The Vocational Skills Integration in TVET Classroom Assessment Practices Instrument: The Validity and Reliability Analysis

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***Abstract* – Assessment in Technical and Vocational Education and Training (TVET) is a systematic and continuous procedure used to determine and evaluate students' competency and develop their knowledge, skills, and attitudes. Assessing students' proficiency through assessment is essential in correcting the discrepancy between the abilities required by the industry and those possessed by students. Active engagement in the assessment method also can enhance teachers' educational efficacy. Although many teachers have a theoretical understanding of assessment methods, they often lack the practical competence to evaluate and apply the requisite skills within the TVET. A current discourse has arisen regarding the correlation between a nation's employment landscape and acquiring skills and abilities. This study aims to validate the instruments used for classroom assessment (CA) practices by integrating vocational skills into the assessed domains using the Content Validity Ratio (CVR) suggested by Lawshe (1975) and analyze Cronbach's alpha value for the reliability test. Six TVET experts were appointed to evaluate the accuracy of item content with the concepts necessary for the analysis. 30 TVET lecturers from community colleges in Johor, Malaysia, were selected as the respondents for the reliability study. The findings show that the three items in the technical skills construct had to be excluded according to the value of 0.33 CVR; the rest of the items will remain. Cronbach's Alpha value for vocational skills and TVET classroom assessment practices is α = 0.816. The results indicated that while assessing TVET students, it is crucial to consider the application of vocational skills as a fundamental criterion. Developing a classroom assessment practices instrument to measure the skill level of TVET students can assist TVET professionals in designing instructional strategies that correspond to the highlighted areas of assessment. The process involves creating instructional and assessment modules that align with the student's abilities and skills.**

***Keywords* – Classroom Assessment, Vocational Skills, Secondary School, TVET, CVR, Reliability**

I. INTRODUCTION

The Malaysian Education Development Plan 2013-2025, through the Development of an Integrated Assessment System Methodology (Kementerian Pendidikan Malaysia, 2018), raises awareness of the need for an integrated and holistic achievement measurement methodology as part of the ongoing transformation of the education system.

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Assessment in Malaysia is still based on Central Assessment (Adam et al., 2019), and the reliance on exam-oriented has become a heated topic among the country's community, academics, educators, and international debate. The examination-based strategy may be adjusted so that the percentage level in its weighting matches the qualities of spiritual balance and unity as well as hands-on work movement skills (Ab Rahman et al., 2014). In TVET, CA evaluates students' competency and skills. However, if the examination is not well constructed, it can impact the employability rate of Malaysian TVET graduates. One potential issue is the existing CA practice's lack of providing students with the real-world skills and information required to succeed in the labor market. For example, assessment focuses solely on theoretical knowledge rather than practical abilities, leaving students unprepared to satisfy technical work needs (Ahmad Zaidi Husin, 2019).

All methodologies and development of the framework, as well as the items of the assessments, should be geared towards the demands of the industry from the perspective of empowering new changes to complete the curriculum led by the industry. According to Febriana et al., (2017), if the evaluation does not meet the industry's requirements or expectations of competence, TVET students may not be qualified to work in their area. As a result, curriculum revisions that align with and are relevant to the needs of the present industry necessitate competency assessment techniques capable of meeting the newly established goals (Yusop et al., 2023). New improvements in the assessment must explain knowledge, skills, and competencies related to industry needs, as designed by the TVET sector (UNESCO-UNEVOC, 2017). It attempts to lessen the country's reliance on skilled employees from outside by preventing an increase in unemployment caused by the workforce created by TVET institutions with skills that do not fit the sector's needs.

Therefore, this study aimed to validate the CA practices for assessing student vocational competencies in secondary schools. The research question for this study is (1) What is the value of CVR for CA practice instruments? (2) What is the reliability value for the CA practices instrument? CA is a critical process that evaluates students' classroom knowledge, skills, and abilities. It requires careful implementation by educators with the necessary skills and expertise to coordinate assessment methods with learning objectives. CA serves various purposes, including providing student feedback, guiding lesson planning, monitoring progress, evaluating teaching effectiveness, and informing parents and stakeholders (Yusop et al., 2022).

