



# Technical Vocational Education and Training (TVET) Capability Approach Framework [TVET-CAF]

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**Abstract:** TVET played an important role as one of supply mechanism on the competence human capital towards the economic growth of Malaysia including for construction industry. However, the mass of unemployed graduates has caused their readiness towards involvement in the industry become questionable. Thus, the aim of the study is to propose a TVET-CAF framework to enhance the career readiness of Construction Technology graduates through systematic reviews of literature. The major elements of the framework are: the relevance of the graduates, efficacy level of the graduates and ways to enhance level of efficacy the graduates. Therefore, it will assist in improving the quality of education for the graduate towards better student outcome alongside with RMK-11 strategic thrust which is accelerating human capital development for an advanced nation.

**Keywords:** TVET, construction industry, construction technology, graduate, preparation

## 1. Introduction

Construction sector plays an important role and become one of the keys in Malaysian economy by its multiplier effect on other industries (CIDB, 2017). However, in the extent of local participation for labour in construction industry, productivity is not in a healthy condition with areas need to be enhanced to boost the industry to be in line with other main sectors; the incentive program towards the labour itself (El-Gohary & Aziz, 2014). According to CIDB (2019) Technical Vocational Education and Training (TVET) play an important role in providing skill labours which required for industry to achieve nation aspiration. Thus, Building Technology Programme is the programme offered at the Vocational College where its role to equip the students with high technical skill as required by the construction industry (Manap et. al., 2017).

Unfortunately, the Building Technology course has the lowest graduates' employability after completed their course among other classes (Shaharuddin et al., 2018). Besides, lack of success in college has caused an issue, and industry leaders have indicated that students were not ready with the skills and knowledge required to be efficient as the workforce (Hart, 2008). Employers and college students agree that graduates should attain a wide range of academic, technical skills, and expertise, including opportunities to apply learning to gain a successful career (Hart, 2015). However, career readiness was not well defined, and there is little evidence to investigate and determine what makes a student ready for their career (Di Benedetto and Myers, 2016). The Integrating College and Career Readiness Task Force (ICCR) Task Report (2012) stated that career readiness means an individual has the requisite knowledge, skills,

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and experience in the academic, workplace readiness and personal domains to successfully navigate to completion an economically viable career pathway in a 21st-century economy (Chester, 2013).

Master Builder Association Malaysia (MBAM) in 2016 stated that by 2020, the construction industry is expected to need at least 1.995 million on-site foreign workers to accommodate the shortage of local supply, which is only expected to be only 405,135 workers in 2020 (Teng, 2016). According to the Construction Industry Development Board Malaysia (CIDB), the estimated local supply is based on the average yearly increment for skilled and semi-skilled, which is assumed to be 3,346 and 15,746, respectively. Furthermore, one of six Eleventh Malaysia Plan (RMK11) strategic thrust is to accelerate the human capital development for an advanced nation with the focus area are (i) improving labor market efficiency to accelerate economic growth, (ii) improving the quality of education for better student outcomes and institutional excellence, (iii) transforming TVET to meet industry demand, and (iv) strengthening lifelong learning for skills enhancement.

## 2. Background to The Study

The perception of TVET in Malaysia seems to be the last resort for less qualified students since the academic option has been aggravated for admission into TVET programs with the limited prospects for further educational and professional development of TVET graduates (Pang, 2011). Furthermore, various TVET providers often operate as silos and do not take into account program offerings in the broader context, resulting in overlapping courses and institutions that creates confusion for students and employers (Ismail and Hassan, 2013). Furthermore, the National Union of the Teaching Profession (NUTP) secretary-general, Harry Tan said that the feedback from TVET teachers was that the syllabus is outdated, and TVET graduates will end up unemployed unless the syllabus is made more relevant (THE Star Online, 2018). Other than that, the Core and Career and Technical Education (CTE) courses must provide students with core academic skills, employability skills, and job-specific technical skills related to their career pathway (DiBenedetto and Myers, 2016). Furthermore, the traditional Vocational Education Training (VET) idea has far too often been proved as regress based on adoption (Bohne et al., 2017). In addition, Building Technology course is the most challenging course for the student to get the job compared to other courses (Shaharuddin et al., 2018). This is because the course needs to meet the industrial requirement and according to the construction industry's current development (Manap et al., 2017). According to Salleh et al. (2016), numerous studies were conducted and show that there was a massive shortage of local skilled workers to meet industry demand, and one of the institutions that are responsible for providing skilled workers for the construction industry is Malaysian TVET.

