



Exploring Relevant Employability Skills 4.0 For University Students' Readiness in The Work-Based Learning Program

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Abstract: This research discusses employability skills 4.0 for the university students' readiness in work-based learning. This research explored relevant employability skills 4.0 for university students' readiness in the work-based learning program. The survey questionnaire consisted of 65 items developed to study the student's readiness to acquire these skills in a work-based learning program. This research obtained 633 respondents from five Malaysian research universities. The association between employability skills and students' readiness for work-based learning was analysed using the PLS-SEM model of SMART-PLS software. Using measurement and structural model analysis, the PLS-SEM found six employability skills communication skills, interpersonal skills, IT skills, problem-solving skills, entrepreneurship skills, and self-management skills. From this analysis, the student's readiness employability 4.0 for the university students' readiness in work-based learning has developed. Further research can explore more significant respondents from public or private universities, including postgraduate students in the survey

Keywords: Employability skills, student readiness, work-based learning program, industrial revolution 4.0

1. Introduction

Students in higher education institutes (HEIs) must be well-equipped and ready for industrial revolution 4.0 (IR4.0). They will compete for employment in a global market and must be aware of new industrial technologies. Because higher education institutions serve as economic development anchors, student involvement and the formation of industry collaborations will be critical to success in higher education. Higher education institutions should focus on the IR4.0 development since the industrial workforce changes. Collaboration between companies and higher education institutions (HEIs) will become increasingly important. (Hamid et al., 2014). Today's students will be working in an industry 4.0 environment. Therefore, it is critical to get them ready. (Schuster et al., 2016). Industry 4.0 is characterised by the advancement of digitization and robotics to create new intelligent production. The intelligent factories connected by a Cyber-Physical system are the primary goal of this approach (Benešová et al., 2018). Industrial revolution 4.0 not only will impact the industry, but it also can be seen in the labor market and education. There is a chance of the disappearance of certain professions and jobs. This is the main reason behind the current transformation of education and industry needs or demands of the employees (Sun, 2018).

Education 4.0 is a word that refers to a new educational idea for the digital age. It incorporates emerging technology trends, such as augmented reality, into the educational system (Hussin, 2018). As a result, future graduates should be educated and capable of incorporating Industry 4.0 requirements. However, it has become a problem because it is impossible to forecast how innovation will develop and what skills and future knowledge graduates will need for their careers in Industry 4.0 (Siti et al,2021). For success in Education 4.0, coordination between schools and universities with

industries is essential. There is a need to educate and retrain employees because their education and knowledge may not be sufficient for the company's future demands (Haseeb, 2018). The big issue is currently a lack of qualified employees for Industry 4.0. To overcome these issues, new technology trends such as virtual learning environments, learning factories, or augmented reality may need to be included in the education system (Nasreen, et al, 2022; Salah et al., 2019).

2. Literature Review

2.1 University Students' Readiness

University students are students enrolled in a university for their foundation studies, undergraduate, and postgraduate studies (Hosen et al., 2021). Students in higher education institutions must be trained and prepared to fulfil industry 4.0's demands (Katharna et al., 2015). According to PricewaterhouseCoopers, the success of IR4.0 in Industry 4.0 environments depends on skills and knowledge (PWC, 2016). It is critical to train graduates with relevant skills and adapt to the working environment to keep up with technological advancements and compete in a globalised world. Student readiness is defined as an extension to which the representatives have the ideas and properties that make them ready or prepared in the workplace for achievement in the adaption of another learning and skills upheaval of industry 4.0 (Caballero & Walker, 2010). Several studies have identified characteristics and critical features of students' preparation for 21st-century learning that must be addressed. However, these studies only take into consideration of students' readiness to implement e-learning (Ahmad et al., 2018; Almasri, 2015; Khan, 2002; Chapnick, 2000; Volery & Lord, 2000 & Tham, 2002). Students' readiness is considered an essential factor in influencing the success of employability 4.0. It is because students must be prepared to handle the difficulties of Industry 4.0. Many reports from government, industry, higher education authorities, and scholars have been attached to the sector to incorporate employability skills into students' learning experiences. According to the report, institutions and colleges must prepare and plan to support graduates to develop employability skills, which shows the work readiness of the graduates (Rowe & Zegwaard, 2017). Every year, the number of graduates entering the Malaysian labour market grows. According to the Bank Negara annual report (2018), The number of people entering the employment market with a diploma, or a degree increased by 173/457 people per year (2010-2017). However, whether these graduates have the employability skills prospective employers seek is a point of contention. According to some critics, Higher education institutions are criticised for failing to train graduates to satisfy the appropriate job requirements of businesses. (Parry et al.,1996).