II. PROBLEM STATEMENT

TVET is a crucial educational agenda that aims to produce highly qualified human resources to meet the needs of Industry 4.0 to establish a developed country. Malaysia's government anticipates creating up to 1.5 million new jobs, 60% of which will require skilled labor (Unit Perancang Ekonomi, 2021). However, the number of professional human resources has not yet reached that goal, with only around 31% finished compared to the government's plan of 35%. According to Makhbul & Latif (2019), a 4% job deficit still has to be filled. Malaysia needs a world-class trained workforce through TVET, but experts claim that Malaysian employees' abilities are incompatible with the advancement and speed of technology (Saari et al., 2021). According to an expert overview of the findings of a qualitative study by Sohimi et al., (2019), collaboration between industry and educational institutions is not very good in enhancing and establishing academic curriculum standards, particularly concerning Industry 4.0. This situation also explains the low Industry 4.0 skills among Malaysian TVET students. A study on 136 students from 7 distinct TVET learning domains at the Technical University of Malaysia by Ismail et al., (2020) revealed that students' preparation level for knowledge of Industry 4.0 skills is still low.

In addition, Malaysia's secondary school assessment system employs centralized assessment that incorporates three forms of assessment: assessment for learning, assessment as learning, and assessment about learning, allocating 70% of the final exam marks and 30% of the coursework marks (KPM, 2015). This circumstance causes teachers to focus less on students' holistic learning outcomes, including their skill development (Sahaat & Nasri, 2020). This circumstance also explains why the emphasis on parts of competence aligned with industry demand is not implemented, as students are only educated to succeed in exam-related areas. If the secondary school assessment system in Malaysia only employs centralized assessment, the quality of student accomplishment cannot be attained since this method cannot examine all student abilities from a skill perspective (Adam et al., 2019).

III. LITERATURE REVIEW

Curriculum changes that match and are relevant to the needs of the current industry require competency assessment methods that can meet the newly planned goals. As designed by the TVET sector, new changes in assessment need to outline knowledge, skills, and competencies relevant to industry demand. It aims to prevent the increase in unemployment due to the workforce produced by TVET institutions due to skills that do not match the needs of the industry and reduce the country's dependence on skilled workers from abroad (Surono et al., 2020).

Vocational Skills Constructs Integration in TVET CA Practises

Identifying three fundamental skill elements as vocational skills is crucial for establishing competency indicators within the CA practice model for TVET subjects, as determined by the researchers. To proficiently cultivate the intended proficiencies, it is imperative to implement and evaluate these constituent components. Various studies (El-Sabaa, 2001; Fauzi, 2017; Haron et al., 2019) have identified that the technical skills of TVET students comprise three fundamental elements: methods, processes, and techniques. The components have been specifically developed to augment the technical proficiencies of students and address their individualized learning needs. The drive to create generic skill elements was derived from various antecedent research endeavours (Ahmad, 2018; Karim & Maat, 2019; Sa-Nguanmanasak & Khampirat, 2019). The survey outcomes have furnished an overview of the diverse constituents of generic abilities, encompassing communication, entrepreneurship, ICT, numeracy, planning and management, problem solving, interpersonal, technological, teamwork, self-management, and leadership proficiencies.

The skill components of Industry 4.0 have been developed and incorporated to determine the industry skill competencies related to Industry 4.0. These competencies require enhancement to provide students with the necessary expertise to address the changes in Industry 4.0. The curriculum for the Design and Technology subject places equal emphasis on the technical skill component and the Industry 4.0 generic skill component, starting as early as Form 1 (KPM 2015). Therefore, educators need to give priority to the assessment of Industry 4.0 competencies. Integrating Industry 4.0 generic skills is crucial in developing a framework for applying technical, generic, and career adaptability skills in the context of CA in TVET subjects. The components of skill required in Industry 4.0 encompass six key elements, namely: (1) the ability to solve intricate problems, (2) technical proficiency, (3) knowledge of information and communication technology, (4) practical communication skills, (5) aptitude for working with data; and (6) emotional intelligence (Aulbur et al., 2016; Schwab, 2016). The present investigation amalgamates or clusters every constituent of Industry 4.0 competencies to formulate all-inclusive proficiencies, drawing on antecedent research endeavors (Ramli, 2020; Saari et al., 2021). This study identifies the components of generic skills as follows: (1) entrepreneurial skills, (2) interpersonal skills, (3) skills application of technology, (4) teamwork skills, (5) leadership skills, (6) communication skills, (7) complex problem-solving skills, (8) technical competence and ICT knowledge, (9) communication skills and data processing ability, and (10) emotional intelligence and self-awareness skills.