Furthermore, TVET programs are often similar but with two different accreditation standards and lack of specialization areas (Chin, 2018). There was a consensus that TVET should be re-branded, but it is critical to recognize that the issue goes very deep, starting with fundamental (Chan, 2018). Besides, Malaysia's TVET needs to be reform and strengthen by mainstreaming TVET in the education system, enrolment of student needs to increase, employability of graduates should be increase as well as the harmonizing the course offering through various training providers (Ashari et al., 2016). However, lack of equipment and no large area for computers become one of the restrictions to enhance the student preparedness to work in the construction industry (Manap et al., 2017). Professor Dr. Mohammad Sattar Rasul from Universiti Kebangsaan Malaysia stated that professional bodies in Malaysia need to step up to ensure the standard curriculum is in line with industry requirements and have to be developed by the board of an institution which sometimes does not cater to industry demand (Karim, 2018). Furthermore, the preparation of TVET graduates has never been analyzed, as the involvement of them in the local construction industry as skilled workers are still low, making their method of their readiness become an issue (Manap et al., 2017).

Furthermore, to become a high-income economy by 2020, Malaysia needs to have a workforce that is equipped with the necessary skills and knowledge to support and drive the economy (Ismail & Hassan, 2013). Furthermore, the education system, especially TVET, must yield K-workers to push Malaysia into the K-economy (Jailani et al., 2009). Based on the findings of Dlimbetova et al. (2016) employers lack of knowledge and unaware of the importance of green skills, which is caused by inadequate training and proper qualifications prior to entering the labor market. Training, curriculum, trainer or teacher, facilities and resources, and cooperation from industries are among the factors which affected the readiness of graduates of Malaysia Skills Certification (SKM) towards the working environment (Yunus, 2015). Thus, it is inevitable to identify the elements in enhancing the career readiness of Construction Technology graduates.

## 3. Methodology

This research aims to establish a conceptual framework of TVET-CAF through systematic review of literature which as such, will serve as the grounds for future research and theory. A Systematic Literature Review was conducted using the Literature Search Method adopted from Papanti et al. (2013) which consists of four phases of analysis: 1. Identification, 2. Screening, 3. Eligibility, and 4. Included, as shown in Figure 1. The Systematic Literature Review will allow an interpretation of existing research from a new point of view and a combination with previous researches (Mark & Lewis, 2012). Hence, the effective way to conduct this research is through the use of the internet and databases.

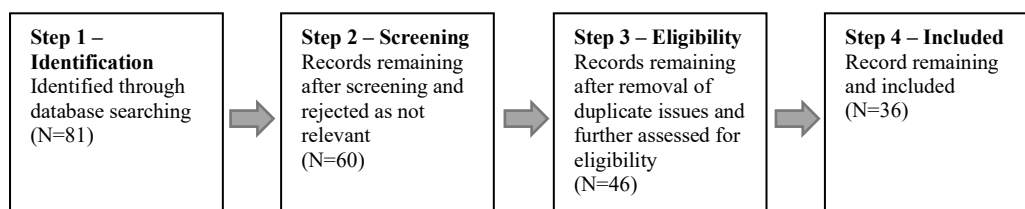


Fig. 1 - Literature search method

The literature review was focusing on the current preparation of building technology graduates specifically for Malaysian TVET. The search was carried out using internet search of electronic database (i.e., Scopus, ScienceDirect, Emerald Insight, Google Scholar, government database, official websites including journal papers, conference proceedings, and other publications between the year 1978 until 2019). The set of keywords were used in the search including “Technical Vocational”, “Construction technology”, “TVET efficacy”, “Construction vocational”, “TVET graduate”, “TVET in construction”, “Graduate TVET capability”, “Technical vocational graduate”, “TVET preparation”, “TVET challenges”, “TVET efficacy level” were also considered. This literature search method as per shown in figure 1 has followed the 4 steps for systematic literature review. The search identifies 81 potentially relevant references and 36 were selected for this review.

## 4. Results

### 4.1 Overview of TVET in Malaysia

The current Programme for International Student Assessment (PISA) saw Malaysia declining further to the bottom in terms of education (Pamela, Yunus, and Mohamad, 2016). Thus, Malaysia's government initiated the Malaysia Blueprint to furnish a rapid but sustainable transformation of education until 2025. According to the Ministry of Education (2013) in the Malaysia Education Blueprint 2013-2025, for Malaysia's push from middle income to high-income status, the country needs to be fueled more knowledge workers and leaders than any other inputs such as unskilled labor or capital. Therefore, there are five aspirations of education system adapted from the Malaysian Education Blueprint, which one of it is to become top third in international assessments such as Programme for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS) in 15 years' times (MOE, 2013). In line with this, the Government of Malaysia has strategically channeled the planning towards the TVET, which is the most critical mechanism in supplying the competent human capital for economic growth (MQA, 2019). Thus, the Malaysian Qualification Agency (MQA), as representative body of MOE, takes the responsibility to strengthen the TVET sector to be in parity with the academic sector (MQA, 2019). The consequence of this will contribute towards one of the 11th Malaysia Plan pillars, which is to empower human capital, which will accelerate it for an advanced nation. More specifically, the contribution will focus more on improving education quality for better student outcomes and institutional excellence.