Employers are saying that graduates lack the ability to meet their needs and current market trends, (Salina et al., 2011). The lack of relevant knowledge and technology among recent graduates negatively impacts graduates' capabilities, and it also affects their capacity to enter the workforce, resulting in graduate unemployment. On the other hand, graduates should equip themselves with the most up-to-date industry-required skills. Furthermore, graduates must improve their cooperation and communication abilities to gain confidence. As a result, colleges can provide students with real-world work experiences and job training programs. HILs must collaborate closely with the industry to improve graduates' marketability and employability. Employability is one of higher education's main performance factors (Hamid et al., 2014). Higher education aims to generate graduates capable of working effectively in the twenty-first-century workplace, emphasising employability skills. However, graduates face difficulty securing jobs upon graduation due to the lack of relevant skills. Therefore, HIL should focus on relevant employability skills needed for the current labor market. Eventually, it produces productive workers, which leads to a competitive national economy (Mohamad et al., 2018).

2.2 Employability Skills (ES)

In the twenty-first century workplace, specialised occupational skills are no longer adequate for graduates to meet labour market demands (Suarta et al., 2017). Therefore, employers are searching for graduates with unique abilities and characteristics known as employability skills (ES) are considered a vital issue in the national, regional, and international labour market (Mason et al., 2009). According to the literature, graduates require to have several ES and traits when they enter the workforce (Bennett et al., 2000). Communication skills, problem-solving, decision-making, and teamwork are some of the essential ES for graduates to have (Hashim, 2015). Personal qualities including self-awareness, self-confidence, independence, emotional intelligence, flexibility and adaptability, stress tolerance, creativity, readiness to learn, reflectiveness, lifelong learning, and professional behaviour may also be required of graduates (Wye & Lim, 2009). Many reports from the government, industry, higher education organisations, and researchers who collaborated with the higher education sector to integrate employability skills into students' learning experiences are published. According to the research, institutions and colleges should make plans to support students graduates to develop ES, which represents the work readiness of the graduates (Saunders & Zuzel, 2010).

ES in the 21st Century and work-based learning (WBL) are essential elements in academic program 4.0 (Bhattacharyya, 2018). To refer to employability abilities, the international research community has utilised a variety of terms (Hamid et al., 2014). The term ES has become necessary since the transformation of the workforce. Generic skills, transferable skills, non-technical skills, core skills, important skills, vital skills, and 21st-century skills are phrases used interchangeably when discussing employability skills (Rao, 2010). These skills apply to all levels of a company's personnel. The conceptual ES framework has been created in several nations (Suarta et al., 2018). This framework illustrates why ES is necessary. The ES framework encompasses eight key skill types and a variety of personal

characteristics. The eight primary skill groupings are communications, teamwork, problem-solving, initiative and effort, planning and organising, self-management, and technology. The attributes are categorised into four skills groups. Personal characteristics, skills team, real-world skills, and academic talents, to mention a few (Marchioro et al., 2011). This study looks at the prospective employability core skills required for employability 4.0 skills and students' readiness for the WBL program. This is because universities' teaching and learning (T&L) processes should be aligned to meet the needs of industry 4.0. As a result, HIL must ensure that its academic programs for students are capable of addressing these issues and fulfilling industry and graduate needs. In addition, the human element needs to go along to address the challenges of Industry 4 in the long term (Sani, 2018). According to Rahmah et al., (2011) graduates are lacking in ES, and also their performance in the workplace seems not at a satisfying level. These cause high unemployment among graduates. Other factors contributing to these issues are employers' high expectations, mismatching skills, and the country's economic status. Further, Ahmad et al., (2017) carried out research to explore the level of employability skills in the hospitality field. This study recommends that policymakers, curriculum developers, and industry partners work together to ensure that hospitality students are capable enough to be well-equipped with the ES, which needs for the 21st Century.

