



Pertanika Journal of
**SOCIAL SCIENCES
& HUMANITIES**

JSSH

VOL. 25 (S) May 2017

A special edition devoted to
TVET Talent Development:
Advancing Society Through Quality, Technology, Innovation
and Skill Mobilisation

Guest Editors

Johnson Lim Soon Chong, Mohd Erfy Ismail & Norhasyimah Hamzah



PERTANIKA
JOURNALS

A scientific journal published by Universiti Putra Malaysia Press

Journal of Social Sciences & Humanities

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Journal of Social Sciences & Humanities: ISSN 0128-7702 (*Print*); ISSN 2231-8534 (*Online*).

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The *Introduction* explains the scope and objective of the study in the light of current knowledge on the subject; the *Materials and Methods* describes how the study was conducted; the *Results* section reports what was found in the study; and the *Discussion* section explains meaning and significance of the results and provides suggestions for future directions of research. The manuscript must be prepared according to the Journal's **INSTRUCTIONS TO AUTHORS**.

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(Special Edition)

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A scientific journal published by Universiti Putra Malaysia Press



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E-mail: executive_editor.pertanika@upm.my

URL: www.journals-jd.upm.edu.my

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Kamariah Mohd Saidin

UPM Press

Universiti Putra Malaysia

43400 UPM, Serdang, Selangor, Malaysia.

Tel: +603 8946 8855, 8946 8854

Fax: +603 8941 6172



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Preface

We are very pleased to present this Special Issue of the *Pertanika Journal of Social Sciences and Humanities (JSSH)*. This issue is a compilation of selected papers that were presented at the 5th World Congress on Technical and Vocational Education (WoCTVET) held on 1 and 2 November, 2016 at KSL Resort Hotel, Johor Bahru, Malaysia. A total of 52 papers were selected for journal publication in two separate volumes. These papers were selected based on reviewers' approval and have undergone the required peer-reviewing process for journal publication.

WoCTVET 2016 was a joint collaboration between Universiti Tun Hussein Onn Malaysia (UTHM) and key players in Technical and Vocational Education in Southeast Asia, among whom were the Polytechnics Department, the Ministry of Education Malaysia, UNESCO-UNEVOC, SEOMEO-VOCTECH, the Regional Association for Vocational Teacher Education (RAVTE) and the Colombo Plan Staff College (CPSC). In line with the theme 'TVET Talent Development: Advancing Society Through Quality, Technology, Innovation and Skill Mobilisation', topics of interest for WoCTVET 2016 compiled in this volume include, but are not limited to, curriculum and instruction, assessment and evaluation, innovation and educational technology, and job and career development.

We would like to thank the contributors as well as the reviewers for their commitment and patience as well as their significant contribution towards the success and publication of this JSSH WoCTVET 2016 Special Issue. It is hoped that this publication will be an encouragement for researchers from around the world to be more active in publishing research papers that are insightful and useful for academics and practitioners alike.

Last but not least, we wish to thank the Chief Executive Editor of UPM Journals, Dr. Nayan Kanwal, and his dedicated publication team, for their kind assistance, advice and understanding towards the successful publication of this Special Issue in this prestigious journal.

Guest Editors:

Johnson Lim Soon Chong (*Dr.*)

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May 2017



Pertanika Journal of Social Sciences & Humanities
Vol. 25 (S) May 2017

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Implementation Challenges on Career Transition Program (CTP) of Special Education Needs Learning Disabilities (SENLD)

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ABSTRACT

The Career Transition Programme (CTP) is a programme for finding and moving into a new career or starting a career. There is no set period of time for career transition and no limit to the number of times one might decide to change careers. Special Educational Needs Learning Disabilities (SENLD) refers to a child or young person who has special educational needs (SEN) and has learning difficulties or disabilities that make it harder for him or her to learn compared with other special needs children of about the same age. This study aims to explore, understand and explain the Career Transition Programme (CTP) of Special Education Needs Learning Disabilities (SENLD) implemented in an academic secondary school. The school selected for this study was one of the pilot schools for CTP. Six students who graduated from the school and who are working in the industrial sector are participants in the study, which uses qualitative research methodology and the case study research strategy based on unstructured interviews, observation and document analysis. The purposive sampling method is used. The challenges identified as a result of this study include management procedure, roles in the implementation of the programme and student enrolment. The researcher also understands better the existing procedure of the implementation of CTP. It is noted that the existence of a proven guideline would help the school improve the process of the implementation of CTP.

Keywords: Career Transition Programme (CTP), challenges, qualitative research methodology, Special Education Needs Learning Disabilities (SENLD)

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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INTRODUCTION

Special education plays an important role in helping special needs people with learning disabilities i.e. those with Special Educational Needs Learning

Disabilities (SENLD) to learn and to transition to working life (Nasri, Hamzah, & Udin, 2010). As much as 738 mainstream secondary schools have implemented the Special Educational Integration Programme (Ministry of Education (MoE) Malaysia, 2013). The MoE is therefore aware of the importance of providing appropriate education to students with special needs, who may benefit more from being taught a vocational curriculum as it would provide them with life skills that would enable them to live a life of quality as well as to earn a living (Daros, Nordin, & Saud, 2012). The MoE also believes that vocational education is an alternative education pathway to support improvement in other areas for groups with special needs as it exposes them to the realities of life after leaving school through a systematic programme (2012). It is wise to prepare them for future working life through adequate transition from school to workplace by producing students who are skilled (William-Diehm, 2007). These students need to be guided and supported to enable them to increase their potential and hone their inherent talent. A career transition programme provides vocational training that is relevant and in line with requirements of the current job market, while matching the students' own ability level (Daros et al., 2012). "The career transition programme for SENLD students is a combination of activities based on the needs of individual students, taking into account the preferences and interests of students as well as the job market, including instruction, community experiences, the development of employment and the multi-objective nature of adult life"

(Polloway, Patton, & Serna, 2001). Hence, the development of transition programmes is guided by questions shaped by what, where and how students conduct everyday life and work as adults (Kiarie, 2006). In addition, transition programmes undertaken for each category of disability should have its own service design. Transition programmes should emphasise skills that are appropriate to the needs and capabilities of the individuals who will be participating in the programmes (Daros et al., 2012). To enhance the quality of education for students with special needs, the MoE has given priority to the displacement method of teaching and learning in the school system by involving parents and the community as partners in supporting learning and teaching activities (MOE Malaysia, 2013). In addition to preparing SENLD students for employment, curriculum and activities should be developed in conformity to social change, diversity, increasingly sophisticated technology and lifelong learning (Elleven, Wircenski, Wirceneski, & Nimon, 2006). Challenges in the implementation of the transition programme to prepare SENLD students from high school in Special Educational Integration Programme (SEIP) for their career should be studied in depth to produce SENLD students who are ready to step into the working world.

Implementation of the Career Transition Programme (CTP) for SENLD Students

There are several challenges to the implementation of the transition programme

for SENLD students. Students' achievement is the result of cooperation between school, families and communities (Epstein et al., 2002). Therefore, the involvement of parents and communities is needed in the implementation of the transition programme for SENLD students (Kiarie, 2006). The role of the school principal is crucial for encouraging and establishing a good relationship between the school and the community, facilitating an approach to the process of planning and evaluation, assisting in the development of policies and procedures related to the evaluation process and ensuring that the necessary resources are adequate. While the principal can supervise the process of implementation and evaluation in schools, a special education coordinator could be appointed to facilitate implementation of the programme (Daros et al., 2012). For the programme to succeed, those planning, managing and running it must have extensive knowledge of this field, as well as be prepared and focussed on strategy and management (Dupoux, 2008). Teachers' ability measured in terms of knowledge, understanding and skills must be relevant to the curriculum. Therefore, the special education curriculum must be designed for flexibility, enabling teachers to develop students' talent and potential (Nasri, 2010). Teachers who do not have the experience and training to teach SENLD students will not be able to tap into students' potential to prepare them to use their skills adequately for employment (Haber & Sutherland, 2008). This would leave SENLD students unprepared for jobs that

suit them. In addition, teachers also need to identify students' background information to provide them with a career transition programme based on individual needs (Haber & Sutherland, 2008). Teachers who do not understand transition planning for career will be less effective in ensuring SENLD students receive maximum results from the transition programme (William-Diehm & Lynch, 2007). Therefore, teachers should have self-determination and should respect the choice of students, in addition to creating positive relationships with students and being proactive in fostering partnerships with those involved in the Individual Education Plan (Haber & Sutherland, 2008). It is clear that teachers play a vital role in producing a wide range of student involvement. They should have a good relationship with students, families and communities (Applequist, Mears, & Loyless, 2009). All this will facilitate the smooth implementation of the career transition programme. Family involvement is also necessary because families have advantages over special education teachers in reaching their special needs children and gaining their trust (Tie, 2006). The challenge for special education teachers is that their duty is formal and limited by factors such as time, place and rules, while parents communicate informally and have greater opportunity to engage with their children. Therefore, communication between families and teachers is key to success of any career transition programme. Teachers have perspectives and ideas for helping children with special needs in different aspects such

as implementation of a career transition programme that is based on the interests and abilities of the individual. However, the challenge in the implementation of the programme is to create better communication between families and teachers. With good communication skills, families and teachers can establish a close relationship and this can help SENLD students to develop self-confidence. Consciously or not, the various parties should play their part in awareness to not marginalise SENLD students. The closest party to the students are teachers and families. In addition, other parties must also play a role so that SENLD students can develop themselves as independent individuals. Therefore, employers should also provide opportunities for people with special needs to work and try to train them and focus on their strengths (Ng & See, 2011). However, the challenge for SEIP teachers is also to obtain cooperation from employers. The employer does not have to keep pushing them but should take responsibility for evaluating their work and showing them that they can work well. In addition, employers should look at the individual's ability to get and maintain jobs that can satisfy them (William-Diehm & Benz, 2008). This is because the employer is a fundamental contributor for people with special needs to live a life of quality. Employers who are willing to employ people with special needs have implemented the Code of Practice for Employment of Persons with Disabilities, in which the government has provided that at least 1% of employment opportunity should be offered to people with

special needs (Haber & Sutherland, 2008). In addition, the government has requested the MoE to establish and implement a variety of programmes to help SENLD students by involving parents and the community in their education (MoE Malaysia, 2013).

PROBLEM STATEMENT

The biggest challenge for people with special needs in Malaysia today is getting a job as career paths for them are less clear. The specialty of this group is that they can continue learning until the age of 19, after which, they may choose to work (Isa & Kadir, 2013). However, job security becomes an issue if they are taught the same curriculum as other children as their ability is vastly different from that of other children. The curriculum taught in regular schools is academically orientated, with vocational skills given only a small focus, infused in the subject, Living Skills (Isa & Kadir, 2013). The curriculum for SENLD students should be in line with current developments and should match their ability (Isa & Kadir, 2009). In Malaysia, the implementation of the curriculum through a career transition programme for SENLD students is still unclear (Bari, Yasin, & Yusof, 2013). However, efforts towards implementing such a programme have been set out in Malaysia Education Blueprint 2013-2025. Some teachers have implemented a career transition programme for SENLD students although there are no specific guidelines that can be used as reference (Hamdan, 2003). This causes SENLD students to lack skills for work,

making it difficult for them to get a job upon leaving school. Furthermore, employers in general do seem to have a negative view of people with special needs (Ng & See, 2011), believing them to not have workability skills and thus, they do not hire them. However, a career transition programme for SENLD students in Johor has been successful in training these students for work through Special Educational Integration Programme (SEIP) secondary schools. SMK Mawar was among one of these schools.

SMK Mawar has successfully provided training for SENLD students, and six of the school's graduates were absorbed into the workforce in 2012. The school's industry training programme began in 2012. Meanwhile, as many as 13 people have managed to be accepted into the Buying Seats Programme that is handled by the Division of Special Education (DSE), Ministry of Education (MoE), which was started in 2013. Therefore, SMK Mawar was chosen for this study. The aim of this study was to investigate the challenges faced in assessing the vulnerability of the programme in order to improve it and to see how it can be implemented in all SEIP secondary schools in Malaysia. This would be in line with the MoE's aim of implementing the CTP for students with special needs (MoE, 2013).

METHODOLOGY

This research was conducted using the qualitative case study approach to explain the challenges in the implementation of a career transition programme (CTP)

for SENLD students in SEIP secondary schools in Malaysia. The case in this research was the implementation of CTP in SMK Mawar. The study involved six participants. The processes of collecting data were using purposive sampling approach involving interviews, observation and analysis of relevant documents. The main method used in this research was the unstructured interview. To support the data and information collected using these methods, observation and document analysis were also conducted. Observation of videos, photographs and field notes was also conducted. Documents were analysed based on the information that was obtained through the interviews.

RESULTS AND DISCUSSION

The research revealed several challenges that faced the implementation of a career transition programme (CTP) for SENLD students. These challenges were faced during design and implementation and were seen in the impact of the implementation. The main challenge faced during the implementation of the programme understood the programme and the role played by those involved in it. One of the participants stated:

The challenge is to create understanding teachers and parents on the basis of real transition for SENLD students. (Suri)

According to this participant, teachers and parents should understand the concept of transition for SENLD students. Another participant said that the school must provide clear explanation of the programme to

families of SENLD children so that the families could participate in the programme, giving it their full cooperation to ensure it is run effectively. He stated:

Collaboration must be initiated by the school because the schools should understand more about the explanations procedure to the parents. DSE (Division of Special Education, MoE) is a department which only issues an execution letter from the MoE. (Zain)

The participant said that the school must take on the role of initiating and explaining CTP to the families of SENLD students. The job of the Department of Special Education (DSE) was only to issue the letter of execution. However, the challenge was that the DSE had not up to the time of this study issued such a letter. However, the SEIP secondary schools were running the programme based on the goal of the state Education Department to enable SENLD students to live a meaningful life.

According to another participant:

Teachers are very supportive but they need a power source for the implementation. They should have links with industry. This is the problem because we do not have the power source. (Kim)

This participant explained that teachers provide good support for the implementation of CTP, but they have the authority to initiate collaboration with industry. Letters from the

MoE would help greatly to pave the way for such collaboration to ensure that CTP is run properly.

One participant identified unclear procedure given by the District Education Office (DEO) as a challenge.

The problem is we do not know the procedure from the DEO, and the top, it is hard to us to take the students out. We ought to have a letter of permission and a lot of procedure. If anything happens, who will be responsible for all that, we do not have insurance to cover there. (Suri)

According to her, the DEO should outline procedure related to proper paperwork and correspondence. In addition, the parties involved in the programme were required to bear any risks should any mishaps occur. This was why proper paperwork was necessary.

Another challenge was getting families of the children to understand the programme.

Sometimes parents do not understand. They think that when we sending their children to do practical, their children automatically work there. The reasons why we send their children there are to give practical skills. Some parents urged the employers to take their children to work. We just want to give some exercise to the students. If the employer wants to take their children to work, they can continue to work. But, if they could not work, maybe they should

stop for a moment and further training.
(Azman)

One study participant said that some parents did not understand the concept of the industrial training conducted by the school, which is conducted within the industry in order to provide skills training in the fields of employment relevant to SENLD students. This ensures that the students are properly trained to meet the requirements of future employers. If the students are not qualified, they are given the opportunity to practise further. Some families, however, end up urging employers to take their children in as workers, and this becomes a problem for the school. Other families tend to relinquish responsibility of their children to the school and industry.

These kids did not want to take a leave and do not want to go back home. We are teachers; we also want to take a leave. I had to go there and deal with them. When we contact their parents, they say that their children did not want to get home, so there is nothing that they can do. (Syahid)

Another participant noted the lack of understanding from parents about their responsibility to their children. The parents seemed to release their responsibility to the college, not wanting to take their children home during the holidays. In addition, SENLD students also do not understand that they need to go home during the holidays. Therefore, all parties need to understand the concept of the programme and play their

roles adequately to ensure that the career transition programme runs smoothly.

In terms of communication and lifestyle, perhaps the Chinese and Malay family is a slightly different. Malays parents are more open-minded. They dared to let their children try and believe them. However, the Chinese are too caring to their child. (Kim)

One research participant was of the opinion that the background of families can also pose a challenge to the implementation of the career transition programme. It is a challenge for those managing these students when the students face problems in adjusting to life without family members. Students' acceptance of the programme and lack of expertise among trainers are also challenges.

So far we have not succeeded yet in plantation. Maybe it is because of the lack of our expertise, or maybe the lack of interest in students too. (Kim)

Implementation of the programme is hampered by the lack of expertise among teachers and a lack of interest from students. The diversity of SENLD students is also a challenge in the implementation of the programme. Trainers have to deal with many different health problems, attention levels, communication styles and lifestyle issues displayed by the SENLD students. This leads to different acceptance levels among the SENLD students towards the industrial training.

Actually, they wanted our attention and always with them. There is some who

have shortness of breath. For those who have the hearing problem, we have to talk loud to them. (Syahid)

According to the participants, all parties involved in the training must understand the diversity of SENLD students and pitch the training to the level of the students' ability. SENLD students also always want attention to be given them. This is a huge challenge for teaching staff as they have many students to attend to.

The problem is focus. Focus means mental and physical readiness. It greatly affects. For example, he went on a punch card, there is no punch card at home, but there it is in industry. (Indah)

According to the participant, students should be trained in physical and mental readiness before they step out into industry, where they will have to face many different challenging situations. Therefore, they should be exposed to situations they are likely to meet in the workplace during training in order to reduce adjustment problems in working life. This makes job security another problem for SENLD students.

We are bound by the MoE. We are just the place for accreditation centre and only can train. We just help in managing jobs, but we could not promise a job placement for them. (Syahid)

The research participant was of the opinion that the trainers were bound by the MoE; as administrators of an accreditation centre

and trainers, they do not have the authority to make decisions about hiring. Hiring is based on the SENLD students' qualifications for industry. However, the Buying Seats Programme does not allow the students to work in industry before they have finished two years of study. This shows that job placement that matches SENLD students' ability is also a great challenge.

Some of our students in Imperia have been offered jobs, we did not let they go because of our two-year contract. It involves a period of study. The students should be in school at the age of 16-18 years old. It is impossible for us to pass out our students from school at the age of 17 years old. (Zain)

The research participant noted that jobs were offered to the SENLD students even if they had not completed their studies and were still undergoing training. But the DSE denied permission for students to accept the offers. This is because this programme involves a long-term contract with the college of study. Furthermore, the ministry believes that the students are not eligible for work at the age of 18 when they have yet to finish their studies and receive their certificate.

CONCLUSION

There are many challenges to the implementation of the career transition programme for SENLD students. The challenge for SEIP teachers is to run the programme effectively because they

are dealing with various procedures to collaborate with various agencies and disciplines. SEIP teachers should also play a role in the programme. They could deal with SENLD families who do not understand the programme. Another challenge is enrolment. SENLD students come with a range of abilities, potential and interest. There are also issues concerning lack of suitability of training fields. In addition, there are problems in communication as students speak a different language at home than they are required to in the centre. There are also cultural differences as the students come from different ethnic backgrounds. Additionally, SENLD students need to be prepared in terms of mental and physical readiness before they can step out into the industry. Finally, it is a challenge for the students' families and for SEIP teachers to get them to adapt to the variety of likely situations that can crop up in the working world.

ACKNOWLEDGEMENT

I would like to thank the Faculty of Technical and Vocational Education (FPTV) for help with writing and presenting this paper at the 5th World Conference on Technical and Vocational Education and Training (WoCTVET 2016). I am also grateful to the Office for Research, Innovation, Commercialisation and Consultancy Management (ORICC), Universiti Tun Hussein Onn Malaysia (UTHM) for bearing the cost of the programme. I also indebted to my co-author for help in completing this work.

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Technical and Vocational Skills (TVS): A Means of Preventing Violence among Youth in Nigeria

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ABSTRACT

Technical and vocational skills are an important tool for reducing violence among youth, especially in Nigeria, who face security challenges due to different kinds of violence. This paper focusses on the policies and programmes intended to provide youth with skills that can help them improve their life instead of engaging in violence. The paper also studies youth participation in violence. The study shows that youth in Nigeria participate in violence because of unemployment and economic pressure. These youth are mostly from poor families and are mostly used by others to achieve their own unlawful ambition. The data were collected from various secondary sources such as textbooks, journals and conference papers that were carefully reviewed. The results obtained from the literature revealed that youth are not committed, sensitised and mobilised to taking advantage of the opportunities available to them. The results also revealed that almost all the programmes meant to provide youths with skills have failed. Poverty alleviation programmes established to create jobs, self-employment and self-reliance have been unsuccessful. Therefore, alternatives must be provided to help the younger generations. Based on the literature reviewed, the paper discusses related issues and outcomes and ends with recommendations to improve the situation.

Keywords: Technical and Vocational Skills (TVS), violence, youth, Nigeria

INTRODUCTION

In Nigeria, the main discourse is youth participation in violence that has resulted in loss and damage to life and property, especially in recent years. It has been observed that youth are active participants in most violence (Atienza, Kaltenthaler, &

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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Baxter, 2016). Therefore, solutions to this problem must be explored in order to stop or minimise youth participation in violence so that they can be engaged in different activities in order to live a meaningful life. Violence among youth can be solved in many ways, but this paper focusses only on the provisions enabled by technical and vocational skills as a solution to violence, if properly imparted and put into practice.

According to Leff and Leff (2016), people are always challenged by feelings of disappointment, frustration and anger when their life seems to be fruitless or purposeless. Technical and vocational skills enable youth to deal effectively with idleness. They can prevent hostility, instil a sense of commitment, boost educational accomplishment and improve job prospects. In Nigeria, violence seems to be increasing day by day. Therefore, extensive research must be done to understand the root cause of violence, especially among youth, and to search for possible solutions to this grave problem. A census taken in 2006 gave the youth population as 54.6% of the total population. About 90% to 95% of violence is committed by youth, mostly from poor families (Atienzo et al., 2016). Every year, about 200,000 youth are murdered, both as victims and perpetrators (Taft & Haken, 2015).

Macmillan's dictionary (2016) defines violence as the use or application of physical force to harm or injure someone and damage property. The Violence Prevention Alliance (VPA) defined violence as "the intentional use of physical force or power, threatened

or actual, against oneself, another person, or against a group or community that either results in or has a high likelihood of resulting in injury, death, psychological harm, mal-development, or deprivation" (VPA, n. d.).

Violence can be physical, sexual or psychological, among others (Butchart, Mikton, Ward, & Donnell, 2015). Violence is grouped into three subtypes as follows: (a) Self-abuse or suicide, also called self-directed violence, is violence against oneself, where the individual is both victim and perpetrator; (b) Interpersonal violence, which is violence directed at individuals in the family, close partners and members of the same community; and (c) Collective violence, which refers to violence committed by large groups of individuals such as social, political or economic groups.

Youth, which is the period between childhood and adulthood, is also called adolescence (Gielen & Roopnarine, 2016). According to Bersaglio, Enns and Kepe (2015), the United Nations (UN) classifies youth as young people between the ages of 18 and 30. Youth constitute the most significant human resource potential that can contribute meaningfully to the whole development of a nation. They are the driving force of any society, being life force of the present day and the hope of the future. Fox and Thomas (2016) noted that youth are socially active and should be engaged in different activities that can make them productive in their various communities.

Technical skills are abilities and knowledge needed to perform specific tasks.

Many technical skills require training and capability to master. Vocational skills are skills that individuals acquire in a specific area of interest. Vocational skills are practice orientated rather than theory orientated. Individuals acquire vocational skills from hands-on experience (Alison, 2016).

METHODOLOGY

The study is archival, with research based on a review of the literature on the provisions of technical and vocational skills in Nigeria. The policies, institutions and programmes of technical and vocational skills were tracked in order to assess their progress. This paper reviewed the status of youth in terms of education and social commitment in communities. Thus, the methodology employed in collecting the required data was to examine secondary sources of data obtained from academic journals, conference papers, articles, textbooks and the Internet. The results obtained from a review of the literature are discussed below, and a conclusion is provided, together with recommendations for improvements.

Technical and Vocational Skills (TVS) as a Solution to Violence among Youth in Nigeria

Various research into technical and vocational skills (TVS) in Nigeria were conducted; however, this research focussed on finding solutions to violence among youth in Nigeria as enabled by TVS. The country is faced with different levels of violence that causes much damage to life and property and creates insecurity within

the whole nation. The literature review was conducted as follows: focus was placed on unemployed youth, policies on the ground for the implementation of TVS through Technical and Vocational Education and Training (TVET) programmes, institutions involved in TVS, poverty alleviation programmes and youth participation in different categories of violence.

The National Population Commission ('Nigeria unemployment rates', 2013) stated that half the population is made up of youth between the ages of 15 and 35. As the youth population grows, so does the unemployment rate. Unemployed youth numbered about 11.1 million in 2013. The government of Nigeria has developed policies and educational and training programmes through colleges and several parastatals with the objective of creating jobs for the huge number of unemployed youth in the country.

Nigerian policy on education (NPE, 2013) intends for Technical and Vocational Education and Training (TVET) to be used as a comprehensive term in the provision of technology, practical skills and correct attitude, understanding and knowledge relevant to occupations in the various sectors of economic and social life. TVET covers technical colleges, Vocational Enterprise Institutions (VIEs) and National Vocational Qualification (NVQF).

TVET's objectives are as follows:

- a. To provide trained labour in the applied sciences, technology and business particularly at craft, advance craft and technical levels,

- b. To provide technical knowledge and vocational skills necessary for agricultural, commercial and economic development, and
 - c. To provide training and impart the necessary skills to individuals for self-reliance that is done economically.
- students may specialise in any field such as engineering, environmental studies, health, agriculture etc.

In addition, a National Board for Technical Education (NBTE) was established in 1977. The board regulates and accredits all TVET programmes and institutions. It is also involved with the funding of polytechnics owned by the Nigerian government. Many students graduate from these institutions every year across the country.

According to the National Board on Technical Education (NTBE) (<http://www.nbte.gov.ng/>), everywhere in Nigeria, young people are out of employment or under-employed, having terminated their education too early or graduated with inadequate skills; thus, they are at high risk of economic marginalisation and social exclusion. The challenge is enormous, depending on how Nigeria can transform its youth into highly skilled, competent citizens.

Institutions such as technical colleges, polytechnics and universities are committed to providing technical education to youth (Olaitari, 2016). The institutions offer a formal programme of courses and learning experiences with study or career options, for basic academic and life skills, leading to academic attainment for career preparation and advancement to higher education. Professional skills may be obtained at degree, diploma and certificate levels, and

Vocational skills are acquired through vocational education and training based on practical or manual activities. The skills learnt are specifically related to a particular trade, occupation or vocation; these are occupation skills (Nita, Solomon, & Mihoreanu, 2016). In Nigeria, different organisations have been established for the development of vocational skills. The National Directorate of Employment (NDE) was considered in this paper as a case study. According to Olaitari (2016), the NDE was established in 1986 to look into vocational skills as a means to developing functional and marketable skills among unemployed youth in the county. The NDE (n. d.) operates different centres such as skill acquisition centers, school-on-wheels, and partnership in skill training, to mention but a few. The NDE provides informal skills such as craft work and also provides workshops to train unemployed youth in rural areas. Generally, the aim of the NDE is to provide technical and vocational training for unemployed youth, to equip youth with skills that would enable them to be self-employed or to gain wage employment and to make youth self-reliant.

The organisation trains youth in different skills under different industries such as agriculture, mechanical repairs, electronics, pharmaceutical etc. The NDE accommodates all youth ranging from academic dropouts to the unskilled and the physically challenged. It includes youth of

both genders and from urban and rural areas, engaging them in different programmes. However, Onah (2015) observed that the NDE has now remained an absolute tool since its inception in 1986. The youth population grows progressively, and so does unemployment, in spite of the existence of the NDE. Therefore, violence involving youth is still a problem.

According to Edet (2015), some poverty alleviation programmes were launched with the intention of empowering youths and providing employment. Among these programmes was Operation Feed the Nation (OFN) by the Directorate of Food, Road and Infrastructure (DIFRRI), which provided immediate jobs to participants interested in agriculture. Another was the Subsidiary Reinvestment and Empowerment Programme (SURE-P) by the Youth Enterprise with Innovations in Nigeria (YOU-WIN). The programmes were meant to create job opportunity and reduce unemployment among youth but the majority of Nigerian youth are still unemployed. Unfortunately, many youth do not realise the importance of activities that can improve their life.

Agriculture is a sector full of opportunity. Nevertheless, youth avoid it. Akpan, Patrick, James and Agom (2015) reported that the majority of youth view agricultural activities as unattractive and lacking in essential economic inducements to improve their well-being; however, this perception is false owing to the fact that Nigeria is an agrarian society. Edet (2015) added that Nigerian farmers were

not sufficiently empowered themselves to know farming skills that can enable them to employ skilled youth in the sector. John, Benedict, Kanayo and Ekenechukwu (2016) pointed out that youth are not engaged in technology entrepreneurship to transform the relationship between the educational system and the labour market. They concluded that youth unemployment is a threat in Nigeria and constitutes a real danger to social, economic, political and industrial development.

Nigerian youth were found to be active participants in religious violence. Sampson (2012) identified religion as being at the centre of most conflicts in Nigeria and the rest of the world, which is one of the prime security challenges confronting the country. The majority of perpetrators of religious violence, especially in Nigeria, are youth. Manu (2015) reported that religious violence is mostly perpetrated by dissatisfied young men and unemployed graduates.

People need to be engaged in useful endeavour of one kind or the other. If youth are not committed and involved in meaningful activities, they are likely to become involved in violence. Abdullahi and Issah (2016) noted that youth violence is rampant in Nigerian urban cities as well as rural areas. Youth violence appears to be rooted, especially among the socially disadvantaged, where economic deprivation, poverty and youth underemployment are ingrained. Some youth form groups or gangs that engage in organised crime and violence, generating anxiety, reducing social unity and harming lives (Higginson et al., 2015).

Regardless of skills acquired by individuals, if there is no commitment or a lack of jobs, youths can still fall into violent activities. Ehinomen and Afolabi (2015) postulated that when youth are qualified and willing to work but are not able to find jobs they become frustrated. They added that either greed or a feeling of deprivation can lead to violence and crime. Youth who feel helpless and frustrated can be used by the corrupt, who channel them to crime in order to lay hold of unlawful gains for their own benefit. This suggests that there is a close relationship between unemployment and violence.

Another reason for youth involvement in violence is the shortage of technical teachers. According to Adavbiele (2013), there is a deficiency of skilled technical teachers in the country. He added that mastery of technical skills among students is poor. The shortage of technical teachers has a negative impact on students in terms of acquiring and practising knowledge in real-life situations. Technical skills can lead to jobs, allowing people to live as productive citizens. Nigeria, however, has neglected this aspect of education (Eze, Ezenwafor, & Obi, 2015). If society lacks skilled technicians such as bricklayers, laboratory and pharmacy technicians, electric and electronic technicians and skilled nurses, just to mention a few examples, the social and economic aspects of the country would be jeopardised and this could push youth to turn to violent and criminal activities.

Youth are the future of any society. To help them achieve their potential and

participate actively in the life of the nation through legal employment, those who cannot find jobs should be given technical and vocational skills training. This would make them marketable. Eze et al. (2015) observed that the high rate of unemployment among youth in Nigeria has increased youth restlessness, insecurity, violence and communal clashes. These activities seem to be perpetrated by jobless, unskilled and uneducated youth.

RESULTS

It appears that Nigeria has good technical and vocational skills (TVS) policies and programmes for younger generations. TVET objectives are achievable if they are implemented well. Indeed, TVS can turn youth away from violence. However, Nigerian youth, in spite of the government's stated intention to reduce unemployment among youth, are still heavily involved in violence and crime. The National Directorate of Employment (NDE), which was given the responsibility of training youth in vocational skills, seems to have failed in this endeavour.

The Nigerian government introduces many different programmes like DIFRRI, OFN, SURE-P and YOU-WIN in the attempt to solve the problem of unemployment, which is believed would minimise violence perpetrated by youth. However, violence perpetrated by youth seems to be increasing. This suggests that there is poor implementation of such programmes. Such programmes were created in different political eras and under different military regimes but did not help to generate youth

employment and empowerment. It is important for proper evaluation of these programmes.

Nigerian has both human and natural resources. If Nigerian youth can be trained in technical and vocational skills, they can be a great resource for the country and youth participation in violence and crime would be reduced. As an agrarian society, Nigeria is replete with agricultural opportunities for both skilled and unskilled youth. It would be a huge waste if youth are not trained in skills that can make them productive as Nigeria has about 11.1 million youth. These youth should be channeled away from crime and violence by placing them in gainful employment.

DISCUSSION

The literature revealed that the active participants in violence in Nigeria are youth (Akpan et al., 2015; Higginson et al., 2015; Abdullahi & Issah, 2016; Manu, 2016). None of these scholars reported that skilled youth are engaged and participated in any kind of violence in the country. Mostly, participation in violence is due to unemployment. To solve this problem, youth should be trained in technical and vocational skills so that they can find jobs.

A sluggish economy and unemployment are the principal triggers of violence in Nigeria (Eze et al., 2015; Abdullahi & Issah, 2016; Akpan et al., 2015). Nigeria's economy has been impoverished by corruption and mismanagement of public funds. This has led to unemployment, restlessness, frustration and violence among

its youth. This state of affairs has led to other factors like religious intolerance and violence (Sampson, 2012; Manu, 2016).

CONCLUSION

Nigeria has good policies for youths to be trained in skills that can disengage them from violence. However, these policies are not implemented well, leaving youth unskilled and therefore frustrated and unemployed (NBTE, 2016). The active participation in violence among Nigerian youth is due to lack of engagement, empowerment and proper implementation of Technical and Vocational Education and Training (TVET) policies and programmes. Empowering youths by training them in these skills would improve their productivity, leading to national progress. Poverty alleviation programmes have been unsuccessful because of the lack of skills training facilities and social services. A sluggish economy and unemployment are the major factors leading to youth violence in the country. However, if youth are taught appropriate practical skills that could empower them, they could be turned away from violence, solving this problem.

The following recommendations are suggested as a means of solving the problem of violence among Nigerian youth:

- a. Society stakeholders should sensitise youth to the importance of technical and vocational skills as a means for self-employment, self-reliance and independence so that they are not manipulated by unscrupulous persons who encourage them to commit violent

- and criminal acts to forward their own agenda.
- b. Poverty alleviation programmes for youth must be monitored to ensure proper implementation and productivity.
 - c. Youth rights and responsibilities must be recognised to encourage them to commit to meaningful and profitable activities.
 - d. Youth should be engaged through different meaningful and useful activities in school as part of the curriculum as well as through co-curricular activities.
 - e. There should be career guidance for youth, which should include awareness on the fruitlessness of violence by pointing out its consequences. The career master should point out that young people are precious assets that a country cannot afford to waste.
 - f. The government should provide the necessary resources including funding for youth empowerment programmes, and the creativity and innovations of youth should be recognised.
 - g. The national curriculum must be revised to include awareness training for youth that will expose them to the positive religious teaching.
 - h. TVET teachers should enhance their skill and knowledge by participating in seminars, workshops and training to stay well informed of recent developments in TVET in order to be better trainers for their students.

ACKNOWLEDGEMENT

The study was supported by GIPS Grant Vot U314 from the University Tun Hussein Onn Malaysia.

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I Don't Want to Be a Teacher: Factors Restricting Male Students from Entering the Teaching Profession

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ABSTRACT

This study is motivated by concern about the small number of male school-leavers entering the teaching profession in Malaysia. It is important to determine empirically the reasons why the teaching profession is not popular as their career option, to see whether this can inform us about measures that can be taken to increase the involvement of men in the teaching profession. This study seeks to explore the factors that restrict male students from choosing teaching as a career. A total of 85 first-year male engineering students completed a questionnaire in which they were asked to rate factors that restricted them from entering the teaching profession. The findings of the study revealed that the most significant factor was associated with social influences, followed by poor job conditions, negative perceptions of the teaching profession and limited personal value. This paper proposes that halting the decline in numbers of male teachers is a task that requires the intervention and contribution of not only schools and policy makers but also parents and society, and recommends that effective strategies for attracting young male school leavers to join the teaching profession be developed.

Keywords: Career, male, student, teaching profession

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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INTRODUCTION

Why is the teaching profession not popular among the brightest young male school-leavers in Malaysia? This study was prompted by concern about the decline in the number of male teachers in Malaysia. Educational statistics for Malaysia reveal a significant increase in the imbalance

between numbers of male and female teachers. In 2005, men represented 31% of primary school teachers and 36.6% of secondary school teachers, a decrease from 33.4% and 38.2% in 2001. The gap has continued to widen; education statistics in 2015 showed that the percentage of male teachers declined to 30.06% compared to the percentage of female teachers, which is 69.94% (Malaysia Educational Planning and Research Division, 2015).

It cannot be denied that the decline in the number of men entering the teaching profession is due to the decreasing population of male students compared to female students. At the same time, the teaching profession has to compete with demand for male workers in other professions. Competition is getting tighter with the growing number of career possibilities. Unless adequate initiatives addressing the factors that restrict men from entering the teaching profession are taken, the imbalance between male and female teachers promises to worsen. The implications are that most teachers teaching today's children are female, appearing to support the notion that men do not wish to enter the profession (Taylor, 2006). There is a growing belief among educators that, as a consequence, young children do not have the opportunity to get the pedagogical and societal benefits of having a balance of male and female teachers in schools (Reynolds, 2010; Sax, 2005).

If policy-makers and employers wish to redress the current gender imbalance among teachers, then it is essential to

understand the factors restricting young people from pursuing teaching. There has been a considerable amount of research investigating the factors motivating pre-service teachers and teachers to opt for teaching as a career. In contrast, scant attention has been given to those who choose other careers. This paper aimed to investigate the reasons why male graduates are not choosing teaching as a career option. In order to appropriately address the decline in male participation in the teaching profession, we need a better understanding of their reasons. An understanding of the issues restricting male participation could significantly contribute to a larger effort to attract more male school-leavers to teaching as a career. This study was designed to answer the question: What are the factors that restrict young men from pursuing a teaching career? To seek answers to this question, this investigation surveyed the reasons why teaching is not selected as a career among first-year male engineering students.

LITERATURE REVIEW

Choice of profession is one of the major decisions for anyone. Career choice research within the teaching profession has often sought to investigate the factors motivating young people to opt for teaching as a career. Lortie's (1975) seminal work entitled *Schoolteacher* is among the earliest research in this area. Lortie classified the motivating factors into attractors and facilitators. The first encompasses attributes such as "the desire to work with young people," "viewing

teaching as a mission student teachers wish to accomplish” and “a yearning to continue with their positive schooling experiences.” The make-up of facilitators, on the other hand, embraces themes such as “hailing from a family of educators,” “being regarded by others to embody the qualities of a teacher” or “being a female occupational choice, [it] is strongly endorsed by parents.” All these factors illustrate a combination of intrinsic, altruistic and extrinsic motives that align with results from more recent studies. Kyriacou and Coulthard (2000) describe these categories as follows: 1) Altruistic reasons: Deal with seeing teaching as a socially worthwhile and important job, a desire to help children succeed and a desire to help society improve; 2) Intrinsic reasons: Cover aspects of the job activity itself, such as the activity of teaching children and an interest in using their subject matter knowledge and expertise; and, 3) Extrinsic reasons: Cover aspects of the job that are not inherent in the work itself, such as long holidays and salary (p. 117).

The intrinsic and altruistic factors are created by internal motivation resulting from some innate drive, without apparent reinforcement from the outside (Malone & Lepper, 1987; Deci & Ryan, 2000). In contrast, an extrinsic factor is driven by external motivation that relates to environmental factors such as rewards. Many studies have classified the motivation to teach according to the spectrum of altruistic, intrinsic and extrinsic factors (Kyriacou & Coulthard, 2000; Bastick, 2000; Moran, Kilpatrick, Abbot, Dallat,

& McClune, 2001; Richardson & Watt, 2006). Based on the expectancy-value theory, Watt and Richardson (2007) offer a theoretical model of Factors Influencing Teaching Choice Scale (FIT-Choice Scale) to guide systematic investigation into the question of why people choose teaching as a career. The model consists of motivational factors (perceived ability, intrinsic value, fall-back career, personal utility value, social utility value, prior teaching and learning experiences and social influences) and perceptions (difficulty, expertise, social status, salary, social dissuasion and satisfaction). A review of international studies suggested that the motivation to teach can vary across different sociocultural contexts. For instance, a report by the Organisation for Economic Co-operation and Development (OECD) on studies conducted with practising teachers from France, Canada, the United Kingdom, Australia and the Netherlands confirmed that the most frequently cited reasons for teaching were altruistic and intrinsic reasons (OECD, 2005). These include a desire to work with children, make a social contribution and intellectual fulfilment (Alexander, Chant, & Cox, 1994; Tudhope, 1944; Valentine, 1934; Hayes, 1990). In contrast, extrinsic motivation appeared to be more prominent in developing countries. For example, Yong’s (1995) studies conducted in Brunei Darussalam highlighted the fact that extrinsic reasons are the main factors for trainees to choose teaching. Similarly, Bastick’s (2000) studies in Jamaica concluded that the extrinsic motives

given by Jamaican teacher trainees are similar to those reported from trainees in other developing countries and are in contrast with results from metropolitan countries that emphasise intrinsic and altruistic motivation.

All around the world the diminishing presence of men within the teaching profession has gained attention (Smith, Mack, & Akeyea, 2004; Johnston, Mckeown & McEwen, 1999; Riddell & Tett, 2006). However, there has been a lack of focus given to the difficulty of attracting male teachers to the teaching profession. The literature indicated that there are some factors that make teaching a less attractive career. These include a poor salary scheme, poor job conditions and low social status. (Hatch, 1999; Weiss, 1999; Shen & Hsieh, 1999; Ramsay, 2000; Bennell, 2004) identified that prospective entrants to teaching are exposed to many alternative career options in the graduate market, which can offer greater financial reward, career progression and a better lifestyle. Page and Page (1984) reported that the lack of discussion in schools about selecting the teaching profession discouraged high-school seniors from considering teaching as a career option.

So far, there is no empirical evidence exploring specifically the views of men who decided to enter careers other than teaching. Kyriacou and Coulthard (2000) compared three groups of undergraduate students: Those who were definitely not considering teaching; those seriously considering teaching; and those undecided

about entering teaching. However, the study is not gender-specific. A few studies have been reported that have explored the issue of gender and the teaching career. Johnston, McKeown and McEwen (1999) investigated the views of male and female sixth-form students regarding the factors that might be important when considering teaching. Similar gender differences were also found by Reid and Caudwell (1997) in their study of Post Graduate Certificate in Education (PGCE) students, which investigated the reasons for choosing teaching as a career. More male than female students rated extrinsic motivation such as “longer holiday” and “a change of career” as very important. In contrast, fewer male than female students rated intrinsic motivation such as “enjoy the working atmosphere,” “teaching as a challenge” and “hours fit with parenthood” as very important. Newby, Smith and Newby (1995), investigating African-American high school students’ perception of teaching as a career, found that male students evaluated the importance of teaching less than do females. Also, male students were more likely than female students to have been influenced by others in making teaching a career choice. Indeed, in previous research, scant attention was given to men who decided not to teach and the factors that might have dissuaded them from pursuing a career in teaching.

If we are to gain a clearer understanding of what attracts certain people to teaching, we also need to explore how teaching is viewed by men who decide to choose other careers. By understanding the factors

restricting men from entering the teaching profession, one would be better able to appreciate what needs to be done to attract the brightest male school-leavers to the teaching profession. Lack of understanding may contribute to the mismatch between what is needed and what is provided by initiatives for increasing the number of male teachers in schools.

METHODOLOGY

The target sample for this study was a cohort of 85 first-year mechanical engineering students from a public university in Malaysia. Only students with excellent academic achievement have the opportunity to be enrolled into this engineering course.

The majority (98.8%) were aged between 18 and 20 years old. Also, 70 (82.3%) participants were Malay, 13 (15.3%) were Chinese and two (2.4%) were others. The majority (95.3%) used the matriculation certificate as their qualification entry to the course. Nearly all (96.5%) placed engineering as their first choice course.

The questionnaire consisted of 27 statements dealing with the factors that might restrict male students from choosing the teaching profession. The factors included social influences (eight items), perception (perception of teaching profession – six items and perceived ability to be a teacher – one item), job conditions (working hours and workload – eight items) and personal values (four items). The items were developed from the literature review (teaching as a career of choice and teachers' job satisfaction) and informal dialogues with

engineering students about the teaching profession. The statements were Likert-type scale items, where the individual checked one of five possible responses to the statements, "Strongly Agree" (SA), "Agree" (A), "Neutral" (N), "Disagree" (D) and "Strongly Disagree" (SD) to the factors that restricted them from choosing teaching as a career. The questionnaire was administered in tutorial class groups to ensure a high return rate and allow for clarification of respondents' queries. The questionnaire was administered by the researchers, with the consent of programme coordinators, and informed consent of all participants. It took approximately 30 minutes for participants to complete the survey.

RESULTS AND DISCUSSION

The analysis set out the means and the rank orders (Ranks 1 to 4) based on the means scores of each item. Rank 1 was considered as "very important reasons" (having a mean of 4.00 and above on a 5-point scale), followed by Rank 2 as "important reasons" (having a mean of 3.50 and below 3.99), Rank 3 as less important reasons (having a mean of 3.00 and below 3.49) and Rank 4 as not important (having a mean of less than 3.00).

As shown in Table 1, social influences consisted of three sub-categories: School environment, influence from family members and influence from friends. The reason, "School experiences did not develop my interest in teaching," showed the highest mean value (4.11). This finding suggested that male engineering students in the present

study had a lack of exposure to a positive role model from among their teachers, as well as the school environment. Sullivan and Dziuban (1987) discovered that teachers frequently discouraged academically talented students from considering a career in teaching due to the frustrations associated with their own employment and status as a teacher. The mean values of the reasons related to the influence of family members ranged from 4.05 to 3.14 (Ranks 1 to 3). The most important reason was “No encouragement from father” (Rank 1). Three items considered as important reasons (Rank 2) were: “No encouragement from mother,” “No encouragement from sibling” and “Following my family career tradition in the engineering profession.” These findings indicate that family members may have been responsible for the decision of not choosing teaching as a career option. In a study by Norzaini (2013), it was found that 87% of women chose a teaching career due to parents’ influence compared to 63% of men. This may also indicate that parents have internalised the notion of “femaleness with regard to teaching” (Smith, 2000). This study also found that friends had significant influence on the decision of not choosing teaching as a career. This is evident as the reason, “Most of my friends are not choosing the teaching profession,” was at Rank 1. Also, the item “Friends told me teaching was not a good career choice,” was considered an important reason (Rank 2). The influence of peers in career decisions has been discussed widely in the literature (Webber & Walton, 2006; Crumb, George,

& Chandra, 2006). A critical analysis by Naz et al. (2014) of the influence of peers and friends in decision-making concerning career found that although family i.e. parents and other family members primarily shaped and transformed the behaviour of children in multiple ways, peers and friends’ influence are an asset for developing career opportunities and decision-making among youth.

The job conditions that were investigated in this study were focussed on two aspects. The first aspect consisted of five reasons associated with workload. Four of these five reasons were considered as important reasons (Rank 2). These included “Too many student discipline problems in school” (mean=3.98), “Need to teach tuition classes at the weekend” (mean=3.95), “Marking students’ homework after formal school hours” (mean=3.28) and “Teachers working during school holidays” (mean=3.85). Only one reason was considered as being less important (Rank 3), which was “Lots of non-teaching tasks” (mean=3.28). Teachers’ working hours was also one of the important reasons that restricted the male students from entering the teaching profession. Two out of three reasons were at Rank 2. These included “Extended working hours” (mean=3.79) and “Working hours not flexible” (mean=3.60). However, the respondents did not seem bothered about “Working time started too early” (mean 3.24, Rank 3). The overall mean of 5.71 showed that the job conditions was one of the important reasons for not choosing teaching as a career option among male

Table 1
Reasons for not choosing teaching as a career

Category	I am not interested in the teaching profession because....	Mean	Rank
Social influences	School environment		
	School experiences did not develop my interest in teaching	4.11	1
	Influence from family members		
	No encouragement from father	4.05	1
	No encouragement from mother	3.98	2
	No encouragement from siblings	3.90	2
	Following my family career tradition in engineering	3.78	2
	Influence from friends		
	Most of my friends are not choosing the teaching profession	4.04	1
	Friends told me teaching was not a good career choice	3.94	2
	Overall mean	3.97	
Perception	Perceived ability		
	Teaching is not suitable for my ability/I do not have the talent to be a teacher	4.00	1
	Perceptions of teaching profession		
	Teacher's salary is much lower than an engineer's	4.05	1
	Teacher's salary insufficient compared to its heavy workload	4.04	1
	Teaching is not a challenging job	3.29	3
	Lack of exposure to technology development	3.12	3
	Teachers are not valued/respected by society	3.01	3
	Teaching makes less contribution to the county	2.17	4
	Overall mean	3.51	
Job conditions	Workload		
	Too many student discipline problems in schools	3.98	2
	Need to teach tuition classes at the weekend	3.95	2
	Marking students' homework after formal school hours	3.93	2
	Teachers work during school holidays	3.85	2
	Lots of non-teaching tasks	3.28	3
	Working hours		
	Extended working hours – outside office hours	3.79	2
	Working hours not flexible	3.60	2
	Working time starts too early (7.20 am)	3.24	3
	Overall mean	3.70	
Personal value	Limited bonus in a year	3.81	2
	No overtime payment for working after school time	3.72	2
	Limited/poor job prospects/security	3.10	3
	Difficult to get job promotion	3.09	3
		Overall mean	3.43

students. This concurs with Kyriacou and Kunc's study (2007) that highlighted four key reasons to explain teacher attrition rates, namely, workload, salary, disruptive students and the low status of the profession in society.

There are seven reasons related to perception. One of the reasons is related to perceived ability to be a teacher. The respondents felt that teaching was not suitable for their ability. This was considered an extremely important reason (Rank 1), with a high mean value (4.00). Both items regarding perception of teachers' salary, "Teacher's salary much lower than engineer's" and "Teacher's salary insufficient compared to its heavy workload" were also ranked 1 ("extremely important reason") with the mean values of 4.05 and 4.04, respectively. Earlier studies such as those by Connie (2000) and Tiziava (2003) discovered that low salary led to teacher demotivation for continuing their service in teaching. Three reasons fell under Rank 3 ("less important reason") in determining the students' decision of not choosing teaching as their career. The reasons were: "Teaching is not a challenging job" (mean=3.29), "Lack of exposure to technology" (mean=3.12) and "Teachers are not valued or respected by society" (mean=3.01). This study supported Norzaini's (2013) findings that male trainees' perception of the status of teaching as a respected job was not particularly high compared to female trainees'. The perception that "Teaching makes less contribution to the country" was not only the least important reason (Rank 4)

in the perception category but also showed the lowest mean value overall for the 27 reasons presented to the male engineering students. This study supported Kyriacou and Coulthard's finding (2000) that the consideration, "The job will contribute to society," was important when choosing a career as it was ranked higher among the pro-teaching group compared to the anti-teaching group.