Therefore, this causes the industries to continually search for employees who can combine technical skills with professional competencies (Boahin & Hofman, 2014). Other countries like China especially have established a framework of generic competence for higher TVET graduates, which composed of five (5) categories to meet the requirements of the industries contains (i) understanding and communication, (ii) scientific ways of thinking, (iii) management (iv) application and analysis and (v) hands-on skills and know-how (Fan, 2017). Compared to Malaysia, the Dual system of TVET is a part of joints execution projects to ensure the instructor's selection and education process, which will become an output as per employer's requirements (Moses, 2016).

Industries stakeholders has required technical education students' skills training to complement classroom experience to prepare them with required skills for employment in the sectors upon graduation (Oviawe et al., 2017). This is due to the fact that the project's failure happened due to insufficient skilled or qualified tradespeople (Windapo, 2016). However, the supply of skilled tradespeople will be affected if there is a lack of high-quality primary education, the state of the economy, compulsory certification of workers, and an aging workforce towards the industry (Rahim et al., 2016). Thus, Durdyev and Ismail (2016) stated that what could improve construction-site productivity is through proper human resource allocation performed according to the relationship between capability and competency.

Besides that, CIDB, as one of the agencies which are to put the responsibility to develop the construction industry state among the aims to provide the skills training are (i) to provide productive workforce, have awareness towards the safety, quality oriented, and efficient to meet the construction industry requirement which rapidly changing, and (ii) to support the industry to achieve the competitiveness by providing the appropriate workforce to control or handle the technology which becomes more advanced nowadays (CIDB, 2017). In addition, for Malaysia to be prepared to face the Industry Revolution 4.0, the country needs to have a sufficient skilled workforce to drive the industry through the challenge (Kamarudin, 2019).

### 4.2 Vocational College for TVET Programs in Malaysia

The purpose of establishing Vocational College (KV) stated by the Ministry of Education is to produce high school graduates who got a skill certificate accredited by national qualification agencies and government (Hanafi, 2015). This Malaysian Skills Certification System was developed by the Department of Skills Department in 1993 to enable the holders of certificates to progress from semi-skilled levels to advanced levels based on current industry needs (Rahim et al., 2019). Students will take four years to complete the study, which includes two years for pre-diploma and two years for diploma stage if they enroll in Vocational College (Samad et al., 2017). Added more by Samad et al. (2017), the students only got SKM certificate level 3 if they do not reach the CGPA at least 2.5 for them to proceed to the diploma stage. According to Malaysian Qualification Agency (2019), the assessment criteria for the Certificate of Vocational from Level 1 to Level 3 is based on knowledge, practical skills, functional skills, and personal and ethical skills and were highlighted by MQA for every level's objective in Table 1 for the public's awareness of the program.

**Table 1 - TVET programme objectives**  
**Source: Malaysia Qualification Agency (2019)**

Level	Objectives
1	To provide learners with simple basic knowledge and understanding, a basic skill to carry out simple, highly routine and repetitive tasks for work and/or study
2	To provide learners with introductory knowledge, basic skills and competencies to progress in their studies and/or work
3	To provide learners with fundamental, theoretical and/or technical/operational knowledge, skills and attitudes as well as entrepreneurial skills for further study and/or work

Furthermore, according to the Ministry of Education Malaysia (2016) through media statement, the Vocational Certification Malaysia (SVM) is equivalent to the three credits of Malaysia Education Certificate (SPM) for students who got; 1) Average rate of cumulative grade (PNGK) academic equal or more than 3.33, 2) Credit in Malay Language SVM Code 1104, and 3) PNGK Vocational equal or more than 3.67 and competent in all of the modules. Furthermore, through the accredited equivalent of levels standard, the Sijil Vokasional Malaysia graduates are qualified and entitled to further their studies to Diploma Vokasional Malaysia at Vocational Colleges, as well as to acquire the Sijil Kemahiran Malaysia to the highest level, which is at level 4 (Bernama, 2016).

### 4.3 Construction Technology Course in Vocational College

Construction Technology Programme is the program offered at the Vocational College, where its role in equipping the students with high technical skill as required by the construction industry (Manap et al., 2017). According to the Ministry of Education Malaysia, based on Diploma Programme Code Guideline for Vocational College, the Diploma in Construction Technology has been placed under the Civil Technology Departments. However, there are four (4) stages of certification as per Table 2 for Construction Technology Programme under the guideline (Vocational College Kangar, 2014).

