on the relevance of a diploma in an automotive curriculum to the workplace

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Abstract

This research compares student preparation to meet workplace needs through a comparative study between TAFE in Australia and Community Colleges in Malaysia. It addresses responses from Malaysian industries that local graduates do not fulfill the needs of industries. The changing nature and demand in the workplace need focusing for the future workforce. It is important to ensure the future worker can cope with the new technologies. The purpose of this study is to investigate student preparation in mechanical engineering (automotive) and whether they meet workplace needs. The study aims to explore and compare the needs of automotive industries and the educational approaches employed to produce highly skilled workers in both countries. A mixed-method research approach was used to develop an insight to stakeholders' perspectives: students, educators and employers. There were 152 participants: 113 students, 30 lecturers and nine employers. The data generated represents a comprehensive review through case study. The findings provide an insight of the stakeholders' view of a variety of needs; commensurate in developing a technician labour force. The key issues include the update of training facilities, relevance of curriculum content, technological advancement in the automotive industry, and collaboration between educational institutions and the automotive industry. The study also identified gaps in the qualifications and experiences of teacher: especially inadequate experience, knowledge and skills with current technologies for the automotive industry. On this issue of imperatives for economic growth, the programs reviewed in this study in both Malaysia and Australia are commercial activities designed for profit of the training providers and the automotive industries. The best practices from the training providers could be improved by directly involving stakeholders in the curriculum design activities. This may include implementing customized programs that support local priorities; economic, social and environmental.

Keywords: comparative study; automotive curriculum; training facilities; collaboration program; generic skills.

1. Introduction

One of the most debated issues that have affected the world economy is globalisation. The process of globalisation makes the world's economic activities more competitive and challenging. The relationships among developed and developing countries are the process by which all peoples and communities through globalisation are likely to be increasingly visible through common economic, social and cultural environments. Singh and Papa (2010) state that 'globalization impacts all aspects of society' (p.2). In fact, globalisation is bringing common experiences to people and communities around the world in their daily lives. Rostam (2009) states that there are two processes in globalisation: compression and awareness.

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These two processes 'have made the world seem borderless and could cause a country to lose its influence and ability to plan and determine its own development goals' (Rostam, 2009, p. 534). As a result, in many aspects, a country would be more dependent on other countries in the global village.

In the global context, every country must have an education initiative to make improvements to educational planning in the long term. Mouzakitis (2010) states that 'globalization and new emerging economic and social order demand new policies and strategies to education processes' (p. 3914). These changes create new demands in the labour market. Rostam (2009) observes that the recent shift of the economic setting is linked to the knowledge economy, which focuses on education as the key to delivering services. The education sector is a key player in producing human capital for the service industries, and economies, societies and cultures are the core elements that shape the education sector. Their integration is particularly important in preparing the workforces as human capital. Industries' changing needs will create new roles in the workplace environment. Thus, technical and VET organisations play a role in increasing both the quality and quantity of human capital in industries.

Upgrading technical knowledge and skill levels is crucial for economic development and to sustain the transition of Malaysia's manufacturing sector (automotive, electronic and etc) from one based primarily on assembly to one based on knowledge and high-technology processes (Asian Development Bank, 1999). Malaysia needs to increase its workforce by employing highly skilled workers at the para-professional middle level (Bakar & Hanafi, 2007). The changing nature and demands of the workplace require focus for the future workforce. It is important to ensure that future workers can cope with new technologies. According to the Asian Development Bank (1999), graduates of Malaysia's technical and vocational education (TVE) system do not achieve the standard preferred by industries in terms of work quality and preparation for work.

Comparative studies of the VET system conducted in different countries may provide initial insights and direction for this study. Therefore, the overview of VET systems in developed and developing countries may provide a new paradigm for the future needs of VET in Malaysia. There may be opportunities for developing countries to learn from the successes and failures of the practices of developed countries. Developing countries will eventually become potential competitors to developed countries and they will also offer a potential market for developed countries. For this reason, it is important to understand the status, similarities and differences of quality practices in developed and developing countries in order to facilitate insights into quality practices in an international context.

The central aim of this study is to identify strategies on how to improve and develop the quality and quantity of technicians in the automotive industry in Australia and Malaysia's labour workforces. The intention of this comparative study is to analyse how community colleges and TAFE institutes prepare students for working in the automotive industry.