Personal values refer to how teaching may be useful to the individual. Of the four reasons, two were regarded as important reasons (Rank 2). The two reasons were related to the benefit of teaching in terms of income, "Limited bonus in a year" and "No overtime payment for working after school time." The findings indicated that male students showed high concern for extra benefits related to money. The finding concurred with Yuce, Sahin, Kocer and Kana's finding (2013) that males placed greater interest in financial-based extrinsic motives such as money. Unlike the private sector, which is profit-based, public education is a non-profit-based programme. Teachers' terms of service guarantee a regular monthly income and they are not eligible to claim any overtime payment for extra time worked above school hours. The other two reasons, namely "Poor job security" and "Difficult to get job promotion" were ranked "less important," with mean values of 3.10 and 3.09, respectively. That male students considered these reasons as less important may be connected to the status of teachers as civil servants who enjoy a permanent job

status. Studies in Taiwan by Wang (2004) as well as in Singapore by Soh (1988) showed that job security was one of the motives for joining the teaching profession. Besides job security, teaching is also attractive in providing further education to a higher level.

CONCLUSION AND IMPLICATIONS

The present study indicated that the most dominant factors that restricted male students from choosing the teaching profession as their career option were social influences. School experience that failed to develop students' interest in teaching, together with the lack of encouragement from family members and strong influence from peers in career decision-making played an important role for rejection of the teaching profession as a career option. The second factor was job conditions, particularly the reasons related to job workload. The third factor was perception of the lack of talent needed to be a teacher and low salary. The last factor was related to personal value, with the focus on extra benefits in terms of money rewards such as bonuses and overtime payments.

Based on the research findings, some practical recommendations can be made. Firstly, a teacher recruitment campaign that is specifically organised for male students should be developed. In Queensland, Australia, through the Male Teachers Support (MATES) project, the number of male teacher enrolments increased by more than double the national average (Smith, 2005). The MATES project organised some marketing and promotion of the teaching

profession among male students, especially senior male high-school students. Secondly, male students need to be convinced that the teaching profession can offer a pleasant working environment. In this regard, policy-makers should undertake serious actions for overcoming the problem of teachers' workload. Finally, in order to compete with the advantage of high salaries in the private sector or other careers such as engineering, it is important for the government to provide more competitive remuneration packages for teachers.

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Impact of Work Environment on Learning Transfer of Skills

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ABSTRACT

Skills and job mismatch issues have become prevalent in the field of Technical and Vocational Education Training (TVET). These issues are associated with problems encountered in learning transfer, which hinder the application of skills and knowledge learnt in training institutes in the workplace. The findings of previous studies showed that less than 15 to 20% of the knowledge and skills acquired in training institutes can be transferred to the workplace. This contributes to loss of funds invested in training programmes. Concerns over the issue of mismatch between training and industry demand led to this study, which was conducted to identify elements of the work environment that are needed to strengthen learning transfer of skills learnt in training to the workplace. This study used a qualitative exploratory case study. Qualitative data were collected from trainers, employers, NOSS panel, trainees and former trainees through face-to-face interviews and focus group discussion. Qualitative findings found that work environment factors that contributed to the transfer of learning mainly involved learning skills training in Malaysia. The findings of this data may have implications for practitioners in the delivery of skills training in order to shape a skilled workforce to help create a high-income economy.

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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Keywords: Learning transfer, NOSS, skill training,
work environment

INTRODUCTION

Skills mismatch issues among skills trainers still haunt graduates and employers. Statistics and research on job mismatch conducted in training institutions and by employers show

that skills mismatch is very much an issue today (Jabatan Pembangunan Kemahiran, 2011; Jabatan Tenaga Manusia, 2008, 2009, 2010). This raises questions about the suitability of the skills training system based on the National Occupational Skill Standard (NOSS) as NOSS is used in many training institutions in Malaysia. The effectiveness of the NOSS training system is widely disputed as many graduates of training institutions that use the system cannot get jobs (Jabatan Pembangunan Kemahiran, 2011). This is also supported by the Jabatan Tenaga Manusia (2009), which found that there was dissatisfaction among employers with the results of the programme, which was attended by their employees, due to the employees' difficulty in applying what they learnt at work (Jørgensen, 2011; Nielsen, 2009).

There are various reasons for skills mismatch. One is that trainees who participated in the programme are not able to carry out their duties at work properly and efficiently (Nur, Ruhizan, & Bekri, 2015) because they do not have adequate skills, knowledge and behaviour (Ahmad, Wan Ahmad, Kasa, Gessler, & Spöttl, 2010). This was also supported by Pang, Yunos and Spottl (2009), who found that transfer of learning is difficult in the NOSS training system because trainees could not match the quality of work required by their employers. However, this cannot be proved conclusively because there are no specific studies on transfer of learning related to work environment, in particular for a NOSS system. Therefore, research into transfer of

learning acquired under the NOSS training system to the workplace is urgently needed.

Learning Transfer

The issue of transfer of learning is no longer new as problems and concerns related to learning transfer are increasing (Taylor, Ayala, & Johnson, 2009). The main issue of learning transfer focusses on how knowledge, skills and attitudes can be applied or fail to be applied in new situations. However, many studies have only identified and measured factors affecting the transfer of learning in a particular environment (Baldwin, Ford, & Blume, 2009; Taylor et al., 2009). This means that learning transfer still needs to be explored to ensure that it is effectively applied in different environments.

This study explores environmental factors that contribute to effective learning transfer, particularly involving skills training, especially the NOSS-based training system and work environments in Malaysia. Baldwin and Ford (1988) showed that transfer of learning factors varies with each environment. Therefore, a specific model for each environment is needed.

A literature review found that the work environment affects the transfer of learning (Baldwin & Ford, 1988; Burke & Hutchins, 2007; Donovan & Darcy, 2011; Kirwan, & Birchall, 2006; Leimbach, 2010; Pham, Segers, & Gijsselaers, 2010; Rodríguez, & Gregory, 2005). According to Grossman and Salas (2011), environmental factors help determine whether trainees demonstrate learnt behaviour once they return to the

work environment. Lim and Morris (2006) stated that work environment is a factor that obstructs, reduces and promotes the transfer of learning. Therefore, it is up to the trainees whether they use the opportunity provided by their work environment to enhance their work performance or not. If they do not fully utilise such opportunity, they cannot transfer what they have learnt at the training.

Lim and Morris (2006) divided the work environment into two related factors, working system and people. Various factors can be attributed to a working system, but Lim and Morris' findings (2006) revealed that opportunity to use knowledge and skills is the factor emphasised in most studies. The people factor related to supervisors, who are critical in ensuring the success of learning transfer (Baldwin & Ford, 1988; Lim & Morris, 2006). Velada, Caetano, Michel, Lyons and Kavanagh (2007) explained in their study that two factors often emphasised in the work environment are organisational culture and climate. However, some indicators are associated with work environment, such as performance feedback, peer support, supervisor support, supervisor and supervisor sanctions (Baldwin & Ford, 1988; Holton, Bates, & Ruona, 2000; Tracey, Tannenbaum, & Kavanagh, 1995). To sum up, the constructs within the work environment include supervisor support, peer support, opportunity to use training provided and the negative or positive response of trainees when they return to the workplace i.e. whether or not they use the training they received.

METHODOLOGY

This case study used the qualitative design, triangulated by methods and resources. This study was triangulated by a method that involved: 1) face-to-face semi-structured interviews with the instructor, the NOSS panel, employers and trainees who are currently employed; 2) focus group discussion with ex-trainees who have work experience; and 3) observation of the institute and workplace environment. The sources for triangulation were selected by sample selection from a variety of organisations and positions. Through this method, the researchers were able to share their experience and were thus able to explore and understand the phenomenon of research by immersing themselves deeply into what is interpreted through conversations and expressions of feelings.

The thematic analysis method was used to analyse the interview data collected. The thematic analysis is a method of identifying, analysing and reporting patterns (themes) in the qualitative data (Braun & Clarke, 2006). This study refers to the discovery and emergence of themes derived from the results of the interview.

RESULTS

Based on the thematic analysis discussed above, two types of data were used, face-to-face interviews and focus group discussions data. Data were analysed using the NVIVO software version 8.0. In total there were five main themes (Yasin et al., 2014), and 20 sub-themes issued by theory, model

and new findings from the interviews conducted. Among the sub-themes that represented the theme of work environment were positive personal outcomes, negative personal outcome, peer support, supervisor or instructor sanctions and supervisor support supervisors.

Negative-personal outcomes refer to the negative result of personal actions taken by trainees that complicate the transfer of learning. This contributes to the possibility that there will be no improvement when new skills are used. In this study negative-personal outcomes that emerged from the interviews were that the trainees felt there was less communication in the new environment and they were bored with and felt awkward in the new environment.

Positive-personal outcomes are the result of actions taken by trainees that provide a positive impact on work. Among these outcomes are effectiveness of work (Holton, 1996), increased personal satisfaction, increased productivity (Holton, 1996) and able to work independently and follow instructions. Effectiveness refers to the positive effect of applying the learning outcomes at the best level possible. Able to work independently refers to the impact received by the trainees if they were able to apply the lessons learnt in the workplace.

Peer support includes the extent to which peers recognise each other and implement opportunities to use the skills and knowledge learnt in training, promote the use of new skills, show patience in

the face of problems associated with the use of new skills and show appreciation for the use of new skills. Under the sub-theme of peer support, the codes related to showing patience in the face of difficulties in using the new skills (Xiao, 1996) include rewarding the use of new skills (Holton, 1996), encouraging the use of new skills (Bates et al., 2000; Holton, 1996) and helping peers (Holton, 1996).

Supervisor support is defined as the extent to which the supervisor or employer supports and strengthens the use of learning outcomes in the workplace (Holton et al., 2000). In the context of this study, the sub-theme referred to the involvement of employers or instructors in helping the trainees to boost the morale of trainees either internally or externally while helping them use and improve learning outcomes more effectively. Among the examples of support provided were explaining expectations of performance after training, identifying opportunities to use new skills and knowledge, setting realistic goals based on the training, working with the trainees on problems encountered during the application of new skills and providing feedback when trainees successfully apply new abilities.

Supervisor sanctions include the extent to which employers or educators oppose the use of new skills and knowledge and the use of techniques that are different from what was taught in training. Sub-themes in this category include negative feedback by employers (Burke & Baldwin,

1999) and receiving no or little help from employers and instructors (Holton et al., 2000). Negative feedback from supervisors and instructors refers to criticism of the work process and equipment that does not suit the needs of the industry as well as insufficient feedback when trainees successfully apply learning in the workplace. By employers and instructors not helping trainees it is meant that employer and instructors do not help trainees to identify opportunities where they may use newly learnt skills and knowledge.

DISCUSSION AND CONCLUSION

The study found that the work environment influenced and contributed to the transfer of learning (Baldwin & Ford, 1988; Burke & Hutchins, 2007; Kirwan & Birchall, 2006; Leimbach, 2010; Pham et al., 2010; Donovan & Darcy, 2011; Grossman & Salas, 2011). The work environment can enhance or constrain the use of trainees' learning outcomes acquired in training through existing activities. Using these environmental factors through these elements can improve performance and further facilitate the transfer of learning (Baldwin & Ford, 1988; Tracey et al., 1995; Holton et al., 2000; Lim & Morris, 2006).

Instructors, supervisors, employers and training institutions must improve the transfer of learning skills through the work environment. One factor related to the work environment is the reward system; installing

a proper reward system for successful use of new skills would greatly improve the transfer of learning skills among trainees. In addition, effective communication skills are essential to avoid miscommunication among trainers and support co-workers as well as to improve teamwork (Jabatan Pembangunan Kemahiran, 2011; Omar, Abdullah, Sail, & Ismail, 2010; Awang, Saif, Alavi, & Ismail, 2010; Mustapha & Rahmat, 2013). Effective communication allows supervisors or instructors to provide feedback on work performance, to initiate positive discussion, to provide relevant explanation through clear direction and to deliver learning outcomes. Supervisors or instructors also need to emphasise guidance to ensure that the trainees can apply their learning outcomes in the workplace (Azman, Loh, Abdullah, & Francis, 2010; Burke & Baldwin, 1999; Hutchins, 2009; Lim & Johnson, 2002; Hua, Ahmad, & Ismail, 2011; Nijman, Nijhof, Wognum, & Veldkamp, 2006; Ahmad et al., 2010).

Table 1 summarises the importance of the work environment factors. Improving these work environment factors is an important step in ensuring all trainees use inputs from the environment to improve work performance. This is supported by Ahmad et al. (2010), who stated that work environment factors greatly affect the effectiveness of the transfer of learning in TVET.

Table 1
Summary of discussion on work environment

Theme/sub-theme	Benefit/Significance	Emphasis
Work Environment		
• Negative-personal outcome	- Unsuccessful, not motivated, do not achieve the desired performance, tend to violate procedure	- Core abilities evaluation to define and strengthen communication skill, generate interest
• Positive-personal outcome	- Influences individual performance with easy and quick application of learning outcomes in the workplace	- Must be independent and act in accordance with instructions; Supervisory aspect emphasised
• Peer support	- Trust and support of friends in the process of work, sharing ideas; Respect and encourage one another	- Keep good relations/positive communication among peers, the overall team, to create support.
• Supervisor sanctions	- Trainees are humble and unsure of themselves as a result of criticism of supervisors, decreased performance and motivation	- Should be avoided (there is no instructor assistance)
• Supervisor support	- Related to the transfer of learning, strengthen the use of learning outcomes, understanding the work process and the level of performance. The level of confidence and trust	- Close relationship, supervisors encourage trainees to attend the training programme, give them opportunity to apply training acquired, keep communication channels open, provide guidance and give clear instructions

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Employability Skills Mastery of Special Needs Students at Polytechnics

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ABSTRACT

This study attempts to examine the employability skills of students with special needs. Employability skills are related to soft skills and hard skills. The respondents were 81 impaired students in four polytechnics (Politeknik Sultan Salahuddin Abdul Aziz Shah (PSA), Politeknik Ibrahim Sultan (PIS), Politeknik Ungku Omar (PUO) and Politeknik Kota Kinabalu (PKK)). The aim of this study is to identify the extent of implementation and control employability skills among special needs students in polytechnics as well as to recommend improvements to the quality of TVET graduates. Data were analysed using the Statistical Package for the Social Sciences (SPSS) version 20.0 to calculate and process the descriptive and inferential statistical findings. Mean scores for all three problems were high implementation employability skills (soft skills=3.70 and hard skills=3.86). The mean score for employability skills competency mastery of special needs students in polytechnics was 3.89, while the correlation between employability skills and mastery of skills competency was 0.776 (r), showing a relationship between application of employability skills and mastery of employability skills of special need students in polytechnic. The results showed that the activities that contribute to improved employability skills of students with special needs should be intensified to help them compete in the job market and contribute to national development.

Keywords: Employability skills, hard skills, special needs students, soft skills

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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INTRODUCTION

Special education in Malaysia has now been applied at all levels of education such as early childhood education, primary

school, secondary school and higher education. Students under special education programmes can learn something new for the benefit of their future through special education programmes. Special education in polytechnics under the Ministry of Education Malaysia (MOE) established a Special Education Programme in October 1995 for students with special needs for a particular programme in five polytechnics in Malaysia.

Background

In Malaysia through *Pekeliling Bilangan 16 Tahun 2010*, privileges were granted to the disabled i.e. 1% of jobs in the civil service are set aside for them (Jabatan Perkhidmatan Awam, 2015). This policy ensures that disabled people who have academic and skills qualification suitable for positions in the civil service will be considered for employment. According to Halim, Ab. Rahim, Ramlah and Abdullah (2013), the percentage of job opportunities given to disabled people is too small to accommodate the many disabled people who are eager to be independent and get their own job. Students with disabilities are vulnerable and their families face many challenges, especially in the crucial transition period between education and employment. The problems faced by disabled people in Malaysia are similar to those faced by disabled people in other countries, especially the United States of America. The main difference between developed countries and Malaysia in provisions for the disabled is

that developed countries are able to provide better facilities and training for the disabled (Zinaida, 2006).

Students who are hearing impaired face difficulty mastering knowledge and skills because their abilities are deficient and they find it hard to adapt to a new environment (Mohd. Tahir & Mustafa, 2009). The problem of growing numbers of unemployed graduates is indeed a serious problem. Statistics show that institutions of higher education, especially universities, cannot accommodate the demand of employers. One reason for this is that graduates do not seem able to satisfy employers' needs, making employability skills a competency that institutions of higher education must take into consideration (Madar, 2008). Some employers tend to think that disabled employees would be burdensome and would create problems (Lindsay et al., 2014). For instance they might cause delays in completing work or fail to meet the quality and standard of work set by the organisation. This situation calls for research to identify how far implementation and employability proficiency among students with special needs in polytechnics can improve their employability skills as well as to recommend improvements to the quality of TVET graduates in order to transform technical and vocational education.

METHODOLOGY

This study was designed as survey research that used a questionnaire. Wiersma (2000) stated that surveys can provide an overview

of a situation as well as details relevant to a particular period and describe plans for the future. The questionnaire was used as the main research tool for this study as it enabled clear construction of the soft and hard skills of students with special needs. In addition, it allowed the data collected to be easily processed and analysed.

Population and Sample

Eighty-one students with special needs from four polytechnics, Politeknik Sultan Salahuddin Abdul Aziz Shah (PSA), Politeknik Ibrahim Sultan (PIS), Politeknik Ungku Omar (PUO) and Politeknik Kota Kinabalu (PKK), were surveyed. The population was identified first to determine the research problem to be reviewed as well as the data and information to be collected (Abdul Ghaffar, 1999). From the population identified, 81 students were chosen. Another 30 students had been chosen earlier for a pilot test.

Research Instrument

According to Abdul Ghaffar (2000), the questionnaire as a research instrument can improve accuracy and truth of response of the subject to given questions. The instrument for this study, a questionnaire, was designed based on the objectives, issues and theoretical framework of the study. The questionnaire was divided into four sections: Section A was on respondent demography, Section B was on soft skills and hard skills, Section C was on employability

competency of special needs students in polytechnics and Section D was on employability improvement focussed on employability skills needed to achieve a high level of employability.

Four experts in technical and vocational education validated the questionnaire for use in this research. Several improvements in content and language were made based on comments and suggestions from the experts. The pilot test yielded a Cronbach Alpha value of 0.946. According to Abdul Ghaffar (2001), Cronbach's Alpha is a coefficient or validity level that shows the relationship between research items.

Section A of the questionnaire consisted of nominal data collected through response to a set of questions. Sections B, C and D a 5-point Likert scale representing the following ranking: 'Strongly agree', 'Agree', 'Uncertain', 'Disagree' and 'Strongly disagree'. Based on the frequency distribution and percentage of min, the appropriate descriptive analysis was made. The mean score identified the extent of implementation and mastery of the employability skills of polytechnic students with special needs needed to achieve high employability.

RESULTS

A total of 81 respondents were involved in this research, of whom 35 were male (43.21%), while 46 were female (56.79%). Students from the Department of Visual Communication and Design obtained a high score of 25 (30.86%). The highest percentage

was 49.38%, obtained by students from the Department of Design and Visual Communication, which offered two courses, Special Skills Certificate in Fashion and Clothing and Special Skills Certificate in Graphic Design. Students from the Special Skills Certificate Construction programme under the Department of Civil Engineering, numbering 13 persons, obtained a score of 5.16%. The lowest percentage, 7.41%, was obtained by students enrolled in the Special Skills Certificate in Mechanical Maintenance programme offered by the

Department of Mechanical Engineering. There were only six students pursuing this certificate programme.

Table 1 shows the correlation coefficient for the pair of variables, employability skills and mastery of skills competency. The coefficient for employability was high, between 0.776 and 1, while the Pearson coefficient (r) was 0.776, at the significant level of 0.00. Therefore, the two variables had positive and high 0.776 correlation (Cohen, 1988).

Table 1
Pearson correlation analysis between the application of employability skills and mastery of skills competency for employability

Relation		Skills	Competency	Interpretation
Application of employability skills	Pearson Correlation Sig. (two-tailed)	1	0.776**	Strong
Mastery of employability skills	Pearson Correlation Sig. (two-tailed)	0.776**	0.000	
		0.000	1	

Table 2 shows the improvement in employability skills of the special needs students, describing the items, number and percentage of the respondents based on their opinions and views. Competence in mastery of employability skills among the special needs students yielded an average mean score of 4.03 (SD=0.332). This shows that

improvement to the employability skills of the students is urgently needed. The mean score for Item 10 (D10) was high, at 4.32 (SD=0.609). Table 2 also shows that the mean score was lower by 3.37 (SD=0.660) for Item D7 (employability skills outside the classroom).

Table 1

Frequency analysis, percentage, mean, average and the overall mean for items to increase performance for employability

Item	Mean	Standard deviation	Interpretation
D1 Improvement to access to facilities is adequate	4.19	0.760	High
D2 Improvement to infrastructure	3.89	0.806	High
D3 Improvement to curriculum development	3.91	0.809	High
D4 Additional training in employability skills improvement	4.14	0.685	High
D5 Improvement of teaching aids for relevance	4.16	0.715	High
D6 Improvement – Exposure to employability skills is more effective during learning and teaching	3.91	0.616	High
D7 Improvement – Exposure to employability skills outside the classroom (Co-curricular activities)	3.37	0.660	High
D8 Improvement through expert assistance in employability skills in the relevant field	4.17	0.648	High
D9 Improvement to reference materials and price	4.27	0.652	High
D10 Improvement award per achievement for students	4.32	0.609	High
Overall Mean Score	4.03	0.332	High

DISCUSSION

The study found that the majority of the students agreed that improvements were needed, such as the introduction of a rewards system for student achievement. Students who possessed high self-esteem usually obtained good results in school because they already had a sense of direction for the future, had many friends and were close to both parents (Masiron, 2010). This shows that students can improve if they are rewarded for doing well. One way to reward them would be to introduce a Dean's list for excellent students. The lowest mean score for improvements was for employability skills outside the classroom (extra-curricular activities). This is because many students think extra-curricular activities are not

important and just a waste of time as they are not assessed (Bahari, 2002). This aspect needs improvement as co-curricular activities complement and complete one's education, ensuring one is able to contribute meaningfully to national development (Mohd Sofian et al., 2002).

CONCLUSION

The correlation between application and mastery of students with special needs is high and encouraging. These students have the potential to be good employees. However, some improvements are needed to enhance their skills in terms of employability in order to correct the perception of students with special needs held by employers.

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Validity and Reliability of an E-Portfolio Indicators Instrument for Malaysian Skills Certification (MSC)

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ABSTRACT

The development of the E-portfolio system requires indicators or characteristics that are appropriate for meeting the needs of the education system. This pioneering study is to validate and check the reliability of E-portfolio indicators for Malaysian Skills Certification (MSC). The instrument comprised 72 items and was circulated to 40 MSC educators at the Industrial Training Institute (ILP) Kuala Lumpur. This instrument was developed to measure four main constructs, namely i) records of prior attainment, ii) the virtual learning space, iii) competency assessment, and iv) the operating system. The Rasch Model approach was used to check the instrument's validity and reliability. The Rasch Model was used because it can measure respondent and item reliability and it yields data that are more reliable than data collected using only Cronbach's Alpha. The Winsteps Version 3.69.1.11 software was used for the inspection of the items' function from the aspects of reliability and seclusion in terms of item-respondents, polarity and item suitability to measure the constructs and the standardised residual correlation. In the final analysis, 18 indicators were removed as they did not suit the inspection criteria, while 54 corresponding indicators were used to measure the four constructs of the MSC E-portfolio system.

Keywords: Construct reliability, E-portfolio, item polarity, item suitability, Malaysian Skills Certification (MSC), Rasch Model, standardised residual correlation

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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INTRODUCTION

E-portfolios seems to act only as a repository of artefacts without connecting to a real learning process. As a result, although the resulting e-portfolio can provide convenience and comfort to users because of the use of technology, it does

not achieve the real use of e-portfolios. If an institution chooses to use e-portfolios in teaching and learning, it is important to understand and define the characteristics of the e-portfolio first to meet the needs of individual institutions and user requirements. Further consideration should be given to the design process and the use of e-portfolio is consumer characteristics E-portfolio system, the potential of e-portfolios, technology features and capabilities and usability of e-portfolios (Jafari, 2004).

In the Malaysian Skills Certification system, the portfolio is used as a document to assess level of knowledge and student achievement. The traditional paper-based system limits the portfolio to being a mere artefact because the printed portfolio is static and limited in its capacity to share information with others. It is also difficult to process and evaluate and updating material is difficult (Miller, Oliver, & Lilly, 2011; Smyth, Horton, Studdert, Griffin, & Symonds, 2011; Stefani, Mason, & Pegler, 2007). The e-portfolio responds to the recommendations of the Ministry of Education (2011) to strengthen the vocational education delivery system by making it more relevant to current developments.

Several studies related to the implementation of the e-portfolio in vocational education have been carried out (Miller et al., 2011; Handa, Arame, Goda, Naganuma, & Gondo, 2011; Rodriguez-Donaire, García, & Olmo, 2010). The overall results showed that the concept of the e-portfolio forwarded by each researcher

was different and the development of the e-portfolio requires an appropriate framework to meet the needs of the education system. Nevertheless, these concepts have been reviewed and adapted for application in the context of the Malaysian Skills Certification (MSC) system. Generally, researchers have concluded that the e-portfolio should contain four sections, namely track records, virtual learning space, competency assessment and operating system. This paper introduces indicators for an e-portfolio for use for MSC. The e-portfolio was analysed for validity and reliability using the Rasch Measurement Model in a pilot study. Using the Rasch Measurement Model provides deeper analysis that would be possible using the Cronbach's Alpha value alone.

Data Analysis Based on Rasch Measurement Model

According to Bond and Fox (2006), one of the ways to determine the validity and reliability of an instrument is to use the Rasch Measurement Model. Using this model involves performing several tests designed: (i) to test the reliability and index sorting items; (ii) to detect polarity items that measure constructs; (iii) to test the suitability of the items (item fit); (iv) to determine the items' correlation of residual standardisation; (v) to determine item difficulty and the ability of respondents; (vi) to detect the presence of differential item functioning (dIF functioning-differential item) of the instrument; (vii) to determine the structure of the category

scale measurement functionality; and (viii) to identify unidimensionality constructs.

In this study, the Rasch Measurement Model approach was used only to determine the validity and reliability of the instrument that was developed by the researchers. Four testing instruments were applied in this study: (i) to determine the reliability and isolation item; (ii) to detect polarity items that measure constructs based on the Point Correlation Measure (PTMEA CORR); (iii) to determine the fit of the constructs; and (iv) to determine the correlation value of the items dependent on standardised residuals. The Rasch Measurement Model was also used to analyse the data to determine the difference between two variables and to measure correlation.

Objective

The objective of this study was to test the reliability of the instruments that were developed by the researchers for use for the Malaysian Skills Certification system and to detect any weaknesses of the instruments by examining the functional items of reliability and separation based on responses, polarity, fitness of the items and the correlation value of standardised residuals.

METHODOLOGY

The study was conducted using the quantitative approach. An instrument for use in the Malaysian Skills Certification (MSC) system by the researchers was distributed to survey respondents in a pilot study. The respondents were 40 MSC

instructors from the Industrial Training Institute (ILP) Kuala Lumpur. Johanson and Brooks (2010) suggested a minimum of 30 subjects to measure validity and reliability of instruments meant to advance research or examine development scale. The results of the survey were analysed using the software Winsteps Version 3.69.1.11 using the Rasch Measurement Model. The e-portfolio indicator instrument consisted of 72 items that comprised four main constructs namely, historical records, virtual learning space, competency assessment and operating system.

RESULTS

Using the Rasch Measurement Model, the researchers examined the functional aspect of: (i) the reliability and isolation item related to the respondents; (ii) the polarity of items to measure the constructs based on the PTMEA CORR; (iii) the fit of items; and (iv) the correlation value of the items dependent on standardised residuals.

Reliability and Separation Item

To determine the reliability of the instrument, the statistical analysis based on the Rasch Measurement Model was used with respect to reliability and the isolation item. The Cronbach's Alpha (α) obtained was 0.95 (see Table 1). According to Bond and Fox (2006), a Cronbach's Alpha (α) value that is between 0.9 and 1.0 shows the instruments are good and effective and have a high level of consistency, validating them for use in actual research.

Table 1
Reliability value (Cronbach's Alpha)

Person Raw Score-to-Measure Correlation = 1.00
Cronbach's Alpha (Kr-20) Person Raw Score Reliability = 0.95

Reliability and isolation of the items were also analysed. Table 2 shows the reliability and the isolation item; reliability obtained was 0.94, while the value of the item was 4.02 isolation, rounded off to 4.0. Based on the reliability, the value of 0.94 is good and can be accepted (Bond & Fox, 2006). The item value of 4.02 isolation was also good. According to Linacre (2004), a good index for separation is more than 2.0.

Table 2
Reliability and separation of items

	Raw core	Count	Model Measure	Infit Error	Outfit MNSQ	ZSTD	MNSQ	ZSTD
Mean		40.0	50.00	2.11	0.93	-0.5	0.95	-0.4
S.D.	25.5	0.0	9.39	0.07	1.11	1.7	1.11	1.7
Max.	181.0	40.0	88.93	2.17	9.90	9.9	9.90	9.9
Min.	52.0	40.0	40.78	1.89	0.30	-2.4	0.36	-2.3
Real RMSE	2.27	ADJ.SD	9.11	Separation	4.02	item	Reliability	0.94
Model RMSE	2.11	ADJ.SD	9.15	Separation	4.34	item	Reliability	0.95

Table 3 shows that the reliability of the respondents was 0.95 and the isolation of the respondents was 4.15, making the reliability of the respondents very high and, therefore, good, while separation also indicated a good value.

Table 3
Reliability and separation of person

	Raw core	Count	Model Measure	Infit Error	Outfit MNSQ	ZSTD	MNSQ	ZSTD
Mean	282.4	71.0	51.07	1.59	1.02	-0.1	1.03	0.0
S.D.	29.7	0	7.38	0.10	0.44	2.5	0.45	2.5
Max.	330.0	71.0	63.44	1.71	2.39	6.1	2.37	6.1
Min.	207.0	71.0	33.94	1.39	0.29	-5.8	0.30	-5.7
Real RMSE	1.73	ADJ.SD	7.18	Separation	4.15	item	Reliability	0.95
Model RMSE	1.59	ADJ.SD	7.21	Separation	4.53	item	Reliability	0.95

Polarity of Item through PTMEA Value CORR

Examination of the Point Correlation Measure (PTMEA CORR) was carried out to detect polarity of the items. According to Bond and Fox (2006), if the PTMEA CORR value is positive, the item measures the constructs but if the value is negative, it should be corrected or eliminated because

the item does not measure the construct or is too difficult for the respondents to answer. Two items received a negative value in the CORR PTMEA, as illustrated in Table 4 (Items PT3 and PT5). However, only one item was dropped i.e. Item PT3. Item PT5 was amended based on suggestions by experts and the objectives of the research.

Table 4
Correlation measure point value for removed items

Entry Number	Raw Score	Count	Measure	Error	Infit		Outfit		PTMEA CORR	Items
					MNSQ	ZSTD	MNSQ	ZSTD		
3	180	40	41.17	1.99	9.90	9.9	9.90	9.9	-0.08	APEL3
5	52	40	88.93	2.15	0.69	-1.3	0.73	-1.1	-0.03	APEL5

Item Suitability (Fit) to Measure Constructs

The constructs were measured using the outfit index Mean-Square (MNSQ). A good and acceptable value for this should be in the range between 0.6 and 1.4 (Bond & Fox, 2006). An MNSQ value of more than 1.4 means the item was misleading, while a value less than 0.6 indicates that an item was too easy or not expected by respondents (Linacre, 2004). Table 5 shows that 18 items were not in the specified range and they needed to be amended or dropped. Four of the items had a value greater than

1.4, while 14 items had a value smaller than 0.6. Items that exceeded the value of 1.4 were 0003 (9.90), PT2 (2.29), VLS43 (1.57) and APEL14 (1.49), while items less than 0.6 were APEL9 (0.58) Ø50 (0.57), VLS30 (0.57), O60 (0.55), O62 (0.53), O59 (0.53), O8 (0.53), O63 (0.52), O66 (0.51), O49 (0.50), VLS22 (0.50), APEL10 (0.45), APEL11 (0.42) and APEL17 (0.36). Four items (O49, VLS22, APEL11 and APEL10) were amended based on the experts' recommendations and the research objectives. The other 14 other items were eliminated.

Table 5
Item suitability (item fit) based on the MNSQ

Entry Number	Count	Outfit		Items
		MNSQ	ZSTD	
3	40	9.90	9.9	APEL3
2	40	2.29	4.2	APEL2
43	40	1.57	2.2	VLS43
14	40	1.49	2.0	APEL14
9	40	0.58	-1.5	APEL9
50	40	0.57	-1.8	O50
30	40	0.57	-1.4	VLS30
60	40	0.55	-1.4	O60
62	40	0.53	-1.6	O62
59	40	0.53	-1.8	O59
8	40	0.53	-1.9	APEL8
63	40	0.52	-1.6	O63
66	40	0.51	-2.0	O66
49	40	0.50	-2.2	O49
22	40	0.50	-1.6	VLS22
10	40	0.45	-1.8	APEL10
11	40	0.42	-2.3	APEL11
17	40	0.36	-2.3	APEL17

Standardised Residual Correlations Value

The residual correlation was consulted to determine whether there were items that overlapped each other. A high residual correlation showed that items had the same characteristics. If the correlation value of two items was above 0.7, only one item was selected. There were nine pairs of items that had a high correlation value (see Table 6); they were: APEL14 and APEL16 (0.85), VLS38 and VLS40 (0.85), PO71 and O72 (0.82), O67 and O68 (0.79), O60 and O61 (0.75), O52 and O53 (0.74), O63 and O64 (0.74), APEL6 and APEL8 (0.72) and VLS43 and VLS42 (0.70). Items with MNSQ values close to the value of 1.00 were retained, while the following items were eliminated based on previous analysis: APEL14, VLS40, PO71, O67, O60, O52, O63, APEL8 and VLS43.

Table 6
Standardised residual correlation of items

Correlation	Item	MNSQ Outfit	Result	Item	MNSQ Outfit	Result
0.85	APEL14	1.49	Eliminated	I0016	0.65	Retained
0.85	VLS38	0.85	Retained	I0040	0.83	Eliminated
0.82	O71	1.17	Eliminated	I0072	1.07	Retained
0.79	O67	1.16	Eliminated	I0068	0.97	Retained
0.75	O60	0.55	Eliminated	I0061	0.73	Retained
0.74	O52	0.72	Eliminated	I0053	0.79	Retained
0.74	O63	0.52	Eliminated	I0064	0.77	Retained
0.72	APEL6	1.35	Retained	I0008	0.53	Eliminated
0.70	CE42	0.93	Retained	I0043	1.57	Eliminated

DISCUSSION AND CONCLUSION

After the data were analysed, they were checked to confirm the validity and reliability of the instruments based on the Rasch Measurement Model. Elimination and amendment of the items were done taking into account the views and assessment of the experts. Overall, the pilot study showed

that 18 items needed to be removed as they did not meet the requirements of the measurement set, while five items were amended to suit the objectives of the study. Table 7 provides an overview of the items that were retained and those that were eliminated.

Table 7
Summary of dropped and amended items

No	Construct	Retained Item	Retained Item Sum	Dropped Item	Dropped Item Sum
1	Accreditation of Prior Learning (APEL)	APEL1, APEL4, APEL5, APEL6, APEL7, APEL10, APEL11, APEL12, APEL13, APEL15, APEL16, APEL18, APEL19, APEL20, APEL21	15	APEL2, APEL3, APEL8, APEL9, APEL14, APEL17	6
2	Virtual Learning Space (VLS)	VLS22, VLS23, VLS24, VLS25, VLS26, VLS27, VLS28, VLS29, VLS31, VLS32, VLS33, VLS34, VLS35, VLS36, VLS37, VLS38, VLS39, VLS41, VLS42	19	VLS30, VLS40, VLS43	3
3.	Competency Evaluation (CE)	CE44, CE45, CE46, CE47, CE48	5	(None)	0
4.	System Operation (O)	O49, O51, O53, O54, O55, O56, O57, O58, O61, O64, O65, O68, O69, O70, O72	15	O50, O52, O59, O60, O62, O63, O66, O67, O71	9
Total			54		18

Based on this pilot study, it was concluded that validity and reliability are very important aspects to consider in developing a new instrument for a study. The analysis found 18 items had to be

dropped as they were dubious in terms of validity and reliability. The amended instrument was found reliable and valid for producing e-portfolio models as required by the Malaysian Skills Certification system.

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APPENDIX*Pilot study item instrument*

Item No.	Statement
Accreditation of Prior Learning (APEL)	
APEL1	Student's biodata
APEL2	Student's ambition
APEL3	Future career planning
APEL4	Validated academic certificates
APEL5	Educational background (Year, level, grade achieved and institution)
APEL6	Validated education institution project summary
APEL7	Professional organisation membership document
APEL8	Proof of work (Photos of finished projects, reports, budgets and technical drawings)
APEL9	Professional course attended
APEL10	Industrial training attended
APEL11	Working experience (Period, post, job description, employer)
APEL12	Technical skills in knowledge area (i.e. tools handling skills, repair skills etc.)
APEL13	Track record of managing workplace safety skills
APEL14	Track record of organisational structuring skills in the workplace
APEL15	Track record of English language skills (Writing, reading and speaking)
APEL16	Track record of managing work activity skills
APEL17	Work ethics (Related to appearance, personality and time management)
APEL18	Track record of project management skills
APEL19	Malay language skills (Writing, reading and speaking)
APEL20	Acknowledgement of information certified by employer who has extensive experience in the field of expertise of the candidate
APEL21	Acknowledgement of information certified by the supervisor with extensive experience in the field of expertise of the candidate
Virtual Learning Space (VLS)	
VLS22	Allow owners to edit the information in the portfolio
VLS23	Provide space for learning materials that are collected
VLS24	Allow portfolio owners to present the information in different ways
VLS25	Allow students to send homework online
VLS26	Allow instructors to guide students online
VLS27	Allow instructors to monitor students' work online.
VLS28	Allow instructors to detect the process of online learning
VLS29	Allow students to conduct practical work to prove their level of skills and knowledge
VLS30	Enable online discussion of activities
VLS31	Provide test methods by which students can answer multiple-choice questions
VLS32	Provide test methods by which students can write a short essay
VLS33	Exhibit an overall score for the test online
VLS34	Conduct formative tests (Tests carried out continuously, i.e. during teaching and learning to identify weaknesses inherent in the process of teaching and learning)
VLS35	Conduct summative tests (Tests carried out at the end of a course or programme that aims to obtain overall information about student achievement)

APPENDIX (*continue*)

VLS36	Enable suggestions and comments by teachers
VLS37	Confirm assessment tasks
VLS38	Provide space for sharing ideas on learning activities
VLS39	Provide space to send messages concerning learning activities
VLS40	Provide space for students to reflect on learning activities
VLS41	Provide space for students to communicate with classmates
VLS42	Provide space for communication between teachers and students
VLS43	Provide space for students to communicate with other students
Competency Evaluation (CE)	
CE44	Evidence of achievement for all work activities evaluated based on Competency Unit (CU)
CE45	Cumulative Achievement Record (CAR) for the programme
CE46	Cumulative Achievement Record (RCE) for core ability
CE47	Training pathway chart
CE48	Performance evaluation of generic skills (core ability) evaluated for each Competency Unit (CU)
E-Portfolio System Operation Element (O)	
O49	Find information in the system
O50	Looking for information online
O51	Upload information (file) to the e-portfolio system
O52	Create a diverse portfolio template
O53	Produce information no longer needed in the system
O54	Perform verification of downloaded information
O55	Delete a template no longer needed without deleting the information (file)
O56	Rename information
O57	Send message by email
O58	Send a signal to consumers about new activities
O59	See the latest consumer use of the e-portfolios
O60	Receive messages using email
O61	Allow self-registration to access e-portfolio
O62	Share views with others
O63	Export all information in the system to other software
O64	Export the information in the system to other software
O65	Store information or artefacts for a certain period of time
O66	Enable portfolio owner to modify information
O67	Enable portfolio owner to download video
O68	Enable portfolio owner to download audio
O69	Enable portfolio owner to download image
O70	Enable portfolio owner to create/produce information
O71	Enable users to write and send a reflection on information
O72	Enable users to write and send a reflection on an activity

Entrepreneurial Intention among Special Needs Students

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ABSTRACT

The involvement of the disabled in entrepreneurship is low. Many initiatives have been made by the government to increase the participation of the disabled in the business field. Entrepreneurship courses are introduced to the disabled as early as primary- and tertiary-level education. This study investigates entrepreneurial intention among special needs students. The respondents of this study were 90 special needs students from polytechnics in Malaysia. This study employed components of the Theory of Planned Behaviour (TPB). Descriptive analysis found that entrepreneurial intention among special needs students is high. T-test and One Way ANOVA analyses reported that a significant difference in entrepreneurial intention between the genders and courses taken in university. This study suggests that the management of polytechnics should provide resources to the polytechnics pertaining to entrepreneurship among special needs students.

Keywords: Entrepreneurial intention, special needs students

INTRODUCTION

The disabled are identified as individuals who may have disabilities in physical, mental or both aspects since birth, or suffered a situation or condition that led to disability (World Health Organisation (WHO), 2001).

There are six types of disability registered by the Jabatan Kebajikan Masyarakat i.e. hearing impairment, blindness, physical disability, cerebral palsy, learning disability and disability identified by physicians. According to Abdullah (2012), hearing impairment is due to the loss of the ability to hear (Saari & Abd Muis, 2008).

According to the Department of Statistics, Malaysia, 10% of the total population of Malaysia is categorised as disabled. Difficulty in obtaining employment among the disabled is a major challenge for

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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them (Khor, 2002). Work is one way for people with disability to improve their quality of life and economy. From 1998 to 2007, of the 10,332 disabled people who signed up for employment, only 7567 succeeded in being placed in the private sector (Department of Statistics in Malaysia, 2011). The number is low compared with the allocation of 1% participation of special needs persons in the employment sector.

With a view to improving the standard of living and quality of this group, some studies identified factors that hinder the disabled from being employed. Edwin (2012) mentioned that facilities provided by organisations is a major constraint in hiring the disabled compared to their own intellectual ability, while attitude and personality, generic skills and productivity are also barriers for people with disabilities to entering the workforce. Besides a negative attitude towards the disabled, the perception of employers is also a barrier for those with disabilities to getting jobs. Some employers do not understand the capabilities of the disabled and lack understanding of the needs of the disabled, such as the requirement for medical expenses (Toran, Muhamad, Mohd Yasin, Tahar, & Hamzah, 2012). Age, type of disability and lack of experience are also reasons that the job application of the disabled are often rejected (Utusan Malaysia, 2008). It is clear that these factors hinder the disabled from being accorded equal employment opportunities.

Unemployment among the disabled needs to be tackled urgently due to rising unemployment figures (Osman & Rahim,

2014). Entrepreneurship is the most empowering pathway for the disabled to break out of dependency and poverty (Oyewumi & Adeniyi, 2013). Entrepreneurial intention is an aspect that should be nurtured in the disabled. Entrepreneurial intention refers to the conscious intention to pursue entrepreneurship as an income avenue. Gelderen et al. (2008) stated that individuals who have strong intention to do something have a high tendency to act upon the intention as soon as possible. Immediate efforts should be made by all concerned to create more entrepreneurs among the disabled by nurturing entrepreneurial intention in them. However, before this is done, the level of entrepreneurial intention among the disabled must first be measured.

Entrepreneurship is seen as a solution for the disabled as it can empower them to take charge of their lives and to live a more meaningful life. Polytechnics, which provide training in entrepreneurship for special needs students, are viewed as agents on behalf of the government in cultivating entrepreneurial intention among the disabled. A study by Varela and Jimenez (2001) stated that institutions of higher education have the potential to produce more entrepreneurs who are engaged in entrepreneurial activities and programmes. Hannon (2005), and Peterman and Kennedy (2003) stated that there was an improvement in the attitude, desire and perceived feasibility of entrepreneurship among respondents who participated in entrepreneurial programmes in their studies. The purpose of entrepreneurial education

in polytechnics is to expose students to becoming entrepreneurs in the real world. Upon completion of the programme, the disabled should be independent and ready for employment as entrepreneurial education in polytechnics focusses on entrepreneurial activities and programmes. However, the success of entrepreneurial programmes in polytechnics also rests on the desire and willingness of special needs students to pursue entrepreneurship as a pathway to independence and empowerment. Therefore, it is necessary to gauge through research the entrepreneurial intention of special needs students who are pursuing entrepreneurial education in polytechnics.

LITERATURE REVIEW

Entrepreneurial Intention

According to Krueger, Reilly and Carsrud (2000), the establishment of entrepreneurial intention depends on the attitude towards the treatment, and this reflects the beliefs, perceptions, and responses of the individual. Belief in entrepreneurship as a legitimate and desirable activity is very important because this influences one's attitude towards entrepreneurship. Without belief, success in entrepreneurial activities might not be possible (Krueger, Reilly, & Carsrud, 2000). According to Othman and Ishak (2009), desire to pursue entrepreneurship is also related to the attitude of the individual towards risk and self-reliance; a person who has aptitude for entrepreneurial activities exhibits a positive attitude towards risk and is more independent in behaviour. A

study done by Kuratko and Hodgetts (2004) showed that the involvement of companies in international business leads to a reduction in jobs and the interests of graduates as workers. The desire for freedom, independence and taking on a challenge is attracting students to entrepreneurial activities. Frustration at failing to get a job has made entrepreneurship the logical alternative career choice as it can bring financial opportunity and determine the desired work pattern. Hence, entrepreneurial intention can be one pathway for independence and revenue for people with disabilities.

Disability

According to Abdul Rahman and Abu Samah (2011), a person with disabilities is unable to determine the abilities themselves. Bari and Mohd Yasin (2009) stated that the hearing impaired are those lacking the ability to hear from birth or due to an accident. The disabled lack the ability to hear and speak; therefore, their communication skills are limited (Akhtar, 2003). Among the deaf, those with hearing ability of up to 90 decibels are categorised as being partially deaf, while the rest are considered fully deaf (Eymran, 2013). Among deaf students, the most common way to communicate would be to use sign language, hand codes and body language.

Theory of Planned Behaviour

The Theory of Planned Behaviour is an advanced model of human behaviour modified from the Theory of Reasoned

Action developed by Fishbein and Ajzen (1975). This theory focusses primarily on the desire to encourage behaviour that is presented. In this context, this is considered to be the ability to uncover the motivation factor that influences the presented behaviour. This study focussed on

an entrepreneurship model of behavioural competencies, the Theory of Planned Behaviour. The objective of this study was to investigate entrepreneurial intention among special needs students and to examine the significant difference in entrepreneurial intention between the two genders.

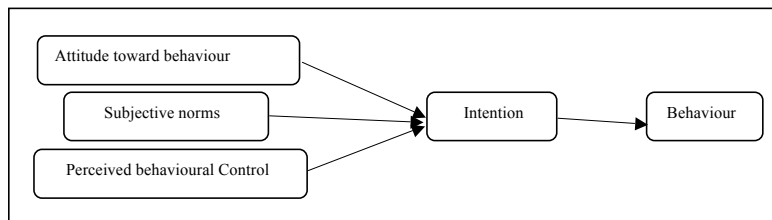


Figure 1. The theory of planned behaviour

METHOD

This research employed a questionnaire survey for data collection. The questionnaire was in Malay and it was validated by three lecturers who were experts in Generic Skills, one who was an expert in special needs education and another who was an expert in formulating content for questionnaires. The questionnaire used a 5-point Likert scale ranging from ‘Strongly disagree’ to ‘Agree’. The questionnaire was adapted from Abbas (2013). It consisted of four sections: entrepreneurial intention, attitude towards behaviour, subjective norms and perceived behavioural control. Section A attempted to investigate the respondents’ intention to be an entrepreneur and consisted of nine items. Section B was on the factors that influenced the respondents’ intention to be an entrepreneur and consisted of 12 items. Section C sought information on the respondents’ socio-demographic data

and consisted of 20 items, while Section D was on the respondents’ knowledge of entrepreneurship and consisted of nine items.

The questionnaire was tested in a pilot test involving eight special needs students from Polytechnic Sultan Salahuddin Abdul Aziz Shah. About 100 questionnaires were distributed to respondents in the three polytechnics. However, only 90 questionnaires were returned and were used for the study. The data were checked for reliability and validity. T-test analysis and an ANOVA one-way test were also conducted.

RESULTS

Frequency Analysis

A frequency analysis of the respondents is shown in Table 1. The respondents were special needs students from three polytechnics. About 72.2% of the

respondents were from Politeknik Sultan Salahuddin Abdul Aziz Shah, while close to 22.2% were from Polytechnic Kota Kinabalu and about 5.6% were from Politeknik Sultan Ibrahim. The number of male students was 42 (46.7%), while that of the female students was 48 (53.3%). The majority were Malay (n=55, 61.1%), while the rest were Chinese

(n=35, 38.9%). Three specialisations are offered in polytechnics; the most popular among special needs students is Hotel and Catering (n=36, 40%), followed by Graphic Design (n=35, 38.9%), followed by Fashion Design (n=19, 21.1%) as the least popular among them.

Table 1
Demographic – frequency analysis

Variable	Description	Number	Percentage (%)
Polytechnic	Polytechnic Sultan Salahuddin Abdul Aziz Shah	65	72.2
	Polytechnic Kota Kinabalu	20	22.2
	Polytechnic Ibrahim Sultan	5	5.6
	Total	90	100
Gender	Male	42	46.7
	Female	48	53.3
	Total	90	100
Race	Malay	55	61.1
	Chinese	35	38.9
	Total	90	100
Specialisation	Hotel and Catering	36	40
	Graphic Design	35	38.9
	Fashion Designer	19	21.1
	Total	90	100

Descriptive Analysis

The descriptive analysis of the variables for entrepreneurial intention among special needs students is shown in Table 2. The

mean score was 4.033, which was higher than 3.50, making it a high score, indicating that entrepreneurial intention among these special needs students was high.