The present study employs the Career Adaptability Model proposed by (Ashari, 2016; Savickas & Porfeli, 2012) to delineate the factors that shape an individual's adaptability: concern, control, curiosity, and confidence. The Model posits that the development of career adaptability is crucial in shaping students' futures, as it can lead to the creation of competent human capital and the provision of highly skilled or semi-skilled labor resources. Individuals with solid career adaptability can thrive and excel in their chosen career paths. The present Model posits that career adaptability is a facet of human development contingent upon the social environment, which plays a pivotal role in shaping and ultimately facilitating the harmonious

integration between the individual and their surroundings. According to (Soresi et al., 2012), a significant correlation exists between career adaptability and career choice. Specifically, individuals with elevated levels of career adaptability tend to exhibit a greater inclination towards various aspects of career choice.

The present study aims to utilize the career adaptability elements identified in the works of (Ashari, 2016; Savickas & Porfeli, 2012) as the foundational components of career adaptability skills. These skills are intended to be developed and applied in constructing a model to enhance skills in the CA practice of TVET subjects. Empirical research demonstrates the existence of these relationships. De Guzman & Choi (2013) conducted a study that shows a significant correlation between generic skills and career adaptability. The survey conducted by Dogara et al., (2020) establishes a significant correlation between the assessment practices of TVET teachers and general skills development. Figure I shows the conceptual framework for integrating vocational skills in CA practices.

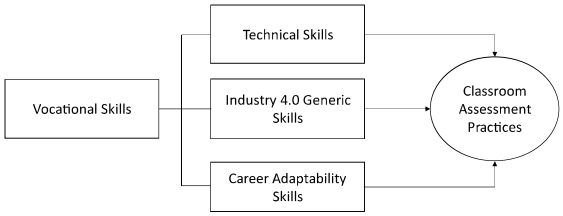

Figure 1. Conceptual Framework for Integration of Vocational Skills in CA Practices

Classroom Assessment Practices and Competency Models

The research was developed by incorporating diverse theoretical frameworks, conceptual models, and previous empirical studies to strengthen its validity. This study employed The Competence Development and Assessment in Technical and Vocational Education and Training (COMET) framework, as proposed initially by (Rauner et al., 2013). The underlying justification for adopting the COMET Model within TVET is to assess the effectiveness of competency evaluation techniques within this field. The Model is a commonly acknowledged framework employed to identify and evaluate the necessary knowledge, abilities, and proficiencies that are imperative for a particular occupation or a group of roles. The COMET Model comprises diverse constituents, including but not limited to the cultivation of competencies, performance domains, performance statements, levels of mastery, assessment techniques, and developmental undertakings.

The COMET Model designs and develops training programs grounded in competencies. Moreover, it is utilized to assess the proficiencies of individuals in specific job positions or cohorts. The present conceptual framework delineates precise competencies considered essential for individuals to perform tasks and achieve their career goals effectively. The COMET Model categorizes competencies into three discrete classifications: technical proficiencies, general proficiencies, and leadership proficiencies specific to the industry or job function (Rauner et al., 2013). The COMET Model aims to provide a clear and consistent understanding of the fundamental components required for success in a particular field and assist individuals in identifying areas that need additional development and training. An organization may employ this Model to facilitate personnel recruitment, offer training opportunities, and implement employee development and evaluation programs (Lahn & Nore, 2019). The specifications of the COMET Model are contingent upon the demands of organizations and industries.