**Table 2 - Certification stages for Vocational Malaysia Diploma (DVM)**  
**Source: Vocational College Kangar (2014)**

Semester	Certification
Semester 1 – 2	Stage 1 Vocational Certificate (Pre-Diploma)
Semester 3 – 4	Stage 2 Vocational Certificate (Pre- Diploma)
Semester 5 – 6	Stage 3 Vocational Certificate (Diploma)
Semester 7 – 8	Stage 4 Vocational Certificate & Vocational Malaysia Diploma (DVM)

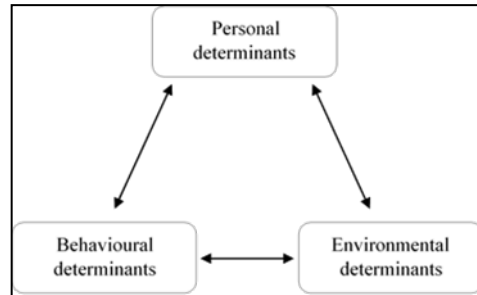
In addition, the program was structured under two (2) modules for the vocational and academic modules which are compulsory subjects for the students to complete the eight (8) semester program and based on Ministry of Education, in the 8th semester, the students need to go through On Job Training (OJB) for three months to enhance the skills during the college programs towards the industry (Vocational College Kangar, 2014).

### 4.4 Evolution of Theories for Capability Approach to Enhance Graduates' Level of Efficacy

The quality of a program is ultimately assessed by the students' ability to carry out their expected roles and responsibilities in society (MQA, 2019). It was further added, program must define the competencies that the learners should demonstrate on completing the program that comprises the mastery of a body of knowledge; functional/practical or work competency skills; personal competency; and ethical and social responsibility skills. For that, this research begins with looking into Social Cognitive Theory by Bandura (1986) which later expanded by Brown et al. (2011) on

Social cognitive career theory model of work performance which form self-efficacy judgments in order to achieve success.

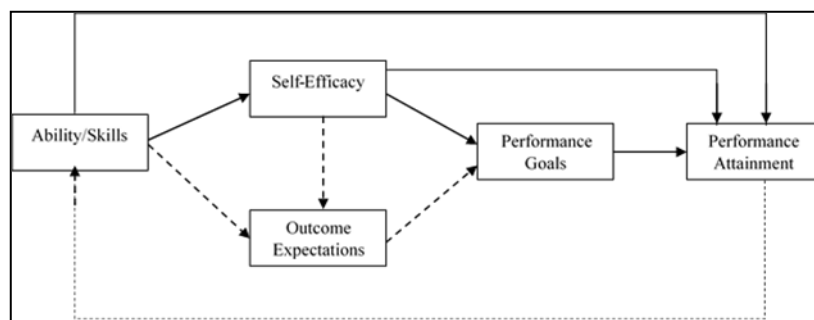
The student's motivation, interest, aspirations, socioeconomic status, support systems and developmental process have played an essential role in determining whether or not students have been prepared for a career has ultimately made their life ready (DiBenedetto and Myers, 2016). Thus, these were aligned with the theory of Social Cognitive by Bandura (1986), which emphasizes human behavior, which is influenced by three main factors as per Figure 2.



**Fig. 2 - Bandura's model of Social Cognitive Theory representing the triangular relationship between the three main factors of human behaviour (Bandura, 2001)**

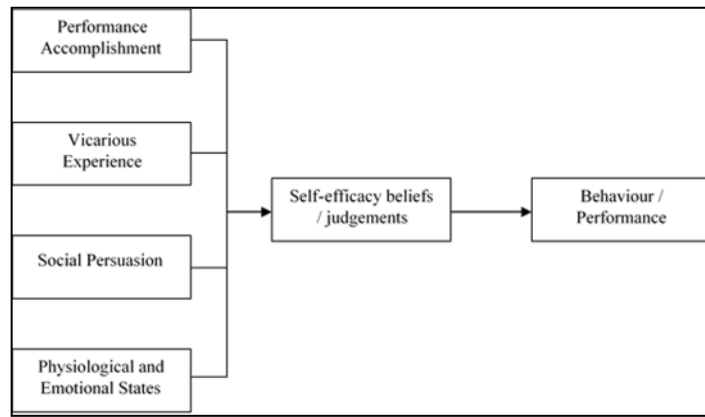
The three main factors highlighted by the theory are; personal determinants, which also described as cognitive factors (e.g., knowledge, expectations, attitudes); behavioral determinants (e.g., skills, practice, self-efficacy); and environmental determinants (e.g., social norms, access in the community, influence on others) (Becker et al., 2012). However, according to Smith (2002), the theory has been extended by Lent et al. (1994) to encompass the academic and career domains, which is called as Social Cognitive Career Theory (SCCT). Added more by Smith (2002), the theory contains three variables for individuals to manage their academic behavior, which is: self-efficacy beliefs, outcome expectations, and personal or performance goals.

The Social Cognitive Career Theory purpose is to provide a unifying framework for understanding, explaining, and predicting the processes which the individual to develop educational and vocational interests, make academic and occupational choices, and achieve varying levels of success and stability in their educational and career pursuits (Lent et al., 1994). However, Brown et al. (2011) tested the model by including the central cognitive predictors of performance, which are ability/skills, self-efficacy, and performance goals, except outcome expectation as per Figure 3. This is due to the self-efficacy beliefs offered to a potential target in the involvement of efforts, as long as it is well understood that there is a necessary level of ability is required to achieve workplace success (Brown et al., 2011).



