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RESEARCH ARTICLE

Identifying Employability Skills 4.0 From The Perception Of Students' Readiness In The Work-Based Learning Program

Fathima Nasreen[1*], Siti Hajar Halili[2], Rafiza Abdul Razak [2], Yeo Sook Fern[1'3]

[1]Faculty of Business, Multimedia University, Jalan Ayer Keroh Lama, Melaka 75450, Malaysia
[2] Department of Curriculum & Instructional Technology, Faculty of Education,
Universiti Malaya, Kuala Lumpur, Malaysia
[3]Department of Business Administration, Daffodil International University, Dhaka 1207, Bangladesh

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***Corresponding Author:**

fathimanasreen@mmu.edu.my

ABSTRACT

Student readiness and employability skills are essential to secure and succeed in the industry. Students' readiness plays a crucial role in employability 4.0. This study aims to identify the indirect effect of students' readiness towards employability 4.0 in work-based learning. This research explores employability skills 4.0 from the perspective of student readiness in work-based learning. This research identified relevant employability skills 4.0 based on students' readiness for employability 4.0 work-based learning. This quantitative research method involved 633 undergraduate students from five research universities in Malaysia. The instrument for this research was developed based on existing literature and the survey questionnaire distributed among UM, UKM, UPM, USM and UTM university students. Data was analysed using SPSS and PLS-SEM. The demographic profile of the respondents was analysed using Descriptive statistics, and PLS-SEM was used to test the hypothesis and develop the model. This research found that four employability skills are supported based on the perspective of student readiness in employability 4.0 work-based learning—namely, communication, interpersonal skills, problem-solving skills and entrepreneurship skills. These skills are essential, combined with student readiness for employability 4.0 WBL. It shows how students are ready to enter employability 4.0. This research recommends that academic institutions focus on enhancing these skills and identifying students' readiness to prepare them for Industry 4.0 collaboration with industry.

1. INTRODUCTION

The Fourth Industrial Revolution, often known as Industry 4.0, refers to changes in the industrial value chain process. Those variations become stronger by evolving technologies, and better ways to organize and handle regular operations (prototyping, advancement, production, coordination, supply, and so on) inside the manufacturing industry strengthen these adjustments (Culot et al., 2020). The emergence of Industry 4.0, also referred to as the fourth industrial revolution, has entirely transformed how the industry or business functions and evolves. This can be attributed to its broadening focus on automation, decentralization, system integration, and cyber-physical systems.

Further, The rise of the Industrial Revolution 4.0 (IR 4.0) has caused a significant paradigm shift in the economy, social life, health, education, lifestyle, employment, and skills development. In the future, advanced technology may revolutionize the structure of employability, with automation and robotics replacing human labour (Nasreen,2023). Researchers, academicians, and business experts predict that technological developments will cause substantial job losses in the coming years (Nissim & Simon, 2021).

In addition, Sohimi et al. (2019) discussed that the emergence of IR 4.0, which combines communication, IT data, and physical systems in sectors, may result in employment losses in the coming years. The role of industries will be updated and restructured to become intelligent factories as a result of this revolution. More skills and a better-trained workforce are required to meet the requirements of IR4.0.Lack of employability skills in graduates can lead to unemployment, and some assessment and learning methodologies used by universities and colleges in their educational systems need to be more innovative and effective.

Furthermore, the influence of IR 4.0 on occupations is determined by skill level. Unemployment among graduates can arise when an individual's skills no longer match the skills employers demand. The problem worsens when existing skills are no longer updated with technical advancements in IR 4.0. To ensure everyone can work in a 4IR environment, individuals must obtain skills that will enable them to meet the needs of the future labour market (Kamaruzaman et al., 2019).

Further, Simic and Nedelko (2019) established a comprehensive employee competencies framework in the Industrial Revolution (IR 4.0) era. The findings were based on a review of recent studies. The authors revealed four categories of competencies: social competencies, personal competencies, managerial competencies, and professional competencies.

Social competencies include building a relationship (interpersonal skills), sharing expertise and experience, identification with the firm, communication, customer 31 orientation, teamwork/team collaboration, conflict resolution, cooperation inside the organization, and exerting influence.

Personal competencies comprise entrepreneurship, analytical thinking, self-reliance(self-management), decision-making, troubleshooting, reliability, professional development/readiness to learn, and managing each other. Managerial competencies include building an effective company team building, capacity to delegate, motivating, strategic thinking, planning, leadership, project management, and team management.

Finally, administering/maintaining, paperwork, negotiating, business orientation(entrepreneurship), procedures– knowledge and application, IT skills, technical skills, professional knowledge, process management, and knowledge of foreign languages are examples of professional competencies.