Several competency models can be used as a reference or benchmark in evaluating individual performance in performing work through a technical skills approach. Among the models referred to is the competency model, adapted and modified from the Model for Human Resources Development (HRD) Practice (McLagan, 1989). The basic principle of this technical competence model explains that individual performance will increase if they have all the technical competence characteristics required to perform the tasks or responsibilities given. A study conducted by Nasir et al., (2011) states that there are four elements of technical skills needed for the industry, which are (1) knowledge of engineering, (2) problem-solving methods, (3) use of work tools, and (4) environment and suitability. The study was conducted by American Manufacturing in 2015 (Doggett & Jahan, 2016). Perceptions of the Advanced Manufacturing Competency Model for Curriculum Development, Technology Interface International Journal (1790) found that there are four elements of technical skills required by employers for employees in the engineering field who want to apply for a job that the individual must have (1) computer technology skills, (2) have basic technical knowledge, (3) problem-solving skills and (4) know calculation skills.

Therefore, developing instruments required researchers to refer to Models, theories, and relevant studies. Tables I, II, III, and IV show the item description for the vocational skills and CA practices instrument.

TABLE I: TECHNICAL CONSTRUCT IN CA PRACTICES ITEMS DESCRIPTION

No.	Construct	Items Description
A.	**Technical Skills**	
A1	Method	Can execute technical tasks by utilizing their planning skills to perform the given tasks in a methodical, organized, and systematic manner to attain the desired outcome.
A2	Process	Effectively apply their acquired knowledge by adhering to work procedures, complying with work regulations, and prioritizing safety measures.
A3	Technique	Define the purpose of technical equipment and proficiently select, utilize, and operate technological tools and materials to execute tasks effectively.

TABLE II: INDUSTRY 4.0 IN CA PRACTICES ITEM DESCRIPTION

No.	Construct	Items Description
B.	**Industry 4.0 Generic Skills**	
B1	Entrepreneurial Skills	Several sub-attributes include level of experience in entrepreneurship, ability to identify opportunities for entrepreneurship, willingness to take risks, capacity for self-supervision, level of achievement, perseverance, and aptitude for financial management.
B2	Interpersonal Skills	Promote interaction and communication with their peers, whereby social norms and relationships are established, conveyed, and modified verbally and nonverbally. The acquisition of this ability is commonly referred to as socialization.
B3	Skills Application of Technology	Select and utilize technological devices according to the assigned learning objectives.
B4	Team Work Skills	Effectively lead a team, enhancing productivity by amalgamating their collective effort, knowledge, skills, and abilities.
B5	Leadership Skills	Cultivate a sense of solidarity and confidence among their peers by demonstrating their competence, expertise, and leadership skills in various tasks and responsibilities.
B6	Communication Skills	Facilitate the communication of educational concerns using simplified language, thereby enhancing the efficacy of the learning process.
B7	Complex Problem Solving	Engage in critical and creative thinking, utilizing their cognitive faculties to generate novel ideas and alternative courses of action. They can construct persuasive arguments to surmount any deficiencies or impediments hindering their objectives.
B8	Technical Competence and ICT Knowledge	Utilize ICT deliberately and suitably, strategizing and enhancing the efficiency and efficacy of the teaching and learning process.
B9	Communication Skills and Data Processing Ability	Engage in interactive communication using ICT to acquire information. Furthermore, they possess the capacity to effectively manage and utilize the data obtained to fulfill their educational requirements.
B10	Emotional Intelligence and Self-awareness Skills.	Social intelligence pertains to their aptitude to monitor their and others' emotions and feelings and utilize this awareness to inform their actions or decision-making processes.

TABLE III: CAREER ADAPTABILITY IN CA PRACTICES ITEM DESCRIPTION

No.	Construct	Items Description
C.	**Career Adaptability Skills**	
C1	Concern	Envision the future, strategize and formulate plans for their professional trajectory, and acquire knowledge regarding educational and vocational opportunities.
C2	Curiosity	Investigate the educational context and its correlation with career prospects, research potential career paths, and envision and document career opportunities.
C3	Control	Exhibit efficiency, attentiveness, rigor, and self-control while adhering to their learning capacities.
C4	Confidence	Possess optimism, courage, accountability, self-assurance, and reliance.