2.3 Work-Based Learning Program (WBL)

WBL allows students to gain industrial experience, reinforce what they have learned at university, and build a bridge between business and HIL. In addition to classroom-based learning, the WBL program includes placements outside of the institution, such as internships, mentoring, workplace simulations, and apprenticeships (Felicity & Linda, 2013). The WBL is one form of contextual learning. According to Smith (2001) and Berns and Erickson (2001), WBL is contextual teaching and learning method that combines workplace activities with classroom activities. The WBL approach assists activities in schools by strengthening and expanding the learning achieved at the workplace. Also, the WBL method aids in the development of students' attitudes. Experiences in two places have given me knowledge and abilities. Such as schools and workplaces (Wonacott, 2002). WBL is a teaching method that gives students real-world experiences in which they can put their academic and technical talents to use, to improve their employability. Hardwick-Franco (2018) highlighted that WBL contributed to the students' broader view. WBL assists the students by enhancing their ability to make decisions, improve personal development, and develop their professional quality.

WBL programs focus on bridging the gap between practical work experience and learning (Subekt, 2019). Compared to established countries such as the United States and the United Kingdom, the WBL programs are considered a new learning approach in Malaysia. WBL has been in use in the United States for almost a century. In Malaysia, however, the WBL program was just launched in 2007 (Rahim & Anuar, 2007). WBL system in Malaysia, Polytechnic and Community colleges were the pioneers. It started at eleven community colleges in February 2007. In June 2010, the WBL program was implemented at the Polytechnic. The assessment procedure for WBL students in diverse courses was one of the concerns. As a result, the program moved to Polytechnic as part of the national education transformation process focused on technical and vocational education. Technical education and vocational skills must be strengthened to meet the country's requirement for trained personnel and acquire the status of a developed nation (Yassin, 2012). Because of this significance, the current failure of WBL in Community Colleges appears to be an example and a starting point for additional research and analysis.

Thus, the purpose of this study is to identify the relevant employability skills in relation to the student's readiness for employability 4.0 in a work-based learning program. The research question for this study is 'What are the relevant employability skills in relation to the student's readiness for employability 4.0 in a work-based learning program?' Six hypotheses (H1-H6) were developed to study this research question as follows:

- H1: There is a significant relationship between communication and readiness for Employability 4.0 in WBL.
- H2: There is a significant relationship between interpersonal skills and readiness for Employability 4.0 in WBL.
- H3: There is a significant relationship between IT skills and readiness for Employability 4.0 in WBL.
- H4: There is a significant relationship between problem-solving skills and readiness for Employability 4.0 in WBL.
- H5: There is a significant relationship between entrepreneur skill and readiness for Employability 4.0 in WBL.
- H6: There is a significant relationship between self-management and readiness for Employability 4.0 in WBL.

3. Methodology

This study used a quantitative method for data collection. It involves undergraduate students at research universities in Malaysia, where it is vital to get their views on relevant students' readiness for two WBL programs. The instrument for the data collection is designed based on a systematic literature review, and then the survey is sent to the experts for validation before the distribution of the survey questionnaire. This study used the PLS-SEM analysis method using SmartPLS version 3.3 software to test the hypothesis using the structural model assessment (path analysis). To examine the significant relationship, the structural model runs through bootstrapping procedure to see the inner path results. All the individual hypothetical paths in the research framework are observed through the regression coefficient (β). The value of β is examined to check the proposed hypotheses results in the structural model.