Furthermore, Maisiri et al. (2019) discussed that lifelong learning skills (entrepreneur skills) are crucial for the future workforce. It will need to continuously improve its skills in response to the demand for new skills due to the quick change in technology advancements that necessitate comparatively new skill sets. The level of complicated skills needed in the future workforce is rising due to Industry 4.0 advanced technology and automated systems.

Therefore, this research aims to identify the relevant employability skills for IR 4.0 from the perspective of student readiness in a work-based learning program. This research focuses on the indirect effect of students' readiness towards employability 4.0 in work-based learning (REWBL), where student readiness is studied in the context of the mediator role between employability skills and REWBL.

BACKGROUND OF THE STUDY

Employability Skills

Employability skills are considered the necessary elements for recruiting graduates for the workplace. Higher education institutions incorporate with industry to explore the relevant skill requirements for the graduates to prepare them for the industry. Also, higher education institutions are incorporating employability skills into the program curriculum to enhance the graduate's capability for future careers (Lowden et al.,2011; Suleman,2018).

Employability skills are not job-specific. However, it is essential for all industries across all jobs, from entry-level to higher positions (Sherer & Eadie, 1987**,** p.16; Suarta &Suwintana,2018**).**In the Malaysian context, many graduates leave universities without skills and attitudes and need help understanding the industry's needs and demands**.** Therefore, employability skills, also known as job-readiness skills, are necessary for students to prepare themselves after graduation. Employability skills can be job readiness skills (Majid,2020). Employability skills are essential for graduates to be assigned to various occupations upon graduation. Researchers have explained employability skills in many ways.

Further, Nisha and Rajasekaran's (2018) research aims to identify the role of employability skills in shaping students' careers. This research also emphasizes how employability skills can assist young graduates in reaching the top of their careers. This study highlights employability skills employers require from the existing studies, such as communication, problem-solving, teamwork, interpersonal, entrepreneurial, IT, self-management, and leadership skills.

Another study by Güleryüz and Duygulu (2020) aimed to study how Mintzberg's (1971;1973) management roles and Kat'z's (1955) managerial skills have changed in the Industry 4.0 era. This study used snowball sampling using the deep interview technique and evaluated using content 123 analysis. Based on the results, some of Mintzberg's roles became less important, and some became more important in the context of Industry 4.0. Namely, leadership, self-management, risk-taking, organizing, motivation (entrepreneur skills), problem-solving, digital literacy, IT skills, interpersonal communication, and cultural awareness.

In addition, the work environment changes the job profiles and requires employees with a wide range of competencies. Today's Digital inclusion depends largely on competencies rather than technology access (Khan, 2021). It is expected that most children entering primary school today might work in jobs that do not yet exist (Kenayathulla, 2021).

Student Readiness

The ability of a person, system, or organization to face a circumstance and carry out a predetermined course of action is known as readiness. The level of planning rigour, sufficiency, staff training, availability, and reserve of backup systems or services are all factors that contribute to readiness. The definition of readiness is a state that expresses how mentally or physically someone is prepared to take action or receive experience.

The level of community readiness to engage in networking is referred to as readiness (Ali, 2021). These definitions suggest that graduates' preparation for the workforce depends on their capacity to apply the skills they learned in school to their chosen careers (Abdullah et al., 2020).

Abdullah et al. (2020) studied the students' readiness to face IR4.0 workplaces in Malaysia among Malaysian undergraduate students. Hence, prior graduates start working in an IR 4.0 environment; this article attempts to reveal the problems associated with their preparation for the workforce. Earlier research about graduate work preparedness was analyzed and assessed in this regard. To ensure that IR 4.0 is human-led and human-centred, this issue is being focused on. Abdullah et al. (2020) highlighted that a need for soft skills is one of the concerns with graduates being prepared for the workforce in Malaysia. Soft skills are the knowledge, talents, and character qualities that indicate a person's personality, attitude, and behaviours.

In addition, student's readiness to learn the skills of IR4.0 is another vital issue. Since IR4.0 will challenge the young generation and the students currently pursuing their learning, their readiness to face these challenges must be studied and investigated, particularly in light of the implementation of globalization and Industry Revolution 4.0. Ali (2021) examined the students' readiness to face IR4.0 in Indonesia based on students' competency, interpersonal communication, teamwork, and technological abilities. Hence, student readiness is a necessary factor for the IR 4.0 environment.

Student Readiness in Work-based Learning Program

University lecturers and management must ensure that the students are equipped with relevant job skills to succeed after graduation (Asmaak & Corresponding, 2010). The student readiness level needs to enrol and succeed –without remediation- in a credit-needed bearing course in a post-secondary institution that offers a bachelor's degree or any high-quality certificate programme that allows students to enter employment efficiently (Bhattacharjee & Ray, 2017).