2. Research methodology

This paper describes and justifies the research methodology adopted for the current study. It provides a methodological framework that informs the methods that have been proposed for the design, protocols and analysis of the research. The purpose of this study is the process of trying to understand the phenomenon of preparing human capital for the automotive industry. The development of scientific understanding is influenced by paradigms. Guba and Lincoln (1998) defined enquiry paradigms as answering three fundamental questions: ontological (form and nature of reality), epistemological (nature of the relationship between knower and what can be known) and methodological (how reality can be known). A major paradigm is constructivism, which is the insight that basic beliefs are embedded in individual experiences that enable us to construct an understanding of the world we live in (Billet, 2001). A mixed-method research approach was used to develop insight to stakeholders' perspectives: students, educators and employers. The study used multiple instruments such as survey questionnaires and semi-structured interview (focus groups and individual interviews). The samples of the study were involved a total of 152 participants, including 113 students, 30 lecturers and nine employers the data generated represents a comprehensive review through case study. These data were analysed and sorted using statistical analysis (SPSS software for survey data and NVivo software for interview transcripts). The data and results present the stakeholders' views and the participant voice. Data identified similar themes and differences of cultural and economic context in developing the quantity and quality of human capital for the automotive workplace.

3. Finding and discussion

The aim of this section of the study was to examine the students' views on the relevance of the automotive curriculum in the context of the workplace environment. An important research finding was that the Malaysian students provided more positive feedback than the Australian group. The responses were slightly different in the interview sessions where both groups of students were slightly more negative. The perceptions of the students from both countries tended to focus on the need for up-to-date technology and familiarity with current practice as well as skills used in automotive technology. They agreed that the curriculum is suitable and relevant to the automotive industry, but felt that it was still far behind industry practice. There was an expectation for the syllabus to emphasize electronic and electrical systems, sensors, hybrid engines, hydraulics, and improved teaching aids and materials. Consistent with the previous study by Caldwell (2009) on the importance of new tools in the toolbox, generation Y's interest in learning new technology is definite. The students were eager to engage in the up-to-date technologies that they aim to be competent with. Clearly, the requirements of learning modern technology are influenced by the students' observations, particularly in the workplace environment. This provides an indicator to the training institutions to formulate their assessment towards the technological developments in the car industry. The nature of the training must incorporate recent work to align with the automotive industry's requirements (Bureau of Labor Statistics, 2010), particularly the need for individuals to engage in high-level technology and the increasing complexity of automobiles. Strong responses seem to be needed to overcome the students' dissatisfaction. The students cautioned against the vulnerability of institutions running obsolete technology. Consequently, a notable aspect of recent curriculum design has been the realisation of the need to accommodate the requirements of individuals, employers and skill change in the automotive industry (Keiser, Lawrenz, & Appleton, 2004). In order to adapt to the changing demands in the industry, the stakeholders and VET must focus on policy-making and curriculum development (OECD, 2011). Specifically, writers such as Mouzakitis (2010) suggested that the relevant direction for curriculum design must be based on needs analysis and market recognition. It should anticipate more engagement with practical skills to develop hands-on technical proficiency.

Both groups of students highlighted work experiences, such as dealing with real cars or engines, diagnostic skills and problem-solving in the car as an important part of preparing for the working world. This, including both theory and practical knowledge, is what the students required in order to solve a particular problem at the workplace. The meaning of a quality workforce entails a process of inference leading throughout the work processes until the end of production. With assistance from their trainers or mentors in the automotive workplace, this kind of working knowledge could assist graduates to solve problems in the work environment. Previous findings by Vygotsky (1978) reported on the potential of development through problem-solving under the guidance of a mentor. In an industrial placement, the apprentice is expected to develop their skills and knowledge through their engagement in the automotive industry. However, the learning processes at the training institutions were regarded as not up-to-date enough to align with the automotive industry.

Within the limitation of their budgets, the training institutions apparently provide adequate training in a broad spectrum of automotive technologies. In addition, the training institutions are keen to acquire new equipment and modern technology as well as update their facilities and their current trainers' experience in recent technology. As indicated by Mustapha and Greenan (2002) (in the context of integrated technical content and employability), Bowers (2006) (in the context of curricula links with the real world) and Mouzakitis (2010) (in the context of employers' needs for new challenges), there is a growing obligation for more research studies on preparing human capital in the engineering field. There is still less formal research being reported on identifying how to improve and develop highly skilled labour for the automotive industry.