Table 2
Mean score of entrepreneurial intention

Construct	Mean score	Interpretation level
Entrepreneurial intention	4.033	High

Table 3
Mean score analysis of entrepreneurial intention

Item	Question	Mean score	Interpretation level
Item 1	I like to do business.	3.83	High
Item 2	I like to have my own shop.	3.93	High
Item 3	I like to succeed as a trader.	3.88	High
Item 4	I like to help my family.	4.48	High
Item 5	I like the ambition to become a dealer.	4.04	High
Item 6	I would like to improve the living standard of families.	4.32	High
Item 7	I like to discuss/talk about business issues.	3.99	High
Item 8	I like to do something profitable.	3.96	High
Item 9	I like programmes related to entrepreneurship.	3.87	High

The table shows that all the items had a high mean score that was between 3.83 and 4.48. The highest mean score was for the fourth item (4.48) while the lowest was for the first (3.83). Therefore, none of the items obtained a mean score lower than 2.40, which would have indicated a low score. So, we may conclude that entrepreneurial

intention among the special needs students surveyed in this study was high.

T-test Analysis

Kolmogrov-Smirnov’s recommendation for the T-test was used for this study because there were more than 30 respondents. The significance value was 0.2 ($P>0.05$).

Table 4
Normality test for the genders

Entrepreneurial Intention	Kolmogrov-Statistic	Smirnov df	Sig.
Female	0.106	48	0.200
Male	0.108	42	0.200

Table 4 shows a significant difference ($t=2.080$, $df=88$, $p=0.05$), which is a significant value less than 0.05 ($p=0.05$),

that is, 0.040. This indicated a significant difference of entrepreneurial intention between female and male students.

Table 5
Independent T-test for gender

Level of Entrepreneurial Intention	Lavene Test for Equality for Variances		T-test for Equility of means			
	F	Sig.	t	df	Sig (two-tailed)	Mean Difference
Equal Variances Assumed	0.05	0.946	2.080	88	0.040	0.2262
Equal Variances not Assumed			2.080	86.337	0.041	0.2262

Table 6
Mean score of entrepreneurial intention between the genders

	N	Mean Score
Entrepreneurial Intention Female	48	4.139
Male	42	3.913

Table 6 shows that the mean score for the females (4.139) was higher than the mean score for the males (3.913). So, we may conclude that the mean score for

entrepreneurial intention among the female special needs students who were surveyed was higher than among the male special needs students.

ANOVA One-Way Analysis

The ANOVA test analysis was used to obtain the mean scores for entrepreneurial intention related to three courses taken by the students in order to discover if there was a significant difference in interest among the students.

Table 7
ANOVA analysis for three courses taken by the students

	Sum of squares	df	Mean Square	F	Sig.
Between groups	2.476	2	1.238	4.901	0.010
Within the group	21.979	87	0.253		
Total	24.456	89			

Table 7 shows that the significant value was 0.010, which was smaller than the alpha value of 0.05. So, we may conclude that there was a significant difference in entrepreneurial intention based on interest.

Table 8
Mean score of entrepreneurial intention related to the three courses

Courses	N	Mean Score
Graphic Design	35	3.825
Hotel and Catering	38	4.167
Fashion Designer	19	4.164

Table 8 shows that Hotel and Catering received the highest mean score (4.167), followed by Fashion Designer (4.164) and lastly, Graphic Design (3.825).

DISCUSSION

This study examined entrepreneurial intention among impaired students. Entrepreneurial intention is considered to be a motivating factor that affects behaviour, in which the intention itself shows how the person is ready to try using their effort to realise a behaviour (Ozaralli & Rivenburgh, 2016). It also explains and predicts how the cultural and social environment affects human behaviour. Ajzen (2005) stated that behaviour depended on three main elements, namely attitude toward the behaviour, subjective norms (social pressure will be felt either to do something or not) and the extent to which individuals are able to control behaviour.

Entrepreneurship has been explored to measure the tendency of motivation and determination in influencing a person's decision to become an entrepreneur. Entrepreneurship is described as a motivating factor that influences individuals to pursue an entrepreneurial venture (Hisrich, Peters, & Sheperd, 2008). This study found that entrepreneurial intention among special needs students in three polytechnics was high. Among the items tested, the highest mean score, 4.48, was for the item, "I like to help my family." This indicated that the students' motivation in pursuing

entrepreneurship was to improve the life of their family. This showed that they believed that entrepreneurial ventures could help and benefit them, and they were ready to become entrepreneurs upon graduation.

According to Othman and Ishak (2009), entrepreneurship is perceived as the relationship between the entrepreneur as an individual and how his business is framed. According to them, an individual desiring to become an entrepreneur may not have a plan regarding the type of business he will venture into, the methods of obtaining funds and other business-related issues. Although he only has the intent at this stage, he is still eager to pursue a career in business (Othman & Ishak, 2009).

This study also identified the significant difference in entrepreneurial intention based on gender. A T-test analysis showed a statistically significant difference in entrepreneurial intention between female and male students. The female students obtained a higher mean score (4.139) than the male students (3.193). Therefore, it can be concluded that the female students had a higher level of entrepreneurial intention than the male students. The results of this study are consistent with the findings of Ismail (2005), which stated that more female students are interested in entrepreneurship compared to male students. Hamid (2012) stated that women have demonstrated abilities, capabilities and skills in their respective fields. Indeed, the financial services industry shows a high involvement of women in business.

CONCLUSION

Based on the analysis of this study, the special needs students in the three polytechnics surveyed have entrepreneurship intention. However, factors related to knowledge of entrepreneurship needs to be improved, as knowledge is essential to becoming a successful entrepreneur. Lack of knowledge of entrepreneurship is one of the challenges and a prohibitive factor for involvement entrepreneurship. Therefore, the relevant authorities such as the Department of Polytechnics and the Ministry of Higher Education should play a role in designing suitable programmed and should make the effort to assist students with special needs to become successful entrepreneurs, thereby helping to reduce the unemployment rate in the country. Special needs students should be given exposure to relevant fields in order that they may acquire information, knowledge and experience necessary to succeeding in entrepreneurship. As Shane (2003) stated, proper education prepares an individual to make good use of opportunities. This is because the information and skills acquired through education can enhance the opportunity to generate good returns from a venture.

ACKNOWLEDGEMENT

This paper was fully sponsored by the Office for Research, Innovation, Commercialisation and Consultancy Management, University of Tun Hussein Onn Malaysia.

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Study on Sustainable Behaviour of Engineering Students in Technical University

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ABSTRACT

This study of the sustainable behaviour of engineering students in three technical universities in Malaysia was carried out to determine two things. First, the study seeks to find students' perception of their level of sustainable behaviour related to the environment. Second, to identify the relationship and the influence of demographic factors, internal and external, on sustainable behaviour. Three hundred and seventy-nine respondents were randomly selected from three technical universities, University Tun Hussein Onn Malaysia (UTHM), University Malaysia Pahang (UMP) and University Malaysia Perlis (UniMAP). The research method used quantitative survey using questionnaires as the research instrument. The questionnaire was divided into three parts. Part A was on demography of the students, while Part B focussed on sustainable behaviour and Part C was on the factors of sustainable behaviour. The analysis used a test score min, Pearson correlation and linear regression obtained using the Statistical Package for the Social Sciences (SPSS) software. The analysis showed that the perception of the level of sustainable behaviour of the students was high and positive. The findings also showed a positive and significant

relationship between sustainable behaviour and internal factors such as knowledge and internal motivation ($r=0.665$, $r=0.495$) and between sustainable behaviour and external factors, social influence social and external motivation ($r=0.593$, $r=0.299$). It is found that there is high relationships between knowledge, social influence, and motivation with sustainable behaviour. However, there

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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is no relationship between demographic factors and sustainable behaviour.

Keywords: Engineering students, internal and external factor, sustainable behaviour

INTRODUCTION

The training in the concept of sustainability is important for engineers in order to solve problems related to sustainability at the local and global level. Therefore, engineering students at universities must be exposed to the concept of sustainable development. Some university students show interest in global environmental issues and display a positive attitude towards the environment but they do not seem to be pro-environmental in their daily activities (Ajzen & Fishbein, 2005). These students may need to develop some key internal factors that would help them to be truly pro-environmental. Students in higher learning institutions show unsatisfactory behaviour when it comes to the environment. This is because sustainable behaviour is not habitual for them (Tan & Azman, 2011). Individual behaviour can be changed through the influence of several factors (Bandura, 1986; Othman & Amiruddin, 2010). Among them are demographic factors, external factors and internal factors. The level of individual participation in environmental preservation is still low (Nickerson, 2003).

Engineers today do not display a positive attitude towards the environmental issues as professionals, and this does not guarantee a sustainable future for the nation (Azapagic, Perdan, & Shallcross, 2005; Amiruddin & Masek, 2014). What is taught in class to students should be made real to students by exposing them to real-world scenarios (Gardner & Stern, 1996; Mohd Affandi, Amiruddin, Che Hassan, & Zainudin, 2015).

This study aimed to identify the engineering students' perception on their level of sustainable behaviour in three technical universities in Malaysia and identify whether demographic factors, internal factors and external factors that lead to sustainable behavioural can change their behaviour regarding the environment. In addition, the study also identified the factors that influence change in sustainable behaviour among these engineering students. The conceptual framework in Figure 1 shows three independent variables i.e. demographic factors, external factors and internal factors, acting on the dependant variable which is sustainable behavior. The sustainable behaviour is composed of three components i.e. perception, action and determination or intention. These variables were used to measure the perception level of sustainable behaviour and the relationship between sustainable behaviour and the three factors of the independent variables.

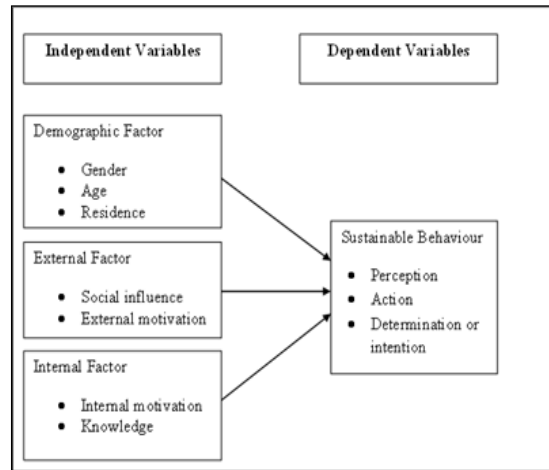


Figure 1. Conceptual framework adapted from the Planned Behaviour Model (Ajzen, 2001)

METHODOLOGY

In this study, the research method was the survey and the tool was the questionnaires. The three universities that were chosen for the study were University Tun Hussein Onn Malaysia (UTHM), University Malaysia Pahang (UMP) and University Malaysia Perlis (UniMAP), while Technical University of Melaka (UTeM) was chosen for the pilot study. A total of 379 respondents answered the questionnaires. In this study, a 5-point Likert scale was used. The section on sustainable behaviour was divided into three: B1 was on perception of the environment, B2 on sustainable actions in life and B3 on the intention or determination towards being pro-environmental. All the data were analysed using mean scores for descriptive statistics and Pearson correlation values for inferential statistics.

RESULTS AND DISCUSSION

The average mean scores for each section on sustainable behaviour are shown in Table

2. The mean score for intention or desire of students to conduct pro-environmental activities was positive and high, with 'responsibility' receiving the highest mean score. This shows that students believed that it is their responsibility to care for the environment (Samsudin & Ikhsan, 2015). There is a high and positive level of sustainable practices based on these engineering students' perception as they started to become aware of the importance of the environment. However, one item under sustainable practices showed a moderate level of sustainable behaviour among the students, 'willing to pay more for environmentally-friendly products' because the students were not willing to purchase sustainable products as they were more expensive. However, they showed interest in buying environmentally-friendly products, as this item received a high min score. The results showed that the students would buy environmentally-friendly products if the products were affordable.

Table 2
Level of perception of sustainable behaviour

Code	Section	Mean Score	Level Of Mean Score
B1	Perception of Environment	4.44	High
B2	Sustainable Action in Daily Life	4.05	High
B3	Determination or Intention Towards Being Pro-Environmental	4.10	High

Pearson correlation analysis was used to measure whether there is significant relationship between sustainable behaviour and demographic factors, internal factors and external factors. Table 3 shows the results for the Pearson correlation analysis of the relationship between sustainable behaviour and the demographic factors. The Pearson correlation analysis indicated that there is relationship between gender, age

and residence of students had a relationship with sustainable behaviour, but it was not significant. This finding is consistent with research by Bandura (1986), who also found that the demographic factors of gender and age had a relationship with sustainable behaviour. However, students' residence had a negative relationship with sustainable behavior.

Table 3
Relationship between sustainable behaviour and gender

		Gender	Age	Accommodation
Sustainable Behaviour	Pearson correlation	0.800	-0.93	-0.520
	Significant	0.122	0.71	0.311

The results of the analysis of the relationship between sustainable behaviour and internal factors is shown in Table 4. There was a significant positive relationship between environmental knowledge and internal motivation. The results show that environmental knowledge had a significant correlation with sustainable behaviour. This finding proves that knowledge of the environment has a positive relationship with

the practice of sustainable consumption (Sanacey, 2013). Indeed, sustainable behaviour is the result of the evolution of environmental knowledge, awareness and concern for the environment (Kollmus & Agyeman, 2002). Internal motivation had positive correlation with sustainable behaviour. This finding is supported by Zamhari and Ali (2014).

Table 4
Relationship between sustainable behaviour and internal factors

		Environmental Knowledge	Internal Motivation
Sustainable Behaviour	Pearson correlation	0.665	0.495

Table 5 shows the Pearson correlation values for the relationship between sustainable behaviour and external factors. There was a positive correlation between sustainable behaviour and social influence and between sustainable behavior and external motivation among the engineering students. Social factors are believed to influence sustainable behaviour (Tan & Azman, 2011). Motivation is correlated with pro-environmental practice concern for the environment is needed to be maintain

within the community (Zamhari & Ali, 2014). Social influence can shape students' sustainable behavior and encouraging them to perform sustainable practices (Amiruddin, Yunus, Mohd Hashim, Rahim, & Abd Rahim, 2015). External motivation can change sustainable behaviour through external stimuli or events (Rashid, 2007). The findings suggested that the engineering students would display sustainable behaviour when such behaviour brought them benefit only if such behaviour is beneficial to them.

Table 5
Relationship between sustainable behaviour and external factors

		Social Influence	External Motivation
Sustainable Behaviour	Pearson correlation	0.593	0.299

CONCLUSION

The results of the study showed that internal factors and external factors influence by encouraging the students' sustainable behaviour. The findings were in line with studies carried out by prior researchers that showed both factors had a positive correlation with sustainable behaviour. As for demographic factors, the analysis showed the opposite of what was found in previous studies. This is because most of the studies noted that demographic factors affected pro-environmental practices among the students. However, there are

also studies that support the findings of this study, which showed that not all the demographic factors correlated with sustainable behaviour among the students. Therefore, it can be concluded that this study of sustainable behaviour among engineering students at three technical universities in Malaysia has yielded positive results. The study also proved that engineering students display sustainable practices and are willing to apply them in their daily life in order to become engineer who promote sustainable development in line with national aspirations.

ACKNOWLEDGEMENT

The authors would like to express their appreciation to all parties who have contributed to this research, especially the Office for Research, Innovation, Commercialisation and Consultancy Management (ORICC) and Centre of Diploma Studies (CeDS) UTHM, Johor. We are also grateful for having been awarded the Short Term Grant, (STG) Vote U387.

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Relationship between Employability Skills towards Career Management among Vocational Students

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ABSTRACT

Technical Vocational Education and Training (TVET) is an important route for vocational education and skills development in Malaysia. Vocational college, Kluang, Johor offers several elements of career management that are applicable to students; for instance, they are taught to always believe in themselves so that they can make informed choices related to careers and secure the best job available. The objectives of this paper are to find and analyse the similarities and linkages between employability skills and career management. The findings will be recommended to education institutions so that they can produce students highly sought-after by the industry; in addition, these students are equipped with practical and soft skills and are ready to take up jobs in the real-world workplace. A quantitative survey in the form of a questionnaire is used as an instrument for the purpose of this study; Likert scale is employed to help respondents give appropriate answers. The population for this study comprises 210 third-semester students from Vocational College Kluang, Johor; the sample consists of 90 people drawn from the population. This study uses mean score, standard deviation and analysis of variance (ANOVA) for statistical measurement. Results of this study taken will be shared with vocational colleges, which may use the findings to improve the employability skills of students. The findings will also be utilised to shape academic and vocational modules as well as the process of teaching and learning. Generally, this paper introduces the new concept of building a relationship between employability skills and career management for vocational students. This model is

important and should be developed because self-knowledge and career-related skills are associated with career management and employability skills, which are vital topics for students.

Keywords: Career management, employability skills, vocational students

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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INTRODUCTION

The transformation of vocational education began in 2013; it emphasised the practice of industrial or technical internship, which indirectly lightens the burden of student academic composition. The system of technical and vocational education is intended to play an important role in training skilled workers and professionals who can meet all the demands of employers or industry (Hamzah, Bakar, & Kazilan, 2006).

The identified employability skills and other aspects related to students that the education system must address include the following: communication skills, technology, skills in planning and managing activities, skills of working with others and in groups, problem-solving skills, management skills, ability to select and analyse information, skills and techniques of applying mathematical concepts and skills of understanding culture. The addition of employability skills to the curriculum will give students an early preparation for their future career to ensure they are ready to work when they enter industry (Kwok, 2003).

Every employee must possess the essential elements of employability skills so that he or she can be a versatile worker, has initiative and ability to solve different problems and can handle different tasks. Very often, employability skills are associated with personal image, attitude, behaviour, habits, and ways of communicating with others, problem-solving and decision-making skills and organising skills. Knight and Yorke defined employability skills

as a set of achievements, knowledge and personal attributes that enable individuals to get jobs easily and be successful in their chosen occupation (Knight & Yorke, 2004).

The characteristics and nature of the work itself demand workers who have employability skills; jobs today require individuals who have the power of initiative, flexibility and ability to assume different roles for different types of work. It is imperative for students to master employability skills in preparation for real-world employment. According to Cox and King, students should prepare themselves for their future career by diversifying into various skills available i.e. technical or employability skills that can help them in their future career (Cox & King, 2006).

In addition to employability skills that are necessary to prepare students to enter the job market, career management is also important for career planning, self-preparation, decision-making, adaptability and productivity enhancement. Most teenage students do not know the direction of their career after leaving school (Damiri & Yahaya, 2004); with this aimlessness, it is difficult for them to plan their future in line with the skills they have acquired. Vocational college, Kluang, Johor offers elements of career management that are applicable to students; for instance, they are taught to always believe in themselves so that they can make wise choices related to careers. When a person has to make a choice related to career, he or she must look at it from various angles associated with the chosen profession such as ability, qualification,

aptitude and personality (Islam, Hamid, Shukri, & Abd Manaf, 2013). They should also be smart in managing their career once they have launched into it; they must be careful to choose jobs that suit their interests and personality, as this is an essential aspect that will ensure a successful career.

Career management can be viewed as the ability to build a career and intentionally manage the interaction of work, learning and other aspects of an individual's life (van Acker & Bailey, 2011). The benefits of career management have been acknowledged in terms of individual and social well-being (Raybould & Sheedy, 2005). A less-promoted area is the contribution of career

management skills to economic growth through employability, productivity and education or work efficiency (Bridgstock, 2011).

In the context of employment, skills are abilities that are discrete, something developed by an individual through his or her ability to perform various activities with intelligence (Van Acker & Bailey, 2011). In the context of this study, according to Harvey, individuals' employability skills are closely linked to the job market (Harvey, 2001), and employers urgently need workers who are qualified to maintain or increase the productivity of their company (Juhdi, Pa'Wan, Othman, & Moksini, 2010).

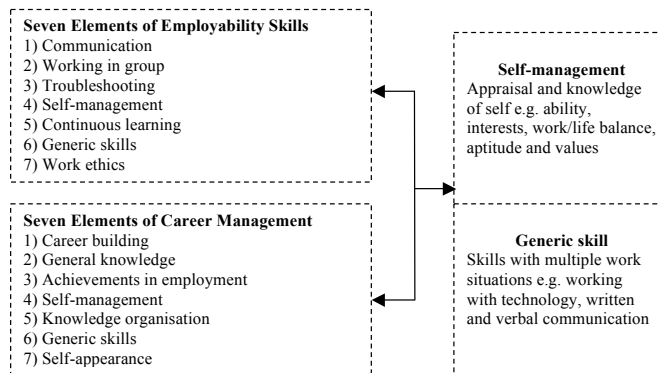


Figure 1. Conceptual model of the relationship between employability skills and career management
Source: Curriculum Standard of Vocational College

Figure 1 show that career management is essential to employability skills, as they play a large part in determining which, when and where generic and specific skills are learnt and used.

Career selection is the process of career development, according to Ginzberg (1971). The result of choosing a career will determine

the pattern and the role practised by an individual in society. Caplow stated that career choice is an important determinant of status and position in society (Caplow, 1954), and this status has an impact on the value of life, attitude, style and personality (Douglas & Shepherd, 2002). There are various career theories developed that are

used by researchers in their study of career fields. Some of the theories are approaches leading to a very clear structure such as the theory of traits and factors, the Holland theory and the theory of Anne Roe (Sidek, 2006). The theory of Super was founded by Donald E. Super, who also used the process approach (Super, Starishevsky, Matlin, & Jordaan, 1963).

Other factors that influence an individual to balance between personal life and the reality of work include opportunities for education, work experience, aspirations, changes, changes in financial resources and requirements of the labour market. According to Ginzberg, level of education is important in making career choices (Ginzberg, 1971). The other factor is level of education that also can determine the type of work suitable for a person. With a high level of education, there is a better chance of getting a better job; with only primary education, the chances of getting a good job are slim (Mustapha, 2011).

A module on employability skills and career management integrates elements of both that are useful for students. These elements include self-management skills and team skills. On the positive side, industry generally requires workers who can meet their needs, and this is the main criterion for the selection of industry workers. The aim of this study was to develop a pattern of measurement for knowledge, skills, capabilities and behaviour, all of which are key factors to success in one's career. This is important because researchers can analyse similarities and relationships

between employability skills and career management, both of which are required by students to meet the needs of industry and to be highly capable workers in the workplace.

METHODOLOGY

Descriptive and inferential surveys were conducted to collect quantitative data. Students were selected from the Electrical and Electronic Technology Engineering Department, Vocational College, Kluang, Johor. The purpose of the study was to investigate elements of employability skills and career management.

Population and Sample

The researchers used the quota sampling technique to select suitable respondents. This procedure ensures a balanced number of respondents.

Research Instrument

The instrument was a questionnaire consisting of two parts. Part A was designed to obtain background information such as gender and courses taken. Part B was to identify the elements of employability skills and career management based on the students' perception; both employability skills and career management had seven elements each.

The skills framework used in this research was the curriculum of the college. Both employability skills and career management had 82 item indicators each, as shown in Table 1 and Table 2.

Table 1
Item indicators of elements of employability skills

Elements of Employability Skills	Number of Items
1. Communication	1-17 (17 items)
2. Problem solving	18-32 (15 items)
3. Lifelong learning	33-42 (10 items)
4. Self-management	43-52 (10 items)
5. Work ethics	53-60 (8 items)
6. Working in a group	61-74 (9 items)
7. Technology	75-82 (8 items)

Table 2
Item indicators for element of career management

Elements of Career Management	Number of Items
1. Career building	1-17 (17 items)
2/ General knowledge	18-32 (15 items)
3. Achievements in employment	33-42 (10 items)
4. Self-management	43-52 (10 items)
5. Knowledge of organisation	53-60 (8 items)
6. Generic skills	61-74 (19 items)
7. Self-appearance	75-82 (8 items)

Table 1 shows the item indicators for the seven elements of employability skills, while Table 2 shows the item indicators for the seven elements of career management. This study was reviewed by four experienced academics. A pilot study conducted had an overall Alpha value of more than 0.7. Examples of the values obtained are: lifelong learning (0.9), work ethic (0.906) and self-management (0.948) for employability skills, while for career

management they are: general knowledge (0.908), employment (0.926) and generic skills (0.954). The findings of Part A were analysed to find frequency and percentage of the respondents' demographics, while those of Part B were calculated to find the mean. A 5-point Likert scale was also used to interpret the data. The instrument used was the survey questionnaire, which was the most appropriate method to achieve the objectives of this study. This method also helps respondents to easily select answers. The information obtained from the questionnaire was encoded and then keyed into a computer data file for further action. The respondents were students of the vocational college.

RESULTS

Table 3 shows the number of respondents and their gender for demographic sampling. Table 4 and Table 5 show the mean scores and standard deviation for the elements of employability skills and career management. This was done to answer the first research question: "What is the rank of the mean scores for the elements of employability skills and career management among vocational students?"

Table 3
Respondents' demographic distribution

Gender	No.	Percentage
Male	49	54.4
Female	41	45.6
Total	90	100

Table 4
Mean scores and standard deviation for elements of employability skills

Variables	min	SD	Score mean	Rank
Achievement in employment	3.87	0.47	High	2
Self-management	3.80	0.51	High	4
Knowledge of organisation	3.77	0.59	High	5
Generic skills	3.67	0.46	High	1
Career building	3.92	0.64	Medium	6
General knowledge	3.75	0.69	Medium	7

Table 5
Mean scores and standard deviation for elements of career management

Variables	min	SD	Score mean	Rank
Communication	3.93	0.53	High	2
Problem solving	3.79	0.62	High	3
Self-management	3.94	0.67	High	1
Lifelong learning	3.47	0.46	Medium	5
Work ethic	3.41	0.59	Medium	6
Working in a group	3.41	0.59	Medium	7
Technology	3.51	0.67	Medium	4

The mean scores obtained for the elements of employability skills are as follows: communications, problem solving and self-management skills were at a high level, while lifelong learning, work ethic, working in a group and technology were at medium level. The elements of career

management that record a high mean score were achievement in employment, self-management, knowledge of organisation, generic skills and self-appearance, while the elements of career management that had medium mean scores were career building and general knowledge.

Table 6
Relationship between employability skills and career management

Relationship		Career Management	Employability Skills
Career Management	Pearson	1	0.754**
	Correlation Sig. (two-tailed)		0.000
Employability Skills	Pearson	0.754**	1
	Correlation Sig. (two-tailed)	0.000	

Table 6 shows the relationship between employability skills and career management. The value of $r=0.75$, indicating a strong positive correlation between employability skills and career management among the students. This test showed a significant correlation between employability skills and career management, with $p<0.1$. This means that the null hypothesis of this study was successfully rejected. The result clearly shows that there is a relationship between employability skills and career management. The results suggested that students who can manage a good career are those who have a high level of employability skills.

DISCUSSION AND CONCLUSION

The results of the study showed that vocational college students: are always ready to learn new skills; they have the potential to assume high positions in an organisation; have good social skills and can mix with others; and are responsible people who can keep secrets or official information (Raybould & Sheedy, 2005). Learning science is the search for personal or professional escape time, voluntarily and due to self-motivation; it is also the development of human potential through the learning process. Continuous effort is needed to motivate individuals to acquire knowledge and values necessary to live confidently and creatively so as to face the challenges of life (Juhdi et al., 2010). The findings showed a significant relationship between students' employability skills and their career management skills. This

finding is supported by Bridgstock (2011), whose study led to the conclusion that students' career management skills are a key element in the development and establishment of a country's economy. Institutions of vocational education clearly play a significant role in developing and shaping this process by financing strategic work and improving teaching and education so that their graduates can get a job. With employability and management skills, vocational graduates can meet the requirements of the job market and industry; in addition, they will be of high calibre and possess an adequate level of education to take on responsible jobs in the workplace.

Finally, students need to develop career management skills early on in vocational college. They must have acquired employability skills by the time they graduate with a vocational certificate in Malaysia. Other parties such as industry, parents and lecturers must work together to build and shape students' self-management and generic skills because the skills learnt through daily activities concerning the environment, behaviour and attitude will encourage them. Lecturers and counsellors have to cooperate with industry in giving guidance and inspiration to students, which will help them to acquire more employability skills in order to be excellent workers. Students need guidance in the course of their study and training, and it is a big responsibility for the college to provide them with relevant education, which will fulfil the requirements of industry.

ACKNOWLEDGEMENT

The authors would like to thank Universiti Tun Hussein Onn Malaysia (UTHM) for funding this research under the contract research grant RAGS-RO65. The authors would also like to express their appreciation to the Research Centre, UTHM for providing the facilities to perform this research.

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Social Skills and Social Values (SSSV) in the National Dual Training System (NDTS)

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ABSTRACT

Employers are expecting to hire graduates who can function as employees who are equipped with various skills and excel in social skills and social values (SSSV). Industry has high expectations of the ability of graduates, and it is now paramount for graduates not only to be equipped with academic qualification but with SSSV as well to be more marketable in a job market that has become intensely competitive so as to land the most lucrative job industry has to offer. Employers now assume that those who lack SSSV are ill-prepared to enter the job market. The opinion is that training institutions are accountable for producing balanced and multi-talented graduates who are competent in both technical and non-technical skills. In this paper, we have used the focus group (FG) to distinguish the SSSV problems faced by the National Dual Training System (NDTS) apprenticeship based on the perspective of the trainers. This study is an expansion of the existing SSSV outlined in the handbook by the Malaysian Ministry of Human Resources. The respondents in this study were NDTS trainers of public and private skills training institutes that offer the NDTS programme. Four FGs were carried out. The data were analysed using the Atlas.ti software based on thematic analysis strategy, and a few themes were identified from the analysis. The majority

of the trainers provided positive feedback on the technical skills of the apprentices. In addition, a few other issues were raised by the trainers regarding the SSSV of the NDTS apprentices.

Keywords: Focus group (FG), National Dual Training System (NDTS), social skills and social values (SSSV)

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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INTRODUCTION

The changing environment of the modern workplace, rapid high technological development and application in combination with the emergence of a knowledge-based economy (K-economy) to sustain economic growth have demanded a labour workforce equipped with a set of skills that are essential for employability. Nowadays, employers are looking for entry-level workers who have high-level skills, knowledge and personal qualities to complement job-specific skills, develop job scope and transform the organisation (Rosenbaum, 2001; Lankard, 1990). Recent studies conducted in various developing and developed countries found that graduates do not have the required skills for the working environment (Tymon, 2013; Cumming, 2010; Heaton, McCracken, & Harrison, 2008). The studies revealed that employers rated the following as major desirable employee traits: punctuality, awareness of responsibility, cooperation with the supervisor, good attitude towards work, willingness to adapt and learn, ability to coexist with other employees, perfect and fitting appearance, perfect and consistent work attendance, familiarity with fundamental computer skills and learning and good communication skills. In fact, many empirical studies conducted in both industrialised and developing countries on the effectiveness of entry-level staff from the perspective of employers expressed dissatisfaction with the level of readiness of entry-level employees (Zakaria, 1998). Various countries across the world have conducted research and published reports on

the need to prepare apprentices or students for the adult workplace of today and the future (Bhaerman & Spill, 1988; Cox & King, 2006).

A knowledgeable, competent and disciplined workforce with a strong sense of creativity is an important element in realising Vision 2020. Based on this scenario, the Department of Skills Development under the Malaysian Ministry of Human Resources plays a noteworthy part in supporting the advancement of knowledge workers (K-workers) to build a knowledge-based economy as a strategy for perpetuating rapid growth and continuous competitiveness towards achieving Vision 2020. Among the issues and challenges from the perspective of the Malaysian government is holistic human capital, which includes knowledge, skills and attitude, and a highly skilled workforce to support a K-economy as well as career paths and jobs for local youth (Master Plan for Malaysian Occupational Skills Development and Training, 2008-2020). The main challenge to industry's point of view is incompetence and little emphasis on occupation aptitudes such as cooperation, problem solving, business know-how and the ability to learn how to learn. There are also issues and challenges faced by training providers and apprentices that highlight the shortage of competent trainers and assessors. Thus, there is a requirement to amend the curriculum with a demand-driven approach and the need to create a new learning environment based on self-learning and learning through experience (Master Plan for Malaysian Occupational

Skill Development and Training, 2008-2020). Consequently, the objectives of the Master Plan is to produce K-workers by emphasising social skills and social values (SSSV) through the most recent training methodologies and extensive aptitudes, the National Dual Training System (NDTS).

The NDTS approach has been demonstrated in developed countries such as, for example, Germany to create talented and skilled labourers through collaboration between public training institutes and private industry in apprenticeship training. This training technique permits a persistent supply of talented and skilled labourers to meet industry demand. The most distinguishing feature of NDTS compared to other skill training programmes is the requirement for trainers and coaches to integrate SSSV explicitly in the conduct of teaching and learning technical content. The quality of NDTS lies in the blend of specialised ability and human-based competency (Sail et al., 2007, p. 5).

With reference to a survey on Malaysian students' employability skills, Malaysian employers indicated that while graduates are exceptional in their field of specialisation, they are shockingly lacking in soft skills (Juhdi, Yunus, & Samah, 2006). As indicated by the City and Guilds Centre for Skills Development Final Report 2008, satisfaction of Malaysian employers with the quality of their employees' training in technical specialisation is higher than the quality of training in generic skills. The report also indicated that Malaysian employers believed that school-leavers with vocational

training have preferable job employment opportunities. Nonetheless, they are less satisfied with the inspiration, communication skills, interpersonal skills, critical thinking and entrepreneurial aptitudes of academic graduates. This obviously demonstrates that non-specific aptitudes ought to be embedded in vocational training programmes. In response to these challenges and issues, the strategy for generating skilled trainers has to be comprehensive and integrated.

Statement of the Problem

In the implementation of NDTS programmes, the trainer is a noteworthy player in training either in the work environment or training institutions. At the training institutions, trainers must prepare the technical theory and non-technical subjects. In addition, trainers need to organise apprentices and guarantee that all training exercises meet the academic module prerequisites.

The government has introduced and implemented the latest and most comprehensive skills training approach to meet the current industrial requirements by emphasising social skills and social values (SSSV) (National Vocational Training Council [NVTC], 2005). Therefore, trainers are required to embed these SSSV unequivocally in teaching and learning of technical content. In this regard, trainers are expected to play an important role as facilitators to develop the employability skills required by the apprentices. To keep pace with rapid technological advancements in their occupational field and in the teaching profession, vocational trainers need to be

more knowledgeable than ever before. Trainers should be well aware of and understand the value of employability skills for apprentices. Furthermore, they should have the ability to integrate these skills during the learning process. Trainers must govern two important dimensions in the implementation of NDTS training, namely the social dimensions and the occupation-specific content of the work.

Vocational trainers need to be aware of and possess positive attitudes towards teaching employability skills if they are to apply or integrate them in planning their training programmes. Therefore, due to the lack of research into this matter, the researcher, who has experienced and been involved in trainer training programmes, feels strongly that this study needed to be carried out to explore the attitudes of trainers in vocational training institutions towards employability skills. This study was undertaken to encourage the capacity of trainers to exchange and apply ability and knowledge into new circumstances and situations of vocational training.

Purpose of the Study

This study fills in the wide gap related to employability skills in the Malaysian context. The focus on NDTS apprentices as the target group is to fulfil the current needs and demands in empowering skilled workers' contribution towards the national economy. Specifically, the objective of this study is to recognise the necessities of SSSV in the NDTS programmes from the

perspective of the trainers in public and private training institutions.

METHODOLOGY

Focus groups (FG) discussions were chosen for this study to explain situations and current issues regarding the NDTS apprentices' SSSV as this study applied explanatory research methodology (Neuman, 2012). FGs are capable of generating discussions that expand ideas on certain matters (Macnaghten & Myers, 2004). The focus group is characterised as a research technique that utilises group interaction as an instrument to gather information (Morgan, 1996); this matches Berg and Lune's (2014, p. 166) depiction of FG as an interview method for small groups that is handled by moderators. The benefit of this technique is that it permits the researcher to investigate into people's encounters (Vaughan, Schumm, & Sinagub, 1996). Thus, this study utilised qualitative data based on the focus group methodology to detail the trainers' personal encounters of SSSV in their training institutions.

This study selected a sample of public and private training institutions through a network of professionals. The sample in this study was representative of the various fields of work in which researchers have been attempting to contact as many participants from various institutions, both public and private skills training institutions. Forty respondents were reached through email to be given a description of the study. Of the 40, only 30 were willing to participate in

the study, of whom only 29 attended the FG sessions. All the participants had at least five years of training experience and represented the central regions of Selangor, Perak and Kuala Lumpur. From the participants, four FGs were formed, (N=7) and (N=8) who worked in various trades from different institutions.

Procedure

The FG sessions were controlled by moderators who facilitated the discussions that lasted approximately 150 to 180 minutes. The moderators ensured that the discussions were completed on time, periodically reminded the participants of the time constraint and asked them to conclude each opinion (Liamputtong, 2012). Morgan (1996) stressed three items that must be considered before any FG takes place. Firstly, as the FG is a method that is specific for gathering data, researchers must ensure that as much data as possible are collected. Secondly, as interaction during the FG is the prime source of data, all panel members should take part actively in the discussion. Lastly, the moderating researchers must participate actively to ensure the smooth running of the discussion so that no participant feels left out. If all the guidelines are adhered to, the discussions should run smoothly, be focussed and provide significant and useful information for the study (Hennink, 2007). Finally, the discussions should end with the moderator thanking the panel for their invaluable contribution and participation.

In the analysis, the coding themes relied on themes that have been published in past studies (Sail & Alavi, 2010). We first transcribed verbatim interviews using Digital Voice Editor 3 for each session. The transcripts were inspected thoroughly several times to get a complete viewpoint of the subject matter. The data were then analysed using the Atlas.ti version 7.5.9. Content analysis was conducted by the first author to identify key themes that emerged in the FG sessions. Interpretation of the data was done using standard analysis by Kvale (1996) to avoid bias as well as by other scholars who were involved with SSSV to validate the analysis. The themes were then matched and in the case of any conflict between the themes, the first author made adjustments to ensure that there was consensus on the themes. By using this method, the themes of this study could be categorised into technical competencies, learning and methodological competencies and efficiency of SSSV. However, the researchers created a new theme that arose from the analysis.

RESULTS

Despite the trainers' personal viewpoints of their experiences and the nature of SSSV at the first level of analysis, the FGs uncovered that SSSV were conceived similarly among Malaysian trainers as they are in Western nations. Most of the participants highlighted the same recognisable variables examined in developed countries and in Western research literature. This could explain how

globalisation has affected trainers by both developed and developing nations' work settings. As delineated in Appendix A, from the 241 statements recorded for analysis, we found that communication was portrayed as the most critical SSSV (25 statements), contrasted with technical competence and learning and methodological competence, as it reflects the capacity of a worker and how well he performs in an organisation.

The research findings provide evidence on the issues affecting NDTS apprentices. In general, the trainers supported the government's efforts on implementing the NDTS programmes, but a number of initiatives were incomplete due to financial constraints and a lack of apprentices. Based on the analysis, a few themes were identified and for each element studied there was a relationship with each individual SSSV.

Technical Competence

The findings from the FG sessions highlighted the fact that a majority of the trainers were satisfied with the NDTS technical apprentices' level of competency and ability. Initially, the trainers felt that NDTS graduates could adapt well in the workplace. This perception might be due to the fact that the training and workplace environments are quite similar. Apart from that, the trainers responded positively towards the NDTS graduates' ability to handle industrial equipment. The perspective was expected as each apprentice had already experienced handling similar equipment as they had spent 70 to 80% of their training time at industrial training institutions.

Learning and Methodological Competence

Every job requires workers to be knowledgeable and competent in order to perform well in it. The findings revealed positive feedback from the trainers on the NDTS apprentices' job competencies. However, a few trainers acknowledged that some apprentices might need more time to understand theoretical elements of given tasks. Providing more drills during training might trigger the interest of apprentices to learn additional knowledge to enrich their daily tasks.

Human and Social Competence

Human and social competencies form the social skills and social values (SSSV). Here, social skills refer to the approaches that one applies to communicate, solve problems, make decisions, manage self-discipline, work in a team, evaluate conceptually, interact with others and multi-task based on priorities. Meanwhile, social values are the self-beliefs or attitudes towards what is considered good, proper, appropriate and beneficial, among others, in the context of social relationships. Among the social values that an employee should have are work commitment, independence, concern and interest, high self-esteem, creativity and originality and loyalty (Sail et al., 2007, p. 73).

The trainers' perception of SSSV is important compared to occupational knowledge as it reflects the ability of workers and how well they perform in an

organisation. As illustrated in Appendix B, the findings showed some invaluable feedback on the NDTS apprentices' display of SSSV.

Interestingly, based on the analysis, a few new themes were identified, such as workers' mobility and entrepreneurship.

Workers' Mobility

Workers' mobility is a phenomenon that occurs when NDTS graduates are offered a better work package in terms of salary, position, facilities and environment. This affects their decision in choosing a new company or making a job hop. However, in terms of hair grooming and beauty care, mobility helps them improve their skills and experience.

Entrepreneurship

Findings from the study showed that NDTS graduates needed to be equipped with skills to add value in entrepreneurship to expand their potential in business. Added value can enhance their independence, leading them to earn a higher income compared to salaried workers. However, one employer in the automotive sector felt differently, explaining that the option to run a business depends on personal interest.

DISCUSSION

The social skills that were often highlighted by trainers were ability to communicate, ability to make decisions and ability to lead.

Overall, the majority of the respondents showed support for the NDTS programmes. They hoped that it would be continued and improved. Hence, continuous support and guidance from the management of the Department of Skills Development is needed to ensure that the target figure for competitive workers is achieved and fulfilled by the year 2020. More effective exposure must be introduced to increase the enrolment of NDTS apprentices in the work sector, apart from enhancing public awareness of the importance of skilled workers in the quest to achieve the status of developed nation.

CONCLUSION

This study found that NDTS trainers need workers who are not only skilled in technical ability but also in attitude and personality to positively impact their work performance (Rasul, Rauf, Mansor, Yasin, & Mahamod, 2013). It is hoped that the findings will provide the authorities concerned a clear picture of the actual scenario in the implementation of NDTS training schemes, especially in terms of employability.

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APPENDIX A

Table 1
Competencies in National Dual Training System (NDTS)

Competencies	Number of Statements
Communication Skills	25
Teamwork	20
Punctuality	17
Problem-solving skills	15
Technical skills	15
Self-learning of theories	15
Critical thinking	10
Entrepreneurship	10
Ability to multi-task based on priorities	10
Ability to handle industrial equipment	9
Decision making	9
Workers' mobility	9
ICT	9
Inclination to learn varied daily tasks	8
Learning skills	8
Job opportunities	6
Self-discipline	6
Self-esteem	5
Ability to work in various situations	5
Self-confidence	5
Leadership	4
Responsibility	4
Evaluation of concepts	4
Independence	3
Obedience	3
Creativity and originality	3
Industrial collaboration	2
Work commitment	1
Loyalty	1
Total	241

APPENDIX B

Table 2
Feedback on the NDTS Apprentices' SSSV

Feedback	Respondent
“We organise English Day once a week. Every Thursday is designated as English Day; hence, everyone is expected to communicate using English... It’s okay if they use broken English... we don’t mind. We will correct their usage.”	Training Centre A
“It is not easy to control the NDTS students. They do not stay in the hostel, some will go back to their rented house and just loaf around with their friends. We are not happy... they enrol in the programme because they want the money, not because they want to study. We have no choice, but we have to appeal to them to come to class. It is the wish of their parents, not their own choice. However, there are also some who are good... very diligent.”	Training Centre B
“The apprentices are skilled... they can do their jobs... However, when it comes to soft skills, they are quite poor at it. They do lack some skills. The problem is, we are not too sure how to train them to improve their soft skills.”	Training Centre C
“So far, we do not have the experience to teach soft skills. In fact, we were not exposed to teaching social skills and soft skills. We just did what we thought we knew about soft skills. We focus on technical skills.”	Training Centre D
“In my opinion, there should be certain procedures to learning social and soft skills. We train them based on what we understand. There are trainers who teach in the form of theories, while there are others who take the students for activities outside the classroom. It all depends on our own creativity.”	Training Centre E
“To me, soft skills is not something that can be taught in the form of theories. We need to expose the students to actual situations in industry. There are quite a number of trainers who are baffled about how to teach soft skills.”	Training Centre F
“We feel that it is very important that we get a good explanation on how to teach soft skills... as we are just doing what we think is right.”	Training Centre G



Factors Contributing towards Malaysian Technical University (MTU) Students' Mental Health

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ABSTRACT

Mental health is related to depression, anxiety and stress, all of which affect the individual. Without good mental health, developing one's potential is difficult. Therefore, identifying the main factors affecting mental health is important to ensure the individual is capable of handling pressure and stress to accomplish given tasks well. Even though much research has been done to determine the factors that contribute to mental health, findings on the cause-effect relationship between the factors and mental health specific to engineering students is limited. Thus, this paper addresses the factors that are directly related to the mental health of students in technical universities in Malaysia. The survey research design was used in this study. The sample consisted of 379 students from three Malaysian technical universities (MTU), namely Universiti Tun Hussein Onn Malaysia (UTHM), University Technical Malaysia Melaka (UTeM) and Universiti Malaysia Perlis (UniMAP). The Depression, Anxiety and Stress Scale 21 (DASS-21) inventory and a questionnaire developed by the researchers were used to measure the students' mental health based on three elements (depression, anxiety and stress) and the factors affecting mental health (self-evaluation, living style, health, learning environment, parents, peers, lecturers, academic factors, financial factors and the lost). The data collected were analysed using frequency, percentage, mean and multiple linear regression. Based on the analysed data, a regression equation for the relationship between the various factors that contribute to mental health

level was formulated. Counsellors and lecturers may use the developed formula as a reference when dealing with mental health issues affecting engineering and non-engineering students.

Keywords: Anxiety, depression, Anxiety and Stress Scale 21 (DASS-21), factors, mental health, stress

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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INTRODUCTION

Mental health is a circumstance of well-being in which the individual realises his or her own ability, can cope with the normal stresses of life, can work productively and is able to make a contribution to the community (World Health Organisation (WHO), 2012). Mental health is a very significant aspect of each phase of human life and is as important as physical health (Lee & Ahmad, 2016) but many tend to overlook this aspect of their well-being. In fact, mental health is directly related to daily life activity performance of not only children and youth, but adults and the elderly. Based on the definition of mental health, each individual must be aware of his or her capability and ensure that he/she can handle pressure well, work productively and be able to contribute to society (WHO, 2012). Mental health deficiencies can lead to common social problems that often occur in Malaysia, such as nervousness or feeling afraid for no reason, inability to sleep, poor achievement in learning and the desire to be alone. Statistics show that 1% of the total Malaysian population of 28.3 million persons struggle with mental illness and 20% are faced with mental health problems, and the most common mental problems are depression, stress and anxiety (Bernama, 2013).

This finding is in line with research findings on the mental health of engineering students, which indicated that about 1% of them tended to have a specific intervention in depression, about 18% tended to have a specific intervention in anxiety, and 1.5% tended to have a specific intervention in

stress (Lee & Ahmad, 2016). This outcome seems to be due to the current education system in Malaysia, which requires students to work hard and put in more effort to achieve the high demands of the system (Ferlis, Rathakrishan, & Ismail, 2009). As a result, students feel pressured. In addition, the changing urban society has directly impacted on students' mental health. Thus, the Malaysian government needs to look into mental health issues seriously, following the release of suicide case figures by the Health Ministry recently (Lee & Ahmad, 2016).

Stress is commonly experienced by university students. Mental health problems among students are increasing, and this is worrying. Action is needed as university students are the future leaders of the country (Lee & Ahmad, 2016). The key cause is pressure exerted by academic and environmental factors that can result in depression, anxiety, insomnia and attempted suicide. Consequently, the development and productivity of the students are affected. Students' mental health needs to be addressed seriously to avoid unwanted situations from happening. According to WHO (2012), the issue of mental health problems is expected to increase by 15% by 2020. Zivin, Eisenberg, Gollust and Golberstein (2009) proved that mental health problems among students are increasing every year. Students studying in institutions of higher education tend to experience serious mental health problems at a greater rate than their peers who are not students (Hamdan-Mansour, Halabi, & Dawani, 2009). This was also reported by

Chen et al., (2011), who stated that second-year students in institutions of higher learning experience high stress levels.

Engineering and non-engineering students suffer from different mental problems. Al-Qaisy (2011) stated that students pursuing the humanities (science, education, literature, administration and finance) having high depression compared to students in scientific fields (science and engineering). In addition, Ali et al. (2014) stated that the number of engineering students who suffered from depression was higher compared with that of medical students. Regardless of programme, the mental health of students in institutions of higher learning should be taken seriously and help given to those affected in order to enhance their academic achievement. This study was conducted to identify the dominant factors affecting the mental health of engineering students. The findings of this research allowed a model showing the relationship between the various factors that contribute to mental health level to be constructed.

METHODOLOGY

The research design for this study was the survey method using the quantitative approach. The advantage of conducting a survey is that the data can be collected directly from respondents and the results can be generalised to the population. The samples consisted of undergraduates from three Malaysian technical universities (MTU), namely Universiti Tun Hussein Onn

Malaysia (UTHM), Universiti Malaysia Perlis (UniMAP) and the Technical University of Malaysia Melaka (UTeM). A total of 379 students from engineering and non-engineering faculties were selected randomly as respondents. The instrument used for data gathering comprised the 21-item DASS inventory (Lovibond & Lovibond, 1995) and a questionnaire developed by the researchers.

The Malay version DASS inventory was used to measure mental health by investigating the presence of three mental health states namely, depression, anxiety and stress. The DASS inventory consisted of 21 items that were translated and tested to fit the characteristics of Malaysian students (Psychology Foundation of Australia, PSY, 2013). The DASS inventory has been widely used to measure psychological parameters in many studies among clinical and non-clinical populations. Also, it has been broadly used as a research tool in measuring psychological aspects similar to those of this study (PSY, 2013). A set of cut-off scores developed by Lovibond and Lovibond (1995) was used to describe the level of mental health.

Also used was a questionnaire developed by the researchers consisting of 57 items to measure 10 factors commonly found to affect mental health namely, self-evaluation, living style, health, learning environment, parents, peers, lecturers, academic factors, financial factors and the lost. These factors were identified through a systematic literature review followed by a pilot test

using the Cronbach's Alpha value as the reliability indicator. The overall Cronbach's Alpha value for this questionnaire was 0.79, which indicated that the internal consistency was quite favourable. The questionnaire was also validated by four experts comprising a psychologist, counselor, doctor and Malay language practitioner.