Here, students need to learn about decision-making, which includes choosing between various alternatives/studying the consequences of specific choices, and studying the value of implementing the decisions. In addition, the students must be aware of and understand current planning and the need to make decisions for their future lives.

Myint et al. (2021) researched outcome-based education (OBE), focused on work-based learning and building relationships between students, instructors, and industries. This research found that Outcome-based education (OBE) has enhanced the students' qualifications and competencies based on work-based learning (WBL). Further, this study assists the instructors by providing ideas to train the students, tools to improve work readiness skills, and applying effective classroom management techniques before starting work exposure. The findings of this study present an effective way of implementing work-based learning (WBL) along with the support of instructors and industries. Hence, for this study, the researcher used Chapnick's (2000) e-learning readiness model to adopt the readiness items and construct relevant items to the student readiness for employability 4.0 and work-based learning.

The student readiness in this research includes four variations, namely, (i)Technological readiness, (ii) environmental readiness, (iii) human resource readiness, and (iv) psychological readiness.

Student readiness plays a vital role in employability 4.0, and various research studies have studied perspectives of student readiness towards employability4.0**.**

Technological readiness considers observable and measurable technical competencies. It includes access to new technologies to do tasks at home or work, using the computer and hardware components like printer, speak mouse, and web browser for the relevant works confidently.

Environmental readiness considers the large-scale forces operating on the stakeholders inside and outside the organization. It includes students' willingness to attend training /internship while studying in the university, understanding the importance of incorporating university and industry for employment, and preparing students with relevant industry skills.

Human resource readiness means the availability and design of the human-support system. It includes understanding the importance of teamwork to improve relevant skills for the industry, attending seminars/workshops to learn new knowledge, and understanding the significance of HR management for the trend of employability.

Psychological readiness is the individual's state of mind as it impacts the outcome of the e-learning initiative. In addition to acquiring relevant knowledge and skills, the students' preparation for future employment includes developing a positive mind towards future employability, the ability to attend skills training, understanding the required employability skills and joining any entry-level position in the market. Hence, student readiness in this research includes all these four types of readiness (Nasreen, 2023). Further, Hizam et al. (2020) conducted a systematic literature review (SLR) using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines and content analysis strategy (Hizam et al., 2020). For this research, the researchers have reviewed 97 papers published in peer-reviewed academic journals and industry reports from 2000 to 2019**.** The findings indicated the importance of improving technology readiness in organizations to strengthen their Industry 4.0 readiness. Although this paper highlighted industry 4.0 readiness, the researchers have discussed the challenges in identifying the industry 4.0 readiness models since many academic institutions and industry firms consider their readiness models as their classified property. Hence, their complete or final model version is private, further adding to the existing research gaps on this critical and continuously evolving topic.

Moreover, the environmental readiness for employability 4.0 (ENV) is essential in future industries. Mokhtar and Noordin (2019) explored the relationship between technologies related to Industry 4.0, people, and the environment in Malaysia's Higher Education Institutions (HEI). This research also identified issues of applying Industry 4.0 at Higher Education Institutions. There needs to be more understanding of Industry 4.0 perceptions in Malaysia, particularly from the perspective of higher education instruction. The results from this study found that the university is aware of the situation and ready to support industry 4.0 in the workplace environment by providing future-ready graduates with relevant skills; the existing curriculum in the university needs to be redesigned, updated and recommended to offer options for students to study multi-disciplinary courses.

Furthermore, Human resource readiness is also an essential factor for employability 4.0**.** Vrchota et al. (2019) conducted a study to understand the human resource readiness implementation for Industry 4.0. This study used Pearson and Spearman correlation for the data analysis; based on the results, it was found that Human resources, their readiness, and capability to learn new things are the main factors for the success of Industry 4.0 in the workplace. This includes many indicators in numerous areas, such as qualifications and skills of the population, participation in education, expenditure on education, and human resources for the development of technology and knowledge-intensive industries. This study concludes with the factors that influence the implementation of Industry 4.0 and highlights the necessity to increase human capital.

Moreover, students' psychological readiness is also an essential factor for employability. Kapareliotis et al. (2019) conducted a study to explore how internship (placement) has impacted the perception of young business graduates' "work readiness" after finishing the internship program. In this study, "work readiness" includes the students' role clarity, ability, and motivation because changes in the workplace highlight concern about the future work and efficiency of undergraduate academic programs to prepare students for the work.

Based on the findings of this study, internship programs assist employers in finding suitable students for the jobs. Also, it will be helpful to understand the psychological readiness of the students for employment. Industries must work closely with academic institutions to enhance the skills that address a globalized workplace's demands. Also, industries operating globally may provide internship opportunities with certain specific skills. Refer to Table 1 for the existing studies on student readiness.