3.1 Sample of The Study

The participants in this research were 633 undergraduate students from five Malaysian research universities. They are UM, UPM, UKM, USM and UTM, from the Faculty of Education, Faculty of Science, Faculty of Computer Science, Faculty of Medicine, Faculty of Languages, Faculty of Islamic Studies, Faculty of Business Studies, Accountancy, and Faculty of Arts, and Social Sciences. The purpose of selecting these universities for this research is that all the above five institutions are research universities (RU) and, the researcher selected research university students as it is the uniqueness of this research since the aim of this research is to identify the employability skills 4.0. The RU is more focused on research and innovation activities. These universities often may have well-known brand names, and the primary aim of the RU is to advance the socio-economic progress of a nation through its human resource development. Currently, research institutions are expected to concentrate primarily on research and innovation activities, driven by highly qualified faculty and competitive student admissions to establish a 50-50 split between undergraduate and graduate students. The RU provide new knowledge and its application and commercialization, and the competency and performance of research universities increase their importance to the economy (Komoo et al., 2008). The main goals of the RU, according to the Ministry of Higher Education (2004), are to be a leader in innovation, to establish and enhance centers of excellence, to prioritize areas of the country, to produce excellent research outputs, to generate high impact research publications, to attract graduate students with high standards, and to provide a convenient research environment. The RU can receive additional funds for research activities, management, quality assurance, RU incentive grants, and specialized research services like patenting, IPR, and repositories under the new hierarchical university paradigm. In brief, RU is supposed to excel in knowledge growth through research and serve as a role model for Malaysian institutions in performing research and publications Majzub (2008). By considering the essential activities of RU, this study was conducted among the students of five research universities in Malaysia to explore their readiness for the WBL program.

Furthermore, the questionnaire is distributed to the students through Google Forms using a random sampling technique. Every respondent has an equal chance of being included in the survey when random sampling is used. Random sampling is useful when the participants are selected from the entire population. The entire population for this study was around 73,983 undergraduate students of RU in Malaysia from all the faculties in the academic session of 2020/2021. This comprises 17,632 students from UM, 11500 from UKM, 14 299 from UTM, 15 352 from UPM, and 15 200 from USM. However, as mentioned above the researcher selected 633 as the sample for this research based on the inverse square root method where the minimum sample size required was 619, and after cleaning the raw data, the researcher came out with a sample size of 633 for this study.

3.2 Instrument of The Study

The instrument used for the data collection is a survey questionnaire. The contents of the survey questionnaire were constructed based on relevant literature reviews on human capital theory (Becker, 1964), employability skills (Azmi et al., 2018; Idkhan et al., 2021), the readiness model by Chapnick (2000), and the work-based learning model by Ismail et al., (2015). According to the Human Capital theory, individuals who invest in training are more likely to succeed and be more efficient than those less skilled, so it can be justified that higher earnings are the output of investment in Human Capital (HC). This research also adopted employability skills from the existing literature (Jamaludin et al., 2019; Azmi et al., 2018; Idkhan et al., 2021). For instance, communication, interpersonal skills, problem-solving skills, information technology skills, entrepreneur skills, and self-management. These skills were selected for the instrument based on the essential skills from employers' perceptions through the existing literature.

The readiness model by Chapnick (2000) describes the measuring of the e-learning readiness of an organisation by answering the following questions: a) can we do this? (b) What method will we use if we go ahead with this? c) What are the expected outcomes, and how will they be measured? The readiness model by Chapnick (2000) includes eight categories of different factors. However, psychological readiness, environmental readiness, human resource readiness, financial readiness, and technological readiness were relevant to identifying employability 4.0 skills. Furthermore, this model is suitable to be used in this study because this study explores student readiness for employability 4.0 in the WBL program. For this purpose, it is necessary to identify the relevant categories of student readiness to identify employability 4.0 skills.

Next, the work-based learning model Malaysia by Ismail et al., (2015) is used in this study because, compared with other WBL models such as Arizona WBL resource guide model, The Technical Institution-Industry connection model, and Edmunds' model, WBL Model Malaysia is relevant to this study as it within the Malaysian context it will be convenient to improvement and implementation (Ismail et al., 2015), this WBL methodology in Malaysia is built on two factors: learning theory in class (25%), which is supervised by industry teachers and learning in the industrial sector (75%).

The instrument can be validly achieved through five sources such as content, response process, internal structure, relation to other variables, and consequences. Content validity can be defined as the degree to which elements of instrument assessment are relevant and represent the fulfilment of the targeted assessment purpose (Cook & Beckman, 2006; Almanasreh et al., (2019). Before distributing a questionnaire to the respondents, the researcher conducted a content

validity based on experts' reviews. The content validity of the survey instrument was completed based on Lynn (1986). The process included two phases. Phase 1 involves the development phase, which consists of the survey's indicators. Phase two involves judgment and evaluation of the indicators.

Phase 1: Adoption and Development

The adoption and development of the instrument include previous research. The first review focused on ES (Jamaludin et al., 2019; Azmi et al., 2018; Idkhan et al., 2021).) the second literature was searched for student readiness (Hizam et al., 2020; Chapnick 2000; Yuksel 2020; Kapareliotis et al., (2019), and the third literature review was for the WBL program Suleman and Laranjeiro 2018; Ali and Marwan 2019; Ismail et al., 2015).