The data collected were analyzed using frequency, percentage, mean, the Mann Whitney U Test and multiple linear regression. Descriptive statistics were used to determine and describe students' mental health level and the dominant factors affecting mental health. The Mann Whitney U Test was used to identify the difference in mental health scores between engineering and non-engineering students, while multiple linear regression was used to construct an equation for describing the relationship between the various factors that were found to contribute to mental health level.

RESULTS AND DISCUSSION

To determine the students' mental health, the data collected were analysed based on three mental health states, depression, anxiety and stress. The level of mental health was measured as five levels: normal, mild, moderate, severe and extremely severe. Those indicating normal, mild and moderate levels would need general intervention, but those indicating severe and extremely severe levels would need specific intervention for their mental health problem.

Table 1 shows the mental health levels of the students surveyed. The findings indicated that the majority of the students enjoyed normal mental health in the three different mental health states. However, about 11.3% of the students tended to need specific intervention for depression, about 22.9% for anxiety and about 4.8% for stress. The Mann Whitney U test was used to analyse the differences in mental health levels between engineering and non-engineering students (see Table 2). The findings showed no significant difference between engineering and non-engineering student in the three states of mental health. The readings were as follows: stress ($Z=-0.488$, $p=0.626$), anxiety ($Z=-0.171$, $p=0.864$) and depression ($Z=-0.679$, $p=0.497$). These findings were supported by Lee and Ahmad (2016), who reported that the level of mental health among engineering students and engineering students in universities were about the same i.e. normal. However, the findings of the study by Shamsuddin et al. (2013) and Bayram and Bilgel (2008) showed that the mental health among students to be only moderate. Even though the findings indicated that the level of mental health among the students tended to be normal, specific monitoring and intervention should be taken for those indicating severe and extremely severe levels. Such alarming levels may be due to a heavy workload, worrying about exams, financial problems, social factors and pressing circumstances of life.

Table 1
Students' mental health levels

Level of Mental Health	States of Mental Health					
	Depression		Anxiety		Stress	
	f	%	f	%	f	%
Normal	235	62.0	151	39.8	224	59.1
Mild	56	14.8	82	21.6	62	16.4
Moderate	45	11.9	59	15.6	75	19.8
Severe	35	9.2	52	13.7	17	4.5
Extremely Severe	8	2.1	35	9.2	1	0.3
Total	379	100	379	100	379	100

Table 2
Mental health level between engineering and non-engineering students

	States of Mental Health		
	Depression	Anxiety	Stress
Mann-Whitney U	15985	16505	16180
Wilcoxon W	44905	45425	45100
Z	-0.679	-0.171	-0.488
Asymp. Sig. (Two-tailed)	0.497	0.864	0.626

To examine the dominant factors affecting mental health, the mean and standard deviation were applied as shown in Table 3. The findings indicated that the top five dominant factors in descending order were personal health condition, peers, the lost, parents and self-evaluation. Personal health condition in this study refers to bad health habits, for example, smoking and alcohol addiction. The findings also indicated that most of the respondents felt depressed when a learning environment was uncomfortable or they were having

relationship problems with parents, friends and lecturers. In line with this finding, Hoo (2008) also found that conflict with peers, parents, faculty and lecturers and a variety of social activities also affected the mental health of students. However, Ooi (2002) found that environmental factors were the contributor to stress among students rather than academic factors, while Mahfar, Zaini and Nordin (2007) identified career issues as the major cause of stress among students, followed by academic factors and environmental factors.

Table 3
Dominant factors affecting mental health

Factors	Mean	Standard Deviation	Ranking
Self-Evaluation	0.79	0.23	5
Living Style	0.51	0.28	8
Health	0.90	0.23	1
Learning Environment	0.53	0.30	9
Parents	0.80	0.22	4
Peers	0.85	0.24	2
Lecturers	0.65	0.33	6
Academic factors	0.59	0.25	7
Financial factors	0.49	0.24	10
The Lost	0.85	0.24	2

To formulate a model to portray the relationship between the various factors that contribute to mental health among the students, multiple linear regression analysis was applied for the three states of mental health. Correlation analysis was conducted to examine the relationship between the factors and the mental health states. The Pearson correlation analyses showed that the factors were positively correlated and statistically significant to the three mental health states.

Multiple regression analysis was run to predict the occurrence of depression among the students based on these factors: self-evaluation, living style, health, learning environment, parents, peers, lecturers, academic factors, financial factors and the lost. These variables were statistically significant in predicting depression among the students, $F(10,368)=14.059$, $p<0.05$, $R=0.526$. However, only three variables were statistically significant with the prediction, $p<0.05$, namely self-evaluation,

peers and lecturers. After correcting the model, the regression equation to predict depression was:

$$\text{Depression} = 14.24 - 6.56 \text{ Self-evaluation} - 3.59 \text{ Peers} - 1.66 \text{ Lecturers}$$

Multiple regression analysis was also run to predict anxiety among the students based on the same factors. These variables were statistically significant in predicting depression among the students, $F(10,368)=6.916$, $p<0.05$, $R=0.398$. However, only one variable was statistically significant with the prediction, $p<0.05$, which was self-evaluation. After correcting the model, the regression equation to predict anxiety was:

$$\text{Anxiety} = 12.95 - 4.87 \text{ Self-evaluation} - 2.60 \text{ Peers}$$

Multiple regression analysis was run again to predict stress among students based on the same factors. These variables were

statistically significant in predicting stress among the students, $F(10,368)=5.557$, $p<0.05$, $R=0.362$. However, only two variables were statistically significant with the prediction, $p<0.05$, which were self-evaluation and peers. After correcting the model, the regression equation to predict stress was:

$$\text{Stress} = 10.11 - 5.44 \text{ Self-evaluation}$$

CONCLUSION

Overall, the level of mental health among students from three universities of MTU was that of normal. However, there were also students who indicated severe and extremely severe mental states. This occurrence must be prevented by all parties by seriously addressing mental health issues among students in institutions of higher learning. In addition, each student must also address the factors that affect mental health to ensure his or her well-being condition in order to face and successfully overcome the challenges ahead. Counsellors and lecturers may refer to the regression equation for depression, anxiety and stress provided here in order to manage mental health problems among their students. It should be noted that all students regardless of discipline can suffer from different levels of mental illness as the results showed that there was no significant difference between mental health problems suffered by engineering and non-engineering students.

ACKNOWLEDGEMENT

The authors wish to thank the Office for Research, Innovation, Commercialisation and Consultancy Management (ORICC) of Universiti Tun Hussein Onn Malaysia and the Ministry of Higher Education Malaysia (MOHE) for the FRGS grant (No. Vote 1472) awarded to conduct this research. The authors would also like to thank the students who graciously gave up their time to participate in this study.

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Rubric for Measuring Psychomotor and Affective Learning Domain

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ABSTRACT

Designing a reliable measurement of the psychomotor and affective learning domains is a major challenge. One assessment tool, the rubric, provides flexibility in assessing and improves grading consistencies. But students are not being assessed properly as only one rubric is used to evaluate different categories of a project, causing inconsistencies in grading. Thus, an assessment rubric for different categories of a project was created, incorporating the psychomotor and affective learning domains aligned with Bloom's Taxonomy. To validate the rubrics, intra-class coefficient (ICC) and reliability tests were done using the Statistical Package for the Social Sciences (SPSS) tool. Analysis was done to determine grading consistency and agreement level among two randomly chosen evaluators when using the rubrics and to evaluate whether clearly defined assessment metrics were used in grading projects. The results showed that the psychomotor rubric has strong inter-rater reliability with scores of 0.90 and 0.86; this suggests that variables in the rubric were 'very good' at measuring the end product. However, the affective rubric shows slightly weak reliability. This might be due to the different way evaluators assess the same work as some tend to be lenient, while others are strict. The developed rubrics enables evaluators to better assess students so that students obtain justified grades according to the quality of their project.

Keywords: Assessment, affective, ICC, psychomotor, rubric

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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INTRODUCTION

Designing assessment that covers different learning domains (cognitive, psychomotor, affective) within specific criteria and standards is challenging (University of New South Wales, 2017), especially for the

affective domain. A common assessment tool, the rubric, enables evaluators to assess students' understanding and creativity, provides flexibility and improves grading consistency (Manson & Olsen, 2010; Meenakshi, 2013; Sharef, Hamdan, & Madzin, 2014; Mustapha, Samsudin, Arbaiy, Mohamed, & Rahmi, 2016). A rubric should be valid and reliable, and to achieve this requires continuous improvement to the tool (Humphry & Heldsinger, 2014; Goldberg & Canty, 2015). Diploma in Information Technology (DAT) offered by the Centre for Diploma Studies (CeDS), Universiti Tun Hussein Onn Malaysia (UTHM), usually have a large number of students, which makes final-year project (FYP) evaluation for the programme challenging, especially when it comes to ensuring fair grading. The FYP is divided into three categories: database management system, multimedia application and hybrid system. Quality of product for each category is evaluated from different aspects. A similar grading scale used for the different categories can result in unreliable evaluation i.e. projects may be underrated or overrated. To address this, a set of rubrics that cater to the different categories is needed to improve grading consistency among the evaluators. The focus of this paper is on developing a validated new set of rubrics as a measurement tool for evaluating FYP end products and presentations for DAT.

Related Work

Curriculum, learning activities, assessment and outcomes must be aligned in order to achieve a meaningful learning experience (Anderson, 2002; Boud & Falchikov, 2006; Martone & Sireci, 2009; Tam, 2014). To see whether a student can demonstrate the outcomes, he or she is assessed using outcome-based assessment (OBA) (Crespo et al., 2010). Assessment of student learning encompasses three learning domains i.e. the cognitive, affective and psychomotor domains (Bloom, 1956). The literature revealed that rubric is a standard assessment tool for evaluating computer science undergraduate FYP (Sánchez et al., 2014; Sharef et al., 2013; Tio, Kong, Lim, & Teo, 2014) and it is used as a scoring tool that lists criteria and level of quality (Andrade, 1997). However, bad rubric design such as being too general (de Sande et al., 2011) or too specific (Fraile et al., 2010; Sánchez et al., 2014) can cause time wastage and an increase in marking load (University of New South Wales, 2017) and could cause the evaluator (Sadler, 2009) or student (Boud, 2010) to lose the overall view of the project. Therefore, rubric designers must create one that is achievable, clarified and suitable for learners' age and level of education. From the perspective of a computer science project, the psychomotor domain is evaluated based on knowledge in the area while the affective domain is appraised through presentation of the product (Mustapha et al., 2016).

Different rubrics are needed to evaluate each learning domain as each has its own defining characteristics (de Sande et al., 2011; Sánchez et al., 2014; Tio, Kong, Lim, & Teo, 2014).

METHODOLOGY

The set of criteria and standards in a rubric covers the learning domains and linked to course learning outcomes (CLOs) and programme learning outcomes (PLOs). In this study, two rubrics were developed to measure the psychomotor (for end product) and affective (for presentation) domains, and they were matched to the CLOs and PLOs of DAT. There are four phases in the

rubric development, explained in subsequent sections of this paper.

Phase 1: Analyse and Identify PLO and CLO for Chosen Type of Assessment

In this phase, mapping of PLOs to CLOs to type of assessment (log book, project proposal, final report, technical report, end product and presentation) was done. However, this study only focussed on CLO 2, measured by evaluation of end product, and CLO3, measured by project presentation. Table 1 shows that each CLO assessed one learning domain with a specific dominant level of learning.

Table 1
Mapping of CLOs and PLOs with type of assessment

Course Learning Outcomes	Programme Learning Outcome		Type of Assessment
	PLO2 Practical Skill	PLO3 Communication Skill	
CLO 2: To manipulate theoretical and practical knowledge to solve a problem or project	Complex Overt Response (P5)		End product of project
CLO 3: To demonstrate the project achievement verbally and non-verbally		Organising value (A4)	Project presentation

Phase 2: Identify Related Level of Learning Domain Covered by CLOs and Criteria of the Domain

The mapping of CLOs to PLOs was used to brainstorm ideas to design the criteria for the rubrics. Based on the information in Table 1, the dominant level of the learning domain was assigned. All the criteria for each learning domain were listed and the

most important were chosen. Other levels related to the dominant level of the learning domain and the keywords for each domain were assigned based on Bloom’s Taxonomy (Bloom, 1956) for each rubric’s criteria.

Two types of criteria (generic and specific) were included in the rubric to cater for the three different FYP categories. Specific criteria were designed based

on category of project. Table 2 shows the list of general criteria and the level of the psychomotor learning domain for each criterion. The rubric for end product

evaluation measured the dominant level of learning, P5, and two supplement level of learning, Guided Response (P3) and Mechanism (P4).

Table 2
Level of learning and its criteria for the Psychomotor learning domain

Criteria	Level
Generic	i. Follow objectives of project P3
	ii. Construct a project aligned with current technology that is also marketable P4
	iii. Calibrate significance and performance of project P5
	iv. Display innovation, creativity and uniqueness of project
Specific	Category 1: Construct an efficient database and user-friendly interfaces
	Category 2: Construct an interactive and attractive interface
	Category 3: Construct usable and accurate results

The rubric for project presentation (Table 3) measured the dominant level of the affective learning domain, A4, and two

supporting levels of learning, valuing, A3, and internalising values, A5.

Table 3
Level of learning and its criteria for the affective learning domain

Criteria	Level
i. Follow professional dress code	A3
ii. Explain end product with good presentation skills	A4
iii. Organise presentation well in a systematic way	
iv. Prepare attractive and precise poster	
v. Display understanding and knowledge of end product	A5

Phase 3: Formulate Rubric by Type of Assessment and Align with Its Approaches

A two-dimensional table was constructed, where the column titles were the scale of performance level and the rows were the learning domains and criteria as listed in

Table 2 for rubric of end product and Table 3 for rubric of project presentation. A 5-point Likert scale was used; 1 – very poor, 2 – poor, 3 – fair, 4 – good and 5 – excellent. The rubric for end product contained seven items measuring the psychomotor criteria, while the rubric for the presentation consisted

of five items for the affective criteria. The descriptions of performance were determined by mapping the criteria to scale.

units in the same group resemble each other in the same set. Scores given by evaluators were analysed using the Statistical Package for the Social Sciences (SPSS).

Phase 4: Validate Reliability of Rubric

In order to validate the reliability of the rubrics, a reliability test was done using Cronbach’s Alpha and Intra-Class Coefficient (ICC). Cronbach’s Alpha is commonly used to assess the reliability or internal consistency of a scale or test items (Gleam & Gleam, 2003). Inter-Rater Reliability (IRR), also known as inter-rater agreement, is the agreement among raters (Taylor, 2010). It displays how strongly the

RESULTS AND DISCUSSION

The sample consisted of 47 groups, each having three members. The mean from both evaluators showed a consistent value; evaluator 1 received a score of 39.6 while evaluator 2 scored 40.9. Table 4 shows the descriptive summary for the assessment rubric between two evaluators that was chosen randomly.

Table 4
Summary for evaluator 1 and 2

	Min	Max	Sum	Mean	SD
Total Evaluator 1 (P & A)	28.00	49.00	1861.00	39.5957	4.91961
Total Evaluator 2 (P & A)	23.00	49.00	1924.50	40.9468	5.84420

Result of Cronbach’s Alpha for Psychomotor and Affective Rubrics

A Cronbach’s Alpha value of more than 0.9 is excellent, while 0.7 to 0.8 acceptable, 0.6 to 0.7 questionable and 0.5 to 0.6 poor, while below 0.5 is unacceptable (Gleam & Gleam, 2003). Cronbach’s Alpha for P (Psychomotor) for two evaluators was 0.798, a reasonably acceptable value. This means that items in P exhibited strong face validity and construct validity. Cronbach’s Alpha for A (Affective) for two evaluators was 0.649, a questionable value. However,

Loewenthal (2004) stated that an alpha coefficient of 0.6 may be accepted.

Result of Intra-Class Coefficient Reliability for FYP Evaluators

Since evaluators were chosen randomly, a one-way random test was used to find the Intra-Class Coefficient (ICC) reliability. The study aimed to determine the reliability of the psychomotor and affective rubrics individually; thus, the results were obtained separately for both domains and evaluators and later compared, as shown in Table 5 to Table 9.

Table 5
Intra-class correlation coefficient for evaluator 1 for the Psychomotor domain

	Intra-Class Correlation	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	0.641	0.522	0.753	9.910	46	188	0.000
Average Measures	0.899	0.845	0.938	9.910	46	188	0.000

Table 6
Intra-class correlation coefficient for evaluator 2 for the Psychomotor domain

	Intra-Class Correlation	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	0.553	0.424	0.683	7.184	46	188	0.000
Average Measures	0.861	0.786	0.915	7.184	46	188	0.000

Table 7
Intra-class correlation coefficient for evaluator 1 for the affective domain

	Intra-Class Correlation	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	0.144	0.039	0.288	1.844	46	188	0.002
Average Measures	0.458	0.168	0.669	1.844	46	188	0.002

Table 8
Intra-class correlation coefficient for evaluator 2 for the affective domain

	Intra-Class Correlation	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	0.500	0.367	0.638	5.991	46	188	0.000
Average Measures	0.833	0.744	0.898	5.991	46	188	0.000

A strong correlation is a nearly perfect prediction for both raters, but actual agreement does not exist. Good agreement is obtained when two values are almost equal and close to 1 (Cicchetti, 1994). The ICC analysis for the total number of 47 groups in terms of the psychomotor domain based on two evaluators were 0.90 and 0.86, while

for the affective domain it was 0.46 and 0.83, respectively. The total ICC score for both evaluators for both learning domains showed that the rubrics were reliable for measuring their assessment. Although the value of the ICC for the affective domain was significant, it was only moderately reliable as the total score obtained was 0.83, which is considered acceptable.

The psychomotor domain showed strong inter-rater reliability with scores of 0.90 and 0.86, respectively, and this suggests that the variables used in the psychomotor rubric were suitable for measuring the end product. However, the affective rubric's reliability was slightly weak; we believe this was due to the tendency of different evaluators to be strict or lenient when grading student work.

CONCLUSION

Reliable rubrics for FYP evaluation that measure the psychomotor and affective domains was established. Usage of the rubrics can be extended to assess students' performance in conducting projects. Students can also use these rubrics as a guideline when developing an IT project. Evaluators must be briefed before assessing on how to use the rubrics to avoid bias and misunderstanding. Further study is needed to investigate and enhance the rubrics' validity. One way of doing this is by seeking the opinion of students and evaluators.

ACKNOWLEDGEMENT

The authors are grateful to Information Technology Department, CeDS as well as Office for Research, Innovation, Commercialisation and Consultancy Management (ORICC), UTHM for funding this project.

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The Skill and Competency of Technical and Vocational Education and Training (TVET) Personnel for the Development and Implementation of a National Teacher Standard in TVET in Malaysia

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ABSTRACT

This study centred on the implementation of a national core standard for Technical and Vocational Education and Training (TVET) personnel, especially teachers, in Malaysian TVET institutions. The descriptive and open-ended survey method was adopted for the study and the structured interview was used to collect data from respondents in Malaysia. The findings show that the major competencies of the TVET Teacher Standard comes from a comprehensive certification called the Vocational Training Operation (VTO) which was created specifically for TVET teachers. This certificate is offered by the Ministry of Human Resources. The competency standard embedded in this certification is studied. However, certain issues need to be taken into account to propose this certification as a requirement for a TVET teacher. This effort must be aligned with the Malaysian Teacher Standard for non-TVET programmes. It is recommended that the government, TVET institutions and other stakeholders give greater recognition to the national core standard for TVET teachers as the main criterion for selecting qualified and capable TVET teachers.

Keywords: National core standard, Technical and Vocational Education and Training (TVET) personnel, TVET teacher, Vocational Training Operation (VTO)

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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INTRODUCTION

A teaching standard is understood as normative or evaluative based on which of the actions of teachers as professionals are appraised in determining their performance. Underpinning this idea of a teaching standard in the literature on teacher education is the

idea of teacher competence (Goh, Saad, & Wong, 2012). Research in teacher education has shown that teacher competence is a prerequisite to effective teaching and learning because of its relationship to student learning outcomes, be it academic or otherwise. The Malaysian Teaching Standard (MTS) is based on this assumption, that is, that improving teacher competence will ensure a high standard of education is achieved not only academically but also in other areas of development. The question is whether improving teaching competence alone is enough to achieve educational excellence. More importantly, is it right to expect that teachers' competency will create world-class students. This question forms the backdrop of this paper and lies behind the concerns raised through critical observation of the MTS framework.

The Malaysian Teaching Standard (MTS) 2016 identifies three major components: (1) Professional teaching; (2) Knowledge and understanding; and (3) Teaching and learning skills. In Standard 1, three domains prevail: the personal, professional and social. The core values of Standard 1 are based on: (1) The seven-culture dimension in teachers' training institutions in Malaysia (IPGM); (2) Teaching profession ethics; (3) Good values in the school curriculum; (4) Main values in public service and society; (5) Main principles of work ethics; (6) The 12 pillars (*Tonggak 12*) Individual communities and (7) Main principle of the work, ethic

and nationality endorsed by the Ministry of Education, Malaysia.

By practising all domains in the Standard Practice of Teaching Professionalism, teachers will have goals, objectives and clear educational vision, have strong ideals and be capable of making changes and can be proactive and strive to improve their own ability, commitment, initiative and personal responsibility in displaying superior and high performance in their duties. Teachers will also be able to identify the level of professional competence in the practice of the teaching professionalism, knowledge and understanding, as well as teaching and learning skills, and use this level for guidance. As for Standard 2, a teacher must be knowledgeable in the objectives of the education, subject content, Information and Communication Technology (ICT), teaching strategies and assessment. By mastering knowledge and understanding, teachers can build confidence and improve performance of professional duties to maintain effectiveness. The implementation of knowledge and understanding of the standard will ensure the professional quality of teachers remains at a high level and stays relevant to developments in education. Standard 3 covers the aspects of teaching preparation, skill to deliver teaching and learning, assessment skills to increase student achievement and class management skills. By mastering the skills to plan, implement, monitor, assess and evaluate and with good classroom management,

teachers can produce efficient teaching and learning. An added benefit is that the classroom environment will also be fulfilled. An enhancement to this standard could be made by more emphasis on skills and vocational training for Technical and Vocational Education and Training (TVET) teachers.

The purpose of this study was to assess the practices of the Malaysian education system in developing and implementing the national core standard for TVET personnel, especially for teachers. This study also sought to identify the development and implementation of the Malaysian national TVET personnel core standard.

The following are the research questions that were addressed in this study:

1. What is the status of development and implementation of national core standards in Malaysia?
2. What are the elements of the core standard for TVET personnel (e.g. qualifications and qualification packaging, assessment guidelines, training provider requirements, qualifications of faculty etc.)?
3. What are the assessment methods used to determine who will be certified or meet the core standard?
4. What agency certifies the candidate who attains the core standard among TVET personnel?
5. What are the challenges and issues in the development and implementation of a core standard?

METHODOLOGY

This project was a study of the development and implementation of the national core standard for TVET personnel in Malaysia. There are four groups of TVET personnel: teachers in schools/colleges, school principals/directors, industry trainers and trainers of trainers. The focus of this study, however, was on the first two, teachers and school principals/directors. Two approaches were used in this study, which are the survey questionnaire and the interview. A survey was administered to teachers in TVET institutions, while interviews were conducted with teachers, school principals and committee members of the Vocational Training Operation (VTO). The document on job profiles for VTO was studied for additional data gathering. The sample for this study was focussed to only three main TVET providers in Malaysia, the Ministry of Education, the Ministry of Human Resources and Majlis Amanah Rakyat (MARA). The sample is shown in Table 1.

Table 1
Study sample

No.	Ministry	TVET Institution		Numbers
1	Ministry of Human Resources	1.	Pusat Latihan Pengajar dan Kemahiran Lanjutan (CIAST)	1
		2.	Pusat Latihan Teknologi Tinggi (ADTEC)	8
		3.	Institut Latihan Perindustrian (ILP)	24
2	Ministry of Education	1.	Kolej Komuniti	82
		2.	Politeknik	34
		3.	Kolej Vokasional	79
3	Majlis Amanah Rakyat (MARA)	1.	Giat Mara	205
		2.	Kolej Kemahiran Tinggi Mara (KKTMM)	10
		3.	Institut Kemahiran Mara (IKM)	13

Three hundred survey forms were sent to the respondents, while 10 principals, 10 teachers and three committee members of the national Vocational Training Operation (VTO) were interviewed for data collection. The document for the development of the VTO was studied as well.

RESULTS

The profile of the respondents is shown in Table 2. This table provides details of the respondents who were teachers. Out of the 101 respondents, most (n=86) came from a background of technical skills.

Table 2
Profile of respondents

	Ministry of Education	Ministry of Human Resources		Majlis Amanah Rakyat (MARA)	
Institution	51	19			
Gender	Male		Female		31
		51		50	
Working Experience	Less than 5 years	6 to 10 years		11 to 20 years	More than 21 years
		30	34	11	26
Specialisation	Education	Electrical	Engineering	Mechanical	others
		86	2	9	3

It is worth to note that TVET personnel, including those in this study, are not nationally recognised today as the teachers' standard is being used only by certain ministries. Nevertheless, the component for TVET teachers has been developed not

only for teachers, but also for principals, trainers and industry as well. Table 3 shows the respondents' awareness of the existence of the standard. The response is given in percentage.

Table 3
Status of the development and implementation of TVET personnel core standard

Status	Teachers' Standard	School/College Principal/Directors' Standard	Trainer of Trainers' Standard	Industry Trainers' Standard
Percentage (%)				
Developed	75	76	57	32
Not yet	3	8	15	18
Not sure	22	16	28	50

Most of the reported issues during the dissemination process comes from unclear guidelines and limited briefing and capacity building. Problems arising from implementation also stem from the same reason i.e. unclear guidelines and limited time. Therefore having a single national

core standard for all TVET teachers can streamline teaching practice and address TVET issues more effectively, as all stakeholders throughout the country can be entertained at the same time. Other benefits of a single standard for the country are tabulated in Table 4.

Table 4
Benefits of having a national core standard for TVET personnel

	Harmonise TVET development in the region	Provide platform for benchmarking	Improve the quality of TVET overall	Strengthen TVET provider integration	Facilitate mobility of human resources
Percentage (%)					
Strongly Agree	57	62	68	58	51
Somewhat Agree	36	36	29	36	39
Somewhat Disagree	7	2	3	3	10
Strongly Disagree	0	0	0	3	0

In the meantime, institutions are looking for the best personnel in terms of professionalism and skill. This are important criteria for TVET teachers. The purpose of a national core standard is achieved

if everyone uses it as a reference in each and every department. Table 5 details the respondents' response to a single national core standard.

Table 5

How the national core standard for TVET teachers will be used in respondents' institutions as perceived by the respondents

	To review/ update the national standard	To use it only as a reference	To use it as an added reference and to give value close to the national standard	To adopt it as the national standard	Not going to use it
	Percentage (%)				
Strongly Agree	53	25	49	42	14
Somewhat Agree	47	49	48	50	27
Somewhat Disagree	1	27	4	8	34
Strongly Disagree	0	0	0	0	26

Interviews with the Committee and Principals

The study included interviews with the teachers, principals and committee members of the Vocational Training Operation (VTO). Most of them received information on the national core standard for TVET teachers through email or as hard copy or from attending a workshop. The document contained guidelines but the guidelines were not clear. All of the respondents agreed that they needed more clarification on the standard. The concerns and issues raised in the development and dissemination process highlighted the minimal involvement of industry in developing the National Occupancy Skill Standard (NOSS) and syllabus for vocational training. One of

the respondents stated that training and explanation were insufficient and guidelines were unclear and lacked detail. In terms of suggestions and recommendations to improve the development and dissemination process, they suggested that more companies/agencies should be involved in developing the NOSS and syllabus and that these bodies they should be rewarded. More training and courses were needed for the teachers especially, and teachers should be provided with all necessary information and details. Participation of the counselling department was also crucial.

The challenges and issues in the implementation of the national core standards for TVET teachers are lack of industry attachment opportunity, dearth of

good mentors, students not being ready to learn new content and the latest technology. Shortage of qualified teachers was also reported in the interview. In terms of recommendations for the implementation of a regional core standard for TVET teachers in Southeast Asia, the respondents proposed benchmarking to advanced countries like Singapore, Germany and Finland, adequate training time, disseminating information to all teachers in the country, capability building and clarifying information about the standard.

Meanwhile, the expected components to be included in a core standard for TVET teachers are training based on skills and pedagogical approach. More knowledge should be made available passed to teachers. Facilities and skills for teachers must fulfil competency and knowledge requirements for new technology. The respondents recommended that practicals and internship related to their major subject as well as to vocational education be incorporated in the core standard for TVET teachers and subjects related to new technology.

All the respondents agreed that the core standard developed for TVET teachers should be used as a referencing/benchmarking/strategic tool to improve teaching and learning. An exchange programme for teachers within member countries of the Association of Southeast Asian Nations (ASEAN) would be greatly beneficial towards this end in terms of sharing of knowledge, training and experience based on strategic tools, the fundamentals of TVET and methodology.

Such collaboration could be a standard reference for TVET training approaches within ASEAN, recognised by all ASEAN countries and the world for preparing skilled workers and enhancing the employability of TVET students. Regional collaboration would also result in the sharing of new technologies at a quicker rate. Possible challenges to such collaboration might be the lack of the following: financial readiness of individual countries, qualified teachers who are ready to change their methods, industry commitment, political commitment and infrastructure.

The respondents suggested that more discussion, conferences within ASEAN and involvement of TVET management and representatives be solicited. Singapore should be engaged as a leader in this area because of its good TVET training approach, which it adopted from Germany. A standard should be set for the evaluation of skills for ASEAN students. Core working skills should be integrated into the TVET system and TVET exchange teachers from within ASEAN should be engaged in member countries.

DISCUSSION

This section will discuss the function of a certification system called Vocational Training Operation (VTO) in educating TVET teachers. The component and the elements of this certification will be explained through deep interview with members of the VTO committee. The interview was conducted with the VTO document in sight. The interviews were

successfully conducted and clarification of unclear statements in the document were resolved immediately. The discussion was divided into two segments: (1) Development of the VTO; and (2) Implementation of the VTO.

Three main topics were involved in the development process i.e. the process and the committee, content and structure of the document and dissemination of content. The process involved in developing the VTO was the Development of Standard and Curriculum (DESCUM), which took around five to six months. Industry experts and practitioners were directly involved in the specified occupation involved in the development of the VTO. Both have practical and teaching experience. The Department of Skill Development (DSD) under the National Occupancy Skill Standard (NOSS) division and the DESCUM facilitators were given the authority to delegate the assignment to the experts. First, the NOSS assigned duties and tasks to the team (facilitator and expert), who then worked on the assigned job. Consultants were also hired under the Department of Tender and Internal Expertise, NOSS and the Industry Lead Body (ILB) to spearhead and complete the programme. There are two levels of certification, the VTO and Vocational Training Management (VTM). The performance indicator is based on performance standard tied to the NOSS development structure.

In terms of the dissemination process, the standard needs to be approved by the Majlis Penasihat Pembangunan Kemahiran

(MPPK), the advisory body for skill development, as outlined on the NOSS development process flow chart. The activities involved are proofreading and validation, followed by endorsement. It takes about six to seven months to disseminate the standard by the NOSS division. Other parties are also involved in this process, such as the Accredited Centres, external assessors/verifiers and those related to the programme, especially instructors and managers. The standard is disseminated through the DSD website to external verifiers, workshops and emails in the form of soft copy or a CD to accredited centres and committee members for specific fields.

The discussion now focusses on the implementation of the standard. To become a training provider, a centre must be: (i) Legally registered as a training provider; (ii) have adequate with training facilities, tools and equipment; and (iii) Have qualified and competent trainers. The institution does not necessarily have to be a specific centre as long as it fulfils all the requirements listed in the KAPPA document. The needed status in accreditation are status of finances, equipment and infrastructure of the institution, all of which should follow regulations by MOSQ (JPK) and NASDA (652 Act). A qualified teacher must have attained Level 5 of the Advanced Diploma in Vocational Training for both technical and vocational courses. The course duration depends on the level and type of training programme. The duration is usually six months to three years. Qualified candidates who meet the standard are those who have

successfully participated in the following types of assessment method: Case study, project, simulation, role play, knowledge assessment, performance assessment, self-assessment and peer assessment.

Internal assessment is conducted by an internal assessor and endorsed by an internal verifier, while external assessment is conducted by an external assessor and endorsed by an external verifier. This assessment takes around one to two weeks. The qualification requirement for personnel and professional assessors is: (i) Have VTO documents; (ii) Possess the technical certificate SKM 1-5; and (iii) Have experience of two years and above. The Department of Skill Development (DSD) and MPPPK will certify those who have VTO documents. Nevertheless, there are a few challenges in the implementation of this standard such as rapid changes in technology, collaboration with industry, teaching and learning approaches and methodology that are not equivalent, learning and teaching materials that are not fully developed and the management of training resources. It is recommended that English be made the medium of communication in the programme and that all involved respect individual differences among trainers/instructors for regional standards.

The existence of a single national core standard for TVET teachers allows the establishment of professional competency based on the specific profession that will foster the teaching and learning including training in TVET institutions. Thus, the image of TVET will be enhanced and this

in turn will bring public willingness to considering TVET as an option for higher education.

TVET teachers must understand the current trend in technical and vocational education. The concern today is not so much on the value and importance of Vocational Training and Education but how to ensure its relevance, responsiveness and value in an increasingly global economy (Law, 2007). The changes in the drivers of the economy today have become a major focus in TVET. When discussing skilled teachers, a person needs to be trained or to have vast experience in hands-on and practical activity. Skills can range from highly concrete proficiency, like the ability to operate a particular machine or to write a sentence, to far less tangible capabilities such as the ability to think strategically or to influence others (Sanghi, 2007). On the other hand, Smyth, Lyons and Darmody (2013) emphasised that the criteria for developing good teaching skills in a teacher should not be burdensome to teachers.

A similar study regarding the general framework of teachers' competencies outlined nine different dimensions: field competencies, research competencies, curriculum competencies, lifelong learning competencies, social-cultural competencies, emotional competencies, communication competencies, information and communication technologies competencies (ICT) and environmental competencies (Selvi, 2010). Teachers' competencies affect their values, behaviour, communication, aims and practices in school and also

support teachers' professional development and curricular studies. Piwovar, Thiel and Ophardt (2013) evaluated the effectiveness of a training programme on classroom management for in-service school teachers and found that positive effects on teachers' competencies and increased student engagement occurred only in the intervention group. These findings were supported by the participants' reported high subjective validity of the training. In this case, a high level of competency is vital.

Hands-on skills, which are often the target of TVET, was emphasised as the main criteria in developing a TVET Teacher Standard. In hands skill development, the willingness of a teacher to do a job or task is very important for a student to develop his/her hands-on skills. The concept of willingness normally stems from the interest and desire of a teacher to perform a task. The complementary role of attitude in skills development is supported by Neihart (1999), who suggested that individuals who were willing to do or to take the risk of doing a new thing, would obtain a higher level of achievement. This component must be implemented during the training for teachers.

In terms of competency that a teacher should possess, a study of Malaysian TVET providers and practitioners conducted by Ali, Kaprawi and Razally (2010) identified 98 competencies derived from a literature review and a focus group discussion that reflected the range of attitudes, attributes, knowledge and strategic and tactical skills required in electrical

instructors. In this regard, TVET teaching competencies are defined as an integrated set of technical competency, learning and methodological competency and human and social competency that are needed for effective performance in various teaching contexts and didactic approaches (Spottl, 2009). These three clusters are the basic components of the holistic K-worker desired for the Malaysian context. The standard of TVET teachers should also be in line with K-worker competency.

CONCLUSION

This research was conducted thoroughly on the development and implementation of a national core standard for TVET teachers. It was found that the guidelines for competency are unclear and that enforcement of the standard is still far beyond expectation. Integration of a common national teacher standard and the Vocational Training Operation (VTO) is seen as the best solution for producing effective TVET teachers. In conclusion, TVET teachers should comply with the following requirements: (1) Professional skill and knowledge; (2) Professional teaching and learning process; (3) Personal and professional attributes; and (4) Professional industries and communities. These requirements are based on the requirements of the Malaysian Teacher Standard, K-worker competency and TVET centres to ensure that TVET teachers not only comply with the national teacher standard but with the larger governing principles of the nation for its modern workforce. To conclude, this

paper outlined the requirements of a good TVET teacher in terms of knowledge, skill and competency. Future research should identify the skills required for each of the four areas mentioned above for further study. Further study should also assess the implementation of the teacher standard as well as the cause-and-effect relationship between these four areas.

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Psychomotor Skills in Pedagogical Context for Technology Courses

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ABSTRACT

Teaching is a process of disseminating knowledge and specific skills (cognitive, affective and psychomotor) that combines teaching strategies and practices. Teaching strategies revolve around planning, implementation and evaluation of pedagogical context. This study focusses on the psychomotor domain of skills. The Simpson Psychomotor Domain was applied as main objective of this research to investigate the teaching strategies in practical courses implemented by instructors. The survey research design was applied using the quantitative approaches and observation method as supporting data to identify implementation of strategies that develop the psychomotor domain. This research involved 301 instructors from vocational colleges who participated in the questionnaire survey and four heads of department who participated in the observation. The results indicate that the most dominant teaching strategies applied in skill-based pedagogical context are throwback, questioning, demonstration, discussion and video screening. Observation of the four heads of department showed that they laid emphasis on implementation of the psychomotor domain through use of observation, inventory, motion control, special movement and adjustment. The results may provide new ideas for instructors to plan teaching strategies to improve the skill-based pedagogical context.

Keywords: Pedagogical context, practical classes, psychomotor skills, teaching strategies

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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INTRODUCTION

The psychomotor domain can be defined as the domain of skills involving motor ability such as handling equipment, handwriting, completing procedure, walking and

demonstrating. The coordination of motor skills requires practice and techniques, all of which are taught in the vocational education curriculum. The psychomotor domain developed by Simpson (as cited in Snowman, McCown, & Beihler, 2011), Harrow (1972) and Dave (1970) is used to develop teaching strategies to achieve learning outcomes. The hierarchy of the psychomotor domain has been described by Ferris and Aziz (2005) as recognition of tools and materials, handling tools and materials, basic operation tools, component operation tools, expert operation of tool, planning work operations and evaluation of outputs and planning means for improvement. The hierarchy begins with recognition of tools and ends with improvement of outputs of procedure. Dawson (1998) provided hierarchies for several aspects: observation, trial, repetition, refinement, consolidation and mastery. In vocational education, especially in practical classes, students are required to assemble, measure and solve problems using practical equipment to comply with students' competencies. Mahajan (1999) explained that instructors need to not only master technical skills but also teaching skills as well as practical skills to ensure the content delivered is accurate and correct. Explanation with demonstration in practical classes will impact on student understanding and performance in the final examination. Effectiveness of learning based on teaching delivery uses a variety of methods on the part of instructors. Since practical classes need more equipment and tools and is costly, clear understanding of

what should be planned and learnt from teaching activities should inform the design of teaching strategies, beginning with basic knowledge in taxonomies and psychomotor skills. Bloom's taxonomy of educational objectives has been a popular method to set goals for particular teaching activities and whole educational programmes (Ferris & Aziz, 2005). However, Bloom discussed the cognitive domain in detail but omitted discussion of psychomotor skills (Bloom, 1979). When teaching psychomotor skills, instructors need to separate the principles of the cognitive component from psychomotor skill development because different skills and functions are required for both. Practising psychomotor skills requires students to be competent in the tasks given. The design of teaching strategies must match the three domains i.e. cognitive teaching must be topic-centred, affective teaching, feeling-centred and psychomotor teaching, performance-centred (Bastable & Dood, 2008).

Psychomotor Skills

The psychomotor hierarchy requires elaboration of several factors as discussed by Ferris and Aziz (2005) The most basic of practical skills is recognition of tools and materials to ensure effectiveness in completing tasks and competence. How to handle the tools and materials is second in the hierarchy of mastering psychomotor skills. The process of picking up and moving tools is necessary for workshop activities. The next step is the basic operation of tools, which requires the ability to use tools

appropriately to perform elementary tasks up to a certain specified level. Competence in operation tools allows smooth and correct use of tools so that tasks are completed step by step using the proper procedure or assembling based on proper sequence. After achieving competence in the operation of tools, the next step would be to become expert at the operation i.e. complete the work with ease, efficiency, effectiveness and safety. Planning of work requires students to consider the specifications of work output before beginning the task in order to complete it well and with purpose. This process requires clear understanding of the particular work operation. At this level students should be able to achieve the desired outcome and complete the task intended. The last stage in the hierarchy of psychomotor skills proposed by Ferris and Aziz (2005) is evaluation of output and planning for improvement. At this level, the review of output is intended for future improvement. Simpson (as cited in Snowman et al., 2011) classified the psychomotor domain into seven descriptions, as shown in Figure 1 (as cited in Gronlund, 1991) and combined the psychomotor domain with

teaching methodology in practical classes (planning, implementation and evaluation) applied as research conceptual framework. The first level makes use of activities that require physical movement. At this level, students perform sensory stimulation through cue selection of the action. This indicates the students' readiness to perform a particular type of action, either mental or physical. The response level is the early stage in learning complex skills with guided response. This level requires repetition and demonstration from instructors, and students learn through trial and error while their performance is judged based on suitable criteria. The mechanism is concerned with whether learners act with confidence and proficiency. The learning outcome at this level is concerned with skills of various type to perform tasks at the next level. Complex overt response is the skilful performance of tasks using complex movement. The adaption level develops the learners' ability for problem solving. The last level of the psychomotor domain is origination, which refers to creating new patterns to deal with specific problems in order to develop higher order skills.

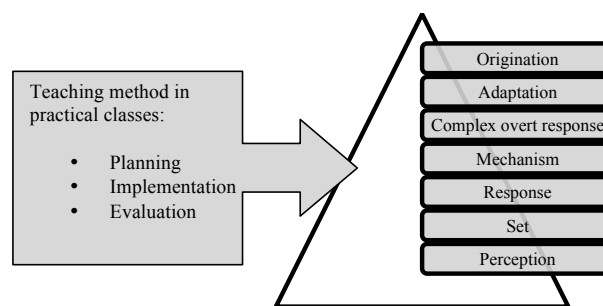


Figure 1. Conceptual framework

RESEARCH OBJECTIVES

The research objectives of this study were:

1. Identifying the teaching method employed in practical classes in vocational colleges.
2. Identifying the application of psychomotor skills in practical classes in vocational colleges.

METHODOLOGY

This research applied the survey design and used the quantitative approach based on questionnaires. The responses and observation method were supported by data related to the psychomotor skills. Three hundred and one instructors teaching technology courses participated in this research. Four heads of department were selected for observation.

RESULTS

Three aspects were identified in identifying teaching method in practical classes i.e. planning, implementation and evaluation. In the planning stage, the instructors' agreement based on items in the questionnaire received a mean of 3.72. In the implementation stage, the mean was 3.54, while in the evaluation stage, it was 3.50. Table 1 shows the detailed results for Research Objective 1, 'Identifying the teaching method employed in practical classes in vocational colleges'.

Table 1
Dominant teaching method

Teaching method	Mean
Planning	3.72
Implementation:	3.54
- Throwback	4.06
- Lecture	3.50
- Learn in group	3.67
- Demonstration	4.05
- Previous model	2.70
- Video screening	3.99
- Drilling exercise	2.60
- Notes	3.40
- Presentation	2.92
- Discussion	4.03
- Questioning	4.05
Evaluation	3.50

The study also included observation, which was conducted based on psychomotor skills applied and teaching method used in practical classes. Table 2 presents the summary of the results of the observation sessions derived from a matrix of teaching methods and the psychomotor domain. The instructors stressed on perception level, set, response, complex overt response, adaptation and mechanism. However, they did not focus on origination in teaching sessions. In implementation, they preferred throwback, questioning, demonstration, discussions and video screening.

Table 2
Observation matrix

Practical Classes		Psychomotor Domain						
Teaching Method	Teaching Strategies	Perception	Set	Response	Mechanism	Complex overt response	Adaptation	Origination
Planning		/	/					
Implementation	Throwback	/				/		
	Questioning	/			/			/
	Demonstration	/			/	/	/	
	Discussion	/	/	/			/	
	Video Screening						/	
Evaluation			/	/			/	

DISCUSSION AND CONCLUSION

The teaching method practised by instructors received a high mean for planning, moderate for implementation and low for evaluation. All aspects of teaching methods applied in practical classes was based on the competency assessment required by vocational colleges as determined by the Malaysia Examination Board in 2013 (Mohamad, Abu Bakar, Sulaiman, Mohd. Salleh, & Sern, 2015). Daniel (2010) mentioned that teaching in skill-based subjects should use demonstration, project work, simulation and discussion as strategies. This research investigated all the aspects needed in the implementation stage of teaching methods matched to the principle of conducting the practical classes. Assessment of competency in vocational colleges focusses on producing skilled workers, and various teaching strategies are needed to ensure that evaluation of competency complies with the pedagogical context of practical classes (Mohamad.

et al., 2015). In observation sessions, the participants stated that they relied on teaching experience and their expertise in technology courses. The results showed that they applied both factors in teaching methods and psychomotor skills; however, they did not apply origination in all stages. They states that limited time to complete the syllabus and having to complete a lot of practical tasks was why they were not capable of planning a structured teaching method even though they wanted to do. They applied five teaching strategies in the implementation stage, relying most commonly on perception in developing psychomotor skills. Damon, Ahmad and Rajuddin (2008) suggested the practical classes should apply a mentoring system and focus on exercises to develop skills. Guney (2012) recommended that the mastery of teaching content should give more opportunity to instructors to develop various effective teaching strategies.

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Confirmatory of Behaviour Competency and Employability Skills Domains and Elements for Industry's Automotive Trainees

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ABSTRACT

The quality of skilled workers in the TVET training system of Malaysia as assessed by the automotive industry includes technical and non-technical skills. However, Public Training Skills Institutions (PTSI) have failed to produce highly skilled, competent and high workability trainees for the workforce. This study aims to confirm the domain and element that contribute to the formation of competent behaviour and workability skills for trainees in the automotive industry. Questionnaires involving 361 respondents from three focus groups involved centre advisers from the southern districts of Johor, Malacca and Negeri Sembilan. The Delphi technique of processing the data is used. The findings of the study revealed that the 11 experts on the panel agreed that 12 domains contribute to the formation of behavioural competence and workability skills. The findings based on the survey identified the 12 domains and most of the elements, which received a mean score of 3.00 to 4.00, as: (i) governance; (ii) standard of competence; (iii) industrial relations; (iv) qualifications framework; (v) standard skill suppliers; (vi) delivery; (vii) evaluation; (viii) industry work experience; (ix) twinning programmes; (x) community service programmes; (xi) industry based curriculum; and (xii) entrepreneurship education. In conclusion, industry and training institutions need these 12 domains to enhance the automotive industry to enable it to contribute to building a high-income nation.

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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Keywords: Automotive industry, Delphi techniques, panel of experts, Public Training Skills Institutions (PTSI)

INTRODUCTION

The weakness of Technical and Vocational Education and Training (TVET) lies in its failure to nurture technical skills and high employability skills among graduates to aid in building an equitable national automotive industry (Department Skills Development, 2012). Callan (2002), Esa (2006), and Jab (2007) advocated that TVE institutions should provide workers with industry knowledge and implement broader skills such as applying employability skills on the job for training purposes. The weakness of TVET apparent in training institutions should also be reviewed in order to nurture a skilled workforce that is productive and possesses technical expertise and high employability skills (Buntat, 2004; Ministry of Higher Education, 2006; Department of Institutional Management of Higher Education, 2006; Rasul, Ismail, Ismail, Rajuddin, & Abdul Rauf, 2009; Tahir, Mohd Yasin, & Ramlee, 2009). Similarly, methods of teaching and learning (P&P) of instructors in institutions should be reviewed in line with industry changes so that trainees are produced in accordance with the needs of the labour market (Md Yunus, 2004; Pillai & Yusof, 2005; Majumdar, 2008). According to Hanafi, Bakar, Hamzah and Abu (2008) and Ahmad (2012), the TVET system is considered effective when it can produce skilled manpower needs of highly skilled industry. This can be achieved by focusing on learning based on industry experience of studying theory at institutions. For example, the National Dual Training System (SLDN) matched the needs of industry, but lacked

the support of industry to make it work (Othman, 2003; Wan Ahmad, 2004; Fong, 2005; Pang, 2008; Tomiran, 2008; Ahmad, 2012).

Unfortunately, at this point, of the 12 million workforce in this country, more than 70% are unskilled workers (Department of Skills Development (DSD), 2012). The DSD found that almost 80% of the 1.2 million holders of the Malaysian Skills Certificate (SKM) held Level 1 and Level 2 certificates. They are categorised as low skilled and earning an income below RM2000 within five years after graduation. The data show that there are 100,000 school leavers each year with SPM qualification who do not participate in any training or skill acquisition programme. This only adds to the number of unskilled workers every year. At the same time, these youths are entering employment without any type of qualification (DSD, 2012). In the long run, this will delay the achievement of the nation's vision of becoming a developed country, particularly in the automotive industry. Behavioural competency is important because it is related to the ability of individuals to perform certain tasks and responsibilities in accordance with the desired performance in the workplace (DSD, 2012). Similarly, employability skills are an important aspect because they are complementary to technical skills or job skills. According to Rasul and Abdul Rauf (2010), technical skills alone will not guarantee jobs for graduates whether professional or semi-professional. Similarly, Rasul and Abdul Rauf (2010), Buntat (2004), and Ali (2012)

discovered that employers are not only looking at technical skills but also require high employability skills from potential employees. Therefore, employability skills are important as a catalyst for greater availability of work required by employers. It is crucial that Public Training Skills Institutions (PTSI) pay attention to and also emphasise on employability skills training programmes in addition to technical skills (Mustapha, 2008; Awaluddin, 2008; Rasul et al. 2009).

The TVET system used in Public Training Skills Institutions (PTSI) must equip their graduates to possess both behavioural competencies and employability skills. This is because industry has created millions of automotive state jobs and downstream sectors, such as spare parts and skilled labour, enabling the transfer of technology (DSD, 2014). The Performance Management Unit (PEMANDU) has estimated that the automotive industry will continue to grow, especially that of Energy Efficient Vehicles (EEV), which can attract some RM328 million FDI and domestic direct investment (DDI) in addition to donating more than RM5 billion to the gross domestic product (GDP) and create more than 14,000 jobs by 2020 (Sarudin, 2016). This fact shows that there is a need for curriculum change or improvement to the TVET system in PTSI; with regards to the automotive industry, this calls for the incorporation of awareness of green technology. This is because green technology such as that used in the EEV sub-sector of the automotive industry is growing rapidly. Similarly, the provision of a skilled

workforce will need to be consistent in EEV green technology because it has the potential of becoming a hub for automotive production in the country.