**Fig. 3 - Social cognitive career theory model of work performance (Brown et. al., 2011)**

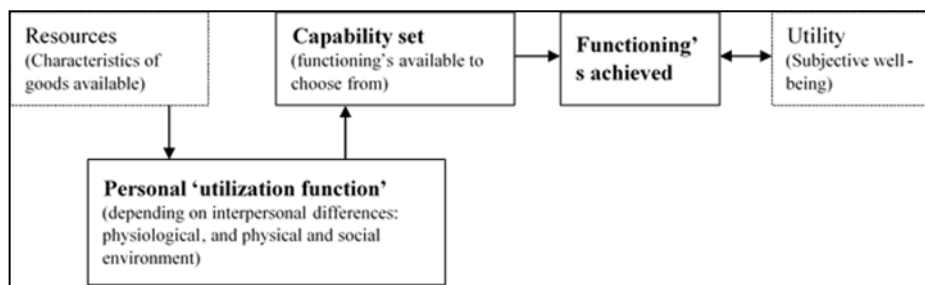
The self-efficacy beliefs are slightly exceeded current talents which encouraging people to take on increasingly challenging work tasks for which success is possible (Bandura, 1997). Through definition, self-efficacy is an individual judgment of their capabilities to organize and execute courses of action required to attain the designated type of performance and it has high impact on a person's beliefs of individual mastery (Bandura, 1978). Based on Self-Efficacy Theory (Refer to Figure 4), there are four significant sources of information used by individuals when forming self-efficacy judgments: performance accomplishment, various experiences, social persuasion, and physiological and emotional states (Bandura, 1986).



**Fig. 4 - Self-Efficacy Theory (Bandura, 1986)**

Perceived self-efficacy is a judgment of one's capability to organize and produce give types of performance, whereas an outcome expectation is a judgment of the likely consequence such performance will be an outcome (Bandura, 1997). Added by Schunk (2003) by referring to the connection between internal factors and behavior, a large amount of research demonstrates that self-efficacy affects students' performance and their learning behavior in terms of the task they choose, their exertion, and performance itself. However, these self-evaluations include perception of self-efficacy (Plourde, 2002), which is "beliefs in one's capabilities to organize and execute the courses of action required to manage prospective situations" (Bandura, 1986).

Thus, as stated by Sen (1999), capabilities represent various combinations of functioning. Furthermore, the capability approach's characteristic is its focus on what people effectively able to do and to be (Kuhumba, 2018). Thus, the capability approach emphasizes the quality of life that individuals can achieve (Wells, 2013) and there are core relationships in the capability approach as per Figure 5 between 'functioning' and 'capability' to analyze the individual's quality of life, whichever they can achieve.



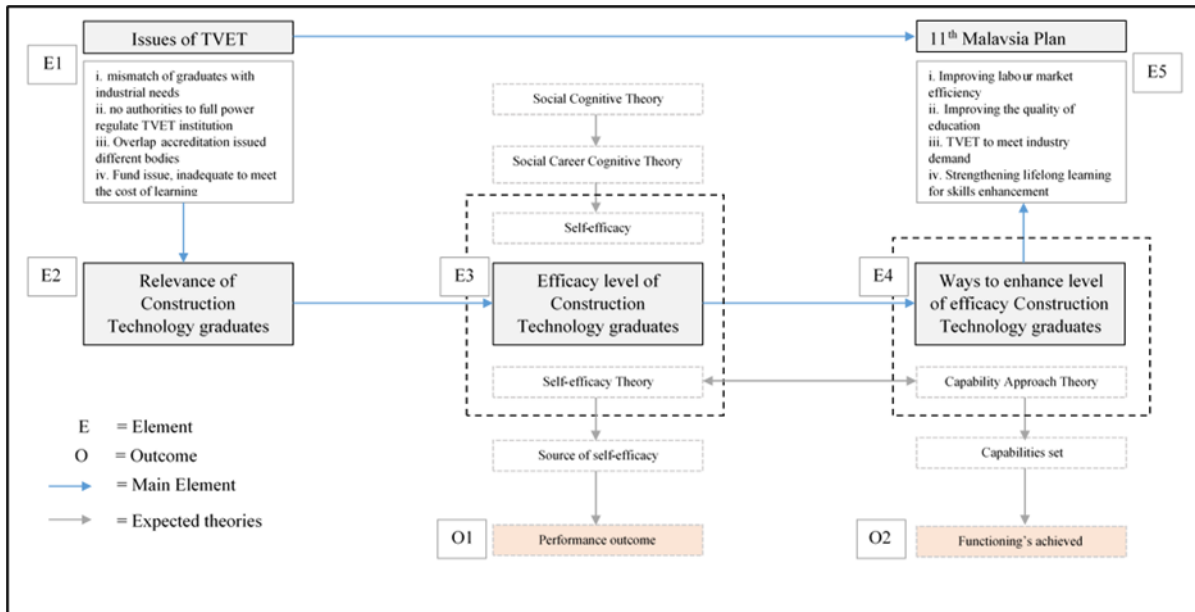
**Fig. 5 - Outline of the core relationships in the capability approach (Wells, 2013)**