Phase 2: Judgement and Evaluation

The panel of experts was involved in phase 2, including 6 experts who are three academicians, and three industry experts. The experts were selected for the content validation based on their academic background and research experience (Lynn,1986). As a part of the content validity process, the instrument was distributed among the experts and the researcher wanted them to focus on the instruments' indicators.

Next, six experts validated the instrument for relevance, clarity, and simplicity, the scale of scores used as 1 = the item not relevant to the measured domain; 2= the item is somewhat relevant to the measured domain;3= the item is quite relevant to the measured domain; 4= the item is highly relevant to the measured domain (Yusoff, 2019). Based on this, prior to calculating CVI, the relevance rating was recorded by the researcher as 1 (relevance scale of 3 or 4) or 0 (relevance scale of 1 or 2). According to the expert's view on the Content Validity process (CVI), several items in the instrument were not achieved the target values of the item-level content validity index(I-CVI), these items need to be deleted from the instrument (Lynn,1986). The experts requested to remove those items from the instrument because many selected ES to come under the subsets of the main ES. For an instance, leadership skills come under entrepreneur skills. Therefore, 20% of the instrument were eliminated, and 79 items were selected for the survey instrument.

The researcher enlisted the help of six experts from academia and industry and used the Content Validity Index (CVI) (Yusoff, 2019). The minimum number of experts to determine the content validity is three. However, the maximum number of experts has not been determined in past studies (Shrotryia & Dhanda, 2019). The items which did not achieve threshold values of i-CVI were deleted from the instrument. Hence, 20% of overall items were removed from the instrument (Shrotryia & Dhanda, 2019; Lynn,1986).79 items were used for the survey questionnaire. The entire data has been screened through frequency distributions, descriptive (statistics), descriptive (frequency), outliers, normality, and Common Method Variance (CMV). Once the initial analysis was completed through SPSS, the data was imported into SMART-PLS to identify the relevant ES in relation to the student's readiness for employability 4.0 in a WBL.

3.3 Data Collection

The researcher distributed the survey questionnaire using Google form due to the Covid 19 pandemic, all the universities operated online instead of physical operation, and the students were not available at the university during that time. The data was collected to identify relevant ES and student readiness in the WBL program. The data collection process was done in three months. The researcher contacted the students in each research university to distribute the survey questionnaire among the undergraduate students. The survey responses were saved in Microsoft Excel before it was imported into partial least squares (PLS-SEM) using SMART-PLS version 3.3.

3.4 Data Analysis

In this study, partial least squares (PLS-SEM) use SMART-PLS version 3.3 to explain the study and test the hypothesis and identify the relevant important skills. Initially, from the measurement model and then followed by testing the structural model (path analysis) to identify the hypothesised relationships of the model (Hair et al, 2017).

4. Findings and Discussions

This research determines the important skills in relation to the student's readiness for employability 4.0 in WBL. Having found these skills from the literature review, a survey questionnaire was prepared to understand the current situation. Before distributing this questionnaire, it was given to get an opinion from the experts. For evaluating the content validity of the generated items, the researcher contacted six-panel experts that including three academicians and three experts from the industry based on their expertise and experience. For this study, content validation has completed using the non-face-to-face approach, the online content validation form was sent to the experts with provided instructions to do the content validation process.

In the content validation form, the experts are requested to critically review the domain and the items based on their relevance, clarity, and simplicity. The indicators of the instrument were placed on a 4-point scale (1= not relevant/not clear/ not simple (Lynn, 1986). Based on the expert's comments, the domain and its items have been refined. Once the experts reviewed the domain and items, the experts are requested to provide a score on each item based on the given

relevant scale. Finally, the experts are required to submit their responses to the researcher. Refer to Table 1 for details of the experts.

Six employability skills are found relevant to this research. They are (i) communication (COM), (ii) Interpersonal skills (IS), (iii) IT skills (ITS), (iv) Problem-solving skills (PSS), (v) Entrepreneurship (EN), (vi) Self-management (SM). These skills were derived from the existing literature. For instance, Idkhan et al., (2021) conducted a study to identify indicators that can be used to measure students 'employability skills and attributes. In his study, he pointed out that work requirements in this globalisation era are challenging. Therefore, students need to enhance their fundamental skills, personal management skills, and cooperative skills to increase their opportunities to enter the workplace.