With this solid foundation and close collaboration by stakeholders including the government and the private sector, Malaysia can be a leader in the EEV sub-sector among Southeast Asian nations. Greentech Technology Corporation (GreenTech Malaysia), a market leader in the EEV sub-sector, was responsible for developing key strategies and action plans to help the public sector with the aim of developing private EEV sustainable ecosystems, as well as performing interactive education and awareness campaigns promoting EEV (Sarudin, 2016). GreenTech Malaysia is now leading in the development of electric mobility between countries to make Malaysia a dynamic market in Asia.

The big question is whether PTSI graduates, upon leaving the institution, have acquired the competence and employability skills required to meet the needs of this high-tech automotive industry to play a meaningful role in it or at least to find jobs in it to sustain themselves. Can PTSI supply a workforce that is capable of contributing to national economic growth?

LITERATURE REVIEW

The National Automotive Policy (NAP), which was published on 22 March, 2006, reflects the government's efforts to assist the growth and development of the automotive industry in the face of various challenges and problems. NAP aims to improve the

competitiveness of the national economy while promoting direct investment in the automotive industry. To further strengthen the automotive industry, the government has to improve the implementation of the policy that was adopted from 2006 to 2014 and outline several new initiatives, particularly on air pollution, for instance to reduce production of carbon monoxide gas and dependence on fuels such as petrol and diesel. The automotive sector is an important industry to the economy of Malaysia (Alli & Mohamad, 2016). The automotive industry's contribution to the economy is huge and closely related to the manufacturing and services sectors. The automotive sector began with the importation of vehicles; this was later expanded to assembly operations and the development of the automotive components industry. Changes in the structure and activities of the national economy as a result of the implementation of the EEV programme, of course, leads to changes in labour. In addition, rapid technological changes constantly impact on employment practices in the automotive industry, causing workers to stay alert to the need to update themselves on knowledge and skills. This has led to the creation of a new job profile for new workers (Boreham, 2002; Fischer & Boreham, 2004). According to Billett (2009), the trend of the future world of work will not be based on any one routine concept but will boast the following features: specialisation and variety; enthusiasm; concept-based; relying on wisdom; complex; networking; centred on equipment and facilities. Wagner (2008)

studied the changes in the market place and highlighted that the old world of the classroom needed to be revamped to cater for new jobs of the present and future that require a core set of survival skills that can support lifelong learning and active citizens. Survival skills as defined by Wagner (2008) in the new world of work comprise critical thinking and problem solving, collaboration and industry-led networks, intelligence and adaptability, initiative and entrepreneurship, effective oral and written communication skills, achievements and analysis of information and curiosity and imagination.

Stern (2003), and Ahmad, Rajudin and Cartridges (2008) proposed that in addition to having specialised skills, good employees must possess skills to perform job-related duties and generic skills. Buntat (2004) defined skills as expertise needed to carry out assignments that each employee must possess to be a competent and capable worker in the world of work in which they operate. Global changes in technology, particularly in the automotive industry, require a skilled workforce and a comprehensive training system. The Technical and Vocational Education and Training (TVET) holistic system for training of knowledge workers (k-Worker) focusses on both technical and non-technical skills (Sulaiman, 2010; Jab, 2007). Studies by Kasa (2006) and Pillai (2005) found that there is still a gap, especially in training systems and training equipment in PTSI versus Private Training Centres (PTC). Skilled workers must show coherence between behaviour and

competence employability skills based on specified criteria and standards sets. Failure of PTSI graduates to master both skills has led to their inability to find employment in the EEV sub-sector, which looks for these skills in its selection of skilled workers for the automotive industry. Lack of behavioural competency and employability skills has also produced graduates lacking in capability and self-esteem to perform a given task. With these matters in view, this study was conducted to verify the domain and behavioural competence element and employability skills of automotive industry trainers. Behavioural competence and employability skills are needed by the automotive industry as industry catalysts to drive the country towards industrialised, developed country status.

METHODOLOGY

The study design utilised the quantitative survey approach involving three focus groups consisting of: (i) PTSI instructors; (ii) one PTC instructor; and (iii) the supervisory and advisory service centre. The data-collecting tool used was the questionnaire. The three focus groups were chosen as they were the main players in developing human capital for the automotive industry. The data collected for this descriptive study were measured in percentage, mean scores, standard deviation (SD) and level. The survey is a field study using the questionnaire as instrument. The research depends on the type of information to be reviewed. This study cannot explain circumstances that might occur in the future. The area studied

was the southern provinces of Johor, Melaka and Negeri Sembilan. Questionnaires were distributed to the groups involved and collected two weeks later.

RESULTS

A total of 1,069 questionnaires were distributed to three focus group study in South Johor, Melaka and Negeri Sembilan: (i) instructor PTSI; (ii) supervisory and advisory service centre; and (iii) instructor PTC (Selangor, Federal Territory of Kuala Lumpur and Kedah). A total of 420 questionnaires were returned to the researchers (40.8%), but the remaining 649 (59.1%) were not returned. The researchers tried to collect more completed questionnaires, but they were not able to do so although they re-contacted respondents and appointed a coordinator to collect the questionnaires. The analysis done in this study was based on data collected from the returned questionnaires only. Table 1 shows the number and percentage of the returned questionnaires.

Table 1
The number and percentage of returned questionnaires

Status	Number (set)	Percentage (%)
Returned	420	40.8
Not returned	649	59.1
Total	1069	100

Part of this quantitative study involved the analysis of 12 domains identified in this research that involved three focus groups. Analysis was carried out on the level of

importance of the findings' mean score and the standard deviation related to the three focus groups i.e: (i) PTSI instructors; (ii) PTC instructor; and (iii) the supervisory and advisory service centre. To be expected, there were differences in the findings based on the mean scores obtained from the 12 domains. The level of interest and the level

of agreement between the averages mean scores of the domains were analysed. Based on the analysis the researchers created a position based on the consent of all three focus groups. Table 2 shows the analysis of the level of interest and the level of agreement.

Table 2
Analysis of the level of interest and the level of agreement

Domains	Level of Interest	Rank No.	Level of Agreement	Rank No.
Governance	4.23	1	4.25	1
Standard of Competence	4.14	2	4.10	2
Industrial Relations	4.13	3	4.09	3
Qualification Framework	4.06	4	4.05	4
Standard Skills Suppliers	4.05	5	4.03	5
Delivery	4.04	6	4.02	6
Evaluations	3.98	7	4.01	7
Industry Work Experience	3.89	8	3.89	8
Twining Programme	3.79	9	3.77	9
Community Service Programme	3.78	10	3.76	10
Industry-based Curriculum	3.76	11	3.74	11
Entrepreneurship Education	3.70	12	3.71	12

DISCUSSION

This study examined the entrepreneurial intention among impaired student. Entrepreneurial intention is considered to be the motivating factor that affect behaviour, in which the intention itself showed how the person is ready to try on their efforts in the realization of a behaviour. It also explains and predicts how the cultural and social environment affects human behaviours.

Entrepreneurship has been explored to measure the tendency of motivation and

determination has an important impact in influencing a person's decision to become an entrepreneur. Entrepreneurship is described as a motivating factor to influence individuals to pursue an entrepreneurial venture. The analysis depicts the interpretation of the special needs of entrepreneurship in polytechnics to become entrepreneurs is high. It was found that among all the items tested, the highest mean score is of the fourth item whereby, the high score is 4.48, which is the item, "I like to help

my family". This is because students have high motivation to become entrepreneurs because they want to improve the life of their family. This showed that they believe entrepreneurship can help and benefit them. This means that students with special needs tend to become entrepreneurs upon graduating from polytechnics.

Entrepreneurship is perceived as the relationship between the entrepreneur as an individual and how business is framed. According to them, where an individual has a desire to become entrepreneur, they certainly have no intention or plan regarding the type of business they will venture, methods of obtaining funds, and other business-related issues. Although it is still only considered as the intent, but it happened due to the tendency of entrepreneurship.

This study also identified the significant difference of entrepreneurial intention to become entrepreneurs based on gender. T-test analysis showed that there is a statistically significance difference of entrepreneurial intention to become entrepreneurs by gender in which female students' were found to have higher mean score of 4.139 compared to 3.193 of male students. Therefore, it can be concluded that female students have a high level of entrepreneurial intention than male students. The financial services industry shows that the involvement of women in business is highly in demand.

CONCLUSION

The study found that there are 12 domains that are important for the formation of behavioural competencies and high

employability skills among trainees in the automotive industry i.e.: (i) governance; (ii) standard of competence; (iii) industrial relations; (iv) qualifications framework; (v) standard skills suppliers; (vi) delivery; (vii) evaluation; (viii) industry work experience; (ix) twinning programmes; (x) community service programme; (xi) industry-based curriculum; and (xii) entrepreneurship education. This study also confirmed the potential for improving behaviour and employability skills among workers in the automotive industry.

These findings may provide guidance to policy makers and others involved in TVET training who are keen to increase cooperation with the industry to improve competence and employability behaviour skills. System changes related to new technology such as Energy Efficient Vehicles (EEV) significantly and dramatically affect various aspects of job performance. The power of globalisation is intensifying the development of automotive technology such as EEV and bringing many changes in the workplace that will certainly affect the individual as well as groups. A study by Mohd Salleh, Sulaiman and Gloeckner (2015) revealed that in order to meet the human capital needs of technological change workers must have the correct knowledge, attitude and skills. Apart from technical skills, graduates also need non-technical skills acquired in real business situations. This clearly shows that the integration of both of these skills can enhance the employability of graduates in the automotive field.

Similarly, research by Ahmad Jailani and Hasmori (2015) investigating TVET challenges showed that the emphasis on employability skills among graduates is no longer a one-off requirement. Every graduate who intends to find a job in today's market place must be able to show they have employability skills in addition to having knowledge and aptitude related to the job. Employability skills prepare graduates for entry into the working world, allowing them to be received as suitable employees in industry (Billing, 2003; Knight & Yorke, 2013). It is not only academic achievements that add value to the individual in the competition for a good job, but also soft skills such as oral and written communication, critical thinking, problem solving, self-management, ability in interpersonal interaction, leadership and teamwork (SCANS 1991; DEST 2002; Cassidy, 2006; Rosenberg, Heimler, & Morote, 2012; Mohammad Yasin, Mohd Nordin, Mohd Noor, Rahim, & Faizal Amin Nur Yunus, 2015).

The results of this study suggest that the country is able to achieve its aim of becoming a developed nation by improving training offered by Public Training Skills Institutions (PTSI) and Private Training Centres (PTC) in terms of competence and employability skills in order to ensure that younger generations of workers are able to achieve Malaysia's economic visions as well as steer it into becoming a leading country in the automotive industry. Therefore, it is crucial for all involved to revisit the curriculum, a key element in the education

process, of training bodies engaged in Technical and Vocational Education and Training (TVET) in order to make changes to it that might be necessary. In conclusion, this study is important as the results can be used to support the government's policy to produce high-income skilled workers and its vision of becoming a developed nation by the year 2020.

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Usability Evaluation Successful Factors (SFs) Framework through Entrepreneurship Program at Community College Malaysia: Modified Nominal Group Technique Approach

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ABSTRACT

This paper discusses the success factors (SFs) of the entrepreneurship programme available in Malaysian community colleges. The benefit of the Modified Nominal Group Technique (NGT) approach carried out aims to achieve understanding of the usability test and evaluation of the SFs framework. The objective of this study is to identify the usability and evaluation of lecturers on the elements of entrepreneurship for four domain areas, strategy, environment, temporal and industry. The analysis covers the importance of SFs framework development, which determines the type of framework to use as reference in carrying out the entrepreneurship programme in Malaysian community colleges. In the usability test and evaluation process, 21 experts were chosen from three types of community college, from whom seven lecturers were allocated to each programme based on the understanding of the lecturers. Questionnaires were distributed to seek lecturer consensus. The Statistical Package for the Social Sciences (SPSS) version 22.0 was used to analyse and find the percentage of consensus for each domain within the framework. This was to find the percentage of expert consensus against the SFs framework. The result of the analysis shows more than 75% acceptance and consensus for the functionality of SFs. Basically, this analysis is capable of providing reference and guidelines for the development of a SFs framework. Therefore, the analysis is able to provide information and reference for future researchers to explore the domain of entrepreneurship.

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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Keywords: Consensus, domain, element, nominal group technique, succes factors, usability evaluation

INTRODUCTION

Entrepreneurship is an important requirement in the development of the national economy, as it depends on the strength of the economy such as business, company and trade. Therefore, the government has often emphasised entrepreneurship as a choice career for graduates from institutions of higher learning, with the aim of producing more entrepreneurs. Successful entrepreneurs are creative, innovative and competitive and have viable skills and competencies. These features need to be cultivated in Malaysian graduates (Budget 2013; Commitment of Higher Education, 2012; Wickham, 2006). Entrepreneurship can also be an added value for graduates while expanding entrepreneurial culture. This can be done through various programmes and extra-curricular activities, increasing graduate activity and providing a conducive environment for producing quality human capital that is creative, innovative, competitive and equipped with admirable ethical values (Nordin, 2012; Nasharuddin & Harun, 2010, p. 11). In fact, local university students are given exposure to the culture of entrepreneurship to make them more competitive and capable. If students successfully establish themselves as entrepreneurs, they will be able to contribute directly to economic growth as well as provide employment opportunities to the community (Critical Agenda Projects under the National Higher Education Strategic Plan, 2012; Hassan, 2012; The Preliminary Plan of Education Development 2013-2015, 2012).

Entrepreneurship is recognised as an area that contributes to the development of productive and innovative economy and indirectly, this field can reduce the issue of unemployment among graduates (Frederick, O'Connor, & Kuratko, 2013). In addition, entrepreneurship plays a very important role in creating new business that can lead to further reforms or innovation in the future to improve economic development (Frederick, O'Connor, & Kuratko, 2013; Kuratko, 2009). Increasing interest in the field of entrepreneurship came with the formulation of the New Economic Policy (NEP), the Second Malaysia Plan (1971-1974) and the National Development Policy (NDP) (1991-2000, 2001-2005). All of the mentioned policies emphasise the importance of entrepreneurship development in the country to achieve the National Vision Policy. The Eighth Malaysia Plan (8MP) introduced Vision 2020 to build a commercial and industrial community focussed on education institutions in the development of entrepreneurship and human resources. This was continued as the Ninth Malaysia Plan (9MP), which focussed on human capital development, emphasising knowledge and intellectual skills, with attention on entrepreneurship through education and training and continual effort up until the 10th Malaysia Plan (10MP).

Along with that, to improve the national economy, the Ministry of Higher Education (MOHE) highlighted the importance of human capital development. Human capital is made up of not only academic knowledge but also skills, ideas and experience in

entrepreneurship. In this century, the skills and mindset of entrepreneurship and innovation are a priority and are used as a catalyst for national economic growth. In addition to creating jobs and wealth for the country and seeking to resolve issues and challenges at the global level, business is very important for improving the employability of graduates and resolving the issue of unemployment of graduates (Moksin, 2012, p. 381; Nordin, 2012).

However, according to Mutalib, Mahmud and Anuar (2012, p. 57), Malaysian higher education institutions organised various activities to produce graduates who are effective, but still not able to achieve the national target. As it is evidently notable, graduates should now practice the value of entrepreneurship. They should be highly competitive in many aspects of life in the face of globalisation. In an economic crisis, this should be used as an inspiration for graduates to be involved in entrepreneurship (Hassan, Hussin, & Yi, 2009, p. 44). In other words, the knowledge can equip students for real life experiences such as entrepreneurship.

Dhliwayo (2008, p. 329), who conducted a study in South Africa, believed that entrepreneurship should provide facilities to students to start a business in a given period, during or after graduation. Based on his findings, training and experience can actually be integrated into entrepreneurship education. There are many places on campus available to students and student entrepreneurs with facilities such as food kiosks and stationery stores, giving them

the opportunity to experience a 'failed' or successful' business enterprise first-hand. Certainly, studies in entrepreneurship learning theory and experiential learning will be beneficial to students who engage in entrepreneurial activities or programmes.

This research paper was intended to explore and identify the domains that are important in entrepreneurship as a guideline and reference (Howell, 2010; Rockart & Bullen, 1981). This paper emphasises the main domain of a successful entrepreneurship programme. This paper also discusses methodologies that apply the Modified Nominal Group Technique (NGT) to test and evaluate the items that have been explored by researchers (Creswell, 2012; Cohen, Manion & Morrison, 2011). In addition, the researchers used the usability and evaluation of community college lecturers to get agreement and confirmation of the identified main domains (see Figure 1 in Appendix A).

METHODOLOGY

In the Modified Nominal Group Technique (NGT), lecturers needed to analyse and present their views and ideas concerning the evaluation of the entrepreneurial activity programme that included a domain that was submitted and then obtained by the researcher. The Final Success Factors Framework was designed and developed and submitted to lecturers for their consensus on the assessment of the framework, as shown in Appendix A. The researchers use PowerPoint slides during a presentation and provided information

and discussed the suitability of the domain. After that, the researchers listened to the views and evaluation of the lecturers by providing opportunities for them to forward questions. Then the lecturers analysed the presented assessment items. In addition, questionnaires were used to obtain comments from lecturers privately without discussing with the groups of lecturers. The questionnaire contained a set of questions or items in written form. It was easy to use because it was constructed properly and data were processed and analysed (Idris, 2010). According to Fraenkel and Wallen (2009), the use of questionnaires can improve the accuracy and correctness of the responses given by the respondents.

The NGT evaluation process was also intended to eliminate or drop items that did not meet the suitability domain. Emphasis was on the consensus in the assessment process if there was a conflict of ideas from a group of lecturers along with a dedicated domain suitability. Feedback from lecturers was also very important because they were the ones who would use the framework in the future. The NGT evaluation process was also used to get votes from the community college lecturers who would use the framework as a reference and guide for achieving critical success factors of entrepreneurship in Malaysian community colleges (Hamid & Madar, 2015, p. 272). Therefore, the questionnaire was used to measure the response of community colleges (Creswell, 2012; Cohen, Manion & Morrison, 2011). Thus, the questionnaire was used in the evaluation

to test the usability of the framework that had been designed and developed. Results collected from the developed questionnaire were used in the analysis process. The NGT reached a consensus of 75% or more. In this research, the researchers only explained the appropriateness of each domain to reach agreement in the assessment process. The study, which involved the development of a framework, used the Modified Nominal Group Technique (NGT). The aim and purpose of using the NGT was to determine the usability of the framework that was developed as a reference and guide for future researchers and lecturers teaching in Malaysian community colleges.

RESULTS

The research question investigated in this study was, "What are the success factors of the usability and evaluation framework for entrepreneurship programmes based in the view of community college lecturers for the domain, suitability?" The findings on the usability of the framework domain, presented in Table 1, show the result obtained from using the Modified Nominal Group Technique (NGT) in order to get information about the assessment of community college lecturers of the appropriateness of the domains in the framework based on the success factors that were designed and developed (Madar & Hamid, 2014, p. 138). Of the community colleges selected, seven lecturers were from the community college in Jempol, seven from the one in Kota Melaka and the final seven from the one in Pekan. The lecturers were gathered

in a group in every community college for discussion of the NGT process on different days and at different times. This meeting was to test usability, views and assessment of the framework. The reason for meeting at different times and on different dates was due to the great distance between the community colleges.

Table 1
Usability test and evaluation of the success factors framework

Domain listed below are part of the Framework		
1. Strategy		
Level of evaluation	Frequency	Percentage (%)
Important	1	4.8
Very important	12	57.1
Extremely Important	8	38.1
Total	21	100.0
2. Environment		
Level of evaluation	Frequency	Percentage (%)
Important	1	4.8
Very important	14	66.7
Extremely Important	6	28.6
Total	21	100.0
3. Temporal		
Level of evaluation	Frequency	Percentage (%)
Important	3	14.3
Very important	15	71.4
Extremely Important	3	14.3
Total	21	100.0
4. Industry		
Level of evaluation	Frequency	Percentage (%)
Important	2	9.5
Very important	14	66.7
Extremely Important	5	23.8
Total	21	100.0

Table 1 shows the results of the usability tests in evaluating appropriateness of the domains within the framework that was designed and developed. Response and feedback from the lecturers used a scale of seven levels representing the level of lecturer evaluation of the answers they provided. Four primary domains were presented in the NGT. In the domain of strategy, only one lecturer (4.8% of the total percentage of lecturers) thought this domain was important, while a total of 12 lecturers (57.1%) out of the 21 thought it was very important. Eight lecturers (38.1%) thought it was extremely important. Thus, the overall opinion of the domain, strategy, was positive and consistent. In the context of the overall findings of this study reached an agreement of 75% and above in the usability test.

For the domain, environment, only one lecturer (4.8%) thought it was important, while 14 (66.7%) thought it was very important and six (28.6%) thought it was extremely important. None of the assessments were lower than the ratings 1, 2, 3 and 4, indicating that the response of the lecturers was positive. They reached an agreement of 75% and above.

For the domain, temporal, three (14.3%) lecturers believed that it was important, while 15 (71.4%) thought it was very important and three (14.3%) thought it was extremely important. On the whole domain is also consistent environment. None of the assessments were lower than the ratings 1, 2, 3 and 4, indicating that the response of the lecturers was positive and consistent.

The last domain was industry. Two (9.5%) lecturers thought this domain was

important, while 14 (66.7%) thought it was very important and five (23.8%) thought it was extremely important. to the overall percentage of. In this industry domain is also consistent, None of the assessments were lower than the ratings 1, 2, 3 and 4, indicating that the response of the lecturers was consistently positive, reaching an agreement in the usability test of 75% and above. The overall results showed that the framework was well received by the lecturers, with no disputes or conflicts having arisen.

DISCUSSION

The following is a discussion of the findings of the usability evaluation phase based on the framework of success factors for the entrepreneurial programme in community colleges in Malaysia (Richey & Klein, 2007). Overall, the findings of the evaluation phase showed the assessment of the usability of the lecturers' consensus framework that had been developed using the framework of the evaluation process using the Modified Nominal Group Technique (NGT) approach involving 21 community college lecturers. The assessment framework of the success factors was developed after the researchers had obtained the experts' consensus of as much as 75% and above and had compiled all the priority domains. Next, the researchers made a presentation and held a discussion to brainstorm for ideas, after which, they identified the extent of the assessment of the usability framework. The researchers then administered a questionnaire based on the concept of NGT. At the end of the session,

the researchers called for questions from the lecturers.

However, discussions in the context of this study also found that entrepreneurship at community colleges was less dependent on other parties for training. These findings can help e-tech centres to develop entrepreneurs among community college students. The researchers recommend the strengthening of the Entrepreneurial Model (Jabatan Pengajian Kolej Komuniti, 2013; Jabatan Pengajian Tinggi Kolej Komuniti, 2012) and the Model Experience Entrepreneurship Education of Entrepreneurship (Honig, 2004)

This study also found that there are many benefits in having a relationship with industry. This is in line with the National Higher Education Strategic Plan (2012) and the policies of the Ministry of Higher Education (2010), which state that there are many benefits to establishing relationship with industry such as having access to advice from personnel from human resources and finance, access to infrastructure and encouragement for students. The Ministry of Higher Education Malaysia recommends that institutions have adequate infrastructure, in addition to providing advisory services, such as planning, management, production, marketing and financial management as well as producing qualified and competent graduates.

Further discussion in the context of a usability and evaluation framework for community colleges, especially entrepreneurship centres, is necessary to help students and lecturers as well as

contribute to improving and increasing promotion of entrepreneurial function. The findings of this study are consistent with those given Yusoff and Zahari's study titled 'E-Tech Centre Function Helps Entrepreneurs Among Community College, Perak Province, the Ministry of Higher Education Malaysia.' This study showed that the function of e-tech centres is to help create entrepreneurs from among community college students.

Finally, this study also found that entrepreneurship is getting a lot of interest especially when a training programme is directly related to the real-life scenario of entrepreneurship. This is because a real-life environment provides a more impactful learning experience in which students experience situations for themselves first-hand. These findings were reviewed by Mohamad (2014) in connection with the implementation of University Utara Malaysia's entrepreneurial programme, 'Siswaniaga', which extends benefits to students who participate in the programme in addition to hands-on knowledge and experience of real-life entrepreneurship. A suitable model associated with this item is the Model Experience Entrepreneurship Education of Entrepreneurship (Honig, 2004).

CONCLUSION

An entrepreneurship programme can serve as a guide and reference for higher education institutions. This study investigated the

entrepreneurship programme offered in Malaysian community colleges. The study evaluated the usability of success factors (SFs) in providing strength and support for the improvement of the entrepreneurship programme. The domains and elements of the programme were studied in order to produce a robust entrepreneurship programme for the future. For such a programme to succeed, it is necessary to collaborate with the agencies involved, such as the Ministry of Higher Education, Majlis Amanah Rakyat (MARA), Tabung Ekonomi Kumpulan Usaha Niaga (TEKUN), AGROBANK and the Malaysian Agricultural Research and Development Institute (MARDI), among others. It is also important for the related bodies to use a workable framework such as the one developed for this study. Such a framework will work as a guide in designing successful entrepreneurship programmes for the future. The researchers hope to develop a framework of real SFs that can provide guidance and reference to all the parties involved in entrepreneurship training. The researchers hope this framework of SFs will have a positive impact on entrepreneurship training in the country.

ACKNOWLEDGEMENT

The authors would like to thank Universiti Tun Hussein Onn Malaysia (UTHM) and the Office for Research, Innovation, Commercialisation and Consultancy Management (ORICC) for supporting this research under the grant vote No. U108.

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APPENDIX A

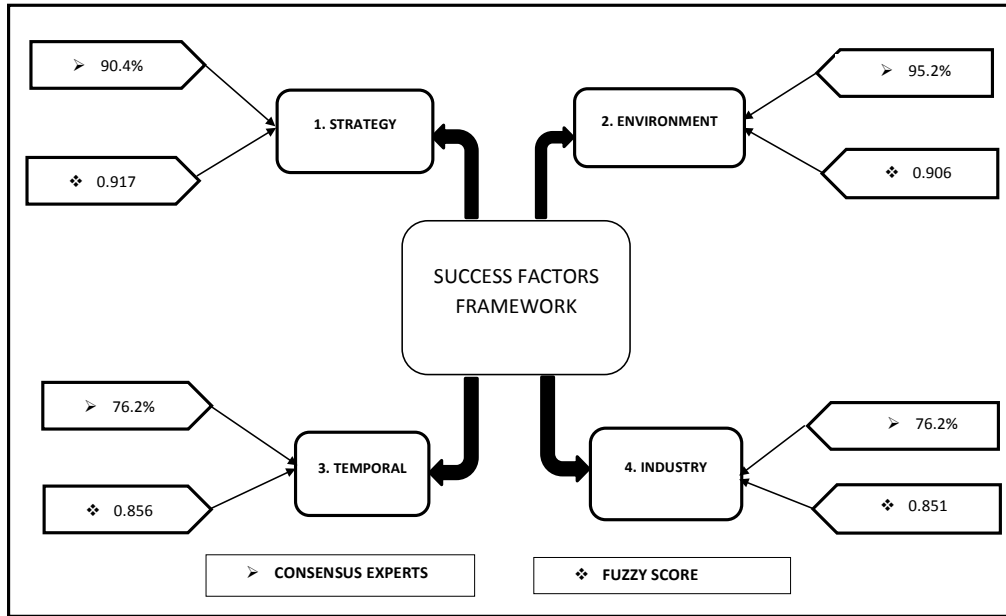


Figure 1. Success factors framework.

Innovative Approaches to Assessment: Develop a Sense of Direction to Promote Students Learning

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ABSTRACT

Assessment practices in educational settings have undergone much transformation in recent years. The innovative approach to assessment includes providing continuous feedback, correctives and enrichment to students with the goal of enhancing students' academic performance. Classroom assessment practices have been more recently influenced by the learning process. The main purpose of this study was to gather information on assessment practices that use the mastery learning approach, which is formative assessment through which teachers in the classroom can develop a sense of direction while providing continuous feedback, correctives and enrichment to students with the aim of bridging learning gaps in what students currently know and what they should know. In this study, the semi-structured interview was conducted with six vocational teachers from vocational colleges. Discussion on the findings was based on the experience of the participants in developing a sense of direction by giving continuous feedback, correctives and enrichment to promote student learning. The outcomes could be a source reference for providing information to teachers on a new concept of assessment and how, at the same time, it can be successfully embedded in the teaching and learning process to promote student learning.

Keywords: Correction, enrichment, feedback, formative assessment, mastery learning

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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INTRODUCTION

Formative assessment is a process used by teachers and students during instruction that provides feedback to adjust ongoing teaching and learning to improve students' achievement of intended instructional outcomes. Formative assessment techniques

are referred to as activities used in the process of assessing students during the teaching and learning process. Assessment for learning uses formative assessment methods to inform, support and enhance the learning process. The focus of this system is placed on the quality of learning, the provision of advice and feedback for improvement and a strong emphasis on cooperative learning groups.

Part of the problem of implementing formative assessment in classroom is the confusion surrounding the purpose of assessment and the concept itself among teachers and students. It appears that teachers are not only unfamiliar with the concept; most regard it as an extra burden, another programme that has to be carried out in the classroom in addition to their already heavy workload. Despite the many efforts of the Ministry of Education to clarify and explain the concept, many teachers and students still view it apprehensively, thinking it has to be administered separately from their teaching and learning process (Adi Badiozaman, 2007).

Taking a slight detour from usual practice, assessment is now regarded as an essential element of teaching and learning development; thus, the teaching and learning process has become an important on-going process that was neglected when the focus, previously, was merely on achievement. This change of focus for assessment was further emphasised in a forum conducted by the Malaysian Examination Syndicate

during which it was pointed out that “the Ministry of Education must re-educate the public to view and accept assessment and not just examination.” It has also been highlighted that the change of focus in assessment should be holistic and integrated and it should develop and maintain a meaningful balance between formative and summative assessments (Adi Badiozaman, 2007).

Understanding the Purpose of Assessment

It is important to highlight and bring assessment to a common definition through discussion to develop a shared ground and understanding for both theoretical and practical development in education (Taras, 2005). According to Rowntree (1987), assessment is about “getting to know our students and the quality of their learning.” Cohen (1994) described assessment as non-threatening and developmental in nature and that it allowed learners to have sufficient opportunity to reveal what they know. Hill (2008) defined assessment as the general process of monitoring and keeping record of students’ progress. McMullan et al. (2003) provided a more specific definition, introducing assessment as “a form of systematic inquiry with the following elements: learning as hypotheses, educational practices and experiences as context, evaluation as information gathering, and decision making as direction for improvement.”

Assessment to Guide Improvement

Since the late 20th century, the use of intelligence tests and academic exams to sort students into tracks has been largely discredited (Guskey, 2007). In today's economy, when everyone needs to be capable of learning throughout their careers and lives, it would be especially counterproductive to keep sorting students in this way; far better would be to try to educate all children to a high level than to label some as losers and anoint others as winners as early as possible. The first limited manifestation of an alternative approach was the mastery learning movement of the late 1970s (Block, 1971; Bloom, 1971; Guskey 1980a, 1980b, 1980c).

Consistent with prevailing approaches to assessment, mastery learning focussed entirely on basic skills in reading and mathematics, and it reduced those skills down to the smallest testable units possible, rather than measuring students' capacity to integrate or apply their new knowledge and skills. At the same time, however, mastery learning represented a real departure from the status quo, since it argued that students should continue to receive instruction and opportunities to practice until they mastered the relevant content. In theory, everyone could succeed. The purpose of assessment was not to put students into categories but, simply, to generate information about their performance in order to help them improve.

To critics of mastery learning, the approach highlighted the limitations of shallow-learning models (Slavin, 1987), a problem that "criterion-referenced" testing

was designed to address. Whereas norm-referenced tests aim to show how students stack up against each another, criterion-based assessments are meant to determine where students stand in relation to a specific standard. Like mastery learning, the goal is not to identify winners and losers but, rather, to enable as many students as possible to master the given knowledge and skills. However, while mastery learning uses tests to help students master discrete bits of content, criterion-based assessments measure student performance in relation to specific learning targets and standards of performance.

A Sense of Direction: Feedback, Correctives and Enrichment

Teachers who use mastery learning provide students with frequent and specific feedback on their learning progress through regular, formative classroom assessment. This feedback is both diagnostic and prescriptive. It reinforces precisely what students were expected to learn, identifies what they learnt well and describes what needs to be learnt better. The National Council of Teachers of Mathematics (NCTM, 2000) stressed the use of assessment that supports learning and provides useful information to both teachers and students. Ainsworth and Viegut (2006), and Stiggins (2008) similarly emphasised the vital nature of feedback from assessment for learning. By itself, however, feedback does little to help students improve their learning. Significant improvement requires feedback to be paired with correctives i.e. activities that offer

guidance and direction to students on how to remedy their learning problems. Because of individual differences among students, no single method of instruction works best for all. To help every student learn well, therefore, teachers must differentiate their instruction, both in the initial teaching and especially through corrective activities

(Bloom, 1976). Generally, assessment is not entirely about marking and giving grades. It is a broad term used to indicate the act of measuring, evaluating, interpreting, making sense of the results, collecting information and providing feedback for a set of purposes. Figure 1 illustrates the sequence of the mastery learning process.

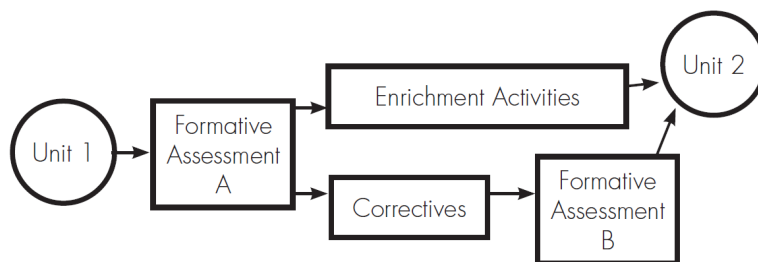


Figure 1. The mastery learning instructional process (Guskey, 2007)

METHODOLOGY

A semi-structured interview was conducted with six vocational teachers who were selected through purposive sampling to share their experiences. The interview technique is a suitable method of exploration to share experiences; here, the vocational teachers could share experiences accumulated throughout their teaching experience of using formative assessment in the classroom. According to Merriam (2001), for this to occur, the participants selected must possess relevant knowledge and information regarding the phenomenon being studied. The interview data collected were managed

using the ATLAS t.i. software for qualitative data analysis.

RESULTS AND DISCUSSION

Competency assessment involves the process of assessing the competence of students. The competence assessment approach depends only on what is listed in the curriculum. Through the formative assessment process, the competence of students based on criteria (Criterion-Referenced Assessment) that has been set, of which the students are also aware, the performance of students is determined by comparing the performance obtained

from students to a statement of the criteria. The findings showed that in assessment, vocational teachers used mastery learning with the a mobility module system. Students are allowed to repeat or do what they can to meet the criteria. However, repeated assessment in one module sometimes cannot be carried out properly due to time constraints. Vocational teachers in vocational colleges also try to run training and learning by the student's ability, consider the dominance of prior learning to support student learning and provide opportunities for students to repeat activities. Teachers try to give opportunities to students to improve their performance and they then provide feedback to the students individually.

Correctives and enrichment are more meaningful and can be run better if teachers understand and appreciate their respective roles and use assessment results to help improve understanding and build positive behaviour among students towards learning. The findings of interviews with teachers revealed that the students enjoyed the work and displayed responsibility in completing it and could detect their mistakes after feedback was given by the teacher. Guskey (2007) stated that a second assessment is made to provide opportunity to students to succeed and detect their mistakes, but the evaluation process can be hindered by time constraints, lack of resources and student absence from school on the day of assessment. Tan (2010) highlighted that the problem of student absence disrupts the assessment process and makes it difficult for teachers to implement assessment.

Mastery learning can enhance learning as teachers can give more attention to weak students without slowing the pace of learning. As a result, all the students in the class have the potential to succeed in achieving learning outcomes. This approach also encourages the attitude of helping one another to learn among students. Modular certification granted to students also helps students gain recognition of the stages of the module. Individualised assessment gives space to those who deserve to be assessed in advance, who, after mastering a certain level, can then help others who have not mastered the level to get their certificate. Through corrective and enrichment activities as well, students can achieve mastery level specified in a module. Nair and Gopal (2014) noted that corrective activities and learning strategies in systematic mastery learning, compared with conventional methods, can help students gain more significant achievement.

Vocational teachers also conduct assessment when students are ready to be assessed and focus on the assessment of the individual, identifying and collecting various pieces of evidence (process or product) relevant to the criteria established for each competency. Teachers allow students who are competent in a module to perform the next module, whereas students who are not competent may repeat the assessment after receiving feedback from the teacher on their performance during the learning process. Race (2010) stated that giving constructive feedback orally or in writing is an important aspect in assessment

for learning. Teachers can give feedback in various circumstances, either immediately or they may provide more official answers in a more formal and planned setting. Based on the interviews with the vocational teachers, it was found that oral feedback was commonly used to reprimand the students when they made mistakes. This was also done during assessment that occurred during the process of teaching and learning. Feedback is also important for students to self-assess the level of their present competency.

CONCLUSION

This study was conducted in response to the strategic plan outlined in the Eleventh Malaysia Plan (2016-2020) for the improvement of the education system and examines the new assessment system, which moves away from memory-based learning designed for the average student to education that stimulates thinking, creativity and caring in all students, caters for individual ability and learning styles and is based on more equitable access. Due to time required, lack of information and understanding the purpose of assessment (Tan, 2010; A Majid, 2011). Generally, assessment is not entirely about marking and giving grades. It is a broad term used to indicate the act of measuring, evaluating, interpreting, making sense of the results, collecting information and providing feedback, correctives and enrichment or a set of purposes.

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Learning Strategies as an Enabler of Study Success

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ABSTRACT

Engineering students enrol in engineering without a clear understanding of how they can achieve success in the field. The current study explores study strategies of engineering undergraduates across two geographical locations, Malaysia and Australia. Qualitative data were collected using semi-structured interviews, in which 16 final-year engineering undergraduates volunteered to participate. Data were analysed using a thematic coding approach and the NVivo software was used to assist with the coding process. The results suggested that engineering students at universities in both locations used very similar learning strategies to achieve different success outcomes such as to fulfil assessment criteria, to achieve a personal goal or success, to endure with challenges, to overcome challenges, to survive after failure and to keep persisting in the programme. Integrating knowledge, visualising engineering applications, optimising the use of learning materials and mastering engineering skills are examples of strategies that were frequently used by the students. The level of importance of each strategy is context dependent.

Keywords: Engineering students, learning strategy, study success

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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INTRODUCTION

Among the cognitive functioning in learning i.e. thinking, learning styles and learning strategies, the one that will be given attention in this study is learning styles or learning strategy. Strategy in general refers to a plan of action designed to achieve a long-term goal or overall aim ("Strategy", 2010). In a learning context, learning strategy implies

actions made by the learner “to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations” (Oxford, 2001, p. 167).

Why do engineering students need to establish a study strategy? Weinstein, Acee and Jung (2007) highlighted that students should possess three important elements of strategy namely, study skills, will and self-regulation to become effective learners. Other researchers have also actively discussed the role of strategies in learning. This includes the use of strategy in problem solving (Mayer, 1998), control and regulation of learning (Pintrich, 1999), determination of the direction of learning and organisation of learning activities (Weinstein et al., 2007), engagement and motivation (Khamisah, Mohd Firdaus, Nik Rusdi, & Ruhizan, 2007) and study performance (Duff, 2004; Yip, 2009). The focus of this investigation into strategy is consistent with the positive view of these researchers that students used diverse strategies for learning and this helps improve learning performance. In engineering, there is evidence that learning activities that involve students’ active participation, such as problem-based learning (PBL), constructivist learning and blended learning can help enhance effective learning compared with traditional ways of learning (King, 2008; Litzinger, Lattuca, Hadgraft, & Newstetter, 2011).

Learning Strategy

Boulton-Lewis, Marton, Lewis and Wilss (2004) introduced three levels of

learning strategy: focusing-rehearsal strategy, organisation-memory strategy and elaboration-monitoring strategy. Focusing-rehearsal strategy involves learners’ interaction with information-gathering activities, such as viewing pictures and skimming through text. This action is followed by the reading and writing process. Organisation-memory strategy explains the way learners arrange and construct information, followed by an affirmative plan to remember the information. Elaboration-monitoring strategy involves an in-depth interaction with information, followed by additional learning activities to relate, discuss, synthesise and analyse. These strategies can be linked to Blooms’ classification (1956) of cognitive development taxonomies.

Previous research implied that learning strategy is context dependent (Litzinger et al., 2011). The diversity in the strategies used can depend on the ways the learning system is structured, including the learning activity, the assessment criteria, the curriculum and the learning environment. In certain institutions, the environment is not properly structured to support meaningful learning (Cano & Cardelle-Elawar, 2008). For example, students may have limited access to learning facilities. Therefore, students feel that it is hard to actively participate in learning. On the other hand, a positive learning environment, such as is created when teachers supply motivational words, can encourage active participation in learning in a way that students may establish strategies to cope with the learning

situation (Lashari, Alias, Akasah, & Kesot, 2013). According to Schmeck and Geisler-Brenstein (1989), students will not only establish a strategy for learning, they will also modify their strategy to match the learning instruction and situation to enable them to actively take part in the learning process. Schmeck and Geisler-Brenstein (1989) suggested that students should be aware of their preferred teaching and learning style so that they can consider a better strategy that better matches their learning style.

There is considerable agreement that learning strategy is often established towards achieving good grades or maintaining performance. There is empirical evidence for a relationship between learning strategy and study performance (Ferla, Valcke, & Schuyten, 2008; Paimin, Hadgraft, Prpic, & Alias, 2011; Yip, 2009). For example, Yip's (2009) study suggested that learning strategy affects the study performance of Chinese university students, with will and self-regulation contributing to high academic success more than skill. The study provided strong support for the importance of learning strategy as one of the success factors in higher education study. In engineering, a study conducted among first-year Hong Kong university students reported a high use of memorising and achievement strategies. However, none of these strategies correlated significantly with the academic performance of the students. The selection of first-year students as a study sample is most likely inappropriate, given that the students are still in the transition phase from

a high-school learning environment to the university setting. They may require at least three years to develop a consistent learning strategy (Niles, 1995). Research shows that students tend to use a particular learning strategy that they have found to 'work well' to achieve their desired goal (Baeten, Kyndt, Struyven, & Dochy, 2010).

A review of the literature on learning strategy suggests that it is a critical learning element, one that should be possessed by higher education students (Boulton-Lewis et al., 2004; Cano & Cardelle-Elawar, 2008). Yet, what we know about strategy is mainly based upon empirical studies that investigate relationships between study strategies with other factors such as interest and performance. Studies that are available in this area have been conducted among Business and Arts students (Duff, 2004). There is a dearth of studies that explore learning strategy used among higher education students, particularly in engineering education. Therefore, we still lack information on the types of learning strategy that are beneficial for engineering students to be successful in their courses. The ubiquitous development of information technologies, which has been largely applied in the context of engineering learning, has opened up challenges for students to become independent learners since they have access to information worldwide.

There is evidence suggesting the importance of first-year undergraduate engineering students establishing their own learning strategy to enable them to survive in the courses (Zeegers, 2001). It is

expected that one of the major challenges for engineering students would be to recognise the required strategy or skills when they enter university, and this could be the reason for the consistently higher percentage of attrition from engineering in the first year of study (Godfrey, Aubrey, & King, 2010). The first-year stage is crucial for students as they are exposed to a new university system and faced with expectations that are different from those they had in high school. During the learning process, students are expected to have mastery over the integration of engineering skills such as computer skills, hands-on skills and being good at mathematics. Also, students must be able to learn complex derivation, perform analyses, demonstrate simulation and use problem solving effectively. Due to the learning complexities, students are expected to adopt different learning strategies as they are experience learning. This highlights the importance of focussing this study on final-year engineering undergraduates in order to identify learning strategies that are vital in the context of engineering education.

The limited research among engineering students in this area and the lack of consistency in the findings of studies on learning strategies highlighted the need for a study to be conducted among engineering students. This study was embarked on to identify learning strategies used by engineering students in their effort to persist and succeed in engineering programmes.

METHODOLOGY

This study was conducted at Universiti Tun Hussein Onn Malaysia (UTHM) and the University of Melbourne, Australia. Invitations through email and distribution of flyers in the final-year engineering classes were some of the strategies used to obtain participants for this study. Sixteen participants (eight participants from each institution) volunteered to share their success story. The participants included seven males and nine females; all scored at least a second class lower (12.5% of the total respondents) in their graduation achievement (second class lower at UTHM is almost equivalent to level H2B Honours at the University of Melbourne). A one-to-one interview session was arranged, in which students were required to answer a set of semi-structured interview questions. The participants were asked about strategies they used in striving towards achieving success in studying.

Data presented in this paper were part of the mixed method design research, where quantitative and qualitative data (from a questionnaire and interviews) were simultaneously collected to understand factors influencing learning success in engineering. Only the qualitative data are presented in this paper. Two activities were designed during the interview to encourage participants to stay engaged with the session. The first activity required the participants to plot their level of academic achievement

throughout the years of study and share learning strategies used to maintain their results or ensure better performance. The second activity required the participants to rank several key words about strategy in a colour-coded zoning card (labelled from most important to less important). The key words were selected based on information on study strategies obtained from the literature. The participants were encouraged to add any other strategies that were not in the list. The activities appeared to be highly effective in facilitating the interview, and students could recall up to five years of their success stories. As hoped, the participants were actively engaged with the activity and expressed their feelings naturally and openly on the topics of selection. The interview

data were analysed using a thematic coding approach. Data were coded into several themes using the NVivo software.

RESULTS AND DISCUSSION

The designed activities for the data collection uncovered nine learning strategies to get meaningful understanding of topics i.e. visualising engineering applications, maximising the use of learning materials (e.g. online learning resources, lecture notes), understanding basic engineering concepts, mastering engineering skills (e.g. computer skills, hands-on skills), asking an expert (e.g. lecturer/technician), studying with friends, focussing on tests and exams, selecting important topics to learn and managing study time (see Figure 1).

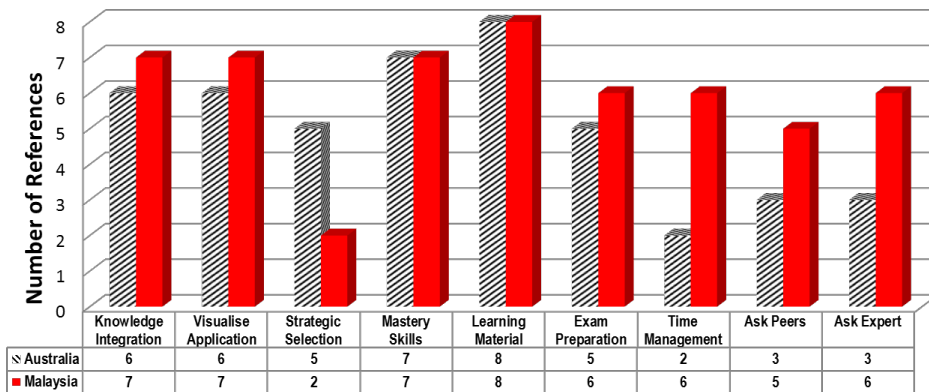


Figure 1. Categories of learning strategies of the engineering students

The four most common strategies highlighted by the participants were mastery of engineering skills, maximising the use of learning materials, visualising application and meaningful understanding of topics (knowledge integration). These strategies

were established for various reasons such as to achieve a personal goal or success, to fulfil assessment criteria (to pass tests or to complete assignments), to endure challenges (e.g. falling sick), to overcome challenges (e.g. having no interest in the subject), to

survive after failure and to keep persisting in the programme.

The learning strategies used by the participants are similar to the strategies proposed by Weinstein, Jung and Acee (2010), except for ‘mastery of engineering skills’ and ‘ask/study with peers’. Mastering engineering skills and knowledge is crucial in engineering as undergraduate students are expected to develop several attributes and professional competencies in engineering. An example of this response, a comment made by a Malaysian participant, is as follows:

For example like Excel. It is notably important, especially for reporting (computer skills). We need to perform analysis, if we do not have that skill we need to learn from others (ask peers)... to have such computer skills makes every single task become a lot easier.

As the engineering students looked forward to preparing themselves to be professional engineers, mastering key competency skills (e.g. communication skills, computer skills, teamwork skills) were deemed vital for ensuring that they could meet the criteria required by industry. Some students acknowledged the importance of doing practical training in industry in order to expose themselves to a ‘real’ engineering setting. The students reflected that they gained useful knowledge and skills and, at the same time, developed greater confidence in dealing with engineering topics.

The participants also mentioned that they created several activities with friends

(ask/study with peers) for knowledge sharing, brainstorming and arguing, discussing concepts, summarising topics, sharing workload and problem solving. The students also found that studying with friends made learning easier than when studying alone as they could get instant answers and feedback and, consequently, achieve better performance. Some examples of comments made by the Australian participants are as follows:

Each person makes a summary for each particular topic. The summary is like key points that are critical and must be remembered. Everyone will be like...for example, explain about the process that is involved. If any of us knows more about the topics, she will teach others.

...from second, third, fourth and now this year is the fifth year, we always study and do our exam papers together. We do everything. It is the biggest difference. Without it, we will be getting at least 20% less in our GPA. It is the single most incredible thing.

The participants exhibited a common understanding of the importance of having a good grasp of engineering concepts to enable better understanding of related engineering subjects and practical work. Some of the participants acknowledged that they managed to develop understanding about engineering topics when relating the topics with a real-world example of engineering. According to the participants, having sufficient learning resources and the chance to do practical work in a “real”

or “virtual” laboratory setting with access to real equipment can facilitate effective learning and understanding about topics. In certain situations where the facilities or learning resources were limited or not available, they had to develop a new strategy to ensure continuous learning.

It was noteworthy that the engineering students had applied multiple strategies that they believed were useful to contributing to their study success. Detailed observation of the interviews revealed that there was also a tendency to use similar strategies throughout their studies. This tendency could be generated based on their experiences and evaluation of the effectiveness of the strategies in achieving success. These findings support Cano and Cardelle-Elawar’s study (2008), which showed that university students who possessed certain study strategies (e.g. gain a meaningful understanding of the topic learnt) performed well in their studies.