TABLE IV: CA PRACTICES ITEM DESCRIPTION

No.	Construct	Items Description
D.	**CA Practices for TVET Subject**	
D1	Assessment Concepts in TVET	The notion of assessment that teachers can conduct based on the timeframe and suitability of skill component implementation in Technical and Vocational Education and Training (TVET) instruction.
D2	Assessment Approaches in TVET	Teachers can conduct various forms and types of assessments to evaluate students' mastery of specific skills they intend to implement.
D3	Level of Proficiency	The extent to which Technical and Vocational Education and Training (TVET) students can attain proficiency reflects their aptitude in acquiring the competencies that educators aim to impart in the instruction of TVET disciplines. • Knowledge • Perception • Civility

IV. METHOD

This study employed content validity methodologies to establish content validity by engaging a panel of experts tasked with evaluating the alignment of item content with the essential ideas that the study aims to measure (Ghazali & Sufean, 2018). The content validity method involved appointing six experts (6), aligning with the number of experts in other studies. (M. E. @ E. Mohd Matore et al., 2017). Furthermore, this research enlisted a panel of experts comprised of university lecturers holding a Doctor of Philosophy degree in TEVT and educational assessment. The minimum requirement for expertise in the field and research issue necessitated a duration of no less than three years, focusing on achieving consensus (Mohr & Shelton, 2017).

The Content Validity Ratio (CVR) is a statistical approach to evaluate content validity, and the number is the mean level of appropriateness of the items derived from the comprehensive content validity panel. The computation employs a formula developed by Lawshe (1975) and has gained popularity among academics for assessing the statistical significance of content validity (Azwani et al., 2016; Nor Azizah et al., 2019; Zamanzadeh et al., 2015). Based on the findings of (M. E. E. Mohd Matore & Khairani, 2020), using the CVR value facilitates determining the retention or elimination of items, owing to the expert appraisal of content validity. Calculating the CVR value involves a three-point scale assigned to each instrument item, indicating the importance level. These points correspond to (1) Very Essential, (2) Less Essential, and (3) Not Essential. After collecting replies from all the panels, the number of issues the experts designated "Very Essential" was tallied. Based on the research conducted by (Ayre & Scally, 2014; Lawshe, 1975), it has been determined that the crucial value of the CVR for a panel consisting of six experts is 1. According to Lawshe (1975), two recommended approaches exist for eliminating or removing items below the critical value of 1. These approaches involve either upgrading the items that fall below this value or eliminating them (Zainal et al., 2020). The calculation of CVR using this formulation:

$$CVR_i = \frac{[\,n_e - (\frac{N}{2})}{\frac{N}{2}}$$

Which is:
ne = numbers of experts assessed "Very Essential"
N = number of experts

Following the computation of the value for each CVR item, items exhibiting a value of 0.33 are excluded, items with a value of 0.67 necessitate enhancement, and items with a value of 1 are preserved. The quantity of items was reduced after the content validity assessment, and the quantity of items was subsequently adjusted and augmented per expert recommendations. Table 2 displays the evaluations conducted by experts on the item for each indicator, leading the researchers to enhance the item following the advice provided by those experts.

Subsequently, the researchers conducted a pilot study following the specialists' comprehensive examination and validation of each item, who also made any required modifications. According to J. W Creswell (2012), it is necessary to perform a pilot study to assess the validity of the research questions and to evaluate the respondents' understanding of the concepts being investigated. Hertzog (2008) recommends employing a sample size ranging from 10 to 30 participants for instrument development during the pilot phase. The researchers used a sample of 30 TVET lecturers from community colleges in Johor, Malaysia, to conduct the pilot study.