Table 1 - Details of the experts

Designation of the experts	Organisation	Years of experience
Professor	Universitas Negeri Yogyakarta/ DIY Yogyakarta.	18
Associate Professor	University of Malaya	15
Statistician & Educational Researcher	Universitas Jambi & University of Malaya	10
HR manager, Senior Business Planner	Oil & Gas Company, Qatar.	25
Chief Financial Officer, HR head	Toshiba Carrier Thailand Co Ltd.	25
Senior Enterprise Architect	Strategy Group of Companies, Malaysia.	20

The development of students' employability skills also focuses on improving the competency attributes such as communication skills, teamwork skills, problem-solving skills, skills, taking initiative and effort (entrepreneurship skills), self-management skills, skills in using technology (IT skills), skills in learning, and skills in terms of occupational health and safety. Further, similar to this opinion, (Azmi et al., 2018; Scott et al., 2019) concluded in their study that the main skills needed by companies and industries are interpersonal skills, communication skills, problem-solving skills, teamwork, entrepreneurial skills, and project, and process-oriented work.

Moreover, Chan et al., (2018) studied to identify employers' perceptions of the most important employability skills in the manufacturing industry. This study also finds the differences between necessary employability skills from the employers' perspective based on gender, company size, and types of companies in the manufacturing industry. For this study, 182 employers from the manufacturing industry were selected randomly. The data analysis has been done using descriptive and inferential analysis. Based on the results, it was found that communication skills, problem-solving skills, interpersonal skills, personal organisation (self-management), English language proficiency and leadership skills, and Information technology skills were important employability skills from the employers' perception.

Another study by Arruti and Castro (2020) defines leadership skills as entrepreneurial skills. In line with this study, Syae (2020) in his study identified entrepreneurship values. For instance, honesty, discipline, hard work, creativity, independence, leadership skills, work in a team, willingness to take risks, realistic, and being committed. Furthermore, Nugraha et al., (2019) conducted a study to understand the essential employability skills for engineering students from the perspective of the industry. This study used a systematic literature review (SLR) and reviewed 120 academic papers. Based on the findings, it was found that it is necessary for engineering students to have technical skills and generic skills. Technical skills include mechanical engineering drawing, conventional machining, computer numerical control, metal fabrication, and welding and generic skills are social skills (Interpersonal skills), teamwork, communication, critical thinking, ICT skills, and self-management. Refer to Table 2 for the past studies in ES.

Table 2 - Past studies on employability skills in industry

Author	Method	Skills
Idkhan et al., (2021)		Communication skills, teamwork skills, problem-solving skills, skills in taking the initiative and effort (entrepreneurship skills), self-management skills, skills in using technology (IT skills), skills in learning, and skills in terms of occupational health and safety.
Jamaludin et al., (2019)	Content analysis	Basic skills (Communication), thinking skills (problem-solving skills), personal qualities (self-management skills) workplace competencies (Interpersonal skills), and entrepreneurship skills
Scott et al., (2019)		Interpersonal skills, communication skills, problem-solving skills, teamwork, entrepreneurial skills and project, and process-oriented work.
Chan et al., (2018)	Descriptive and inferential analysis.	Communication skills, problem-solving skills, interpersonal skills, personal organisation (self-management), English language proficiency and leadership skills, and Information technology skills
Nugraha et al., (2019)	SLR	Technical and generic skills. generic skills consist of social skills (interpersonal skills), teamwork, communication, critical thinking, ICT skills, and self-management.

The findings of the hypotheses are as follows:

H1: There is a significant relationship between communication and readiness for employability 4.0 in WBL

Data analysis in this research found an insignificant relationship between communication (COM) and students' readiness for employability 4.0 in WBL. It is because the p -value of communication (COM) toward readiness for employability 4.0 in WBL is higher than 0.05 ($p= 0.051$) while the t -value is less than 1.96 ($t= 1.959$). It is further elaborated by its' β value. The β value of communication (COM) and readiness for employability 4.0 in WBL is lower than the expected value. It is indeed a negative value range ($\beta= - 0.056$). Therefore, communication (COM) rejects the direct effect on readiness for employability 4.0 in WBL.