Reflection made by the participants also demonstrated that they developed several strategies to fulfil the assessment criteria. In engineering, teaching and learning activities encourage group work activities and students are expected to have some practical experience by the end of their engineering studies. The participants expressed that the heavy workload required them to establish strategies such as organising tasks, distributing the workload among team members and managing time effectively. This finding was consistent with Gow and Kember’s study (1990), which demonstrated that students limited their reading and

study time because of the overwhelming curriculum. Since overload of curriculum has been listed as among the contributing factors of attrition in technical programmes including engineering (Seymour, 1995), it is necessary to enlighten the students about the strategies that can be used for more effective learning.

Even though participants from both groups demonstrated the need to master engineering related knowledge and skills, they aimed to attain different skills. It was observed that the Malaysian participants, particularly the males, had the tendency to focus on mastery of hands-on skills, such as operating machines, software applications and site-work experience, while the Australians tended to focus on developing communication skills and teamwork skills. This variation may reflect the differences in the professional development criteria between the two countries.

In long-term practice, appropriate selection of learning strategies is said to generate students who are independent in learning (Zimmerman & Martinez-Pons, 1988). University students should become independent learners. They should have the ability to make their own decisions in determining the appropriateness of topics to learn, know how to select learning materials and implement study techniques that best match their preferred learning style and desired goal.

CONCLUSION

This study provided useful information on learning strategies as an enabler of study

success in engineering education. The findings revealed that learning strategies used by engineering students in the two learning contexts were similar. However, a small sample size was used for the current research, thus, the findings might reflect learning strategies used by engineering students at the two institutions only. There was also supportive evidence demonstrating the difference in intention of using the strategies by the Malaysian and Australian participants; however, this is not within the focus of this study. Much more research needs to be done to prove this assumption.

ACKNOWLEDGEMENT

The researchers would like to express gratitude to the Ministry of Higher Education, Malaysia for supporting this research and publication (FRGS 1605). The authors also thank the participants who were involved in this study.

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Development and Validation of an Instrument for Measuring Technical Teachers' Attitudes towards Teaching Engineering Drawing

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ABSTRACT

The ability to conduct valid assessment of teachers' attitude towards teaching of a technical course is important as teachers' attitude influences the quality of teaching and students' learning experience. This paper focuses on the development and validation of an instrument for assessing technical teachers' attitudes towards teaching engineering drawing. The study used a developmental research design method. Three factors of attitude were postulated and 19 items were constructed based on the understanding gained from existing literature. The draft instrument was piloted on a sample of 235 teachers and analysed using Principal Component Analysis (PCA) method, specifically Exploratory and second order Confirmatory Factor Analysis (EFA & CFA) techniques with orthogonal varimax rotation. The results indicate that all 19 items are properly loaded on the three postulated factors, providing evidence for the construct validity of the instrument. The overall reliability of the instrument based on inter-item consistency was found to be high ($\alpha = 0.81$) and therefore, scores obtained using the instrument are reliable. In conclusion, the findings indicate that the instrument is a valid and reliable tool for measuring teachers' attitudes towards teaching engineering drawing.

Keywords: Attitude scale, engineering drawing, technical teachers

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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INTRODUCTION

Teachers with their knowledge and skills are the most important human resources in schools to influence human resource development through students' performance (Ministry of Education Government of India, 1970). In particular, teachers' attitudes

play a crucial role towards achieving set educational goals (Pintrich & Schunk, 1996). Attitude, which reflects feeling and emotions, is an individual's prevailing predisposition towards responding favourably or unfavourably to an object or event (Morris, Charles, & Maisto, 2003). Attitudes can be positive, negative or neutral and also dormant and more generalised and are made up of three components namely, the affective, cognitive and behavioural components (Kreitner, Kinicki, & Cole, 2007).

Teachers' feeling and emotions influence their attitude towards teaching quality, which in turn influences students' satisfaction and learning performance. For example, Denessen, Vos, Hasselman and Louws (2015), and Frenzel, Goetz, Lüdtke, Pekrun and Sutton (2009) found that teachers' enjoyment in teaching was positively associated with students' learning satisfaction. The more teachers enjoyed their teaching, the more enthusiastically they taught and the more students enjoyed the lesson. Similar effects of teachers' attitude towards their teaching subject were observed by Mastin (1960), who found that teachers' attitudes towards a particular subject influenced students' attitudes towards that subject. In particular, students tended to have poorer attitudes when teachers lacked ability, confidence and enthusiasm (Mastin 1960 as cited in Denessen, Vos, Hasselman, & Louws, 2015). Thus, teachers with a positive attitude tend to affect students positively, while teachers with a negative attitude affect students negatively.

Quality management in the education system is designed to achieve set standards through proper planning, adequate supervision and timely evaluation and monitoring to ensure quality education delivery (Sahu, Shrivastava, & Shrivastava, 2013). Assessment of teachers' attitude through valid instrument, thus, can provide information on teachers' needs, which can then be addressed to improve performance in instructional delivery. Numerous studies on development and validation of attitude measures have been conducted (Kulinna, Cothran, & Regualos, 2003; Ezeudu, Chiahah, & Eze, 2013; Zahra & Bee, 2013; Anthonia, 2014), but most of these focused on students' attitudes towards learning, in particular learning of the sciences. There are currently limited studies on the development and validation of instruments for attitude measurement among teachers. Two notable studies on instrument development for measurement of teachers' attitudes deal with teaching the sciences (Tortop, 2013; Van Aalderen-Smeets, & Van der Molen, 2013). Tortop (2013) attempted to develop a Teacher's Attitude Scale towards Science Fair (TASSF), while Van Aalderen-Smeets and Van der Molen (2013) developed an instrument for assessing the attitude of in-service and pre-service primary-school teachers towards teaching the sciences, the Dimensions of Attitude towards Science (DAS) instrument. Both instrument development examples are for assessing the attitude of science teachers. No available study was found on the development of an attitude instrument for technical teachers,

in particular with regards to teaching engineering drawing courses. Demand for engineering drawing teachers is high and the teaching of engineering drawing is challenging as it requires a high level of spatial visualisation skills in addition to cognitive skills (Akasah & Alias, 2010). Thus, sometimes less competent teachers are hired to teach the course, which may negatively impact the quality of teaching especially if the teachers are also suffering from poor attitude towards teaching engineering drawing. Thus, knowing the attitudes of technical teachers towards teaching engineering drawing is important and having a valid measure of their attitude is essential if the assessment data are to be used in decision making. The aim of this study was to develop and validate an instrument to measure technical teachers' attitude towards teaching engineering drawing.

METHODOLOGY

This study employed a developmental research design method. This type of design provides for production of knowledge with the goal of improving processes of instructional design, development and evaluation. Adamski (2000, p. 40) defined developmental research as "the systematic study of designing, developing and evaluating instructional programs processes, and products that must meet the criteria of internal consistency and effectiveness." While developmental research is only one of several types of research methods that can provide experts with usable data, its focus

on the design, development and evaluation of instructional products and processes is unique (Richey & Klein, 2005).

Developmental research can be described as Type I and Type II developmental research (Richey & Klein, 2004). Type I describes the development of the entire design based on extensive research grounded in a specific context. This category, according to Richey and Klein (2004), typically involves situations in which the product development process used in a particular situation is described and analysed, and the final product is evaluated. This type of developmental research includes "activities performed during the entire development process of a specific intervention from exploratory studies through (formative and summative) evaluation studies" (p. 1102). Type II developmental research is orientated toward a general analysis of design, development or evaluation process, addressed either as a whole or regarding a particular component. It is the overlaying of a tested design onto existing programmes to improve outcomes. Table 1 presents the types of and phases of developmental research. With regards to measurement scale development, the process usually involves four stages namely, defining constructs and determining domain content, generating items for the survey and judging the appropriateness of the items, designing and conducting studies to test the scale and lastly, finalising the scale based on data collected in the third stage (Burton & Mazerolle, 2011, p. 29).

Table 1
Developmental research types and common research methods employed for a particular study

Type of Developmental Research	Functions/Phase	Research Methodology Employed
Type 1	Product Design and Development	Case Study, In-Depth Interview, Field Observation, Document Analysis
Type 1	Product Evaluation	Evaluation, Case Study, Survey, In-depth Interview Document Analysis
	Validation of Tool or Technique	Evaluation, Experimental, Expert Interview, In-depth Interview, Survey
Type 2	Model Development	Literature Review, Case Study, Survey, Delphi, Think-Aloud Protocols
Type 2	Model Use	Survey In-Depth Interview, Case Study, Field Observation, Document Analysis
Type 2	Model Validation	Experimental, In-Depth Interview, Expert Review, Replication

Source: Richey & Klein, (2005)

The Attitude Scale development process follows the steps outlined by Burton and Mazerolle (2011, p. 29), which will be explained next.

Stage 1: Defining Constructs and Determining Domain Content

The constructs and domain content for the attitude scale were determined from knowledge gained from the existing literature. In this study, attitudes are the degree of belief adopted by teachers towards teaching Engineering Drawing. Teachers' attitudes towards their teaching of Engineering Drawing were developed based on the three components of attitudes (affective, cognitive and behaviour) identified through literature review of teachers' attitude towards teaching (Patrick, 2014; McLaren, 2007; Wagah, Indoshi,

& Agak, 2009; Fishbein & Ajzen, 1975). Thus, in this study, the measurement of technical teachers' attitude is composed of three latent constructs: the affective (feeling and emotions about the course), cognitive (knowledge and skills related to the course) and behaviour towards teaching the course.

Stage 2: Generating Items for the Survey and Judging the Appropriateness of the Items

Items were generated to operationalise the concept of attitude towards teaching engineering drawing. The conscripting of those items emerged from the fieldwork of different technical education teachers who are experts in the subject matter. Thirty-six items were initially drafted and subjected for review by a panel of experts, after which 24 items were selected and clustered

into three factors: affective (feeling and emotions), cognitive (knowledge and skills) and behavioural. The details of the items conscriptions process is shown in Figure

1, which is consistent with the suggestions from Costa and Polak (2015), Schutt (2011) and Vaske (2008).

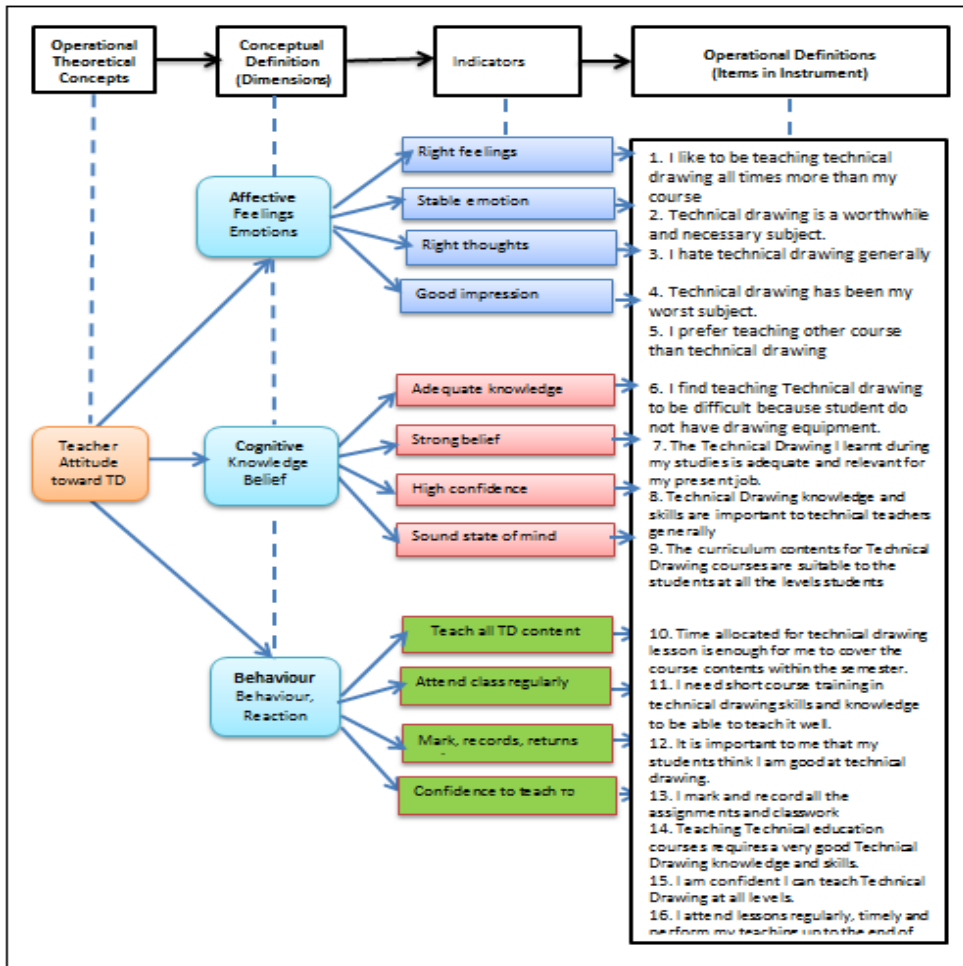


Figure 1. Generating items to operationalise the theoretical concept of attitude towards teaching engineering drawing

Stage 3: Designing and Conducting Studies to Test the Scale

Two hundred and seventeen technical education teachers from the six institutions

offering NCE technical education programmes in Northern Nigeria (Table 2) participated in the testing of the instrument. These institutions were established

specifically to groom and produce teachers in technical, vocational and commercial as well as academic disciplines leading to the Nigeria Certificate in Education (NCE TECH). The aim of this study was to test the construct validity of the scale based on an existing theoretical framework; this is an important step when a new

instrument is being developed (Melorose, Perroy, & Careas, 2000). For this purpose, the respondents were asked to rate their agreement based on a 5-point Likert scale with 1='Strongly Disagree' and 5='Strongly Agree'. The sum of the relevant items in each subscale represented the strength of the respondent's attitude.

Table 2
Distribution of respondents according to institution

S/N	Name of Institution	Respondents			
		Heads of Department (HoD)	Teachers'	Students'	Total
1	Federal Colleges of Education (Technical) Bichi	5	49	50	104
2	Federal Colleges of Education (Technical) Gombe	5	56	50	111
3	Federal Colleges of Education (Technical) Gusau	5	27	50	82
4	Federal Colleges of Education (Technical) Potiskum	5	59	50	114
5	College of Education Minna	5	19	50	74
6	Kaduna Polytechnic	5	25	50	80
Total		30	235	300	565

The results of the Exploratory Factor Analysis (EFA) are discussed in the next section.

Stage 4: Finalising the Scale

After pilot-testing the scale, it was finalised using further analysis. The results of the Confirmatory Factor Analysis (CFA) are presented in the next section.

RESULTS AND DISCUSSION

Exploratory Factor Analysis (EFA)

EFA was used to determine the underlying structure of the data. EFA is a multivariate statistical procedure commonly used in the social sciences, education and other related fields (Williams & Brown, 2012). It is an orderly simplification of interrelated measures applied to a single set of

variables and is used to explore the possible fundamental structure of a set of interrelated variables without imposing any defined structure on the outcome. This study of the development and validation of instruments for measuring teachers' attitude towards teaching engineering drawing was then undertaken to find the underlying structure of the data.

Factor analysis was carried out on 24 items for the primary components using orthogonal rotation (varimax) on the

assumption that the factors are uncorrelated with one another. Five items were deleted because their factor loadings were less than 0.4 or loading on more than one factor, leaving a total of 19 items. Table 2 below presents the loading pattern after the deletion with varimax rotation. The 'affective' factor was loaded with eight items, the 'cognitive' factor was loaded with six items and the 'behaviour' factor was loaded with five items.

Table 3
Factor structures and loadings of 19 items with a Varimax Rotation on the attitude towards Teaching Engineering Drawing Scale

S/N	Items	Description	Factor Loadings	Factor Label	Cronbach's Alpha
1	AFF1	I would like to teach Engineering Drawing all the time, more than my course.	0.725	Affective	0.88
2	AFF2	I hate Engineering Drawing generally.	0.860		
3	AFF3	I prefer teaching courses other than Engineering Drawing.	0.791		
4	AFF4	I find teaching Engineering Drawing to be difficult because the students do not have drawing equipment.	0.762		
5	AFF5	It is important for me to be recognised by my students as a competent Engineering Drawing teacher.	0.576		
6	AFF6	Engineering Drawing is a worthwhile and necessary subject in technical education programmes.	0.706		
7	AFF7	Engineering Drawing has been my worst subject.	0.729		
8	AFF8	Most technical teachers hate to teach Engineering Drawing.	0.669		
9	COG1	The Engineering Drawing learnt during my studies is adequate and relevant to my present job.	0.888	Cognitive	0.77
10	COG2	Engineering Drawing knowledge and skills are important to technical teachers.	0.879		
11	COG3	The curriculum content for Engineering Drawing courses is suitable for the students at all levels.	0.817		

Table 3 (continue)

12	COG4	The time allocated for Engineering Drawing is enough for me to cover the course content within the semester.	0.674		
13	COG5	I need a short course on training in Engineering Drawing skills and knowledge to be able to teach it well.	0.831		
14	BEH1	Teaching Engineering Drawing is important for all technical education students' future career.	0.743		
15	BEH2	I mark and record all Engineering Drawing assignments and class work.	0.758	Behaviour	0.79
16	BEH3	I am confident and can teach Engineering Drawing content for all levels.	0.787		
17	BEH4	I attend my Engineering Drawing lessons regularly and on time and perform my teaching up to the end of the lesson.	0.681		
18	BEH5	I use different teaching methods to teach Engineering Drawing.	0.723		
19	BEH1	I teach Engineering Drawing because I am required to.	0.737		

The KMO measures for the second-order construct of attitude showed that the data were factorable as the Bartlett's test of sphericity was high (2357.995) and the Kaiser-Meyer-Olkin (KMO) criterion was 0.856, indicating that the data were adequate for the EFA (Shiyaku, Kasim, & Harir, 2016; Hair, Black, Babin, & Anderson, 2010; George, Leech, & Barrett, 2005). The communality tables for the construct showed a high relationship between the variables and all other items before rotation, as most communalities ranged from 0.410 to 0.807, which was very good, meaning that there was no small sample size in the factors that could distort the results (George, Leech, & Barrett, 2005).

The Eigen values obtained for each factor (affective, cognitive and behaviour) were greater than 1.0 (4.778, 4.304 and

3.162, respectively), explaining a total variation of 64.441% (25.15%, 22.65% and 16.64%, respectively). This takes us to the next level of validation of the instrument via Confirmatory Factor Analysis (CFA). However, before progressing to CFA, the estimates of reliability for the draft revised scale were obtained (see Table 3). The scale and subscales seemed to have adequate reliability based on the internal consistency coefficients.

Table 4
Reliability results for HODs, teachers and students

Constructs	Number of Items	Teachers' Cronbrach's Alpha
Overall Attitude	19	0.81
Affective	8	0.88
Cognitive	6	0.77
Behaviour	5	0.79

Confirmatory Factor Analysis (CFA)

To finalise the scale, CFA was conducted. The objective of the CFA was to test how well the hypothesised model fit the observed data and minimised the difference between them (Yu & Strobel, 2013). As with the Exploratory Factor Analysis (EFA), CFA was performed on the attitude constructs using three-factor models, the three factors being the affective, cognitive and behaviour aspects. All the 19 observed variables of the three latent variables of attitude were initially incorporated, and the result did not show acceptable goodness of fit with the sample data based on the threshold

suggested (Hair, Black, Babin, & Anderson, 2010). All the fitness indices indicated good fit except for the NFI and the GFI, which are slightly less than the suggested 0.90 and above (Hair, Black, Babin, & Anderson, 2010; George, Leech, & Barrett, 2005). The RMSEA was 0.062, which is below the recommended index of less than 0.080, while the GFI was 0.888, CFI, 0.945, TLI, 0.938 and NFI, 0.888. Even though the ChiSq/df and RAMSEA indicated good fit at 1.824 and 0.062, respectively, according to the models and the modification indices, the initial model needed to be improved to fit the sample data better (Figure 2).

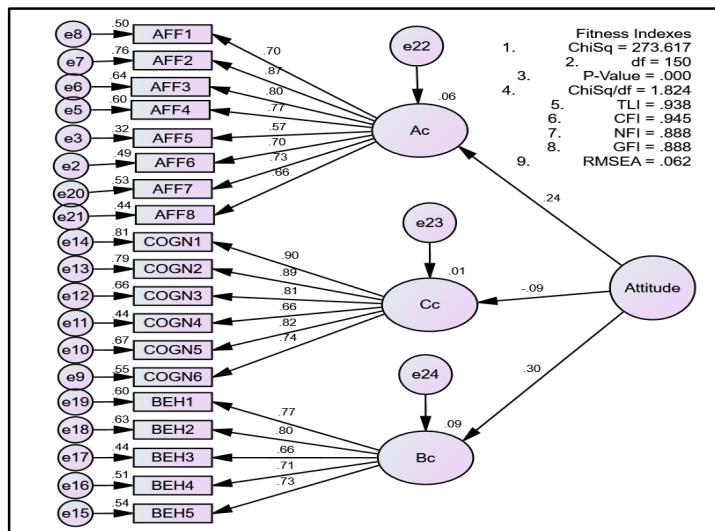


Figure 2. First iteration of the CFA for the attitude construct of the measurement model

Because of the weak index of the NFI (0.888) and the GFI (0.888), a second and final iteration became necessary. Two criteria were employed to identify the items with imperfect behaviour in the model. The details of the criteria are as follows:

the model's modification indices (MI) showed that if the analysis were repeated by treating the covariance between e2 and e21 as a free parameter, the model fit would increase. Removal of any observed variables identified with the least squared multiple

correlations may also have improved the model fitness. Based on these criteria, AFF5 was found to have the least squared multiple correlation of 0.57; as a result, it was considered for elimination.

The modification indices (MI) showed that if the analysis were repeated by treating the covariance between e2 and e21 as a free

parameter, the fitness of the model would be increased. After the removal of item AFF5 and covarying e2 and e21, a re-run analysis on the remaining items in the model gained significant goodness of fit with the sample data and retained the revised specification of the structural model (Figure 3).

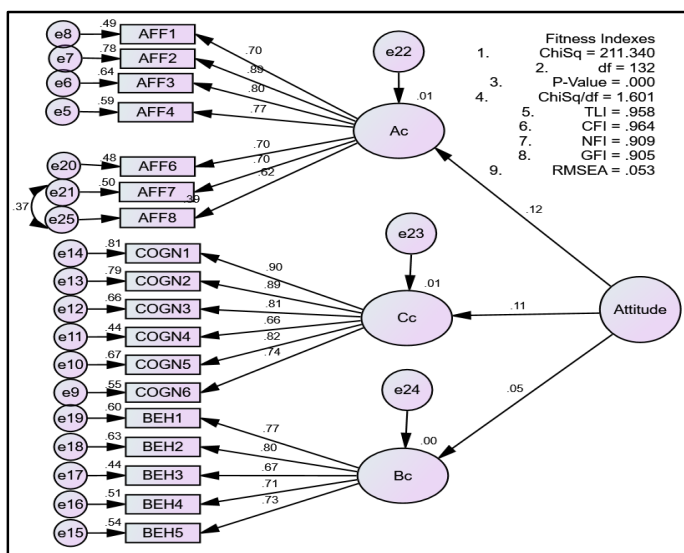


Figure 3. Second and final iteration of CFA for the attitude construct of the measurement model

Finally, only one item was removed from the model and this resulted in 18 items comprising the attitude construct. The final model's fit indices were: ChiSq/df = 1.601, TLI = 0.958, CFI = 0.964, NFI = 0.909, GFI = 0.905 and RAMSEA = 0.053. The adjusted model fits the sample data well (Figure 3).

CONCLUSION

This study was conducted to develop and validate a reliable instrument for measuring teachers' attitude towards

engineering drawing and teaching of the subject. The principal component analysis method using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) techniques with orthogonal varimax rotation indicated that the domains of teachers' attitude towards engineering drawing evolved from feeling and emotions, knowledge and skills and behaviour related to the subject. The three factors namely, the affective, cognitive and behaviour factors, were the order of attitudes believed to be a

vital part of the measuring instrument and thus, were looked into in assessing technical teachers' attitudes towards teaching engineering drawing in technical education institutions running technical education programmes. The internal consistency coefficient for the overall scale and sub-scales were found to be adequate and thus, could produce reliable scores on attitudes. In conclusion, the data indicated that the instrument developed was valid and reliable for measuring technical teachers' attitude towards teaching engineering drawing.

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Mastering Soft Skills in the Implementation of Work-Based Learning among Community College Students

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ABSTRACT

Various efforts have been taken by the Ministry of Education (MOE) and the Ministry of Higher Education Malaysia (MOHE) to improve the country's education system. Learning methods were introduced to ensure the education system achieves the desired educational goals and produces individuals who are well-balanced spiritually, emotionally and physically. However, the issue of graduate unemployment often crops up in the mass media; more often than not, the discussion has centred on the failure of tertiary educational institutions to churn out quality graduates. Thus, the method of work-based learning (WBL) is seen as a way to improve the soft skills of local graduates. This study was conducted using the quantitative research survey, with an adapted questionnaire as the instrument. Data were analysed using the Statistical Package for the Social Science (SPSS) version 20. The respondents consisted of 97 students who attended WBL programmes at five community college i.e. Community College Selayang, Community College Ampang, Community College Kota Melaka, Community College Sg. Petani and Community College Besut. The findings revealed that the level of soft skills among community college students was high. The soft skills included communication skills, problem-solving skills, learning and information management skills, profession related ethnics skills and leadership skills. This study of community college students is significant because it identified the level of soft

skills of students who had performed WBL methods. The findings of this study can help community colleges to produce high-quality graduates, hence reducing the number of unemployed graduates.

Keywords: Community colleges, soft skills, work-based learning

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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INTRODUCTION

Education is an important area that contributes to the development of the country. Learning methods are introduced to ensure that the education system reaches its goals as contained in the National Education Philosophy (NEP). According to the Community College Management Sector GCMS (2010), work-based learning (WBL) is an approach to learning and innovative teaching that involves cooperation between the Community College Management Sector and participating companies. WBL is a learning approach that requires work placement as part of the student's learning process; this learning style will increase employment-related competency, real-world work experiences and expertise in industrial applications (Becker, 2013). This may address the issues related to graduate unemployment, a subject often broached by the academic community and employers who regard it a failure of higher education institutions that the nation is suffering a shortage of quality graduates. Students with soft skills are equipped to compete in the job market and in the workplace, and they are ready to tackle the challenges of globalisation (Anuar & Esa, 2010); it is evident from various findings that WBL is one of the effective ways to improve the mastery of soft skills among community college students.

The collaboration between industry and education institutions is a major milestone towards the consolidation of higher education. According to Reave (2005),

cooperation between education institutions and the industry is not well coordinated and implemented; the former are required to include compulsory industrial training for students in the curriculum, while the latter has the responsibility of providing the required training to the students. Cooperation between education institutions and industry is the best way to shape the curriculum in determining the skills required.

Graduate unemployment in Malaysia has become a worrying phenomenon in recent years. This problem occurs not only in Malaysia but also in many other developing countries such as the Philippines, Indonesia and India and even in developed countries such as Britain and the United States (Stevens, 2014). Employers want employees who have technical or hard skills and soft skills. Tahir (2005) stated that an academic degree is no longer the passport to a good job; it is not the main attraction in the job market. Employers of any company today are looking for graduates who have a combination of technical skills and soft skills. Graduates in Malaysia have sufficient technical skills, but employers are less satisfied with their soft skills.

In Malaysia, employers and industry have a limited number of graduates to choose from; many have the knowledge and technical skills, but most are not able to communicate properly (Zaharim, 2009). According to Sulaiman (2010), thinking skills, popularly known as Critical and Creative Thinking Skills (CCTS), were first emphasised in teaching and learning in 1988.

However, the problem or the big question is still: What is the level of critical skills and problem-solving skills attained by students in institutions of higher learning? Reave (2005) stated that although universities have put in place various measures to ramp up the quality of teaching and learning, students still do not have the teamwork skills and experience required by employers. Syed (2013) stated that entrepreneurship is the key transformation factor for solving today's unemployment problem.

Profession-related ethnics are increasingly taking a prominent role due to the high frequency of white-collar crime; these are very serious matters and they involve students (Mohamed, Zin, & Kadir, 2011). Leadership skills are important in the formation of a nation's cultural identity, but students are not paying much attention to developing these necessary skills (Esa, 2013). Thus, this study aimed to investigate the mastery of soft skills namely, communication skills, critical and problem-solving skills, teamwork skills, learning and information management skills, entrepreneurial skills, Profession-related ethnics and moral skills and leadership skills in the implementation of Work-Based Learning (WBL) among community college students.

LITERATURE REVIEW

Communication Skills

According to Zaharim (2009), employers are satisfied with the technical skills of

graduates but are not very happy with their communication skills, which are still poor. This statement is supported by Pumphery (2001), who stated that a large number of graduates do not have the skills required by employers. Students will benefit from the implementation of Work-Based Learning (WBL); their communication skills will improve. In addition, WBL indirectly prepares students to meet the requirements of industry. This is because students who have participate in WBL have actual experience and have become accustomed to working conditions in industry. These skills are very important for the present business environment with its highly competitive nature; many employers are concerned with that their companies should run smoothly and production flow be efficient (Pumphery, 2001).The WBL approach can help various institutions to produce graduates of quality who are equipped with soft skills. This augurs well for the education fraternity, who can take pride in achieving the objectives and goals of teaching and learning, particularly in the aspect of imparting communication skills to students.

Critical Skills and Problem-Solving Skills

Critical and problem-solving skills are crucial abilities that tertiary-level students should acquire as outlined by the Malaysian Higher Education Ministry. Problem solving requires a student to think critically, creatively, innovatively and analytically; at

the same time, he or she must be capable of applying the knowledge and understanding learnt to new and different problems (Acar & Newman, 2003).

Teamwork Skills

Teamwork skills, also known as teamwork or group work, are soft skills that can be applied through WBL. Hambur, Rowe and Luc (2002) defined teamwork skills as skills that allow a structured collection of individuals to interact efficiently with one another to achieve common goals. According to Anderson (2007), teamwork skills are a necessary ingredient for graduates to compete for and complete future work. WBL is an effective approach that can train graduates to have the required teamwork skills for future tasks.

Learning Skills and Information Management

In the 21st century, the international community is more concerned with increasing knowledge through the concept of continuous learning and information management. Learning skills and information management are processes of democratising education, which include programme acquisition of knowledge, skills and competence, formal and informal experiences and training in the workplace. Global competitiveness and diversity requirements compel people to constantly update their knowledge and skills. The

implementation of WBL can help improve the soft skills of students through continuous learning and information management, thereby producing all-rounded employees that employers desire. According to the policy of the Ministry of Higher Education Malaysia (MOHE) (2006), continuing education entails learning independently for the acquisition of new skills and knowledge; it encompasses three stages as outlined by institutions of higher education: Learning how to find and manage relevant information from various sources, learning to accept new ideas and developing the capacity for autonomous learning.

Entrepreneurial Skills

According to Harun (2010), entrepreneurial skills are soft skills that students need to master in the earlier years of schooling or later years of higher education. Entrepreneurial skills give a person the ability to explore opportunities and develop awareness of risk, creativity and innovativeness in business and work-related activities (MOHE, 2006). This is supported by Kuratko and Hodgetts (2007), who pointed out that students require entrepreneurial skills so that they can be shrewd entrepreneurs who are capable of looking for opportunities, take risks and translate dreams and ideas into reality. By undertaking entrepreneurial activities, students will gradually develop business acumen and business culture (Othman, 2009).

Profession-related ethnics

According to the Ministry of Higher Education Malaysia (MOHE, 2006), successful professional practices and fruitful social interaction demand the observance of professional and moral standards. The MOHE (2006) highlighted three stages in the development of profession-related ethics and moral skills: The ability to understand the impact of economic, environmental and socio-cultural factors on professional practices; the ability to analyse problems related to ethics and make decisions in solving them; and the ability to practise ethical behaviour, in addition to having a sense of responsibility towards society.

Leadership Skills

Employers expect their employees to possess leadership skills. According to the MOHE (2006), leadership skills involve the ability to practise leadership in a variety of activities through three levels of knowledge related to leadership: The ability to lead projects; the ability to understand and interchange roles between team leader and team members; and the ability to supervise team members. Students can develop leadership skills through WBL.

METHOD

Descriptive and inferential surveys were conducted to collect quantitative information. For this study, the population

was composed of diploma students of five community colleges i.e. Community College Selayang, Community College Ampang, Community College Kota Melaka, Community College Sg. Petani and Community College Besut, all of which had carried out the implementation of the WBL.

Population and Sample

This study used the random sampling technique and the respondents were students of community colleges in Malaysia. The population in this study consisted of 104 people and the selected sample was 97. This generalisation is based on the sampling schedule developed by Krejcie and Morgan (1970).

Instrument

The instrument used in this study was the questionnaire. The questionnaire used consisted of two parts. Part A included questions related to the background of the respondents. This section contained four items namely, gender, race, education institution and field of study.

Part B aimed to identify the level of soft skills of community colleges when implementing WBL. It consisted of seven sections, each of which represents a soft skill. The scoring was based on a 5-point Likert scale for each soft skill. Table 1 below shows the number of items in the questionnaire.

Table 1
Number of questionnaire items

Factor		
1.	Part A	Demography Gender Race Education Institution Field of Study
		4 items
2.	Part B	Communication Skills Critical Skills and Problem-Solving Skills Teamwork Skills Continuous Learning and Information Management Entrepreneurship Skills Profession-related ethics Leadership Skills
		11 items 11 items 12 items 6 items 9 items 7 items 12 items

To test the reliability of the instrument, this study used the Statistical Package for Social Sciences (SPSS) for Windows 20 to obtain Cronbach's Alpha reliability coefficient, which indicates the connection of items to one another (Ghafar, 1997). This study was reviewed by four experienced academics in the specified field of study.

The results of a pilot study conducted showed that the Alpha value was more than 0.7. Based on the results of the pilot study, the researchers obtained the Cronbach's Alpha values, which indicated good levels of communication skills, namely 0.737 and 0.724 for professional ethics and moral skills, respectively.

Table 2
Respondents' background

Gender, Race, Education Institutions	Number of people	Percentage (%)
Male	36	37.1
Female	61	62.9
Malay	95	97.9
Indian	2	2.1
Kolej Komuniti Selayang	14	14.4
Kolej Komuniti Ampang	10	10.3
Kolej Komuniti Kota Melaka	30	30.9
Kolej Komuniti Sg. Petani	20	20.6
Kolej Besut	23	23.7
Total	97	100

RESULTS

The findings were divided into two parts: Part A consisted of four items on the background of the respondents. Table 2 shows the background of the respondents based on the number and percentage of respondents.

This section contains the descriptive analysis for each soft skill and its level for respondents participating in WBL. The overall average mean score for the level of communication skills was 4.1218, which indicates a high level. The mean score for

critical skills and problem-solving skills was 4.0946, and that of teamwork skills was 4.2297. The mean score for continuous learning and information management was 4.1219, and that of entrepreneurship skills was 4.0240. The mean score for profession-related ethics among community colleges was 3.9410, and that of leadership skills was 4.2104. Overall, the level of soft skills among community colleges which had implemented WBL was high. Table 3 below shows the mean score for each soft skill among the community colleges.

Table 3
Mean score for soft skills

Overall Average Mean Score for Communication Skills	4.1218	High
Overall Average Mean Score for Critical Skills and Problem-Solving Skills	4.0946	High
Overall Average Mean Score for Teamwork Skills	4.2297	High
Overall Average Mean Score for Continuous Learning and Information Management	4.1219	High
Overall Average Mean Score for Entrepreneurship Skills	4.0240	High
Overall Average Mean Score for Profession-related Ethics	3.9410	High
Overall Average Mean Score for Leadership Skills	4.2104	High

The analysis of the one-way ANOVA, listed in Table 4 below, showed a significant difference between the levels of communication skills among the students of the five community colleges. This study showed a significant difference of less than 0.05 ($p < 0.05$). Therefore, the null hypothesis (H_0) was rejected. There was a significant difference in communication skills among community colleges when implementing WBL. As for the other soft skills, there was no significant difference among the students

of the five community colleges, as shown in Table 4 below. It shows that the p-value was greater than 0.05 ($p > 0.05$). Thus, the alternative hypothesis (H_1) was accepted, meaning that there was no significant difference between the critical skills and problem-solving skills, teamwork skills, learning and information management, entrepreneurial skills, profession-related ethics and moral skills and leadership skills among community college students after implementing WBL.

Table 4
Differences between soft skill levels among students of the five community colleges

KI 1	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1.803	4	0.451	3.433	0.012
Within Groups	12.079	92	0.131		
Total	13.882	96			
KI 2	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	0.257	4	0.064	0.648	0.630
Within Groups	9.114	92	0.099		
Total	9.371	96			
KI 3	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	0.281	4	0.070	0.691	0.600
Within Groups	9.358	92	0.102		
Total	9.639	96			
KI 4	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1.330	4	0.333	2.216	0.073
Within Groups	13.809	92	0.150		
Total	15.140	96			
KI 5	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	0.981	4	0.245	2.241	0.071
Within Groups	10.062	92	0.109		
Total	11.043	96			
KI 6	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	0.289	4	0.072	0.551	0.699
Within Groups	12.068	92	0.131		
Total	12.357	96			
KI 7	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	0.661	4	0.165	1.190	0.321
Within Groups	12.784	92	0.139		
Total	13.446	96			

DISCUSSION

Levels of Soft Skills

The overall findings derived from data analysis show that students who took WBL programmes in the community colleges obtained high mean score for the communication skills. The highest mean

score goes to communication skills in English as well. High mean scores were also recorded for both critical skills and problem-solving skills. These skills will be helpful for students when enter the job market and then begin work. This finding contradicted those of Anderson's study (2007), which states that all people use

critical thinking while solving problems because they lack self-awareness and other features that enable them to interpret and evaluate the problem. Most previous studies showed the same trend i.e. students do not use critical thinking to analyse problems properly. However, the researcher found that most of the community college students who were studied in this research displayed good critical thinking skills and problem-solving skills. The community college students surveyed could also improve their skills in order to be more competitive and move ahead of other students to secure a place in the business world.

The analysis of data showed a high score for teamwork skills. This is because during industrial training, the community college students surveyed developed teamwork skills as they were required to cooperate with other workers. This proved that WBL was able to improve teamwork skills among students, who, in fact, also need to cooperate with other students during group sessions that require sharing of ideas, knowledge and solutions. A study conducted by Rosenshine (1999) showed that teamwork is considered present when group members can create interdependent situations among one another. Based on this statement, the community college students who participated in this study are likely to display excellent teamwork skills in the workplace.

The results also showed high scores for continuous learning and information management among the community college students surveyed. This suggests that

students who pursue tertiary education have the aim of seeking knowledge, and they are rewarded with what they desire. This is because these community college students are open-minded; they are ready to assimilate new ideas that bring positive results.

The results also showed a high score for entrepreneurial skills, suggesting that community college students are good at identifying business opportunities. These findings are in line with the studies carried out by Stevens (2014), which showed that graduates surveyed could identify business opportunities in line with solving the problem of unemployment. This suggested that the community college students trained under the WBL approach had learnt good entrepreneurial skills with which to tackle the problem of unemployment. This study finding is supported by Mitchelmore and Rowley (2010), who stated that graduates must think of themselves as inventors rather than job seekers.

In the course of investigation in meeting the objectives of this study, the respondents were asked seven questions. The results showed that the score for profession-related ethics was high. Student culture can be open to immoral or unethical activities that can adversely affect the process of building up a pool of first-class human capital, which is vital for a country to succeed. However, the responses of the community college students surveyed suggested that they possessed a high level of profession-related ethics and moral skills. A good attitude and a professional work ethic will ensure

that students behave and conduct business deals with the utmost propriety, wherever they are. The findings suggested that the community college students surveyed can practise ethical behaviour; this is consistent with the findings of a study conducted by Zaharim (2009), which revealed that quality employees are not only experts in their work, but also have an admirable character and display commendable behaviour.

The results of the data analysis show a high level of leadership skills among community college students. These findings are supported by Lee-Barron (2012), whose study showed that when a person has good leadership skills, he or she can influence and convince people inside and outside organisations to work and help to achieve organisational goals. Based on the findings of this study, the community college students surveyed seem to have excellent leadership skills; they can mingle with and judge people well. The implementation of WBL in community colleges has certainly been a wise move, and will produce students equipped with good leadership skills.

CONCLUSION

The discussion of the findings leads to the conclusion that the implementation of WBL programmes in community colleges has produced students with a high level of soft skills. The result for communication skill shows that the community college students have a high level of communication skills in English. The community college students have a high level of critical skills and problem-solving skills. This is

probably because the students, who were trained through WBL, were thus exposed to higher-order thinking skills required by employers. The implementation of WBL in community colleges seemed to have been effective in training the students to think. In addition, teamwork skills are required in WBL, requiring students to organise group activities together to acquire and exchange views and ideas. The community college students were also open-minded and receptive to the idea that they would benefit from interacting with others. Overall, the community college students had a high level of soft skills. This is in line with the requirements of the Ministry of Higher Education that tertiary-education institutions should produce students who have strong soft skills.

Overall, there were no significant differences in students' level of soft skills among the community colleges that practised WBL. However, there was a significant difference in students' level of communication skills among the community colleges. This may have been caused by various situational factors: different beliefs among the students, different confidence levels among the students and different teaching methods and delivery styles of teachers, among other reasons. However, this study showed that there were no significant differences in students' level of soft skills among the different community colleges. This indicates that the community colleges surveyed had been successful in achieving the objectives of WBL upon implementation of the teaching method and these colleges were now

capable of producing students who meet the requirements of industry. Hopefully, the wider implementation of WBL will continue to supply versatile students as needed by today's employers. With all these positive reports, it is recommended that community colleges around the country introduce more work-based learning (WBL) programmes, especially for courses at the certificate level.

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E-Portfolio MSC Indicator for a Virtual Learning Environment

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ABSTRACT

This study was conducted to identify indicators for the use of e-portfolio for a virtual learning environment in the Malaysian Skills Certification (MSC) system. The approach is through a modified Delphi technique run in three stages. The first stage is analysis of past research material and documents as guidelines in the development of questionnaire items. In the second and third stages, the developed questionnaire is distributed to experts for approval in determining e-portfolio indicators for implementation of the Malaysian Skills Certification system. The sample selected consists of 11 experts in the field of skills certification in Malaysia. Feedback from the experts was analysed using descriptive statistics (mean, median and interquartile range). The findings identify four elements (Assessment, Personal Space, Exhibition and Learning Management) and 32 indicators through a literature review. In conclusion, there are 22 indicators were identified as necessary for the implementation of the use of the e-portfolio in the Malaysian Skills Certification system.

Keywords: E-portfolio, indicator, Malaysia Skills Certification (MSC)

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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INTRODUCTION

The e-portfolio is a collection of information in the form of digital, interactive and systematic material in monitoring student's knowledge and achievements in learning that is easier to use for publishing such information online (Bullock & Hawk,

2005; Handa, Arame, Goda, Naganuma, & Gondo, 2011; Kilbane & Milman, 2005; Young & Morriss, 2007). Halstead and Sutherland (2006) explained that written portfolios should be converted into electronic portfolios because: (i) the work of the students are now mostly in electronic form; (ii) most of the students have access to the web; and (iii) the database available through the Web allows students to store information more widely and easily.

E-portfolios now available seem to function only as a repository of information without connection to the learning process. As a result, although e-portfolios now can provide convenience and comfort to users through the use of technology, they still cannot achieve the real use of e-portfolios. Zeichner and Wray (2001) listed seven questions that must be asked before building an e-portfolio namely: (i) What are the objectives of e-portfolios?; (ii) Who decided what should be included in the portfolio?; (iii) How is evidence in a portfolio managed?; (iv) What are the types of artifact that can be stored in the e-portfolio?; (v) Can the teacher add information to the e-portfolio during the teaching and learning process?; (vi) How should the e-portfolio be evaluated?; and (vii) What should happen to the e-portfolio after it is completed?

Various concepts of ICT-integrated teaching and learning have been introduced in recent times such as e-learning, multimedia-aided training and blended learning. The e-portfolio is an educational product that uses ICT-based e-learning. It

can store all kinds of information in digital form, is flexible, can be accessed at any time and anywhere (Dimarco, 2006; Montgomery & Wiley, 2008; Stefani, Mason, & Pegler, 2007).

The use of e-portfolios in the teaching and learning process has become very popular at all academic levels. Using the latest technology, the e-portfolio has outperformed the traditional portfolio of paper format and provides a better way to store information (Bhattacharya & Hartnett, 2007; Hallam, Creagh, Harper, & Hauville, 2010; Halstead & Sutherland, 2006; Mcallister & Hauville 2010; Montgomery & Wiley, 2008; Siti Fatimah, 2007; Smyth, Horton, Studdert, Griffin, & Symonds, 2011). Information that can be included in e-portfolios is in the form of personal artifacts, lesson plans, assignments, video clips, notes, evaluation and results of work already done (Powers, Thomson, & Buckner, 2001).

In the Malaysian Skills Certification system, the portfolio is used as a document to assess the level of knowledge and student achievement, whereas the traditional paper-based portfolio is limited merely to storage of artifacts. The use of printed portfolios is not relevant to the present application. This is because the printed portfolio is static, limited to sharing information with others, difficult to manage, evaluate and update and cannot improve students' professional skills (Mcallister & Hauville, 2010; Smyth et al., 2011; Stefani et al., 2007). In contrast, the e-portfolio has many advantages: It can store and organise material more easily, share

information, enhance professional skills to improve employability skills of graduates and facilitate searches for information (Bhattacharya & Hartnett, 2007; Halstead & Sutherland, 2006; Mcallister & Hauville, 2010; Smyth et al., 2011). Thus, the e-portfolio has great potential in improving the Malaysian Skills Certification system.

However, the development of e-portfolios requires an appropriate framework to meet the needs of the education system (Young & Morriss, 2007). Before implementing the e-portfolio system in Malaysian skills education, a detailed study needs to be done first to identify the corresponding elements in the production of the e-portfolio are easy to use, user-friendly, appealing to teachers and students and in line with the standard of the Malaysian Skills Certification.

METHODOLOGY

This study used the Modified Delphi approach. The Modified Delphi approach is a procedure to find consensus among experts on the matter at hand and it uses the questionnaire as instrument (Wiersma & Jurs, 2009). The first stage of the interview was not required as the researchers had sufficiently defined the issue in the first stage of the Delphi method, so the Modified Delphi process for this study began with the second stage of questionnaire exploration of the subject.

In the first stage, the researchers conducted a literature review of models of e-portfolios and analyses of documents

related to skills education in Malaysia. This step was undertaken to create a benchmark and find variables for the study.

Next, an instrument in the form of the questionnaire was produced. Experts in the field were selected based on their qualifications to evaluate and provide feedback in connection with the criteria required for each item selected. The experts chosen were experienced and involved in setting up the Malaysian Skills Certification (MSC) system.

In the second stage, the panel of experts selected was given the questionnaire for assessment and they were asked to indicate their level of agreement and comment on the statements relating to the construction of the e-portfolio intended for use in the MSC system. The completed questionnaires were collected and analysed.

In the third stage, each expert was given a questionnaire based on feedback on material collected from the second stage. This questionnaire asked for approval of each item and the reasons given for any discrepancy in views. The results obtained were analysed and the researchers concluded the findings on the approval of elements selected for inclusion in the e-portfolio.

Eleven experts were selected as the sample for this study who: Had the relevant experience related to the issues discussed; Were able to contribute insights, and; Were able to assess and make decisions in order to achieve consensus on the matter at hand (Pill, 1971). The data were analysed using the Statistical Package for the Social

Sciences (SPSS), one of the more popular tools in contemporary statistical analysis due to its easy-to-use graphical user interface and wide range of capabilities ranging from add-on modules to add-on packages. The analysis results were presented in the form of descriptive statistics with score percentages, mean and median scores for the approval of a panel of experts representing those involved. To reflect the consensus of the expert panel on the items of the questionnaire, interquartile range scoring was used (see Table 1).

Table 1
Level of consensus among the experts on the questionnaire items

Interquartile Range Score	Level of Consensus
0 - 1	High consensus
1.01 – 1.99	Medium consensus
≥ 2	No consensus

Source: Peck and Devor (2012)

RESULTS

The data analysis of indicators for an e-portfolio to be used in the Malaysian Skills Certification system for a virtual learning environment was divided into two: (i) review of the literature (first stage of the Modified Delphi Technique) (ii) data analysis (second and third stages of the Modified Delphi Technique).

The First Stage of the Modified Delphi Technique: Literature Review

In the first stage of the Modified Delphi Technique, a literature review of previous research material and documents related to the e-portfolio was done to establish the questionnaire items that would be used in a second survey. The literature review yielded four elements and 32 indicators essential for a virtual learning environment (Nunez, Sheremetov, Martínez, Guzmán, & Albornoz, 1998; Punie, 2007; Pereira, Harris, Davidson, & Niven, 2000). Table 2 reflects the findings classified according to concept.

Table 2
E-Portfolio indicators for a virtual learning environment classified by concept

Element	Indicator			
Assessment	-	Formative test	-	Tests in the form of multiple-choice answers
	-	Summative tests	-	Test in the form of short essay
	-	Comment by teacher	-	Comments by members of the same group
	-	Assessment verification	-	Comments by members of different groups
	-	Online discussion activities	-	Overall score testing
	-	Tests in the form of right or wrong answers		
Personal space	-	Space to send messages	-	Space for communication among students of one class
	-	Space for reflection	-	Space for communication between teachers and students
	-	Space for socialising	-	Space for communication between teachers and families of students
	-	Space for sharing ideas	-	Space for communication between students and students from other classes.
	-	Space for working together		
Exhibition	-	Storing personal information	-	Collecting learning material
	-	Presenting information in various ways	-	Presenting learning material
	-	Editing information		
Learning management	-	Posting practical work	-	Guiding students
	-	Teacher's control	-	Online monitoring
	-	Posting homework	-	Detection of the learning process

The Second and Third Stages of the Modified Delphi Technique

Table 3 shows the detailed data analysis of a virtual learning indicators for the second and third stages. In the second stage, the analysis revealed 10 virtual learning indicators needed to be dropped from the list (2, 5, 6, 13, 16, 19, 23, 24, 31 and 32). All the experts agreed strongly on keeping the remaining 22 indicators, with consensus receiving a score of IQR=1 and a mean value between 3.50 and 5.00 (high). For

Indicators 3, 18 and 30, the IQR value was 2, which indicated no consensus among the panel members. However, since the three indicators received an acceptable mean score, they were retained.