Functioning is the measuring dimensions of capabilities that can be achieved to different degrees, such as being illiterate, having primary education, high-school education, etc (Mock et al., 2013). Whilst, functioning's are modes of doing and being, or action and states that people want to engage in and achieve (Terzi, 2014) and the capability as the real, effective opportunities people have to achieve valued functioning's. According to Robeyns (2005), in terms of achieved functioning's versus capability, the term capability was synonymous with the 'capabilities set' consisting of potential functioning's. Thus, these functioning's can be either potential or achieved. Furthermore, the capability approach is a broad normative framework that prominently in development studies and can evaluate several aspects of people's well-being, such as inequality of individual or a group.

Therefore, the goal of the framework of the capability approach establishment is human flourishing, which is expressed through the enhancement of one's capability set (Sen, 1999). This is by the value of goods and services that will affect the individual capabilities, which, consequently, in the specific condition, the person can use the goods and services in a crucial role (Mock et al., 2013). In fact, the capabilities approach comes very near to the central aspects of education and pedagogy beyond primary schooling (Andresen et al., 2008). For that, it is believed that by identifying the capability set of a student, proper approach can be prepared in ensuring the achievement of the students; particularly within the TVET graduates.

## 5. Development of Proposed Conceptual Framework

Based on the findings from the review, Figure 6 presents the proposed capability approach framework to enhance the level of efficacy on the Construction Technology graduates from Sijil Vokasional Malaysia (SVM) towards their involvement in the industry.



**Fig. 6 - The proposed Technical Vocational Education and Training (TVET) Capability Approach Framework [TVET-CAF]**

The technical education course needs to be imparted the academic and technical skills and knowledge which is important for the graduate career readiness (DiBenedetto and Myers, 2016). Thus, there are several issues for TVET (E1) arises which affect the Building Technology graduate which cause the relevance's of the graduate (E2) being question in their involvement for industry. The framework highlighted the level of efficacy of the Building Technology graduates (E3) which will being evaluate through their performance outcome (O1) by Self-Efficacy Theory. As the way forward, the framework stressing about ways to enhance the efficacy of Building Technology graduates (E4) which will being analyse using the capabilities set by Capabilities Approach Theory as 'functioning's achieved' (O2) as the outcome. Hence, the (E4) will contribute to the National Agenda of 11th Malaysia Plan (E5) which is to empowering human capital and more focusing on improving the quality of education and institutional excellence.

## 6. Conclusion and Recommendations

This work has identified the general and specific Construction Technology graduate's capability issues from Sijil Vokasional Malaysia (SVM) towards their industry involvement. The evidence is clear that there are ways and opportunities to enhance the graduates' level of efficacy on their readiness towards the construction industry. Hence it is possible to achieve the national agenda on empowering the human capital for the sector under the 11th Malaysia Plan.

In conceptual terms, this research is limited to literature and past empirical research, which have presented valuable evidence for scholars and practitioners. Future studies can adapt the proposed conceptual framework to become the structural model for statistical analyses, to analyze and confirm the relations between the elements of efficacy level of Construction Technology graduates and ways to enhance the efficacy of Construction Technology graduates and the contribution to national agenda. The conceptual framework is relatively new and has potential to be developed in future.

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## References

Andresen, S., Otto, H. U., & Ziegler, H. (2008). Bildung as human development: An educational view on the capabilities approach. In *Capabilities—Handlungsbefähigung und Verwirklichungschancen in der Erziehungswissenschaft* (pp. 165-197). VS Verlag für Sozialwissenschaften.