The current research rejects the direct effect of communication on students' readiness for employability 4.0 in a WBL. However, there are studies that emphasised the direct effect of communication skills on employability in the industry. Ali and Mahmud (2018), for instance, said that communication is necessary, and the student's communication will improve by implementing WBL. It means that communication, although an important skill in the industry, might not be prominent in 4.0 in the WBL. On the other hand, communication in research like Ali and Mahmud (2018) means speaking in an international language, particularly English. However, English might not be a necessary language in the future since there are many apps and technologies that would be available for instant translation (Ducar & Schocket, 2018). Hence, communication is not prominent in employability skills 4.0 in WBL.

H2: There is a significant relationship between interpersonal skills and readiness for employability 4.0 in WBL.

According to the data analysis of this research, there is a significant relationship between interpersonal skills (IS) towards readiness for employability 4.0 in WBL. This relationship has been found in this research based on p -value, β value, and t -value. For instance, the relationship of interpersonal skills (IS) towards readiness for employability 4.0 in WBL is clear since the p -value (0.000) and the β value (0.216) of interpersonal skills (IS) are in the positive range while the t -value is more than (4.169). It shows that the relationship between interpersonal skills (IS) towards readiness for employability 4.0 in WBL is significant.

There are researchers who emphasised the importance of interpersonal skills in the workplace. Paolini (2020), for instance, mentioned that interpersonal skills are necessary for the industry and new graduates should be given the opportunity in the industry to improve these skills to transform them into successful employees academically and professionally. Misra (2018) also highlighted the essentiality of interpersonal skills for the workplace from the perspective of the global market. She stated that companies and employers are not only looking for candidates with a good academic background but also candidates who have good background with interpersonal skills. It is because industries need people to handle customers with different cultural and religious backgrounds. According to Misra (2018), interpersonal skills are compulsory for graduates, and they should be given the opportunity to get these skills in the workplace.

H3: There is a significant relationship between IT skills and readiness for employability 4.0 in WBL.

The relationship between information technology (IT) skills (ITS) and employability 4.0 in WBL is also significant. It is because, the p -value (0.050), and the β value (0.098) of ITS towards employability 4.0 in WBL are in the positive range while the t -value is higher than (1.963). It shows that the relationship between ITS towards readiness for employability 4.0 in WBL is significant.

This research endorses Atasoy et.al (2021) research findings that stated that IT skills increase the chances of employment. They conducted a study to explore the role of IT skills in the labour market and employed a household labour force survey on workers 'wages, occupations, and industries and individual-level data on IT skills and IT use for employment. Hence, this research supports the findings of Atasoy et.al (2021) since there is a significant relationship between IT skills and readiness for employability 4.0 in a WBL. Another study by Vrchota et al., (2020), highlights that IT skills are one of the prominent skills for industry 4.0. The students must improve their IT skills when preparing for future employment. Further, this research also confirmed Atasoy et.al (2021)' observation of the role of IT skills in the labor market. It convinces us that IT skills continue to play a role in the labor market for years to come.

H4: There is a significant relationship between problem-solving skills and readiness for employability 4.0 in WBL.

The problem-solving skills (PSS) are another important skill that has a significant relationship with employability 4.0 in WBL. The p -value (0.005), and the β values (0.161) of problem-solving skill (PSS) are in the positive range while the t -value is (2.804). It shows that the relationship between problem-solving skills (PSS) towards readiness for employability 4.0 in WBL is significant. Refer to table 1.6 for the direct effect of PSS.

The significant relationship between PSS with employability 4.0 has been elaborated by Chaka (2020). He studied essential soft skills for IR4.0 and found it essential for the graduates who would work in the industry during the IR4.0.

Furthermore, Obi et al., (2020) also highlight the importance of problem-solving skills (PSS) for the IR4.0. They considered problem-solving skills as one of the brand qualities for employability. In addition to problem-solving skills, they found analytical thinking as another important skill for a potential graduate who would be prepared for employability. Hence, the significant role of problem-solving skills for IR4.0 in this research has endorsed the findings of previous studies and highlighted its persistence in the industry.