In the third stage, all 22 indicators for an e-portfolio received strong consensus from the panel of experts. The IQR value was between 0 and 1 and the mean value was between 3.50 and 5.00 (high). This clearly showed that all 22 indicators received high approval from the panel of experts.

Table 3
Data Aanalysis of virtual learning indicators for the second and third stages of the Modified Delphi technique

No	Indicator	Second Stage			Third Stage		
		Mean	IQR	Cons.	Mean	IQR	Cons.
Assessment							
1	Online discussion activities	4.6	1	H	4.5	1	H
2	Tests in the form of right or wrong answers	3.1	0	H	Remove		
3	Tests in the form of multiple-choice answers	4.0	2	No Cons.	4.1	1	H
4	Tests in the form of short essay	4.4	1	H	4.2	1	H
5	Comments by members of the same group	3.2	1	H	Remove		
6	Comments by members of different groups	3.2	1	H	Remove		
7	Overall score testing	4.5	1	H	4.4	1	H
8	Formative test	4.4	1	H	4.3	1	H
9	Summative tests	4.4	1	H	4.4	1	H
10	Comment by teachers	4.5	1	H	4.5	1	H
11	Assessment verification	4.5	1	H	4.2	1	H
Personal space							
12	Space for sharing ideas	4.6	1	H	4.3	1	H
13	Space for working together	2.7	1	H	Remove		
14	Space for sending messages	4.4	1	H	4.6	1	H
15	Space for reflection	4.2	1	H	4.6	1	H
16	Space for socialising	2.8	1	H	Remove		
17	Space for communication among the students in one class	4.2	1	H	4.3	1	H
18	Space for communication between teachers and students	4.1	2	No Cons	4.0	0	H
19	Space for communication between teachers and families of students	2.9	1	H	Remove		
20	Space for communication between students and students from other classes	4.4	1	H	4.3	1	H
Exhibition							
21	Editing information	4.6	1	H	4.6	1	H
22	Collecting learning material	4.6	1	H	4.5	1	H
23	Presenting learning material	2.8	1	H	Remove		
24	Storing personal information	2.7	1	H	Remove		
25	Presenting information in various ways	4.6	1	H	4.6	1	H
Learning management							
26	Posting homework	4.5	1	H	4.5	1	H
27	Guiding students	4.2	1	H	4.5	1	H
28	Online monitoring	4.5	1	H	4.6	1	H

Table 3 (continue)

29	Detection of the learning process	4.4	1	H	4.3	1	H
30	Posting practical work	3.8	2	No Cons	3.8	1	H
31	Teacher's control (for learning activities at school)	2.9	1	H	Remove		
32	Teacher's control (for learning activities at home)	2.9	1	H	Remove		

DISCUSSION

The results indicated a degree of consensus and agreement among the panel members on online discussion activities, tests in the form of multiple-choice answers, tests in the form of short essay, overall score testing, formative test, summative tests, comments by teacher and assessment verification. However, three indicators were rejected by the experts i.e. tests in the form of right or wrong answers, comments by members of the same group and comments by members of different groups. Assessment of students' knowledge and skills in formal or non-formal education is easier conducted online. Therefore, the e-portfolio is an effective platform for assessment, and for this reason is used in various fields of expertise (DiMarco, 2006; Mcallister & Hauville, 2010; Montgomery & Wiley, 2008).

Next, six indicators for the element of personal space received high consent among the experts. The indicators were space for sharing ideas, sending messages, reflection, communication among students in one class, communication between teachers and students and communication between students and students from other classes. However, three indicators were eliminated i.e. space for working together,

space for socialising and communication between teachers and families of students. Personal space refers to an environment that allows users to interact with each other and resources and for reflection and socialising (Pereira et al., 2000; Punie, 2007; Nunez et al., 1998; Ku & Chang, 2011). Personal space is important in web-based learning because it allows students to organise and develop a learning environment on their own that matches their learning style (Attwell, 2007; Wilson et al., 2007).

On exhibition elements, eight indicators received consensus of the experts to retain them. The indicators included editing information, collecting learning material and presenting information in various ways. Two indicators, presenting learning material and storing personal information, were removed. In this study, exhibition space is defined as a repository of personal information and learning material that is accessible at any time (Ku & Chang, 2011; Nunez et al., 1998). Specifically, the concept refers to the three indicators mentioned above that were retained as these indicators are ideal for storing in a virtual learning system, which provides a more structured, quick and easy way to facilitate storage of information or articles.

On management of learning, the indicators for posting homework, guiding students, online monitoring, detecting learning process and posting practical work received consensus of the experts. However, two indicators were eliminated i.e. teacher's control (for learning activities at school) and teacher's control (for learning activities at home). The five indicators that the experts agreed on were important for allowing students to submit assignments easily. Teachers would be able to monitor the students' learning process and to guide them online.

In the Malaysian education system, the use of a virtual learning space in teaching and learning is rare (Liaw & Muzafar, 2011; Sukri et al., 2010). Virtual learning is an easy and fun learning process that allows students to learn anywhere and at any time (Punie, 2007; Pereira et al., 2000; Nunez et al., 1998). It allows students to manage their time more effectively and allows them to explore information that has been downloaded from websites. Hence, the development of virtual learning indicators as discussed in this study can produce an efficient e-portfolio system for learning. The outcome of the e-portfolio is important for providing a learning space for students in general and exposure for vocational students to applying Information and Communication Technology (ICT) in the learning process.

The indicators that were established can be used to create an e-portfolio to support learning activities. In this study, exhibition space, evaluation and management of personal learning were concepts developed

to meet virtual learning needs as outlined by Punie (2007), who highlighted the necessary elements as being a space for socialising, digital personal space, space for educational activities and legalisation space. The concept of virtual learning space that is applied in the system of e-portfolios is in line with the theory of the virtual learning, as pointed out by Pereira et al. (2000), who stated that the structure of the virtual learning environment must allow students to interact, reflect and socialise.

CONCLUSION

Overall, it can be concluded that the concept of virtual learning space discussed in this paper has the potential to provide many benefits to vocational education in Malaysia i.e.: (i) there is no gap in time and distance to prevent learning from taking place; (ii) sources of information can be easily and quickly obtained; and (iii) more students will be motivated to master Information and Communication Technology (ICT) skills. Also, e-portfolios provide a dynamic facility for personal interaction and reflection, support information exchange and are convenient for online discussion. The indicators discussed here allow for a more compact e-portfolio compared to those currently available. The e-portfolio proposed here focussed only on fulfilling the expectations of the Malaysian Skills Certification only. This will provide motivation and interest to users to use the system more frequently for the purpose of teaching and learning.

ACKNOWLEDGEMENT

This research was supported by a Short Term Grant (STG) from the Office for Research, Innovation, Commercialisation and Consultancy Management (ORICC), UTHM awarded to Dr. Mohd Bekri Rahim. The data presented, the statements made and the view expressed are solely the responsibility of the author.

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A Document Analysis of the Visibility of Sustainability in TVE Teacher Education Programme: The Case of a Malaysian HEI

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ABSTRACT

There has been a global call for institutions of learning to engage in Education for Sustainable Development (ESD) by leading world organisations. Although scholars advocate for an interdisciplinary approach to sustainability, the research literature shows that majority of sustainability issues are addressed through fields such as environmental and developmental education. There has also been a call for the integration of Sustainable Development (SD) in Technical and Vocational Education and Training (TVET) programmes by various scholars and bodies such as the United Nations Education, Scientific and Cultural Organisation (UNESCO). The issue, however, is that Technical and Vocational Education (TVE) programmes are not yet embracing this call to integrate ESD into their programmes. Hence, it is imperative to reiterate the intersection between TVE and SD and how the former can contribute significantly to the SD agenda. Therefore, by completing a qualitative documentary analysis of a TVE programme, using a Malaysian Higher Education Institution (HEI) as a case study, this paper discusses the visibility of sustainability in TVE programmes as well as explores the overarching goal of ESD and why it is especially crucial for TVE. Findings reveal that the concept of sustainability is only barely reflected in the TVE teacher training curriculum. Recommendations for practice change and further research are presented and discussed.

Keywords: Education for Sustainable Development (ESD), ESD integration, qualitative document analysis, teacher training, Technical and Vocational Education (TVE)

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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INTRODUCTION

At a time when climate change is altering the natural conditions of the earth, and at a time

when the world population index begins to rise exponentially, the survival of humanity for both present and future generations alike may be duly affected. According to Pavlova (2006), the world faces global challenges such as emission of greenhouse gases, global warming, rising ocean levels, destruction of the forests, an outbreak of wars as well as mass migration. Research literature suggests that human actions, activities and the relationships humans have with the natural habitat and environment led to this challenges and efforts to curb and reduce these effects are required (Armstrong, 2011; Egan, 2004; Fien & Maclean, 2000; Majumdar, 2009; Reid & Petocz, 2006; United Nations Educational Scientific and Cultural Organization, 2005). These efforts gave rise to the conceptualisation of Sustainable Development (SD).

Various definitions of the concept of Sustainable Development (SD) have been put forward. The most widely used definition of SD is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (United Nations Educational Scientific and Cultural Organization, 2005). This is, without doubt, the initiative and idea behind the SD agenda. Hence, SD was seen as a means to maintaining the delicate balance between the human need to improve living conditions, lifestyles and wellbeing on the one hand and the essential need to also preserve natural resources and ecosystems upon which both present and future generations depend on (Madhavi, Shailaja, Gopal, & Keren, 2007).

As a result, Sustainable Development Goals (SDGs) were formulated to serve as a map in the quest to curb the excesses of human activities that drastically affect the socio-economic and environmental aspects of development, leading to the improvement of living conditions (Madeley, 2015; Sachs, 2012). SDGs are merely intergovernmental aspirations and goals with specific targets aimed at transforming our world.

One of the SDGs emphasised by the United Nations (UN) was to ensure equitable access to quality education and promote lifelong learning opportunities for all. In an attempt to realise this goal by the year 2030, specific targets have been set; of those targets was the need to ensure access to quality Technical and Vocational Education (TVE) for all and the creation of decent jobs and entrepreneurship education.

Thus, it becomes evident that individuals need to develop knowledge and skills in particular vocations and occupations that will enable them to make progress in employment, become self-reliant and lead sustainable enterprises. However, such knowledge and skills also need to include an appreciation of SD principles to create awareness among individuals of the implications of their actions that impact the environmental, social and economic aspects of their nations negatively (Tilbury, 1995; United Nations Educational Scientific and Cultural Organization, 2008). Therefore, instructions and lessons emphasising a balance between economic and social issues as well as protection of the environment are thus required.

It also, therefore, becomes the goal of Education for Sustainable Development (ESD) to lead and inform this instruction by creating the needed awareness and educating people to become aware of the implications and consequences of living unsustainable lifestyles and engaging in unsustainable practices (Tilbury, 1995). In an attempt to juxtapose SDGs and ESD, a description of each is necessary. SDGs are broader world transformation goals, while ESD is a specific target with which these SDGs can be achieved. For example, UNESCO outlined 17 SDGs, and one of them was centred on quality education. To achieve the goal of quality education as a world transformation agenda, specific targets were set, of which ESD was one. Hence, it can be summarised that ESD is a subset of the SDGs.

Moving forward with the ESD debate, who better to take up this challenge of educating citizens and students for sustainable development than teachers themselves? With this, the UNESCO declared ESD for teacher education the “priority of priorities.” With this, teachers are saddled with the responsibility of first learning and upgrading their knowledge and skills related to SD concepts and then translating these understandings into their teaching pedagogy (United Nations Educational Scientific and Cultural Organization, 2008). Environmental and developmental education have no doubt spearheaded the ESD goal of educating children for a sustainable future, and they do so more from a developmental and environmental perspective with little

attention to the social and economic dimensions of SD (Birdsall, 2014; Tilbury, 1995).

In the same vein, TVE, as well as engineering education, have been slow in responding to the charge of ESD. Some reasons attributed to this unresponsive or delayed zest for ESD in TVE institutions in the literature includes the notion that ESD is irrelevant to TVE held by some TVE educators, inadequate awareness, the question of what ESD learning outcomes to pursue, understanding SD to mean campus greening and use of energy efficiently only, the perceived notion that ESD is an expensive process and so on (Brundtland, 1987; Griggs et al., 2013; New Zealand Ministry of Education, 2015; Thienemann, 2014). Perhaps there is a need to reiterate why ESD is especially important to TVE and not just environmental education. Hence, this paper would attempt to shed light on the overarching goal ESD is supposed to achieve and why it is especially crucial to TVE. The study further explores the visibility of SD concepts in a TVE teacher education programme in Malaysia.

Research Questions

The following questions guided this inquiry:

- a. What is the overarching goal of ESD and why is ESD especially important to TVE?
- b. How visible are SD concepts in the TVE teacher training programme constituting the case of this analysis?

LITERATURE REVIEW

To provide answers to the first research question, “What is the overarching goal of ESD and why is ESD especially important to TVE?” the following concepts are discussed based on a review of the literature.

Sustainable Development and Its Core Dimensions

The term sustainable development has been conceptualised and defined in various ways, with most definitions attempting to depict ‘development that meets the needs of the present without compromising the ability and capacity of future generations to do the same’ (Brundtland, 1987, p. 41). Sustainable Development (SD) is an attempt and need to create equilibrium between the human need to improve lifestyles and wellbeing on the one hand and the environmental need to preserve ecosystems and natural resources on the other, upon which present and future generations depend. The goal of SD at this stage is not to juxtapose the various depictions and descriptions of the term; instead, it is to give a working definition to the term that can be consistently understood and used in the context of this paper. Hence, a more recent description of the term as redefined by an Australian academic is thus put forward.

Griggs et al. (2013) redefined Sustainable Development (SD) as “the development that meets the needs of the present while supporting Earth’s life

support systems, on which the welfare of current and future generations depends (p. 306)”. Griggs’ conceptualisation of SD takes into account the three major dimensions of sustainability as described by the UN, i.e., the environmental, social and economic dimensions of SD. Rather than conceptualise the environment as just the immediate environment, Griggs and colleagues chose to use Earth’s life support system in the definition. This is an all-inclusive term describing the ecosystem, natural resources, the environment and an interplay of several other factors that make up Earth’s life support system. Thus, SD can be implied to be continued economic growth and the protection of the quality of Earth’s life support systems, with each reinforcing each other.

Summarily, from most conceptualisation of SD, it can be concluded that SD aims at the following: (a) creating a desirable human condition i.e. a society that people want to sustain and protect because it meets their needs; (b) maintaining an enduring ecosystem that ensures its capacity to protect human life and others; and (c) maintaining a balance between present needs and the potential and capacity for future generations to do the same (Madhavi et al., 2007).

Education for Sustainable Development – Features and Intended Goals

Among all the sustainable development goals proposed by the UN, education appears

to be central to all. This is because education provides the means and the capacities by which people can learn to create and achieve these goals. Education provides not just the means to learn but also the system upon which one can develop holistically. Hence, Education for Sustainable Development (ESD) according to the Cloud Institute for Sustainable Development is defined as the “transformative learning process that equips students, teachers, and school systems with new knowledge and ways of thinking needed to achieve economic prosperity and responsible citizenship while restoring the health of the living systems upon which lives depend on” (Cloud Institute for Sustainable Education, 2016).

Similarly, the New Zealand Ministry of Education (2015) described ESD as learning to think and act in ways that will safeguard the future and wellbeing of people and our planet. It is thus evident that ESD has within its tenets, the primary goal of raising sustainability-conscious citizens to safeguard the future of our planet and the well-being of people. This no doubt has vivid implications for teacher education programmes because, in order for teachers to teach ESD principles and concepts effectively, they have to learn and develop their knowledge and understanding about SD; this evidently means teacher education programmes will have to be reoriented to account for SD vividly.

Education for Sustainable Development (ESD) and Technical and Vocational Education (TVE)

Some academics believe ESD should only apply to environmental education and those in the sphere of developmental studies (Sharma, 2009). Before we can come to such a conclusion, an understanding of what ESD aims to achieve is necessitated and also what TVE entails is thus required, and the potential intersection between the two if any should be discussed. The overarching goal of ESD has been broadly specified in the previous section; a focus on what TVE entails follows.

Technical and Vocational Education (TVE), according to Winer (2000), is aimed at developing skills, understanding, attitudes, work habits and appreciation encompassing knowledge and information needed by workers to enter and make progress in employment on a useful and productive basis. In other words, TVE involves training in a vocation or particular occupation, to develop skills and competency needed to carry out the duties and tasks of a vocation. TVET is also a major driver of human development and an enormous workforce supplier in the world (Hofmann & Strietska-Ilina, 2013; Marsden, Medhurst, & Irving, 2013; Sivapalan, 2016; United Nations Educational Scientific and Cultural Organization, 2002; Zolkifli, Kamin, Azlan, Yahya, & Awang, 2016). Therefore, if the

training of those in the ambit of vocational education who would take on roles as craftsmen, technicians and technologists in industry reflects the underlying principles of SD, it then implies that they would have developed competencies required to carry out their tasks in more sustainable ways that have little or less of a negative impact on the ecosystem.

With ESD, tasks and duties, which range from the use of materials and resources in the creative design and fabrication of models and products in small- and large-scale industries to the use of higher-order thinking skills, would be carried out with consideration of nature and our ecosystem. Furthermore, the introduction of ESD to TVE would mean vocational teachers would be able to train workers who will become conversant with the threat facing our ecosystem and, as a result, they would develop skills, knowledge and competency that are needed to tackle environmental issues, develop sustainable attitudes for relating with nature, develop and redesign work processes to reduce consumption and waste, emphasise recycling and reuse of materials, develop alternative sources of energy and so on. The benefits are without doubt enormous and significantly impactful. Since TVET is a major supplier of the total distribution of the workforce for many nations, it can reach out to so many workers about these issues through formal, informal and non-formal education, if and only if vocational educators are well trained to

develop an understanding of SD that they can, in turn, apply in their pedagogy.

It has become necessary that TVE educators begin to change their orientation about who and what ESD applies to. The UN through its agency, UNESCO, has emphasised that ESD requires an interdisciplinary and multidisciplinary approach; hence, various disciplines must adapt ESD goals and discover how they can solve environmental, social and economic issues in ways that create a balance among these systems without endangering and compromising the capacity of future generations to do the same. Therefore, it is apparent that ESD goals can also be better achieved through TVE because TVE teachers are responsible for the education and training of vocational professionals. Hence, educating vocational professionals about SD issues would help equip workers within the industrial ambit of nations with skills for sustainability, thereby contributing to transitioning the world towards a sustainable future.

MATERIALS AND METHOD

This study utilised the Qualitative Documentary Analysis (QDA) approach in ascertaining the visibility of sustainability in TVE teacher education programmes. A Malaysian Higher Education Institution offering the Bachelor of Education programme in Technical and Vocational Education was used as a case study to explore this visibility by analysing

elements of sustainability in the curriculum document of the programme. According to (Bowen, 2009), “document analysis is a systematic procedure for reviewing or evaluating documents – both printed and electronic (computer-based and Internet-transmitted) material. Like other empirical research methods, they require that textual data contained in relevant documents be examined and interpreted in order to elicit meaning, gain understanding, and develop empirical knowledge.”

A curriculum according to Tanner and Tanner (2007) is the planned and guided learning experiences and intended outcomes, formulated through the systematic reconstruction of knowledge under the auspices of the school for the learner’s continuous and willful growth in personal social competence. This makes it a suitable document for exploring the extent to which sustainability has been embedded in the TVE teacher education programme. Hence, a document analysis would enable the researcher to take a scientific position of the case being explored and discuss the overlying implication.

Document analysis has been used as a complementary research method to other established research methods for triangulation purposes (Bowen, 2009). However, several scholars have made cases for document analysis as a legitimate research method and as one that can also be used as a stand-alone research method

in social science research as well as other research contexts (Ahmed, 2010; Bowen, 2009; Gregg, 2011). Ahmed (2010) argued that documentary research is an important research method and should be utilised by social scientists with full confidence. He also explained that it is a scientific method that requires rigorous adherence to research ethics. Similarly, some scholars also explained that document analysis is particularly applicable to qualitative case studies, i.e. intensive studies aimed at producing rich descriptions of a single phenomenon, event, organisation or programme as is the case of this study (Bowen, 2009; Stake, 1995; Yin, 1994). Hence, the qualitative document analysis is utilised in this study as a stand-alone research method for ascertaining the visibility of sustainability in the TVE teacher training programme because it provides an avenue for critically examining and analysing TVE programme features contained in the curriculum in an attempt to gain an understanding of how well sustainability is reflected.

Data Analysis

In order to provide a detailed analysis and critique of sustainability in the TVE programme, an audit framework was developed by the researcher to serve as a template and structure for the analysis. Figure 1 shows the audit framework utilised in this study.

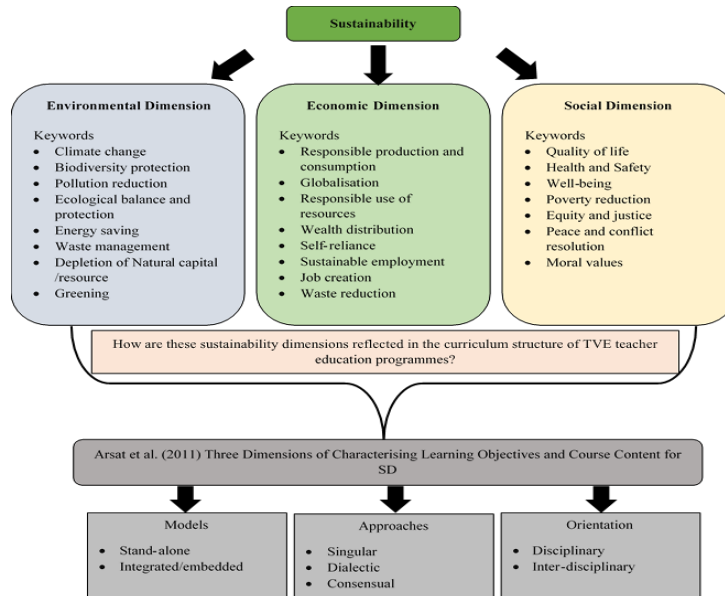


Figure 1. Sustainability qudit Framework for assessing SD visibility in TVE teacher education programmes

In designing the framework, the researcher first separated sustainability into its three main dimensions – environmental, economic and social dimensions, each representing significant categories to be used in the analysis. After this, specific keywords depicting each sustainability dimension were chosen as indicators representing sub-categories used in the analysis. The keywords selected do not entirely represent all the possible keywords that could represent each sustainability dimension, as such a list would be too long. Instead, they represent the commonly used terms and phrases in the sustainability discourse as represented in the literature. For this analysis, the specific keywords/ phrases in the sustainability discourse were used as search items, but the researcher was also open to emerging themes contained in

the curriculum not represented among the list of keywords/phrases represented in the framework.

The next phase in the analysis utilised the work of Arsat, Holgaard, and De Graaff (2011), who pointed to three dimensions for characterising courses for sustainability in engineering education to categorise how the identified sustainability courses/ elements were embedded into the TVE programme. Identified course elements in the TVE programme curriculum were categorised either as models (stand-alone or integrated), approach (singular, dialectic or consensual) and orientation (disciplinary or interdisciplinary).

To ensure that rigour and explicitness are achieved in the analysis, the researcher utilised Gregg (2011) document analysis procedures, which were initially designed

by Lincoln and Guba (1985). Firstly, the researchers read and reread the entire TVE curriculum programme document, searching through programme outcomes, learning outcomes and specific course synopses for elements of sustainability. By doing this, the researchers gained a sense of what the programme was all about and what the program mainly aimed at exposing students to. Secondly, we engaged in data reduction process to simplify the information for ease of analysis, storage and dissemination. Ahmed (2010) argued that there is too much information in texts and as a result, their richness precludes analysis and inference without some form of reduction. Hence, the purpose of data reduction is to reduce the data without any significant loss of information. To achieve this, bits and sections of the curriculum were copied into Wordle to gain an overall picture of the information contained in the data.

Furthermore, because this analysis focussed on three dimensions of sustainability, i.e. the environmental, economic and social dimensions, identified sustainability elements were coded according to the sustainability dimension they best represented, while also classifying them based on the model, approach and orientation with which they were embedded in the TVE programme. Hence, sustainability courses or elements reflecting each dimension of sustainability were coded as follows: EDM₁= environmental dimension with a stand-alone model, EDM₂= environmental dimension with an integrated model, EDA₁= environmental dimension with a

singular approach, EDA₂= environmental dimension with a dialectic approach, EDA₃= environmental dimension with a consensual approach, EDO₁= environmental dimension with a disciplinary orientation, EDO₂= environmental dimension with an interdisciplinary orientation, ECM₁= economic dimension with a stand-alone model, ECM₂= economic dimension with an integrated model, ECA₁= economic dimension with a singular approach, ECA₂= economic dimension with a dialectic approach, ECA₃= economic dimension with a consensual approach, ECO₁= economic dimension with a disciplinary orientation, ECO₂= economic dimension with an interdisciplinary orientation. Finally, for the social dimension of sustainability, codes such as SOM₁= social dimension with a stand-alone model, SOM₂= social dimension with an integrated model, SOA₁=social dimension with a singular approach, SOA₂= social dimension with a dialectic approach, SOA₃= social dimension with a consensual approach, SOO₁= social dimension with a disciplinary orientation and SOO₂=social dimension with an interdisciplinary approach were utilised.

RESULTS AND DISCUSSION

The Visibility of SD concepts in the TVE Teacher Education Programme

The TVE teacher education programme for this analysis comprised four areas of specialisation under the TVE umbrella namely, Bachelor of Tech. with Education (Electric/Electronics), Bachelor of Tech.

with Education (Living Skills), Bachelor of Tech. with Education (Building Construction) and Bachelor of Tech. with Education (Mechanical Engineering). A documentary analysis was carried out to ascertain and explore the visibility of sustainability in a TVE teacher education programme using a Malaysian HEI as a case study. By visibility of sustainability, we mean how integrated the concept of sustainability in the TVE teacher education programme is.

The result of the analysis revealed that the concept of sustainability was implicitly rather than explicitly reflected in the TVE teacher education programme. To give a detailed overview of the visibility of sustainability in the TVE teacher education programme, the findings are discussed in tandem with the three dimensions of sustainability and under specific sub-headings depicting the way and manner with which sustainability is reflected in the TVE programme. First, an analysis of the program objectives and learning outcomes will be presented.

TVE Program Outcomes and Learning Outcomes

All four areas of specialisation under the TVE programme had similar programme outcomes and learning outcomes, with each relating to the specific area of study. Although no programme objective specifically aimed at developing student teachers' understanding of sustainability issues, they, however, did implicitly imply elements of economic and social sustainability. For

instance, it was stated that at the end of the programme, students "should be able to develop the ability to identify, develop and explore business and job opportunities as well as develop the ability to draft a business plan and create self-employment." This depicts economic sustainability although not in its entirety and probably not consciously recognised as an element of economic sustainability. Similarly, it was also stated that students "should be able to practice high ethics and integrity in teamwork and collaboration with peers," encouraging social integration, ethics and equity among all teacher trainees, thus reflecting social sustainability implicitly.

Models, approaches and orientation of sustainability in the TVE programme.

Elements of sustainability were reflected in seven different courses in the TVE teacher education programme. These courses only minutely reflected the elements of sustainability. They included Basic Invention, Workshop Safety and Management, Industry and Technical and Vocational Education, Entrepreneurship, Basic Commerce, Family Resource Management and Principles of Environmental Engineering. The course, Basic Invention, for instance, as explained in the course synopsis, aimed at developing teacher trainees' capacity "to find solutions to the needs and problems of their societal environment. Knowledge and skills acquired from this course can enhance or redesign the existing products or solutions." According to Arsat et al. (2011), dimensions for characterising courses for sustainability. The

course reflects elements of economic and social sustainability, indicating a dialectic approach. Arsat et al. (2011) described the dialectic approach to sustainability as one that reflects two dimensions of sustainability at the same time. The model utilised for this course was an integrated model, in which the elements were only slightly integrated into the course, Basic Invention, which specifically aimed at developing students' design creativity and innovation. Course orientation was also disciplinary.

Similarly, an aspect of the course, Workshop Safety and Management, as detailed in the course synopsis, aimed at developing students' capacity "to be able to identify potential hazards particularly in the workshop, and plan strategies to improve safety practices as well as school workshop management." This depicted an aspect of social sustainability that emphasises health and well-being. Industry & TVE was also another course that had elements of sustainability as it aimed at inculcating students with the capacity to "be able to discuss the role of TVE in the human development plan to meet present and future needs." This reflects elements of economic sustainability now and for future generations as human development was the epicentre and focus of the course. However, there was no clear evidence that described whether the course was carried using a consensual approach. Entrepreneurship and Basic commerce were also courses that had little elements that reflected the economic and social dimensions of sustainability. Students were exposed to instruction and

lessons that enabled them to create viable businesses while improving the standard of living.

Family Resource Management and the Principles of Environmental Engineering were courses that reflected economic, social and environmental sustainability independently. While Family Resource Management aimed at developing students' capacity for making informed decisions in the management of resources to meet family goals and maintain a healthy living condition, the Principles of Environmental Engineering was concerned with exposing students to pollution and its control, water management, air quality as well as waste management. All the courses that reflected elements of sustainability only did so dialectically or as a singular approach. Arsat et al. (2011) explained that a singular approach to sustainability is one that focusses only on one aspect or dimension of sustainability, e.g. the environmental dimension, while the dialectic approach focusses on two aspects of sustainability, e.g. economic and social dimensions. No course was, however, stand-alone and aimed at addressing sustainability issues while considering a balance between the three dimensions, i.e. economic, social and environment (consensually).

It was also observed that courses only slightly reflected elements of sustainability as small units or as topics in those particular courses and modules. While integration is a suitable approach to sustainability, it should also be explicitly done, so that students are consciously exposed to these

sustainability issues, which are now a major concern for the world we live in. Sterling and Scott (2008) recommended that integration should be carried out holistically and not just as add-ons to courses. This he explained that although stand-alone courses on sustainability were needed to explicitly and consciously expose students to environmental, social and economic issues, integration of sustainability courses should be structured into core courses, minor courses and electives.

Overall, among all the seven courses identified to reflect only slightly some elements of sustainability, it was observed that economic and social sustainability were better reflected, while only one course had elements of environmental sustainability. The issue with this, however, is that most of these identified courses were elective and minor courses, meaning that not all TVE students would enrol in them. The implication of this is that not all TVE students would undertake courses reflecting sustainability in the TVE programme. Sustainability courses need to form an integral part of the learning experiences students in TVE programmes are exposed to; as a result, core courses should be designed as a stand-alone, with a consensual orientation that attempts to balance all three dimensions of sustainability, giving all TVE students equal opportunity to learn about sustainability, while also integrating other courses as minors and electives.

Other courses in the programme should also be made to visibly reflect more sustainability dimensions and issues, as

embedding sustainability throughout the fabric of majority of the courses in the programme would better prepare TVE students for the challenging role of educating for sustainable development when they take on job roles as teachers in various technical and vocational colleges.

Recommendations

The following recommendations are made in line with the objectives of this study:

- a. A working framework or model is needed for TVE to synchronise SD principles and initiatives. This model should be ideally problem-solving. That is, it should attempt to address the problem of guiding TVE programme developers, policy makers and concerned stakeholders in developing and reorientating TVE programmes to ensure sustainability is more visible in theory and practice. This calls for more collaborative research efforts between relevant TVE stakeholders aimed at addressing this problem of ESD integration.
- b. More awareness is needed to drive the ESD agenda in TVE. The practical benefits of engaging in this initiative may not be seen in the short term, but TVE administrators and educators must realise that they do not need to wait until it becomes apparent that TVE can help change and impact people's knowledge and attitudes towards living a more sustainable lifestyle before they begin to act. The consequence may be that too

much damage may have already been done to our ecosystem. Hence, more awareness programmes are needed in the form of workshops and seminars to get more TVE stakeholders in the decision-making process to be aware of ESD and promote actions to integrate ESD in TVE further.

CONCLUSION

The paper discussed the intersections between SD and TVE, while also exploring some SD and ESD models, as well as ascertain the visibility of sustainability in a TVE programme. The discussion makes it clear that TVE teachers are central to the advancement of ESD in TVE as TVE teachers can reach out to the many future workers whom they train in their classrooms every day. Findings from the study also established that the concept of sustainability had not been fully integrated into TVE teacher education programmes. There were no stand-alone courses that were explicitly aimed at treating sustainability issues consensually, i.e. in the balance between the three dimensions of sustainability. Therefore, a guiding framework is needed to guide action towards refocussing TVE curriculum to account for more ESD. Recommendations for practice change were also made in this paper; it was suggested that a collaborative effort between all relevant TVE stakeholders is needed to drive the ESD agenda forward in TVE institutions.

ACKNOWLEDGEMENT

This paper was partially sponsored by the Office of Research, Innovation, Commercialisation and Consultancy Management (ORICC) and Centre for Graduate Studies, UTHM. I would also like to show my gratitude and appreciation to Associate professor Wan Azlinda Wan Mohamed for sharing her pearls of wisdom and comments, which greatly improved this manuscript.

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Exploring a Green Element to Greening the Existing Curriculum in Polytechnic Malaysia

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ABSTRACT

Workers who have green skills can also be considered sustainable human capital. In fact, the process to produce sustainable human capital is closely linked to the curriculum implemented in institutions that offer training for occupations. Polytechnic Malaysia is one of the big institutions in Malaysia that offer Technical Vocational Education and Training (TVET). Focus area 1 (BT1), action plan 5 (PT5) of the Blueprint Polygreen document clearly refers to the lack of green elements in the Polytechnic Malaysia curriculum. Blueprint Polygreen also states the urgent need to implement green practices by incorporating green elements across the curriculum by up to 30%. In response to this, this study was conducted to explore green elements for greening the existing curriculum at Polytechnic Malaysia. The study was conducted using the Fuzzy Delphi Method (FDM). The FDM analysis shows elements of integrity get first ranking in the inventory of green elements in this study. These findings also indicate that the element of integrity is a very important element and should be incorporated in the Polytechnic Malaysia curriculum to enrich students' learning in order to produce sustainable human capital for the nation's needs.

Keywords: Fuzzy Delphi Method (FDM), green element, green skills

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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INTRODUCTION

Green jobs can be found in various sectors of the economy from energy supply to recycling, agriculture and construction to transport. The global market for green jobs up to 2020 is estimated to be worth around USD2,740 billion (European Centre for the Development of Vocational Training, 2009,

p. 10). Green jobs also involve a diverse workforce and require workers with green skills. Workers who have green skills are known as sustainable human capital. The process of producing sustainable human capital is closely linked to the curriculum implemented in institutions that offer training for specific jobs. Polytechnic Malaysia is an institution that offers training for jobs. It is better known as an institution for Technical and Vocational Education and Training (TVET). Polytechnic Malaysia offers programmes in engineering, technology, commerce, tourism and hospitality, agro technology and bio industry, design and visual communication (Department of Polytechnic Education, 2016).

Statement of Problem

The curriculum of most of the programmes offered by Polytechnic Malaysia has reached a mature stage, and nearly all the programmes at the Polytechnic have received full accreditation from the Malaysian Qualification Agency (Malaysian Qualification Agency, 2016). However, the Blueprint Polygreen document clearly states that there is a lack of green elements in the Polytechnic Malaysia curriculum (Focus area 1 (BT1) and Action plan 5(PT5)).

The Polygreen Blueprint document also states the urgent need to implement green practices by incorporating green elements across the curriculum by up to 30% (Department of Polytechnic Education, 2015). Thus, the process of greening the existing curriculum at Polytechnic Malaysia is necessary to meet the demands of the

global market in the future that emphasises jobs conditioned to greening the economy. Greening the curriculum also aims to improve the employability of Polytechnic Malaysia graduates. This study is limited to the three major areas of engineering taught at Polytechnic Malaysia i.e. mechanical, civil and electrical engineering.

METHODOLOGY

Process of Exploring Green Elements

A literature review yielded 33 elements that are considered green elements. After the literature review, interviews with experts were carried out to confirm whether the elements obtained from the literature review were important enough to incorporate in the curriculum of Polytechnic Malaysia as required green elements. During the interviews, the experts were asked for comments or suggestions on the appropriate green elements for inclusion based on their knowledge and experience. The experts used in this study, as required by the criteria for interviews with experts were practitioners of Technical and Vocational Education and Training (TVET) with experience teaching in TVET institutions for at least 5 years. They were also recognised by colleagues as practitioners or academics who excelled in their respective fields (Swanson & Falkman, 1997). A total of eight experts who had extensive experience in TVET were selected for the interview process in order to explore the required green elements (see Table 1). From the interviews, a list of green elements was prepared (see Table 2).

Table 1
List of experts interviewed

List of experts	Institution
Officer from the special unit of TVET	Department of Polytechnic Education
Officer from the policy division	Department of Polytechnic Education
Officer from the curriculum development division (Unit of Mechanical Engineering)	Department of Polytechnic Education
Officer from the curriculum development division (Unit of Civil Engineering)	Department of Polytechnic Education
Officer from the curriculum development division (Unit of Electrical Engineering)	Department of Polytechnic Education
Officer from Unit of Psychology	Polytechnic
Officer from Unit of Research and Innovation	Polytechnic
Lecturer from the Faculty of Technical and Vocational Education	UTHM

Table 2
Green elements listed from interviews with the experts

Green element	Green element
1. Sustainability practices	18. Interpersonal skills
2. Material resources	19. Integrity
3. Safety, health and environment	20. Professionalism and ethics
4. Social responsibility	21. Initiative
5. Knowledge about carbon emission, global warming, climate change, rise in ocean level and environmental degradation	22. Adaptability and flexibility
6. Business fundamentals	23. Dependability and reliability
7. Working with tools & technology	24. Lifelong learning
8. Checking, examining & recording	25. Willingness to learn
9. Reading & writing	26. Teamwork
10. Mathematics	27. Creative thinking
11. Science	28. Communication: Visual, listening and verbal
12. Engineering and technology	29. Following directions
13. Basic computer skills	30. Planning, organisation and scheduling
14. System thinking	31. Problem solving, prevention and decision
15. Sense of belonging	32. Seeking and developing opportunities
16. Naturalist ability making	33. Critical and analytical thinking
17. Existential/spiritual ability	33. Critical and analytical thinking

Expert Consensus on Using FDM

According to Jamil, Siraj, Hussin, Noh and Sapar (2014, p. 38) the first step in conducting the Fuzzy Delphi Model (FDM) testing is to determine the experts involved in the study. The number of expert should be between 10 and 50 experts. A questionnaire based on the FDM was prepared and distributed to 12 TVET

experts in the fields of mechanical, civil and electrical engineering. Three of the experts were from Universiti Tun Hussein Onn Malaysia (UTHM), while nine were from Polytechnic Malaysia. The questionnaire is an instrument used for the purpose of obtaining a consensus among experts on a matter. In this study, it was used to determine the required green elements.

Table 3
Experts involved in the study (FDM)

Number of experts	Experts who answered the questionnaire for the FDM	Institution	Years of experience in the field
1	Lecturer in Mechanical Engineering	UTHM	Over 10 years
1	Lecturer in Civil Engineering	UTHM	Over 10 years
1	Lecturer in Electrical Engineering	UTHM	Over 10 years
4	Lecturer in Mechanical Engineering	Polytechnic	Over 10 years
3	Lecturer in Civil Engineering	Polytechnic	Over 10 years
2	Lecturer in Electrical Engineering	Polytechnic	Over 10 years

The second step was to determine the scale of the study. This study used a 7-point Likert scale because, according to Ramlie et al. (2014), the higher the scale used, the more accurate the data obtained.

The third step was to process the data collected to obtain an average value (m1, m2, m3). Step four was to determine the distance between two fuzzy numbers to determine the value (d) provided if $d \leq 0.2$. There was consensus among the experts, and this meant that a second round of interviews or removal of items could be avoided. To get the value (d), the distance between two fuzzy numbers was determined using the following formula:

Table 4
Fuzzy scale

Level of important	
Extremely not important	(0.0, 0.0, 0.1)
Very not important	(0.0, 0.1, 0.3)
Not important	(0.1, 0.3, 0.5)
Not sure	(0.3, 0.5, 0.7)
Important	(0.5, 0.7, 0.9)
Very important	(0.7, 0.9, 1.0)
Extremely important	(0.9, 1.0, 1.0)

$$d(\tilde{m}, \tilde{n}) = \sqrt{\frac{1}{3}[(m_1 - n_1)^2 + (m_2 - n_2)^2 + (m_3 - n_3)^2]}$$

The fifth step was to determine the group consensus; group consensus had to exceed

Table 5
Results of the analysis of the data using FDM

Expert	Green Elements															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	0.3	0.0	0.3	0.2	0.2	0.1	0.2	0.0	0.0	0.1	0.2	0.3	0.0	0.2	0.0	0.2
2	0.1	0.2	0.1	0.2	0.1	0.1	0.2	0.0	0.2	0.4	0.5	0.0	0.2	0.0	0.0	0.0
3	0.1	0.2	0.1	0.0	0.2	0.2	0.2	0.0	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.0
4	0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.0	0.0	0.0
5	0.1	0.0	0.1	0.0	0.2	0.3	0.2	0.2	0.2	0.1	0.2	0.0	0.2	0.2	0.0	0.0
6	0.1	0.0	0.1	0.2	0.2	0.3	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.2	0.2
7	0.1	0.0	0.1	0.0	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0
8	0.1	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.2	0.0	0.2
9	0.1	0.0	0.1	0.0	0.1	0.3	0.2	0.2	0.2	0.1	0.1	0.0	0.2	0.2	0.0	0.2
10	0.1	0.0	0.1	0.0	0.1	0.2	0.2	0.2	0.0	0.1	0.2	0.0	0.2	0.0	0.0	0.0
11	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.0	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2
12	0.1	0.2	0.1	0.0	0.2	0.6	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.2	0.2	0.0
d value of each item	0.098	0.082	0.097	0.091	0.138	0.241	0.155	0.091	0.125	0.172	0.162	0.070	0.125	0.125	0.082	0.109
Percentage of each item d ≤ 0.2	92%	100%	92%	100%	100%	67%	100%	100%	100%	92%	92%	92%	100%	100%	100%	100%
Fuzzy evaluation	10.933	10.267	10.833	10.367	10.033	8.700	10.233	10.367	10.300	9.567	9.733	10.533	10.300	10.300	10.267	10.100
Average of fuzzy number	0.911	0.856	0.903	0.864	0.836	0.725	0.853	0.864	0.858	0.797	0.811	0.878	0.858	0.858	0.856	0.842
Score	5	25	7	16	30	33	27	17	20	32	31	15	21	22	26	29

Table 5 (continue)

Expert	Green Elements																
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
1	0.0	0.2	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.3	0.2	0.0	0.0	0.3	0.3	0.3	0.3
2	0.0	0.2	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0
3	0.2	0.2	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1
4	0.0	0.2	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0
5	0.0	0.2	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.2	0.3	0.2	0.3	0.0	0.0	0.3
6	0.2	0.2	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.0	0.0
8	0.2	0.0	0.0	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.2	0.0	0.0	0.3	0.3	0.3	0.0
9	0.2	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1
10	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.2	0.1	0.1	0.1	0.1
11	0.2	0.2	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.0	0.1	0.1
12	0.0	0.2	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.3	0.0	0.3	0.2	0.0	0.1	0.1	0.1
d value of each item	0.091	0.147	0.057	0.074	0.076	0.125	0.076	0.057	0.074	0.122	0.125	0.112	0.091	0.147	0.119	0.112	0.112
Percentage of each item d ≤ 0.2	100%	100%	100%	100%	100%	100%	100%	100%	100%	83%	100%	83%	100%	75%	83%	83%	83%
Fuzzy evaluation	10.367	10.133	11.300	11.100	11.000	10.300	11.000	10.700	10.900	10.767	10.300	10.567	10.367	10.600	10.667	10.567	10.567
Average of fuzzy number	0.864	0.844	0.942	0.925	0.917	0.858	0.917	0.892	0.908	0.897	0.858	0.881	0.864	0.883	0.889	0.881	0.881
Score	18	28	1	2	3	23	4	9	6	8	24	14	19	11	10	12	13

75% to avoid a second round of interviews. Step six was to determine the aggregates based on the fuzzy evaluation and the seventh was to do a defuzzification process. The defuzzification process was carried out through the process of analysing the data collected using the Fuzzy Delphi technique. This process determines the ranking or priority of each item or the position of each variable or sub-variable (Jamil et al., 2014, p. 37).

RESULTS AND ANALYSIS

DISCUSSION AND CONCLUSION

Based on the results of analysis, two elements (Element 6 & Element 30) did not get the consensus of the experts. These elements scored a percentage value (d) of 67% and 75%, respectively. Based on the FDM percentage for group consensus, each element must receive a score exceeding 75% to avoid a second round of data collection or the element should be removed. In this study, the researcher removed these two elements from the inventory of green elements. Analysis of the defuzzification process showed that the element of integrity received the topmost ranking, while business fundamentals received the lowest. These findings indicated that integrity is a very important element to should be incorporated in the curriculum of Polytechnic Malaysia students in order to produce sustainable human capital.

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Role and Application of Study Skills for Tertiary-Level English Courses: Teacher and Student Perspectives

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ABSTRACT

Even though Malaysian students attend 11 years of formal English language classes in primary and secondary school and continue to learn English at tertiary level, for many undergraduates, using the English language competently is still a challenge. This may be attributed to the lack of study skills among students; using the right study skills is synonymous with autonomous learning. This paper draws on findings of a university research project and aims to report on an investigation into the role and application of study skills in tertiary-level English courses. Lecturers/teachers and students from a Malaysian university formed the study sample and the focus was on their perception. Purposive sampling was used to select the samples, while data collected via semi-structured interviews were analysed using a grounded theory approach. Classroom observations were also used to support the findings. The findings of this qualitative study revealed a mismatch between the perception of lecturers/teachers and students of study skills due to their differing expectations. Nevertheless, there was general agreement among the lecturers/teachers that should study skills be taught in tertiary-level English courses, it should be embedded within the course content and not exist as a separate, stand-alone entity. The study concludes with recommendations to direct future research.

Keywords: Autonomous learning, English classrooms, perception, study skills, teaching practices

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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INTRODUCTION

The use and importance of the English language in Malaysia has undergone many phases. Contrary to the idealistic intentions and efforts envisioned by the Ministry of Education, the actual scenario with regards to the mastery of the English language

among students is not very encouraging (Che Musa, Koo, & Azman, 2012). Even though students attend 11 years of formal English language classes in primary and secondary school and continue to learn English at tertiary level, an alarming number of Malaysian undergraduates remain weak in their command of the English language (Che Musa et al., 2012).

Although the Malaysian Education Blueprint 2013-2025 (2013) highlights the use of Autonomous Language Learning (ALL) in the teaching and learning process, ALL remains a crucial element that is missing from English language classrooms because of the exam-orientated system as well as the traditional teacher-centred approach that is resorted to in Malaysia (Yunus & Arshad, 2014). It is fairly common to see students assuming a passive role in the process of their own learning, waiting for their teachers to provide them with examination tips. The ramification is students in this context become devout rote learners, memorising for examinations and not for long-term knowledge or skills gain. This is supported by a study by Lowe and Cook (2003), which showed that learners often continue using study skills and learning strategies shaped by teaching styles and evaluation systems in secondary school in higher education institutions. However, these skills might not be suitable for autonomous learning, which is synonymous with higher education, and students may find themselves struggling to

cope with their studies in university (Lowe & Cook, 2003).

In many ways, the factors mentioned above have directly or indirectly contributed towards students' lackadaisical attitude towards English learning and low English language proficiency. Gill (2004) highlighted that Malaysian undergraduates' limited English language proficiency is one of the lead causes of unemployment. This is a cause of concern and calls for more research into English courses at the tertiary level, which supposedly exist to help students to improve their communicative competence in the language. Some aspects that need to be examined are teaching practices of English lecturers/teachers as well as the perception of students of study skills or learning strategies employed at tertiary level. The following section presents the research questions that guided this study.

Research Questions

This paper sought to address the following questions:

- 1) What is the perception of English lecturers/teachers and students of study skills in English courses at tertiary level?
- 2) What are the current teaching practices employed by lecturers/teachers at tertiary level to integrate study skills in English courses?

LITERATURE REVIEW

What Are Study Skills?

Study skills refer to strategies or techniques that allow an individual to utilise time, resources and academic potential to their maximum capacity (O'Donoghue, 2005). Gettinger and Seibert (2002) described study skills as “academic enablers,” or tools crucial for learning. On the other hand, ineffective study skills have been shown to lead to poor academic achievement. It was found that students who do not perform well in their studies are mostly passive in their learning and tend to possess a limited number of study skills (Gettinger & Seibert, 2002). Over the years, study skills have more or less remained the same, covering skills such as creating mind maps, skimming, note-taking, searching for information, listening and reading in order to learn (Richardson, Robnolt, & Rhodes, 2010).

Many universities offer study skills as separate courses students can take as part of learning support programmes but Wingate (2006) suggested that when study skills are taught independent of subject content and the learning process, they are ineffective. It is often recommended that study skills be taught according to context to make it easier for students to apply them in the learning process (Kiewra, 2002; Petersen, Lavelle, & Guarino, 2006).

Types of Study Skill

Gettinger and Seibert (2002) categorised study skills into four clusters namely, repetition-based skills, procedural study skills, cognitive-based study skills and metacognitive skills. Each cluster of skills is briefly explained below.

Repetition-Based skills

As the name suggests, this type of study skill involves rereading or rehearsal of information. One common example would be language drills.

Procedural skills

Procedural skills help students by structuring their study materials and study routines in order to optimise their study time. Students are better able to study and complete their work on time with effective implementation of these skills. Examples of procedural skills include varying the types of study tasks and prioritising tasks when one is most alert.

Cognitive-Based study skills

Cognitive-based study skills enhance the learning experience of students by assisting them to process information. These skills are designed to help learners activate prior knowledge before studying new material, form connections between new concepts or

information and what learners already know and develop new schemata so that learning becomes meaningful. An example of a tool used for cognitive-based study skills is the mind map.

Metacognitive skills

Metacognitive skills help students to learn better by facilitating them in choosing, monitoring and deploying study skills. Reflection and self-questioning techniques are some examples of metacognitive skills.

Study Skills vs Learning Strategies: Same or Different?