The stability and consistency of the questionnaire items are contingent upon the instrument's reliability (John W. Creswell & Creswell, 2018). The term "reliability" pertains to the degree of consistency a test exhibits. According to (Nunnally & Bernstein, 1994), a test with high reliability demonstrates consistent measurement values when assessing the same conduct on multiple occasions. The reliability test of the questionnaire necessitates the appropriateness and comprehension of the study participants regarding the items contained within the questionnaire.

Reliability, in other words, refers to the consistency of a test. When a test has high reliability, the measurement value is almost the same as measuring the same behaviour at different times (Nunnally & Bernstein, 1994). The questionnaire's reliability test requires the suitability and understanding of the study participants on the items in the questionnaire. The conditions for seeing the questionnaire as appropriate are based on the value of Cronbach's Alpha. Hair et al., (2014) and Johnson & Christensen (2000) stated that the minimum Cronbach's Alpha value accepted is 0.7. The interpretation of Cronbach's Alpha reliability test scores is shown in Table V.

TABLE V: CRONBACH'S ALPHA INTERPRETATION OF RELIABILITY TEST SCORES

Alpha Coefficient (α) Score	Interpretation
> 0.8–1.0	Very good and practical with a high level of consistency
> 0.7–0.8	Good and acceptable
0.6–0.7	Acceptable

Sources: Johnson and Christensen (2000)

V. FINDINGS

The findings of this study answer the research question as stated in the initial stage of the study.

1. What is the value of CVR for CA practice instruments?

Table VI shows the CA practices instrument's content validity reports (CVR) value results. Three items in technical skills constructs are excluded according to the lowest CVR value, which is 0.33, and the rest of the 109 items will remain accepted for future study.

TABLE VI: CVR FOR EACH CONSTRUCT IN CA PRACTICES INSTRUMENT

Constructs	CVR Value	Item Number	Total Item	Researchers' Action
Technical Skills	1.0	A2-A5, A9, A11, A13, A15-A18	11	Included item
	0.67	A7, A8, A10, A12, A15, A19, A20	6	Item included but needs to be improved
	0.33	A1, A6, A14	3	Excluded item
Industry 4.0 Generic Skills	1.00	B1-B4, B6-B13, B15-B22, B25-B30, B32-B50, B53-B55	48	Included item
	0.67	B5, B14, B23, B24, B31, B51, B52	7	Needs to be improved
Career Adaptability Skills	1.0	C1-C4, C7-C15, C17, C18, C20	16	Included item
	0.67	C5, C6, C16, C19, C21, C22, C23	7	Item included but needs to be improved
Classroom Assessment Practices in TVET	1.0	D1-D4, D6-D15, D17-D37, D40, D41, D43, D44	39	Included item
	0.67	D5, D16, D38, D39, D42	5	Item included but needs to be improved
Total Item			142	

2. What is the reliability value of the CA practices instrument?

The appropriateness of the questionnaire is contingent upon the value of Cronbach's Alpha. According to (Hair et al., 2014; Johnson & Christensen, 2000), it has been shown that a minimum Cronbach's Alpha value of 0.7 is generally recognized. Table VII shows the value of the Cronbach's Alpha test.

TABLE VII: CRONBACH'S ALPHA SCORE FOR EACH CONSTRUCT

Constructs	Alpha Coefficient (α) score
Technical Skills	0.736
Industry 4.0 Generic Skills	0.752

Career Adaptability Skills	0.851
Classroom Assessment Practices In TVET	0.924
Mean	0.816

Cronbach's Alpha value for vocational skills and TVET classroom assessment practices is α = 0.816. The reliability of this study meets the validity with the characteristics of stability, consistency, and accuracy (Nunnally & Bernstein, 1994).

VI. DISCUSSION

Technical Skills Construct

The findings of this study aim to discuss the indicators of technical skills in the CA practice of daily secondary school TVET subjects. Research findings through expert verification show that technical skills include three (3) elements, namely (1) methods, (2) process, and (3) techniques for learning TVET. Technical skills in this study refer to specific knowledge and abilities, especially involving analyzing methods, processes, and techniques and using tools and materials in a particular field. Students can understand and be able to perform specific tasks, especially those that require certain methods, processes, or techniques when performing certain activities that involve technical activities. The findings of this study are basically in line with the technical skills element in the survey El-Sabaa (2001) and Fauzi (2017), which is that technical skills can be classified in detail according to methods, processes, and techniques to perform work in the technical field.