- Ashari, Z. H., Rasul, M. S., & Azman, N. (2016). A Review on The TVET Issues in Malaysia and The Participation of Industries in the TVET System. *Academia. edu*, 10.
- Bandura, A. (1978). *Social learning theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, 52, 1-26.
- Becker, J. S., Paton, D., Johnston, D. M., & Ronan, K. R. (2012). A model of household preparedness for earthquakes: how individuals make meaning of earthquake information and how this influences preparedness. *Natural hazards*, 64(1), 107-137.
- Bernamea (2016). SVM Made Equivalent to SPM with 3 Credits.
- Boahin, P., & Hofman, W. A. (2014). Perceived effects of competency-based training on the acquisition of professional skills. *International Journal of Educational Development*, 36, 81-89.
- Bohne, C., Eicker, F., & Haseloff, G. (2017). Competence-based vocational education and training (vet). *European Journal of Training and Development*.
- Brown, S. D., Lent, R. W., Telander, K., & Tramayne, S. (2011). Social cognitive career theory, conscientiousness, and work performance: A meta-analytic path analysis. *Journal of Vocational Behavior*, 79(1), 81-90.
- Chan, Y. S., (2018). We Need to Change Perception of TVET. Retrieved from <https://www.thestar.com.my/opinion/letters/2018/11/23/we-need-to-change-perception-of-tvet>
- Chester, M. D., (2013), Joint Initiatives with Higher Education to Promote College and Career Readines. Retrieved from <https://www.doe.mass.edu/bese/docs/fy2013/2013-01/item1.html>
- Chin. C., (2018). TVET gaining popularity but grads underpaid, says NUTP. Retrieved from <https://www.thestar.com.my/news/nation/2018/10/20/tvet-gaining-popularity-but-grads-underpaid-says-nutp#ZR21di91DP9vO8fu.99>
- Construction Industry Development Board (CIDB) (2019). TVET Pembinaan. Retrieved from <https://tvetpembinaan.my/>
- Construction Industry Development Board (CIDB) (2017). Latihan Kemahiran Pembinaan. Retrieved from [www.cidb.gov.my/index.php/my/warga-industri/personnel-binaan/latihan/latihan-kemahiran-pembinaan](http://www.cidb.gov.my/index.php/my/warga-industri/personnel-binaan/latihan/latihan-kemahiran-pembinaan)
- DiBenedetto, C. A., & Myers, B. E. (2016). A Conceptual Model for the Study of Student Readiness in the 21st Century. *NACTA Journal*, 60.
- Dlimbetova, G., Zhylybaev, Z., & Syrymbetova, L. (2016). Green Skills for Green Economy: Case of the Environmental Education Role in Kazakhstan's Economy. *International Journal of Environmental and Science Education*, 11(8), 1735-1742.
- Durdyev, S., & Ismail, S. (2016). On-site construction productivity in Malaysian infrastructure projects. *Structural Survey*.
- El-Gohary, K. M., & Aziz, R. F. (2014). Factors influencing construction labor productivity in Egypt. *Journal of management in engineering*, 30(1), 1-9.
- Fan, D. D. (2017). Competence-based education in China's higher TVET: the case of Shenzhen Polytechnic. In *Competence-based Vocational and Professional Education* (pp. 429-448). Springer, Cham.



- Hart, P. D. (2008). How should colleges assess and improve student learning? Employers' views on the accountability challenge. Association of American Colleges and Universities Report.
- Hart, P. D. (2015). Falling short? College learning and career success. Association of American Colleges and Universities.
- Hanafi, S. (2015). Kesiediaan pelajar dari aspek kemahiran teknikal terhadap pembentukan kebolehpkerjaan di Kolej Vokasional Wilayah Selatan (Doctoral dissertation, Universiti Tun Hussein Onn Malaysia).
- Ismail, A., & Hassan, R. (2013). Issue and Challenges of Technical and Vocational Education and Training in Malaysia for Knowledge Worker Driven. In National Conferences on Engineering Technology (NCET) (pp. 1-2).
- Jailani, M. Y., WA, W. M. R., & Syarizul, A. M. D. (2009). Research and Development for Capacity Building In TVET: The International PhD Programme Between UTHM And ITB Germany. *Journal of Technical Education and Training*, 1(1).
- Kamarudin, K. (2019) Kekurangan Tenaga Mahir Menjadi Cabaran Industri 4.0. *Bernama*. Retrieved from <https://www.malaysiakini.com/news/458549>
- Karim, M. A., (2018). TVET, a viable pathway. Retrieved from <https://www.nst.com.my/education/2018/10/422015/tvet-viable-pathway>
- Kuhumba, S. (2018). Amartya Sen's capability approach as theoretical foundation of human development. *Journal of Sociology and development*, 1(1), 127-147.
- Lent, R. W., Brown, S. D., & Hackett, G. (1994). Toward a unifying social cognitive theory of career and academic interest, choice, and performance. *Journal of vocational behavior*, 45(1), 79-122.
- Malaysian Qualification Agency (MQA) (2019). Code of Practice for TVET Programme Accreditation, Malaysia
- Manap, N., Hassan, N. S., & Syahrom, N. S. (2017). PREPARATION OF VOCATIONAL COLLEGE GRADUATES AS SKILLED WORKFORCE IN THE LOCAL CONSTRUCTION INDUSTRY. *Journal of Technical Education and Training*, 9(2).
- Mark, S., and Lewis, P. (2012). *Research Methods for Business Students*. SHRM Research: Prentice Hall.
- Ministry of Education Malaysia (MOE) (2013), *Malaysia Education Blueprint 2013-2025*.
- Ministry of Education Malaysia (MOE) (2016) *Kenyataan Media Kementerian Pendidikan Malaysia Berkaitan Penyetaraan Sijil Vokasional Malaysia (SVM) Dengan Sijil Pelajaran Malaysia (SPM) Dan Laluan Pelajar*. Retrieved from <https://www.moe.gov.my/en/pemberitahuan/media-statement/kenyataan-media-kementerian-pendidikan-malaysia-berkaitan-penyetaraan-sijil-vokasional-malaysia-svm-dengan-sijil-pelajaran-malaysia-spm-dan-laluan-pelajar>.
- Mock, M., Omann, I., Rauschmayer, F., & Fuchs, D. (2013). Do community currencies enhance sustainable quality of life?
- Moses, K. M. (2016). Improving the quality and competence of technical vocational education and training output through vocational school cooperation with industry: A case study of Uganda. In *AIP Conference Proceedings* (Vol. 1778, No. 1, p. 030060). AIP Publishing LLC.
- Oviawe, J. I., Uwameiye, R., & Uddin, P. S. (2017). BEST PRACTICES IN TECHNICAL EDUCATION PROGRAMME FOR STUDENTS' CAPACITY BUILDING AND SUSTAINABLE DEVELOPMENT IN THE 21ST CENTURY. *Journal of Technical Education and Training*, 9(2).
- Pamela, L. M. S., Yunus, M. M., & Mohamad, M. (2016). The Malaysian education blueprint 2013 and its effects on English language teaching in Malaysia. *Asian EFL Journal*, 4, 58-171.
- Pang, C. L. (2011). Key Reforms in Revitalising Technical and Vocational Education and Training (TVET) in Malaysia. *Regional Conference on Human Resource Development Through TVET as a Development Strategy in Asia*. Colombo Sri Lanka.