‘Study skills’ and ‘learning strategies’ are sometimes used interchangeably to mean the same thing i.e. learning how to learn. According to a review of the literature, however, few researchers have attempted to make the distinction between learning strategies and study skills. Nisbet and Stucksmith (1986) argued that strategies are more advanced than skills, and that they are processes that are required to manage and apply skills. On the other hand, Ellis and Sinclair (1989) differentiated between study skills and learning strategies by suggesting that study skills are more often than not product-orientated whereas learning strategies are process-orientated. For example, study skills are seen as a means to an end because people relate these skills as a way for students to pass examinations. Learning strategies, in contrast, are seen as ways for individuals to exert more control over their own learning.

Despite the slight differences between study skills and learning strategies, these two terms will be used interchangeably in this paper. This is because although the motivation behind the two may be different, the ultimate aim of both is to equip learners with skills to become autonomous in their learning.

Study Skills and Autonomous Learning

Be it in terms of language learning or language use, Little (2007) claimed that the aim of learning is to create autonomous learners. An autonomous learner can be described as an individual who is able to manage and take responsibility for his or her own learning (Holec, 1981; Little, 1991). Nevertheless, this does not mean that the role of the teacher is relinquished. Instead of being the ‘sage on the stage’, in autonomous learning, the teacher’s primary role is to develop autonomous learners by facilitating students to make learning happen.

The concept of learner autonomy is not new in Malaysia. It was introduced as ‘Self Access Learning’ (SAC) in 1990 in primary schools, and later in 1995, in secondary schools for English courses (Yunus & Arshad, 2014). Since then, a number of studies on learner autonomy have been done based on the Malaysian context. Thang (2005) found that undergraduates learning English as a Second Language (ESL) in Universiti Kebangsaan Malaysia lacked the qualities of autonomous learners and heavily depended on their teachers during the learning process. Another study by Thang and Alias (2007) on readiness

for autonomy revealed that students from three separate Malaysian public universities namely, Universiti Kebangsaan Malaysia (UKM), Universiti Putra Malaysia (UPM) and Open University Malaysia (OUM) favoured the teacher-centred approach to learning. This is echoed by the findings by Januin (2007), which indicated that students were not ready to engage in autonomous learning as most of them relied heavily on their teachers and were not confident of their own language learning ability. In another study, Yunus and Arshad (2014) showed that English language teachers in Malaysia have a positive opinion of the implementation of autonomous language learning (ALL) although the attainment of ALL among students remains discouraging.

One of the skills needed to produce autonomous learners in a tertiary setting is study skills or learning strategies. This is because autonomous learning is widely considered to be facilitated by suitable study skills or learning strategies used by learners (Hurd, 2005). It is crucial for students to know how to learn and manage their own learning so that they can achieve the desired level of competence in communication. While the studies mentioned in the review above paint a picture of the current state of autonomous learning in Malaysia, it is evident that more should be done to examine the perception of teachers and students of study skills as well as teaching practices employed by teachers to better understand the need for study skills for tertiary-level English courses.

METHODOLOGY

The aim of the current study was not to generalise findings on study skills and teaching practices, but to obtain insight into the experiences of teachers and students; “broad and general so that the participants can construct the meaning of a situation” (Creswell, 2014, p. 8). Thus, this study adopted a grounded theory approach to analyse the data collected by means of individual interviews (Strauss & Corbin, 1990). A grounded theory approach is defined as a qualitative research method using a systematic set of processes to develop an inductively derived grounded theory about a phenomenon (Charmaz, 2006; Strauss and Corbin, 1990). The rationale for using the term ‘grounded theory approach’ and not ‘grounded theory’ is that no actual theory was expected to be generated from this study; however, the use of constant comparison of data to obtain the findings is a typical characteristic of grounded theory.

Instruments

The instruments used for the purpose of data collection in this study were the semi-structured interview with teachers and students and classroom observation. The utilisation of these two instruments helped in triangulating the data and obtaining validity. The use of the semi-structured interview allowed some flexibility to probe deeper than initially intended, providing additional data that was interesting and

situational for a more complete finding (Patton, 2002). The interview questions were developed based on the objectives of the study and revolved around lecturers'/ teachers' understanding of study skills and perception of study skills and teaching practices with regards to the integration of study skills in English classrooms. The students, on the other hand, were asked questions regarding their perception of study skills and actual application of study skills in English courses. The questions were reviewed and refereed by the co-researchers to check that they matched the direction of the research questions and could produce substantial data. In addition, a total of 15 hours of classroom observation was carried out to substantiate and cross-reference the interview data.

Participants

Five lecturers/teachers teaching English courses were chosen for the interview via purposive sampling as this sampling method allows for the intentional selection of samples who possess certain qualities in accordance with the research objectives (Koerber & McMichael, 2008). These teachers were selected through convenience sampling strategy due to its practicality (Dornyei, 2007) in accounting for feasibility in terms of time and respondent availability. The teachers were selected based on diversity of age, education and teaching experience as part of the purposive sampling. They possessed a Bachelor's degree, a Master's degree or a PhD; their age ranged from 28 to 46 years old and they had 47 years of

experience among them. They are addressed as T1, T2, T3, T4 and T5 in the results and findings. Details of the teachers' profile are shown in Table 1.

Table 1
Teachers' profile

Teacher	Qualification	Experience (years)
T1	PhD	20
T2	Master's	14
T3	Master's	6
T4	Master's	4
T5	Bachelor's Degree	3

In addition, 10 students were randomly chosen consisting of two from each of the five English courses taught by the respective lecturers/teachers, using the homogenous sampling strategy as they shared a common learning experience, which allows for in-depth analysis to identify common patterns among the learners (Dornyei, 2007). Thus, the students' age, grade or other influential factors were not taken into account but willingness to participate was considered. These students were interviewed separately to obtain representative overviews of the class as a whole from the student perspective and are labelled as S1, S2, S3, S4, S5, S6, S7, S8, S9 and S10 in the findings section.

Data Collection and Analysis

The interviews were audio recorded, transcribed using TRANSANA v.2.61, a qualitative video analysis software, coded and finally, categorised according to theme. Field notes of classroom observation of

each course were recorded by the researcher to verify the data obtained through the interviews. Classroom observation of each course was recorded by the researcher in the form of field notes and was guided by a checklist, where any teaching practice or classroom activity related to study skills was described in detail and later categorised.

The nature of the qualitative grounded theory approach employed allowed the researcher to continue collecting data during the data analysis stage. Analysis was ongoing and emerging data were examined according to an iterative process that served both to inform the interview and observation and establish concepts for subsequent analysis. The interview procedure helped the researcher to collect supporting data while analysing and describing the results.

RESULTS AND DISCUSSION

The findings are divided into several sections. The first part focusses on lecturers/teachers and students' understanding of study skills. Next, the need for study skills at tertiary level and current teaching practices are explored through examining the perspective of both educators and students as well as studying the classroom observation to reveal the reality of the role and application of study skills in English classrooms. Finally, some suggestions are given on how to improve the current situation.

Defining Study Skills

In order to find out whether or not study skills are important in the context of English

teaching and learning, it was crucial to examine what teachers and students understand about study skills. The following segment presents definitions and examples of study skills from the perspective of lecturers/teachers and students.

Teachers' perspective

Despite having taught English courses for a considerable period of time, not all the lecturers/teachers had a clear idea of what study skills are. "Study skills? I'm not sure."(T5). Other interviewees however, gave a fairly clear depiction of study skills. T1 described study skills as "it also involves them taking notes... searching for information," whereas T4 explained that study skills is about "how to study efficiently, to understand better". T3, on the other hand, gave a rather interesting definition of study skills: "Study skills...when we say skills, it will lead to habit. They (students) will have study habits". He explained that how students learn becomes a habit that is formed over time. Having a clear understanding of study skills is important as it helps educators to be aware of the different types as well as the application of study skills.

Students' Perspective

Based on the interviews, eight out of the 10 students interviewed did not really understand the term 'study skills' nor had they come across the term before. When asked, their responses were: "What is study skill? What does it mean? (S3); "If you're talking about study tips I know a bit, study

skills...I'm not sure which aspect you are referring to" (S1). S2, on the other hand, described study skills as "make a note, make a homework." Others who were not so sure about the term gave responses such as: "Example of study skill, ermm make practice?"(S4). Others shared that they tend to associate study skills with passing examinations. For instance, S9 shared that study skills were simply for her to just "to pass and get a degree," whereas S10 expressed that study skills were "for exams only."

Even though the students were found to have a limited understanding of study skills from the way they defined the term, it did not mean that they did not usually apply study skills in their English courses. Further probing and dropping the term 'study skills' and asking instead the question, "What do you do to learn better?" managed to draw quite a number of responses from the students.

Need for Study Skills at Tertiary Level: Perception of Teachers and Students Conflicting views

From the interviews, it was found that there were conflicting views in terms of the need for study skills at tertiary level among lecturers/teachers themselves as well as between the lecturers/teachers and their students. Most of the lecturers/teachers felt that there was no need to teach or embed study skills in English courses because they expect that students can easily learn the skills themselves using resources from the Internet, access to which is widely

available in the campus area. "There are so many sources that they can get the information about the study skills...Why not they just Google (study skills) if they don't get it from us, the lecturers?" (T3). In addition, T2 expressed that there was no necessity to teach study skills because students nowadays only need to "follow patterns," in other words, to go through drills or routine to accomplish a certain task. However, the students, when interviewed, expressed that study skills at tertiary level were important for them to improve their language competency. "I think it's (study skills) very helpful" (S2).

The beliefs held by the lecturers/teachers who felt that study skills were not necessary were reflected in their teaching practices, as students from those classes acknowledged during the interview that their lecturer/teacher did not focus on study skills in class. S2 and S3 mentioned that their English lecturers/teachers had the tendency to emphasise on course content. "They (lecturers/teachers) don't teach you how to study, they just teach you what is their subject" (S2). This finding is in line the observation that educators seem to be successful when it comes to teaching students content, but fail when it comes to teaching students how to learn or how to master subject matter (Kiewra, 2002).

S7 added that another reason why educators at tertiary level did not stress on study skills could be due to assumptions that students should have already been equipped with the necessary study skills at primary or secondary school level. Therefore, they

expected students to handle academic tasks independently at tertiary level. “I think they have thought that we have already grown up and then we already learn the skills during school so they didn’t really focus on it. They er...they assume that we already know about it and then we can think by ourself” (S7).

On the other hand, there were other lecturers/teachers who thought that study skills were necessary for students at tertiary level, especially when it concerned skills such as reading, writing and listening. T4 and T1 highlighted the importance of identifying main ideas when reading, a skill which they thought was crucial for students to accomplish language tasks in English courses. “They (students) should be able to... extract main ideas...if they cannot do that, they will have problems with their studies” (T1). “To identify right, main ideas. To take important points from whatever they read and from whatever they write, from whatever they listen to so identifying the main point is very important” (T4). Not only is reading efficiently an important skill for English courses, it is also “directly related to many students’ career paths” (Dhieb-Henia, 2006) and will benefit them immensely when they enter the working world.

Reality of English Classrooms: Lack of Study Skills among Students at Tertiary Level

Lecturers/teachers observed that students at tertiary level did not possess sufficient study skills to cope with the demands of the English classroom. They attributed this to the secondary school system, where students

were made to do language drills, which required memorisation as the main study technique and students were not trained to think critically. “They don’t have that study skills. Perhaps it goes back to school where for languages they just need to do drills” (T2). “In terms of making notes, they... prefer to write everything that they see on the slides...they are not able to put it in point form” (T1).

The influence of study skills from primary and secondary education, which consisted mainly of drills and rote learning, was evident when lecturers/teachers noted that many of their students were unable to apply the skill of identifying main points during note-taking because they tended to write down everything they heard without assessing the information given critically. “Whenever they (students) listen, they simply write anything...It’s together note-taking and thinking so you think and then you make notes instead of just simply writing” (T1). According to Richardson et al. (2010), a learner must be able to plan, monitor and evaluate information in order to learn effectively. The act of note-taking itself is not sufficient; educators need to expose their students to the proper techniques of note-taking and guide them through the thinking process, which includes identifying main points.

From the students’ perspective, study skills acquired in secondary school education to excel in English exams revolved mainly around memorisation. S1 shared that her teacher in school taught her how to write English essays through memorisation; “I

got an A...the method was memorisation. You take one essay and memorise, after memorising you make adjustments.” (S1). However, it was clear that not all the students enjoyed memorising, as seen in S6’s statement: “Back in secondary school there they teach me how to memorise grammar...it was quite terrible, it was so hard to memorise them.”

On the other hand, S3 shared how he was taught to make notes for examinations in secondary school: “During secondary school, we got...poem, novel then we got the book...I just read and then I just write down, besides the meaning.” They continued to apply the study skills learnt in school such as memorisation and note-taking at tertiary level as they were not familiar with other types of study skill. This observation is consistent with a study by Cook and Leckey (1999), which confirmed that study habits formed in high school tended to persist at tertiary level. This shows that there is a need to bridge the gap between study skills in high school and study skills in tertiary level to assist students in learning efficiently as academic demands are often more challenging at tertiary level.

Current Teaching Practices of Lecturers/Teachers in English Classrooms

Classroom observation performed of all five classes taught by the lecturers/teachers confirmed that study skills were given almost no or minimal emphasis in class. This

observation concurred with the perception of the lecturers/teachers on the need to teach study skills in the English classroom. “I don’t really emphasise on this (study skills)” (T3), as well as statements by the students that their lecturers/teachers normally focussed on the content of the course, and not on study skills. Nevertheless, T3 justified her stance on study skills, saying, “We didn’t really highlight it (study skills) to students but we do ask them questions... we ask do they have any problems... they can share somehow their experience, and can give them tips as well” (T3). Even though she does not focus on study skills in the classroom, she does ask questions frequently in class and tries to find out if students face any problems in their learning. She encourages them to share their learning experiences and tries to tackle the problem from there.

Only one of the language lecturers (T1) was observed asking her students to draw a mind map of details of a progress report using information they searched for online. It should be noted that this particular class took place in a multimedia lab; hence, online information was easily accessible by the learners. The other classrooms were conventional ones fitted with LCD projectors. The lecturer was seen guiding students on how to look for information online and constantly reminded them of the features they should include in the mind map. The students of this particular class mentioned in the interview that their lecturer

did guide them to “try to draw a mind map” (S3) to organise information. S4, on the other hand, expressed that her lecturer taught students how to use mind maps “for writing.”

During the interview, T1 said that her students required a lot of guidance when it came to study skills and she assisted them by giving them many examples and sometimes even modelled the skill herself. “Sometimes I ask them to do the mind mapping, sometimes I will do it myself on the whiteboard.” T1 added that she always strove to give specific and clear-cut instructions to students when drawing mind maps as otherwise, they would simply “write like writing notes.”

T5 preferred to give her students grammar drills and post them on Edmodo. However, she did not make it compulsory for students to do them and instead, gave them the freedom to choose what and when to complete the exercises. However, T5 admitted that she lacked confidence in terms of exposing students to study skills as shown in this statement, “I don’t think I give enough I mean like, good approach in teaching them (study skills).” This could be due to the lack of information or exposure to study skills during teacher training.

Other examples on how study skills are generally incorporated in English classrooms were discovered during the interview with the students. For instance, S10 shared that the lecturer taught them “how to read in general or how to find specific points.” Another student (S3) expressed that their instructor always asked

them to “listen to the exercises, ask us to listen to the website and then make notes” when they did listening exercises.

Should Study Skills Be Taught? What and How?

Despite mixed views regarding the need to teach study skills in the context of the English classroom, lecturers/teachers unanimously agreed that the skills should not be taught as a separate component. They thought that study skills should be integrated into lessons and taught in context. “English study skills? No I don’t focus...But I put them into the context...put them into the situation” (T2).

In terms of subject-related study skills, T3 recalled that “there was a specific part in the syllabus where we provide them (students) with study skills” for Academic English (AE) about four to five years ago. For instance, there were segments in the AE module teaching students how to make notes. However, she admitted that even so, she did not stress on those skills and focussed instead on the course content. This suggested that including study skills as part of English language modules alone might be futile if teachers themselves failed to emphasise on the development of those skills (Allan & Clarke, 2007). For the integration of study skills in English courses to work, lecturers/teachers have to be made aware of the importance and application of study skills. They should subsequently be able to focus on creating opportunities for students to put those skills into practice.

T1 concurred that there was a real need for English lecturers/teachers to equip students with study skills as that would assist them in dealing with tasks and assignments such as report writing and proposal writing. "We need to equip them with the skills that for example, ok reading? They are able to read academic journals, they are able to read references, and how to get the main idea from there" (T1). T5 mentioned that study skills such as learning how to draw mind maps were crucial because very often, for writing, "the points are actually scattered all over." She believes that it is important for students to be able to organise their points well. Perhaps one of the most crucial aspects of inculcating study skills in the English classroom was pointed out by T3, who believed that if students knew how to apply the right study skills, they would eventually be able to improve their English language proficiency.

For the initial stages to incorporate study skills in English classrooms, lecturers/teachers could begin by conducting a needs analysis for study skills via questionnaires to find out what type of problem their learners faced in the learning process. Alternatively, lecturers/teachers could hold regular discussions with their students to find out what learning strategies or study skills they lacked or found problematic. Furthermore, training courses on raising awareness on the subject of effective study skills as well as workshops on integrating study skills in English classes via classroom activities, assignments or online tasks should be

conducted from time to time in institutions of higher learning to give English lecturers/teachers a clear idea of how to embed strategy instruction through the teaching of content. As T1 mentioned, the idea of embedding study skills may already be present among lecturers/teachers, "but the execution needs to be more strategic." This is supported by T2, who mentioned that "the instructions, the activities and how the students are guided in doing the activities" should be emphasised on in the integration of study skills in ESP classrooms.

CONCLUSION

To sum up, this paper investigated the perception of lecturers/teachers and students of study skills at tertiary level as well as the current teaching practices of English lecturers/teachers. The findings showed that a mismatch exists between the perception of lecturers/teachers and that of students regarding the need for study skills in English courses due to differing expectations. Nevertheless, there was general agreement among the lecturers/teachers that should study skills be taught at tertiary level English courses, it should be embedded within the course content and not exist as a separate, stand-alone entity. Further research should be done to look into how educators can effectively incorporate study skills or learning strategies through English courses and further develop them in order to make students more autonomous in their language learning.

ACKNOWLEDGEMENT

The funding for this research was provided by the Ministry of Higher Education, Malaysia under the FRGS grant (Vot. 1477).

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Science Attitude Indicators among Indigenous Pupils

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ABSTRACT

This research paper discusses the development of an instrument to measure the attitude to science displayed by indigenous pupils. The two main objectives of this research are to build a set of criteria for developing a correct attitude to science among indigenous pupils and to determine the reliability of each criterion to develop a correct attitude to science among indigenous pupils. A qualitative approach using document analysis and an expert interview protocol was undertaken to build the criteria for developing a correct attitude towards science among indigenous pupils. Data from the document analysis and expert interviews were analysed manually using the frequency matrix table. Cohen's Kappa reliability analysis was used to determine the agreement index items for each criterion identified. The reliability of the nine criteria and 28 dimensions that were established to measure attitude towards science among indigenous pupils was tested using the quantitative approach. To obtain the reliability score of these criteria, questionnaires were distributed to 31 indigenous pupils throughout Johor, Malaysia. The Kappa coefficient value was 0.84, which showed very good agreement. The responses were analysed using the Rasch Measurement Model as available in Winstep software. The Cronbach's Alpha value for the criteria was 0.98. The development of the instrument to measure the attitude of indigenous

pupils towards science is one of the research efforts to enhance the learning competency of indigenous pupils, especially in the aspect of knowledge. The outcome of this research will be one of the key elements for future research in developing a science competency standard for indigenous pupils.

Keywords: Criteria, indicator, indigenous pupils and attitude towards science

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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INTRODUCTION

Curriculum transformation in Malaysia has taken into account the participation of minorities in Malaysia including indigenous pupils (Kementerian Pendidikan Malaysia (KPM), 2012). The Ministry of Education and Department of Orang Asli Development (JAKOA) have intensified efforts to improve the educational attainment of indigenous pupils. Various provisions and facilities have been channelled towards improving the performance of indigenous pupils, but a matter of concern is the twin issue of drop-outs and low-academic achievement among indigenous pupils that have still not changed significantly.

In this research, an instrument to measure attitude to science was built in an effort to improve the competency of indigenous pupils. This indicator can be used as a guide for teachers to shape a correct attitude among students towards science subjects. According to Martin, Seaton, Wagner and Gerlovich (2007), science can develop a positive attitude in terms of emotions and the intellect. Pupils who have a positive attitude towards science will accept the subject, its objectives, the activities and the overall learning environment positively.

Indigenous pupils seem to prefer non-formal education, particularly that which offers them freedom to do more challenging activities (Maarof & Sarjit, 2008). Therefore, indigenous pupils' interest need to be considered in addressing their learning problems. Thus, the implementation of a precise indicator to measure their attitude

to science would be able to improve the motivation and inclination of indigenous pupils to learn and explore.

PROBLEM STATEMENT

Education as a right of indigenous communities is not a new issue for the Ministry of Education and the Department of Orang Asli Development (JAKOA). Both organisations have collaborated to provide education for indigenous communities and have allocated a large amount of funds to assist indigenous communities in receiving education and achieve success in life. To realise Malaysia's vision of achieving developed nation status by the year 2020, the social and economic progress of indigenous communities need to aligned with those of the rest of the country notwithstanding the often-heard cliché that these communities are undeveloped and laid-back (Ma'rof & Sarjit, 2008).

Ahmad and Mohd. Jelas (2009) stated that education is considered a trivial matter by indigenous communities. According to them, the majority of parents in indigenous communities are not concerned about their children's school attendance and they do not monitor their children's education performance. In addition, reviews of indigenous pupils' competency level and attitude towards learning give an alarming report (Ahmad & Mohd Jelas, 2009; Ma'rof & Sarjit, 2008; Shaari, Yusoff, Nuraini, Ghazali, & Dali, 2011).

They have been found to be sensitive, humble and prone to sulking, leading to difficulty in interacting with the outside

world (Ma'rof & Sarjit, 2008). They seem to find interaction with others difficult because they are rather timid. According to Ahmad and Mohd. Jelas (2009), the timidity of indigenous pupils causes them to learn only when there is external reinforcement. They also feel ashamed when they have difficulty understanding a topic and are embarrassed to ask questions. Ma'rof and Sarjit's finding (2008) that indigenous pupils are sensitive is supported by Ahmad and Mohd. Jelas (2009), who found that the reason for their sensitivity was low self-esteem. They are embarrassed and demotivated from going to school because they feel they are looked down upon by society.

A positive attitude towards science subjects was used as the main subject in this research. Identifying the attitude of indigenous pupils to science allows teachers to identify suitable opportunities, space and time that can develop indigenous pupils' interest in learning in order to motivate these children to be engaged in lessons, for instance by asking questions to satisfy their curiosity. Hence, the objectives of this research were:

- i. to build a set of criteria for an instrument that measures attitude towards science among indigenous pupils
- ii. to determine the reliability of each criterion of the instrument

METHODOLOGY

This research used the qualitative approach based on document analysis and expert protocol interview to determine a set of

criteria for an instrument to measure the attitude of indigenous pupils towards science. The document analysis was done to identify the key criteria. According to Hassan (2009), a document review is the most suitable method to collect information in a qualitative study.

Data obtained from the document analysis were analysed to identify the criteria for an instrument to measure pupils' attitude to science. Subsequently, data obtained from interviews with experts were analysed manually using the frequency matrix table. Cohen's Kappa reliability analysis was conducted to determine the overall agreement index from the obtained criteria. The coefficient agreement value was calculated using Cohen's (1960) formula. The formula is as follows:

$$K = (fa - fc) / (n - fc)$$

where, K is the coefficient

fa is the unit of agreement

fc is the possibility that the unit is set at the level of 50%

N is the number of transcription units or construct-tested agreement

The reliability of the criteria was tested using the quantitative approach. Sets of a questionnaire that measured the criteria, consisting of 80 items, were distributed to 31 indigenous pupils throughout Johor. The responses were analysed using the Rasch Measurement Model as available in Winstep software.

RESULTS AND DISCUSSION

Document Analysis and Expert Interviews for Criteria to Measure Attitude to Science

Data obtained from the document analysis were summarised (see Table 1). Some of the studies consulted were Noll (1935), Kozlow and Nay (1976), Martin and Harlen (1996) and Kementerian Pendidikan Malaysia (2011). Noll (1935) found that attitude to science is closely related to application of science skills such as intellectual honesty, accuracy in action, open-mindedness (rational), suspended judgement, findings based on the evidence of cause and effect and critical thinking. Noll’s (1935) definition of attitude to science has some

similarities with the measurement of attitude to science by Kozlow and Nay (1976), which encompasses criteria such as critical thinking, suspended judgement, dependence on evidence, honesty, objectivity and willingness to change opinion. According to Harlen (1996), the inquiry learning approach can build individual criterion such as honesty, respect for evidence, curiosity and critical reflection.

A proper attitude to science as outlined by the Ministry of Education, which is in line with Martin et al. (1994), emphasises criteria such as diligence, a caring nature, independence, honesty, rationality, critical thinking, accuracy, objectivity and truth. The summary of criteria based on the document analysis is shown in Table 1.

Table 1
Criteria to measure indigenous pupils’ attitude to science obtained from document analysis

Researcher/Criteria	KPM (2011)	Harlen (1996)	Martin et al. (1994)	Kozlow & Nay (1976)	Noll (1935)	f
Diligence	√	X	√	X	X	4/7
Caring nature	√	X	X	X	X	4/7
Independence	√	X	√	√	X	5/7
Rationality	√	√	√	√	√	7/7
Critical thinking	√	√	√	√	√	7/7
Dependence on evidence	X	√	√	√	√	4/7
Objectivity	√	√	√	√	√	5/7
Willingness to change opinion	√	√	√	√	√	5/7
Rationality	√	√	√	√	√	5/7

Table 1 shows that the main criteria in measuring indigenous pupils' attitude to science as obtained from the document analysis are: i) diligence; ii) caring nature; iii) independence; iv) honesty; v) rationality; vi) critical thinking; vii) dependence on evidence; viii) objectivity; and ix) willingness to change opinion.

Table 2
Review by experts of criteria to measure attitude to science

No	Pupils' Science Attitude Criteria	Expert 1	Expert 2	Expert 3
1.	Diligence	√	√	√
2.	Caring nature	√	√	√
3.	Independence	√	√	√
4.	Honesty	√	√	√
5.	Rationality	√	√	√
6.	Critical thinking	√	√	√
7.	Dependence on evidence	√	√	√
8.	Objectivity	√	√	√
9.	Willingness to change opinion	√	√	X

Based on the document analysis and protocol of interviews shown in Table 2, the main attributes frequently cited by researchers in measuring attitude to science are: i) diligence; ii) caring nature; iii) independence; iv) honesty; v) rationality; vi) critical thinking; vii) dependence on evidence; viii) objectivity; and ix) willingness to change opinion.

Comparison of Criteria Selected by Researchers Based on Document Analysis

Table 3
Comparison of attributes selected by researchers for dimension of diligence

No	Diligence Dimension	Hussin (1984)	Md Aroff & Hoon (1994)	Martin et al. (1994)	KPM (2011)
1.	Dedication	√	√	√	√
2.	Determination	√	√	√	√
3.	Diligence	√	√	√	√

Table 3 compares the criteria selected by different researchers for the dimension of diligence. The frequently mentioned attributes are dedication, determination and diligence.

Table 4
Comparison of attributes selected by researchers for dimension of caring nature

No	Caring Nature Dimension	Hussin (1984)	Md Aroff & Hoon (1994)	Martin et al. (1994)	KPM (2011)
1.	Compassion	√	√	√	√
2.	Understanding	√	√	√	√
3.	Appreciation	√	√	√	√

Table 4 compares the criteria selected by different researchers for the dimension of caring nature. The frequently mentioned attributes are compassion, understanding and appreciation.

Table 5
Comparison of attributes selected by researchers for dimension of independence

No	Independence Dimension	Hussin (1984)	Md Aroff & Hoon (1994)	Martin et al. (1994)	KPM (2011)
1.	Responsibility	√	√	√	√
2.	Initiative	√	√	√	√
3.	Confidence	√	√	√	√

Table 5 compares the criteria selected by different researchers for the dimension of independence. The frequently mentioned attributes are responsibility, initiative and confidence.

Table 6
Comparison of attributes delected by tearchers for dimension of honesty

No	Honesty Dimension	Noll (1935)	Kozlow & Nay (1976)	Hussin (1984)	Md Aroff & Hoon (1994)	Martin et al. (1994)	Harlen (1996)	KPM (2011)
1.	Truth	√	√	√	√	√	√	√
2.	Trustworthiness	√	√	√	√	√	√	√
3.	Readiness to acknowledge the work of others	√	√	X	X	√	√	√
4.	Readiness to assess findings	√	√	X	X	√	√	√

Table 6 compares the criteria selected by different researchers for the dimension of honesty. The frequently mentioned attributes are truth, trustworthiness, readiness to acknowledge the work of others and readiness to assess recording findings.

Table 7
Comparison of attributes selected by researchers for dimension of rationality

No	Rationality Dimension	Noll (1935)	Kozlow & Nay (1976)	Hussin (1984)	Md Aroff & Hoon (1994)	Martin et al. (1994)	Harlen (1996)	KPM (2011)
1.	Open-mindedness	√	√	√	√	√	√	√
2.	Logic	√	√	√	√	√	√	√

Table 7 compares the criteria selected by different researchers for the dimension of rationality. The frequently mentioned attributes are open-mindedness and evaluation based on logic.

Table 8
Comparison of attributes selected by researchers for dimension of critical thinking

No	Critical Thinking Dimension	Noll (1935)	Kozlow & Nay (1976)	Hussin (1984)	Md Aroff & Hoon (1994)	Martin et al. (1994)	Harlen (1996)	KPM (2011)
1.	Critical Thinking	√	√	√	√	√	√	√
2.	Dependence on empirical evidence	√	√	X	X	√	√	√
3.	Readiness to challenge validity of statements	√	√	X	X	√	√	√

Table 8 compares the criteria selected by different researchers for the dimension of critical thinking. The frequently mentioned attributes are critical thinking, dependence on empirical evidence and readiness to challenge validity of statements.

Table 9
Comparison of attributes selected by researchers for dimension of dependence on evidence

No	Dependence on Evidence Dimension	Noll (1935)	Kozlow & Nay (1976)	Martin et al. (1994)	Harlen (1996)	KPM (2011)
1.	Readiness to ensure facts are supported by explanation	√	√	√	√	√
2.	Readiness to provide evidence for supporting facts	√	√	√	√	√

Table 9 compares the criteria selected by different researchers for the dimension of dependence on evidence. The frequently mentioned attributes are readiness to ensure facts are supported by explanation and readiness to provide evidence for supporting facts.

Table 10
Comparison of attributes selected by researchers for dimension of objectivity

No	Objectivity Dimension	Noll (1935)	Kozlow & Nay (1976)	Martin et al. (1994)	Harlen (1996)	KPM (2011)
1.	Readiness to consider all data before making decisions	√	√	√	√	√
2.	Readiness to report findings based on observation	√	√	√	√	√

Table 10 compares the criteria selected by different researchers for the dimension of objectivity. The frequently mentioned attributes are readiness to consider all data before making decisions and readiness to report findings based on observation.

Table 11
Comparison of attributes selected by researchers for dimension of willingness to change opinion

No	Willingness to Change Opinion Dimension	Noll (1935)	Kozlow & Nay (1976)	Martin et al. (1994)	Harlen (1996)	KPM (2011)
1.	Readiness to accept facts	√	√	√	√	√
2.	Readiness to admit knowledge is dynamic	√	√	√	√	√
3.	Readiness to modify a hypothesis based on evidence	√	√	√	√	√

Table 11 compares the criteria selected by different researchers for the dimension of willingness to change opinion. The frequently mentioned attributes are readiness to accept facts, readiness to admit knowledge is dynamic and readiness to modify a hypothesis based on evidence.

Findings from Interviews with Experts

Table 12
Findings from interviews with experts on dimension of diligence

No	Diligence Dimension	Expert 1	Expert 2
1.	Dedication	√	√
2.	Determination	√	√
3.	Diligence	√	√

Table 12 compares the criteria selected by the different experts during the interviews for the dimension of diligence. Both experts agreed that these attributes should be present: dedication, determination and diligence.

Table 13
Findings from interviews with experts on dimension of caring nature

No	Caring Nature Dimension	Expert 1	Expert 2
1.	Compassion	√	√
2.	Understanding	√	√
3.	Appreciation	√	√

Table 13 compares the criteria selected by the different experts during the interviews for the dimension of caring nature. Both experts agreed that these attributes should be present: compassion, understanding and appreciation.

Table 14
Findings from interviews with experts on dimension of independence

No	Independence Dimension	Expert 1	Expert 2
1.	Responsible	√	√
2.	Initiative	√	√
3.	Confidence	√	√

Table 14 compares the criteria selected by the different experts during the interviews for the dimension of independence. Both experts agreed that these attributes should

be present: responsibility, initiative and confidence.

Table 15
Findings from interviews with experts on dimension of honesty

No	Honesty Dimension	Expert 1	Expert 2
1.	Truth	√	√
2.	Trustworthiness	√	√
3.	Readiness to acknowledge the work of others	√	√
4.	Readiness to assess findings	√	√

Table 15 compares the criteria selected by the different experts during the interviews for the dimension of honesty. Both experts agreed that these attributes should be present: truth, trustworthiness, readiness to acknowledge the work of others and readiness to assess findings.

Table 16
Findings from interviews with experts on dimension of rationality

No	Rationality Dimension	Expert 1	Expert 2
1.	Open-mindedness	√	√
2.	Logic	√	√

Table 16 compares the criteria selected by the different experts during the interviews for the dimension of rationality. Both experts agreed that these attributes should be present: open-mindedness and evaluation based on logic.

Table 17
Findings from interviews with experts on dimension of critical thinking

No	Critical Thinking Dimension	Expert 1	Expert 2
1.	Critical thinking	√	√
2.	Dependence on empirical evidence	√	--
3.	Readiness to challenge validity of statements	√	√

Table 17 compares the criteria selected by the different experts during the interviews for the dimension of critical thinking. Both experts agreed that these attributes should be present: critical thinking and readiness to challenge validity of statements. However, for the attribute of dependence on empirical evidence, the experts had different opinions. Expert 1 believed it was necessary but Expert 2 did not. According to Expert 2, in order to obtain empirical evidence, integration science skills need to be used, but these skills are less appropriate for use by lower primary pupils.

Table 18
Findings from interviews with experts on dimension of dependence on evidence

No	Dependence on Evidence Dimension	Expert 1	Expert 2
1.	Readiness to ensure facts are supported by explanation	√	√
2.	Readiness to provide evidence for supporting facts	√	√

Table 18 compares the criteria selected by the different experts during the interviews for the dimension of dependence on evidence. Both experts agreed that these attributes should be present: readiness to ensure facts are supported by explanation and readiness to provide evidence for supporting facts.

Table 19
Findings from interviews with experts on dimension of objectivity

No	Objectivity Dimension	Expert 1	Expert 2
1.	Readiness to consider all data before making decisions	√	√
2.	Readiness to report findings based on observation	√	√

Table 19 compares the criteria selected by the different experts during the interviews for the dimension of objectivity. Both experts agreed that these attributes should be present: readiness to consider all data before making decisions and readiness to report findings based on observation.

Table 20
Findings from interviews with experts on dimension of willingness to change opinion

No	Willingness to Change Opinion Dimension	Expert 1	Expert 2
1.	Readiness to accept facts	√	√
2.	Readiness to admit knowledge is dynamic	√	√
3.	Readiness to modify a hypothesis based on evidence	√	X

Table 20 compares the criteria selected by the different experts during the interviews for the dimension of willingness to change opinion. Both experts agreed that these attributes should be present: readiness to accept facts and readiness to admit knowledge is dynamic. However, the experts disagreed on the attribute readiness to modify a hypothesis based on evidence. Expert 1 agreed that this attribute was necessary but Expert 2 did not. According to Expert 2, evaluating a hypothesis might be confusing for pupils, especially if there are discrepancies in observed data.

Agreement Value for Criteria

Based on the analyses, the researchers identified nine criteria and 25 dimensions to be used to build an instrument to measure

the attitude of indigenous pupils to science. The instrument was reviewed by two experts and received the agreement of both that it was useable. The Kappa coefficient value for agreement was 0.84, which indicated very good agreement.

Aspect	Science Attitude
Kappa Agreement Value	$K = (46-25) / (50-25) = 0.84$
Interpretation	Excellent

Summary of Reliability of the Items and Respondents

Questionnaires were distributed to 31 indigenous pupils in order to obtain the reliability of the proposed instrument. The completed questionnaires were collected and analysed using the Rasch Measurement Model available in Winstep software. The results of the analysis are given below.

Cronbach's Alpha	Item reliability	Person reliability	Item separation	Person separation
0.98	0.82	0.95	2.15	4.48

The value for Cronbach's Alpha was 0.98. According to Pallant (2001), for an instrument in the preliminary stages of a study, the acceptable Alpha value is 0.6. The reliability of the items and the respondents for the criteria in the proposed instrument to measure the attitude of indigenous pupils to science was more than 0.80. Bond and Fox (2013) stated that when the reliability value was above 0.80, strong reliability is indicated. The separation indices for the items and respondents obtained were 2.15 and 4.48, respectively. This shows that there

was separation for difficulty levels for two categories of item difficulty and four levels of achievement of pupil attitudes. This finding indicated that the instrument that was built to measure the attitude of indigenous pupils towards science was highly reliable and therefore, highly acceptable.

CONCLUSION

In conclusion, the findings yielded nine criteria for measuring the attitude of indigenous pupils towards science namely, diligence, caring nature, independence,

honesty, rationality, critical thinking, and dependence on evidence, objectivity and willingness to change view. The instrument developed was found to have high reliability and was strongly accepted.

With this instrument, teachers will be able to understand the attitude to science that should be formed during science lessons. Attitude is important because it affects what is learnt as well as the effort put into carrying out activities during a lesson.

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Identifying Learning Styles among Engineering Students

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ABSTRACT

Every student learns with different learning preferences in a classroom. In order to know dominant learning preferences, learning styles play a significant role. Studying learning styles is important as contemporary studies have revealed that to increase the value of students' learning process, there should be a match between students' learning styles and teachers' teaching style. Mismatches in teaching style and students' preferred learning style often lead to poor academic performance among students. Therefore, the main purpose of this research was to explore learning styles of engineering students in the Faculty of Technical and Vocational Education, Universiti Tun Hussein Onn Malaysia. Forty-six students from the Electrical, Civil and Mechanical Engineering disciplines participated in this study. The instrument used is the survey questionnaire based on the Index of Learning Styles (ILS) by Felder and Silverman that consists of 44 items. The ILS consists of four dimensions, each with two sub-scales: process (active-reflective), perceive (sensing-intuitive), input (visual-verbal) and understanding (sequential-global). Each main dimension has 11 items. Data were analysed using SPSS 20.0. The analysis showed that in the process dimension, 57.11% of the participants were active learners, while 42.86% were reflective learners; in the perceive dimension, 54.54% were sensing learners and 45.45%, reflective learners; in the input dimension, 76.87% were visual learners and 23.12%, verbal learners; and in the understanding dimension, 52.96% were sequential learners and 47.03%, global learners. This study highlights that knowing the preferred learning style

of students will help teachers to create a classroom environment that suits students' needs so that their academic achievement can be easily enhanced.

Keywords: Index of Learning Style (ILS), learning style, survey

ARTICLE INFO

Article history:

Received: 01 November 2016

Accepted: 15 April 2017

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INTRODUCTION

Learning style plays a vital role in engineering education that portrays the ways in which students normally obtain, retain and retrieve information. It facilitates students to improve their mental capacity and to cope with learning difficulties, which in turn, improves their academic performance (Mohamad, Mei, & Tze, 2014). Students have different learning styles depending on their preferences, such as auditory, listening, observing or practicing (Graf & Kinshuk, 2008). Students make use of certain environmental stimuli namely, seeing, hearing, reflecting and acting to acquire learning. These environmental stimuli help students to engage in the learning process, which includes reflection, acting, logical reasoning, intuition, memorisation and visualisation (Yee et al., 2015).

Learners acquire knowledge when teaching and learning materials provided cater for their preferred learning style (Mohamad, Sulaiman, Sern, & Salleh, 2015). In addition, learning styles determine how the individual receives and processes information. Students and teachers may prefer one learning style for one subject and another generally prefer to use for most subjects that they learn or teach (Letele, Alexander, & Swanepoel, 2013). Indeed, every classroom is diverse in terms of educational background, cognitive ability, preferred learning style and cultural influence of the learners and teachers.

Mismatches in teaching style and students' preferred learning style often lead to poor academic performance

among students (Graf, Viola, & Leo, 2007). Therefore, to understand a particular learning style which meets the needs of a student, teachers need to determine the best possible learning style that can flourish in the classroom. In higher education, tertiary students are assumed to be mature enough to deal with lessons and assignments on their own (Romanelli, Bird, & Ryan, 2009). Nevertheless, the majority of those among them who fail exams usually attribute their failure to external stimuli such as lack of academic standards or inadequate teaching methods (Mohamad, Yusof, Muhammad, Yee, & Tee, 2013).

Definition of learning styles is also the trend in adopting a particular learning method. The teacher is a leading facilitator and guide to learning in the classroom. Teachers should have the capacity to understand how students learn (Eva & Kristýna, 2016). Therefore, it is required that teachers should adapt their teaching approach to help students learn and improve their learning styles. Discrepancy between teaching style and learning style results in poor academic performance among students (Felder, 1996). Thus, there is a need to provide effective teaching that combines elements of teaching style and preferred learning style in teaching activities, with a particular view to taking cognitive and intellectual demands into consideration (Alias & Zainuddin, 2005).

Due to lack of understanding of learning preferences, students fail to achieve satisfying academic results. Continuous use of effective learning styles may lead

students to better performance (Felder, Brent, & Prince, 2011). Felder is of the opinion that strong preference of any student for a particular learning style may be troubling if the teaching style does not match the student's learning style (Graf, Viola, & Kinshuk, 2006). Every student is different and has a different learning style, speed of pickup of information, passion and motivations to learn. However, teaching methods and academic activities are different. So, learning styles are intended to seek out individual thinking skills, motivation and preferred ways of acquiring knowledge to enhance a student's performance. Thus, educators must understand students' learning styles and learning needs to enhance their learning ability to help them meet the expected educational goals (Eishani, Saad, & Nami, 2014).

Learning Style

Learning style is the method by which students think, process and retain information. It varies from student to student as every student has a different preferred learning style. Learning style in general is assumed to be behaviour, belief and preferences used by individuals to help acquire learning (Koh & Chua, 2012). Every learner has his/her own attributes, preferences and strengths that are used to collect information and learn in class; for this reason, learning preferences are associated with teaching methods (Mansor & Ismail, 2012).

Learning styles have achieved significant attention in recent decades, and is now studied from many angles such as academic achievement, learning attitudes and culture, among others. Many researchers and theorists believe that learning styles have a significant role in the learning process and they agree that integration of learning styles in education will bring a prominent change in education institutions as well as among learners, helping them to learn easily (Felder & Spurlin, 2005). Moreover, Felder, for example, argued that learners with a strong preference for a specific learning style might have difficulty learning if the teaching style does not match their learning style (Felder & Silverman, 1988; Felder & Soloman, 1997).

Thus, from a theoretical point of view, it can be said that integrating learning styles should make learning easier and increase learning efficiency. On the other hand, learners who are not supported by the preferred learning environment may experience problems in the learning process (Felder, 1993). Learning styles can be considered in different ways in education. The first step is to make learners aware of their learning styles and show them their individual strengths and weaknesses (García et al., 2007). Knowing their learning styles helps students to understand why learning is sometimes difficult for them and is the basis for developing areas they are weak in (Alias & Zainuddin, 2005).

Furthermore, students can be supported by matching the teaching style with their learning style. Due to the nature of learning styles, providing students with learning

materials and activities that fit their preferred ways of learning seems to have high potential of making learning easier for them (García, Amandi, Schiaffino, & Campo, 2005). As students think and learn in their own different ways, teaching methods should be varied (Felder & Silverman, 1988). Indeed, preferred learning style is reflected by many students to be one aspect of success in education.

Felder-Silverman Learning Style Model (FSLSM)

This model was initially designed for engineering students to capture the essential differences in learning styles among students to provide engineering teachers with a good base for framing a teaching approach that meets the learning

needs of all learners (Felder & Silverman, 1988). According to the Felder-Silverman Learning Style Model (FSLSM), students are characterised into four major dimensions of learner preference for dealing with information: to process information, to perceive information, to receive information and to understand information (see in Table 1). Every dimension consists of two sub-dimensions: to process information (active vs. reflective); to perceive information (sensing vs. intuitive); to receive information (verbal vs. visual); and to understand information (sequential vs. global). In these sub-dimensions, students prefer one or the other learning style: either active or reflective, sensing or intuitive, verbal or visual and sequential or global. Only one dimension is selected from the two options.

Table 1
Dimensions of Felder-Silverman index of learning style (Felder & Spurlin, 2005)

Major Dimensions	Sub-dimensions	
To process information	Active	Reflective
To perceive information	Sensing	Intuitive
To receive information	Verbal	Visual
To understand information	Sequential	Global

These dimensions were the foundation for the development of the Index of Learning Styles (ILS), which was created in 1991 and later on available as a pencil-and-paper version on the Internet (Felder & Spurlin, 2005). With respect to the instrument’s psychometric qualities, numerous studies have shown that the ILS is a valid, reliable

instrument that deals with predictive value and yields more consistency than other generally used instruments of learning style (Felder et al., 2011).

Identifying Learning Styles

The learning procedure is a communication between learners, educators and teaching

resources. The student learning process should always be given importance (Eishani et al., 2014). Preferably, educators' teaching style should match students' preferred learning style. Mismatches in teaching style and students' preferred learning style often lead to poor academic performance among students (Graf, Liu, Chen, & Yeng, 2009). As learning styles play a significant role in education, educators should not neglect learners' preferred ways of learning to enhance students' academic achievements. Achievement is greater when emphasis is placed on students' preferred learning style as this also develops critical thinking skills such as problem solving, analytical ability and decision making.

METHODOLOGY

This study adopted the survey research because this approach provides greater accuracy and reliability of research findings (Creswell, 2008). A survey is an empirical method that explores and provides potential information regarding the targeted population and enables the collection of data from individuals about their knowledge, feelings, ideas, health, social, financial and educational background (Creswell, 2008). In addition, a survey is an attempt to obtain data from participants to determine the current status of a population with respect to one or more variables (Krosnick & Presser, 2010).

The main purpose of this study was to explore learning styles of third-year Mechanical, Electrical and Civil

Engineering students from a technical and vocational education institution, University Tun Hussein Onn Malaysia. The sample consisted of 46 students from the above courses. The measurement method was the questionnaire Index of Learning Styles (ILS) by Felder and Silverman (1988) that consists of 44 items. There are four dimensions in the ILS namely, to process, to perceive, to input and to understand. Each dimension contains two further sub-dimensions: active-reflective, sensing-intuitive, visual-verbal and sequential-global. Each of these dimensions contains 11 items with two options "a" and "b," where "a" represents the dimensions active, sensing, visual and sequential, and "b" represents the dimensions reflective, intuitive, verbal and global. Data were analysed using the Statistical Package for the Social Sciences (SPSS) version 20.0.

RESULTS

The results showed that overall, the third-year students of technical and vocational education who were pursuing Mechanical, Electrical and Civil Engineering in University Tun Hussein Onn Malaysia preferred visual learning (76.87%) to verbal learning (23.12%) for the input dimension. For the process dimension, there were more active learners (57.11%) than reflective learners (42.86%) among the students, while for the perceive dimension, 54.54% preferred sensing and the other 45.45% preferred intuitive. For the understanding dimension, sequential learning was

preferred (52.96%) to global learning (47.03%) among the students. Based on the overall findings, the research suggested that teaching material should align with the

students' dominant learning preferences so that they can develop their skills and get good academic achievements. The summary of results in percentage is shown in Figure 1.

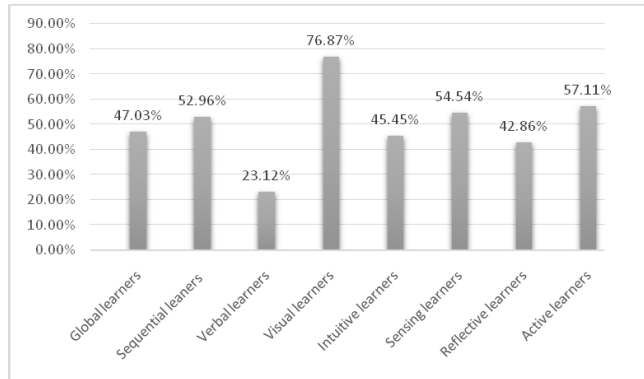


Figure 1. Percentages of sub-dimensions of index of learning style (ILS)

DISCUSSION AND CONCLUSION

In the classroom, teachers mostly focus on finding the ways students learn best (Felder & Spurlin, 2005). Knowing the preferred learning styles of learners may support improvement of the quality of learning and teaching. As Sabine Graf mentioned, identifying the preferred learning style of learners is the road to improving learning and teaching in the classroom (Graf et al., 2009). Knowing the preferred learning style of learners helps teachers first to know how the learners can do well in a subject, as well as prepare teaching material that suits students' preferred learning styles. Mismatching often results in poor performance in the class; therefore, providing classroom materials according to learners' preferred ways of learning can make teaching and learning an

effective and enjoyable experience for both teachers and learners.

This study illustrated that engineering students have different preferences and characteristics in acquiring knowledge. Visual learners tend to learn in diagrams, charts, figures and pictures as well as certain subjects in engineering courses. This paper contributes that knowing preferred learning style of students will help teachers to make environment in class according to the students' needs so that they can learn easily and enhance their academic achievement.

ACKNOWLEDEGMENT

This paper was fully sponsored by the Office for Research, Innovation, Commercialisation and Consultancy Management (ORICC), Universiti Tun Hussein Onn Malaysia (UTHM), Johor, under vote number U311.

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JOURNAL OF SOCIAL SCIENCES AND HUMANITIES

VOL. 25 (S) May 2017

Special Edition

TVET Talent Development:

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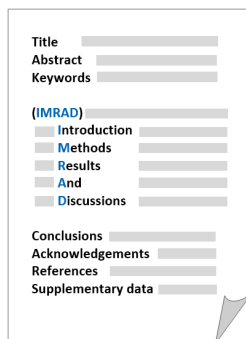
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