According to Simpson (1966), technical skills are closely related to psychomotor aspects, and the field of TVET requires developing and training skills in psychomotor aspects. This finding aligns with the study of (Mazin et al., 2020), which states that doing repetitions in performing psychomotor movements can improve students' technical skills and competence. One of the aspects found in the study (Brewer & Comyn, 2015; Febriana et al., 2017; Griffin et al., 2015) is that the field of TVET is a field that is directly involved with activities that involve such technical skills as communication graphics which is through design activities, engineering drawings, technical drawings, or geometric drawings. In addition, technical skills such as exchanging ideas in visual form with other students are an essential component in the designing process, especially in the initial phase (Hashim et al., 2019). Technical skills are crucial for TVET students in the increasingly complex and rapidly developing modern world. In the context of this research, generic skills are defined as skills other than technical skills that can help students master learning, obtain desired jobs, improve their quality, and subsequently improve organizational performance through their involvement in Industry 4.0.

Industry 4.0 Generic Skills

The findings of elements for generic skills in this study through CVR findings are (1) entrepreneurial skills, (2) interpersonal skills, (3) skills application of technology, (4) team work skills, (5) leadership skills, (6) communication skills, (7) complex problem solving, (8) technical competence and ICT knowledge, (9) communication skills and data processing ability, (10) emotional intelligence, and self-awareness skills. Next, these ten elements of generic skills also get a high consensus among experts. Through a study by the World Economic Forum in 2016, the generic skills of Industry 4.0 that are seen to be in demand in the future workforce are negotiation skills, cognitive flexibility, service orientation skills, decision-making skills, emotional intelligence, collaboration skills, human resource management, creative, critical thinking and complex problem-solving skills (Schwab, 2016).

In addition, entrepreneurial skills are also one of the generic skills that get a high consensus in this study. In line with (Azmi et al., 2018; Sumbodo et al., 2020), entrepreneurial skills are also generic skills needed for the workforce in the 21st century. The discovery of generic skills in the context of Industry 4.0, namely complex problem-solving skills, technical skills and ICT knowledge, communication skills, and the ability to work with data, as well as independent skills, is in line with the study (Mulder, 2017; Ramli, 2020). Abdul Bujang et al. (2020) state that the characteristics of learning nowadays should focus clearly on critical thinking, complex problem solving, metacognition skills, digital era literacy, innovative thinking, and communication which is effective and high productivity, has even become a 21st-century issue agenda that must be addressed in the education system (Saari et al., 2021; UNESCO, 2021). According to Amiron et al. (2019), these Industry 4.0 generic skills need to be integrated into the TVET curriculum by providing conducive skill-based training that is required to produce high-performing and efficient workers in the Industry 4.0 work environment.

Career Adaptability Skills Construct

Career adaptability refers to the psychosocial characteristics in which a student is responsible for understanding their tasks but find themselves unexpectedly faced with transitions and trauma to functions in learning and work. The study's findings show that all experts in the field of TVET agree with the sub-indicator of career adaptability skills as the construct of vocational skills. The indicators of career adaptability skills in this study are concern, curiosity, control, and confidence. This study's findings align with Hirschi et al., (2015), which states that concern, curiosity, control, and confidence are interrelated elements in forming career adaptability skills.

In the theory of career adaptability by Savickas & Porfeli (2012), concern for my career is considered the first and most important dimension, which answers the question, "Do I have a future?" This statement means that an individual can pay attention to his future career. Career control is the second critical dimension of career adaptability skills. It answers the question "Who owns my future?" which is the belief that individuals are self-determining and responsible for building their careers. Career curiosity reflects individual curiosity, encouraging individuals to explore more employment and allowing adolescents to explore education and career options and achieve future goals realistically. The essential function of curiosity towards career building is the same as the function of self-exploration and career exploration in career

development theory, which means that individuals are willing to actively explore themselves and the world of work. Career self-confidence refers to an individual's confidence in problem-solving abilities and self-efficacy beliefs, which can help individuals build a perfect future and overcome upcoming difficulties well (Savickas, 1997).