H5: There is a significant relationship between entrepreneur skills and readiness for employability 4.0 in WBL.

The relationship between entrepreneur (EN) and employability 4.0 in WBL is also obvious as far as the p -value is (0.000), β value is (0.204) of the entrepreneur (EN) is in the positive range and the t -value is (3.813) is higher than 3.0.

Entrepreneurship is the process of creating and innovating, different values by developing the essential time, assuming and accompanying financial, psychological, and social risks, and obtaining the results with personal satisfaction (Ossai, 2018). This research found a significant relationship between entrepreneur skills and readiness for employability 4.0 in WBL. This finding endorses the previous study of Aun et al., (2018). They studied the effect of entrepreneurship skills on youth employment in Nigeria. This study found a positive relationship between entrepreneurship skills and youth employment. Although Aun et al., (2018) research focused only on Nigeria, it has suggested improving entrepreneur skills to solve the employment issue. The positive impact of entrepreneurial skill development on the future job marketplace is highlighted by Astuti (2019). According to Astuti (2019), a good plan to increase students' competence include entrepreneurial skill development. Furthermore, entrepreneurial skills, according to Ali and Mahmud (2018), are essential to managing the issue of unemployment since they can identify business opportunities.

H6: There is a significant relationship between self-management and readiness for employability 4.0 in WBL.

The self-management (SM) also has a significant relationship with employability 4.0 in WBL as far the p -value is (0.002), β value (0.0150) of self-management (SM) is in the positive range while the t -value is (3.117) higher than 3.0. It shows that the relationship between self-management (SM) towards readiness for employability 4.0 in WBL is significant.

According to the findings of this research, there is a significant relationship between self-management (SM) and readiness for employability 4.0 in WBL. This finding is like the previous study by Demartini and Benussi (2017). They studied the importance of self-management to enhance performance in the workplace for IR4.0. this study found a positive relationship between self-management skills and job performance during the IR4.0. Another study by Kipper (2021) emphasised the importance of developing essential sets of competencies (knowledge and abilities) in professional education to implement IR4.0. Self-management is one of the main skills emphasised for the needs of the future industry. This study shows how self-management will be useful along with other skills for the IR4.0

5. Conclusion and Recommendations

ES is necessary for graduates to secure and remain in the profession upon graduation. Currently, the graduates possess lack employability skills and a mismatch between academic qualifications and industrial demands. This leads to unemployment among graduates in Malaysia. Based on the findings, this research found six employability skills relevant to the student's readiness for employability 4.0 in the WBL program. These are (i) communication (COM), (ii) Interpersonal skills (IS), (iii) information technology skills (ITS), (iv) Problem-solving skills (PSS), (v) Entrepreneur skills (EN), (vi) Self-management (SM). The significant role of these skills was studied from the perspective of student readiness and employability 4.0 in WBL. Among these six ES, five skills are supported directly while communication (COM) was not supported. As mentioned above, skills that directly contribute to the readiness for employability 4.0 in WBL are interpersonal skills (IS), Information technology skills (ITS), problem-solving skills (PSS), entrepreneur skills (EN), and self-management (SM). These skills were derived from the structural model assessment of PLS-SEM with the required values of p -values, t -values, and beta values.

Further, this research rejects the direct effect of communication on students' readiness for employability 4.0 in a WBL. Based on the data analysis, the required values for p -values, t -values, and beta values of communication (COM) have not achieved the target level. Several reasons can be discussed to explain this situation. As far as IR4.0 focused more on IT and machines (Khan et al., 2021), communication might not be a necessity in WBL. The employees need knowledge and skills in IR 4.0 to communicate with the machines, rather than people, the communication might not be a necessity in IR 4.0.

Based on the findings and limitations of this study, a few recommendations can be useful for future studies. First, this study was based on a limited and small scale, where the respondents were only undergraduate students from research universities in Malaysia. As a suggestion for future studies, the context of the study needs to be varied. For instance, larger respondents from public or private universities and postgraduate students may include in the survey, so the scope of the study is wider, and the researcher can generalize output for the larger population. Further, students' readiness for the WBL program can be more explored, for an instance, a few more categories of the Chapnick readiness model (2000) and WBL models can be used to construct the instrument of this study, instead of only the WBL model Malaysia, other WBL models can be adopted for the future research.

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