- Papanti et al. (2013). Spiceophobia: a systematic overview of "spice"-related psychopathological issues and a case report. ResearchGate, 379-389.
- Plourde, L. A. (2002). The influence of student teaching on preservice elementary teachers' science self-efficacy and outcome expectancy beliefs. *Journal of Instructional Psychology*, 29(4), 245-254.
- Rahim, F. A. M., Yusoff, N. S. M., Chen, W., Zainon, N., Yusoff, S., & Deraman, R. (2016). The challenge of labour shortage for sustainable construction. *Planning Malaysia*, 14(5).
- Rahim, M. B., bin Yunus, F. A. N., Marian, M. F., Abd Baser, J. B., & Ali, M. M. A. (2019). Developing an E-Portfolio Model for Malaysian Skills Certification. *Journal of Technical Education and Training*, 11(1).
- Robeyns, I. (2005). The capability approach: a theoretical survey. *Journal of human development*, 6(1), 93-117.
- Salleh, N. M., Isa, S. S. S. M., Jamalulil, S. N. N. S., Ibrahim, I. H., & Hussein, E. (2016). Formulating a long-term employment strategy for construction workforce in Malaysia. In *MATEC Web of Conferences* (Vol. 66, p. 00053). EDP Sciences.
- Samad, N. A., Ahmad, T. A. T., Ismail, A., Amiruddin, M. H., & Nor, S. N. F. M. (2017). Kerangka pembelajaran berasaskan proses kerja kurikulum standard kolej vokasional (KSKV) diploma vokasional Malaysia. *Online Journal for TVET Practitioners*, 2(2).
- Schunk, D. H. (2003). Self-efficacy for reading and writing: Influence of modeling, goal setting, and self-evaluation. *Reading & Writing Quarterly*, 19(2), 159-172.
- Sen, A. (1999). *Commodities and capabilities*. OUP Catalogue.
- Shaharuddin, N., Saad, S. K. M., & Yusop, N. S. M. (2018) Memperluas TVET Bagi Melahirkan Tenaga Kerja Berpendapatan Tinggi, *Majlis Amanah Rakyat*, 1-29.
- Smith, S. M. (2002). Using the social cognitive model to explain vocational interest in information technology vocational interest in information technology. *Information Technology, Learning, and Performance Journal*, 20(1), 1-9.
- Teng, L. J., (2016) 'Freeze on foreign workers' intake will impacts projects. Retrieved from <https://www.theedgemarkets.com/article/%E2%80%98freeze-foreign-workers%E2%80%99-intake-will-impact-projects%E2%80%99>
- Terzi, L. (2014). Reframing inclusive education: Educational equality as capability equality. *Cambridge Journal of Education*, 44(4), 479-493.
- THE Star Online (2018), Syllabus is outdated, say teachers, Retrieved from <http://www.thestar.com.my/news/nation/2018/12/28/syllabus-is-outdated-say-teachers/>
- Vocational College Kangar (2014) *Teknologi Pembinaan*. Retrieved from <http://kvkangar.edu.my/>
- Wells, T. (2013) Sen's Capability Approach, Retrieved from <https://www.iep.utm.edu/sen-cap/>
- Windapo, A. O. (2016). Skilled labour supply in the South African construction industry: The nexus between certification, quality of work output and shortages. *SA Journal of Human Resource Management*, 14(1), 1-8.
- Yunus, F. A. (2015). *Pembangunan model pemindahan pembelajaran sistem latihan kemahiran Malaysia berasaskan national occupational skill standard (noss)* (Doctoral dissertation, Universiti Kebangsaan Malaysia)