The curriculum is relevant for admission into the automotive industry but is still not satisfactory in terms of proficiency in up-to-date automotive technology. The problem of mirroring technology that is used in the automotive industry in the training institutions is caused by the limited funding allocated to the training system. In terms of evaluating technology applications at the training institutions, the students' responses were varied according to their experiences of technology in their workplace environments, especially from those doing work experience in the branded automotive industry.

Considerations related to the limited resources at the training institutions is the main factor hindering the alignment of their facilities and training with state-of-the-art technology. The ILO (2010) reported that sharing

knowledge between industry and training institutions is the issue in VET programmes. The negative responses to the training institutions returned throughout the focus group interviews highlight the future demands of preparing quality human capital. Notably, these problems resulted from a lack of funding to invest in the resources necessary for good facilities and equipment, adequate space, materials and teaching aids. These responses indicated that problems still remained in the interface between the provision of learning at the training institutions and the learning required for effective performance as seen from within the workplace environment. Clearly, close relationship with the automotive industries by establishing collaborations as social partners will sustain the needs of the industry (ILO, 2010). In this case, the Malaysian students acknowledged that the Work-Based Learning (WBL) programmes with local automotive manufacturers were developing their skills in recent technology, even though this was slightly lower than with other automotive technologies. Collaboration with a single automotive industry is restrictive, confining the experience into a very specific part of the automotive industry. This limits the students' exposure to the technological changes occurring in the broader automotive industry, especially prestige-branded automotive technology. In fact, no such programme is available to provide a wide range of those automotive industries as a substitute. Indeed, the available programmes cannot fit all levels of expertise.

These are some of the difficulties identified in maintaining currency with the automotive industry. This will affect the preparation of quality human capital for industry requirements, in particular, for a twenty-first century labour workforce. In terms of generic skills, the Malaysian students gave more optimistic responses of the value added by training than their Australian counterparts did. The issue of generic or 'soft skills' was important in the Malaysian context, especially to the Malaysian employers. Results from previous studies have reported that employers wish to employ a person who has multi-tasking skills (Lee, 2004; Al'Rashid, 2004). In fact, generic skills are more recognised in recent studies of required competencies (Hellwig, 2006). Students from both groups were in agreement about the importance of generic skills in the working world.

There was agreement from both groups of students that communication is the most important skill for dealing with and approaching customers. The other generic skills cited as the most valuable to the Malaysian students were team work, presentation skills, entrepreneurship, creativity and innovation, technology skills and management and problem-solving skills. On the contrary, the Australian students considered problem-solving and technology skills as the most important for their employment prospects. This evidence shared the views of Robertson (2003) and Fleming and Soborg (2010). These results show that the training institutions have provided some understanding of what the workplace demands and employers' needs are beyond practical skills. In the larger organisations, working in teams had fostered certain generic skill attributes. The classroom and workshop activities were formulated to enhance the students' generic skill attributes in order to develop individual students with additional skills valuable for their employment. However, the generic skill attributes were slightly less important to the Australian students. Some of the students were not as concerned about the generic skills attributes as they were about practical skills. In preparing human capital at the highly skilled or technician levels, their training must give students the opportunity to develop employability skills, particularly to be able to adapt in the culture and organisation of the workplace environment.

Without doubt, the starting point for quality a workforce requires support from all stakeholders, including government, training institutions, trainers and the communities. The training institutions' key focus was the basic preparation of their students to be adequately qualified for the labour market and to meet industry requirements. In developing a quality VET programme, the responses from the groups of stakeholders declare that VET policy needs to predict and to plan for future requirements. There are similar emphases on the future development of the VET system in reports from organisations such as the DEST (2004), ADB (2006), ILO (2010) and the OECD (2011). It was evident from the current study that the students' responses emphasised the need to improve the quality of the training programmes by considering the content of the curriculum and the quality of the teaching and trainers. This caution must be taken into consideration, especially the inability to provide the trainers with specialisations that cover the whole spectrum of skilled areas in the automotive industry. These situations occur in the Malaysia where most of the trainers in the community colleges are trained in general competencies.