This finding shows that career adaptability skills are essential in developing the competence of TVET students, especially in building a career and competitive ability in today's increasingly challenging world of work. According to Chen, Fang, et al., (2020), career adaptability is a crucial variable applied and practiced in many empirical studies. Even in the field of education Chen, Ling, et al., (2020) believe that career adaptability is very conducive to promoting education that sets the goal of sustainable development of students as the main agenda, which is being able to survive in the world of education and the world of work. In addition, the study de Guzman & Choi (2013) also shows that marketability skills and career adaptability are significantly related and found that there is an apparent effect that a curriculum that aims to develop knowledge and skills as a result of learning will influence the future success of students in the world a real job.

Classroom Assessment Practices Constructs

The CA practice of daily secondary school TVET subjects in this study refers to the assessment elements designed to explain the concept of assessment, the assessment approach, and the level of mastery that can guide TVET teachers. Indicators of CA practice of daily secondary school TVET subjects obtained a high consensus among experts. This finding shows that experts agree that the assessment concept, assessment approach, and mastery level are crucial elements in CA practice indicators for TVET subjects. According to the Malaysian Education Development Plan 2013 - 2025 2025 (Kementerian Pendidikan Malaysia, 2013) and in combination with the Malaysian Education Philosophy, CA is the key to developing students' cognitive skills in a holistic emotional way and psychomotor development skills (Narinasamy & Nordin, 2018).

This study is seen as a CA practice concept for TVET subjects, not only aimed at evaluating student learning outcomes and applying the application results as a fundamental element in forming the CA practice concept. The learning outcomes in this study refer to the formation of skill elements, namely technical skills, generic skills, and career adaptability skills, which can be categorized into three main aspects, namely knowledge (cognitive), skills (psychomotor), and attitude (affective) among students. The study conducted by (Ibrahim Mukhtar & Ahmad, 2015) revealed the concept of assessment, which is assessment for learning in the field of TVET able to assess students in terms of cognitive (intellectual), affective (emotional and mental), and psychomotor (physical) abilities, in line with the philosophy's goals National Education which is the core of the creation of human capital (Pusat Perkembangan Kurikulum, 2001). The CA practice of TVET subjects is also seen positively as learning support for TVET students because this assessment can help students bridge the gap between their current achievements and the goals they have set (Hashim et al., 2021).

VII. CONCLUSION

Integrating three (3) skills, namely technical skills, Industry 4.0 generic skills, and career adaptability skills in CA Practice of TVET subjects, is an essential aspect of teaching and learning at the secondary school level. Integrating technical skills, Industry 4.0 generic skills, and adaptability skills in the practice of CA will influence the improvement of students' competencies and skills through continuous assessment and then provide opportunities for students to continue to improve their technical skills. Teachers and students can detect weaknesses and find opportunities to enhance skills that still need to be improved. It ensures they are always relevant and competent in their chosen vocational field. Cultivating career adaptability skills through assessment practices in TVET involves several aspects that help prepare students to face career needs and challenges.

The study's contribution, which is the construction of indicators and skills and CA practice indicators specifically for TVET subjects in secondary schools, can guide teachers in effectively implementing classroom assessment. Because this study has limitations and only focuses on secondary schools with technical and vocational subjects with the KSSM concept that implements Classroom Assessment as an assessment at the school level, future studies can implement some suggestions for further research. This study proposed further research; qualitative methods are suggested to obtain more precise information on applying CA skills and practices in TVET subjects in daily secondary schools by involving experts in TVET students' assessment and competence building. Continues by confirming the construction of the Assessment Model and involving teachers in conducting assessments on TVET students using the constructed rubric. Therefore, this study is seen to be able to look at the overall skill-building that is expected of TVET students.

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