Students from both groups indicated that limited exposure to up-to-date technology in the workplace environment affects their motivation. They also pointed to gaps between the trainers' field experience and industry requirements. Consequently, their experiences throughout their apprenticeships or work-based learning were bringing different mindsets about their prior learning and future requirements in the workplace. This finding is

remarkably similar to the views of Mahadir (1999), the EPU (2006), Gardner (2006) and Najib (2010). During the interviews, the students mentioned that the trainers lag behind the current knowledge and skills practiced in the industry. This was comparable in both student groups. However, the contexts of trainer education and qualification are totally different. This is supported by authors such as Jomo (2002), Syamsul (1997) and Shamsul (2001), who believe such an exam orientation should exist in the Malaysian education system. There are quite obvious differences in terms of the qualifications of all trainers at the TAFE institutes. For example, they have a strong automotive industry backgrounds (work histories) while the Malaysian trainers tend to have more high-level educational qualifications.

Based on this situation, the development of students' skills would be more reliable and relevant with the qualified trainers with a broad industrial perspective. This is advantageous for the students, but their technological advancement is less effective if their trainers are inactive in the automotive industry. In the Malaysian context it would be ideal if most trainers were qualified in higher education, especially in preparing middle class technicians, and able to give insight into engineering skills. The types of relationships between the social partners in this study have been identified by the ILO (2010). Partnership with the trainers based-in industry, in the context of the development of their practical skills, seems to align with the requirement of the occupations' level in the MQA. This helps provide a balance in the quality of the human capital for the country's needs.

Based on the outcomes of the study, it is clearly important to consolidate the stakeholders' vital role in improving the quality and quantity of technicians in the automotive industry. The training of this workforce requires a focus on the assessment of the training programme in the aspects of training infrastructure, training development, personal development, industry involvement, developing skills and practices, and auditable record-keeping practices. Trainer-based industry participation, flexible programmes and simpler requirements for partnerships, a more precise direction and a focus on the preparation human capital, could all improve the future of the VET programmes considerably.

4. Conclusion

The ultimate purpose of this study is to inform, improve and develop educational systems to be more relevant within their contexts in preparing human capital from both countries, particularly for the paraprofessional strata of the labour market. Consideration of the research outcomes also aims to benefit future training system design, especially in programme development for meeting both individual needs and industry demands.

There are suggestions for future research that could see a greater involvement from key staff within the VET system. This would benefit the design of a programme that considers all stakeholders' perspectives to ensure that future VET programmes provide adequate training programmes that encompass the technological changes in industry. As an important endnote to these suggestions and recommendations, a certain deliberate separation must be maintained between industry and education to ensure that improvements to training systems and the development of human capital are socially responsible and sustainable, and not implemented purely as economic imperatives. On the issue of imperatives for economic growth, the programmes reviewed in this study in both Malaysia and Australia are commercial activities designed to generate a profit for the training providers as well as the automotive industries. The best practices of the training providers could be improved by directly involving stakeholders in their curriculum design activities. This may include implementing customized programmes that support local economic, social and environmental priorities.

Importantly, collaboration between industry and teaching institutions will integrate real practices from the workplace environment into the training system. Therefore, it is reasonable to expect some reinvestment in the industry's own training resources and labour markets, but the concern that commercial interests may outweigh the more altruistic ideals of improving educational outcomes (and personal development) for all stakeholders remains. Consultation with stakeholders should include educators, the community, institutions, industry, the government and policymakers to bring different perspectives that will create better opportunities to share ideas and experiences in developing a new paradigm for preparing human capital.

With the impetus of this study and the valuable data gathered from the stakeholders there are opportunities here to encourage participation in government initiatives for promoting lifelong learning, to provide wider opportunities to the community in general. The major concern for Malaysia in the process of collaboration and the establishment

of closer industry links is to ensure that policymakers see that the programmes are developed for the benefit of Malaysia and not simply underwriting the business interests of global corporations; there must be a connection between economic development and moving towards becoming recognised as a ‘developed’ economy with a highly skilled workforce. Currently, the VET system in Malaysia has incrementally developed the MQA certification that has been closely aligned with similar structures in developed economies such as Australia and Germany, and therefore well positioned for collaborating in international contexts. Preparation for these collaborations must continue to be considered and demonstrate Malaysia’s willingness to adapt its educational and industrial systems for the benefit of the whole country. Ultimately, the quality of these efforts will be measured by how well Malaysia’s training systems balance the consideration of student needs, industry requirements, and labour market demands while moving towards a developed and sustainable economy.

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