Table 1: Past studies on student readiness

Author	**Method**	**Domain**	**Type of readiness**
Hizam et al. (2020)	SLR		Technological readiness
Yüksel (2020)	Quantitative	Industry	Technological readiness
Kapareliotis et al., (2019)	Quantitative	industry	Psychological readiness
Vrchota et al. (2019)	Quantitative	Industry	Human resource readiness
Author	Method	Domain	Type of readiness
Ali (2021)	Quantitative	Education	Competency readiness, environmental readiness, technological readiness
Costa et al. (2022	Quantitative	Education	Psychological readiness

Conceptual Framework

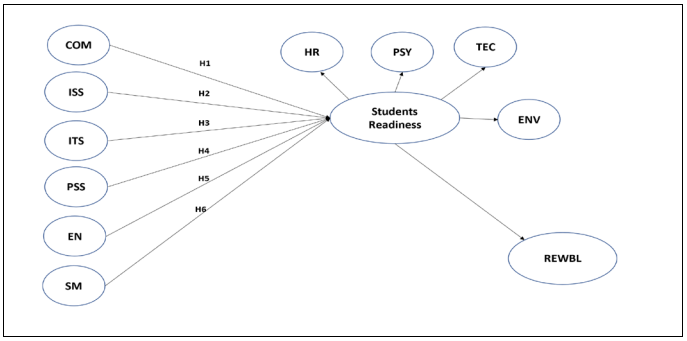

Figure 1. Conceptual Framework of the study

Figure 1 shows the indirect role of student readiness for employability 4.0 Work-based learning (WBL). Based on this figure, student readiness significantly mediates the relationship between employability skills (independent variables) and readiness for employability 4.0 in Work-based learning (REWBL- dependent variable).

Research Question

Is there any significant role of student readiness between employability skills and readiness for employability 4.0?'

Hypothesis Development

Six hypotheses (H1-H6) were developed to study this research question as follows:

H1: student readiness plays a significant role in the relationship between communication and readiness for employability 4.0 in WBL.

H2: student readiness plays a significant role in the relationship between interpersonal skills and readiness for employability 4.0 in WBL.

H3: student readiness plays a significant role in the relationship between IT skills and readiness for employability 4.0 in WBL.

H4: student readiness plays a significant role in the relationship between problem-solving skills and readiness for employability 4.0 in WBL.

H5: student readiness plays a significant role in the relationship between entrepreneurship and readiness for employability 4.0 in WBL.

H6: student readiness plays a significant role in the relationship between self-management and readiness for employability 4.0 in WBL.

METHODOLOGY

This study used a quantitative method for data collection. It focuses on undergraduate students at research universities in Malaysia, where it is necessary to get their perceptions of relevant employability skills and students' readiness for employability 4.0 in WBL. The instrument for the data collection is designed based on existing literature**.** The instrument was sent to the experts for content validation prior to the distribution of the survey questionnaire. This study used SPSS version 23 to analyze the demographic data of the respondents (Halili et al., 2022).

Further, the PLS-SEM SmartPLS version 3.3 software tests the hypothesis using the structural model assessment (path analysis). The structural model runs through the bootstrapping procedure to examine the significant relationship between the inner path results. All hypothetical paths in the

research framework are observed through the regression coefficient (β). The value of β is used to check the proposed hypothesis results in the structural model.

Sample of the Study

This study's participants were 633 undergraduate students from five research universities in Malaysia. Namely, 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 research universities were selected for this study based on their focus on research and innovation activities.

Further, the whole population for this study was around 73,983 undergraduate students of research universities in Malaysia from all the faculties in the academic session of 2020/2021. This includes 17,632 students from UM, 11500 from UKM, 14 299 from UTM, 15 352 from UPM, and 15,200 from USM (Halili et al., 2022). However, the researcher selected 633 as the sample for this research from the inverse square root method, which showed the minimum required sample size as 619, and once cleaning the raw data, the researcher came out with a sample size of 633 as relevant for this study (Halili et al., 2022).

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).

Further, this research adopted employability skills from the existing literature (Jamaludin et al., 2019; Azmi et al., 2018; Idkhan et al., 2021). For instance, communication, interpersonal, problem-solving, information technology, entrepreneurial, and self-management skills. These employability skills are essential for employers' perceptions of the industry.

Furthermore, this research adopted Chapnick's (2000) model to understand the readiness categories to apply for student readiness towards employability 4.0. Hence, this research found that psychological, environmental, human resource and technological readiness were relevant to identifying student readiness for employability 4.0 skills (as cited in Halili et al., 2022).

Following the readiness model, this study adopted the work-based learning model in Malaysia (Ismail et al., 2015) to explore the WBL. Although many WBL models were presented in the literature, this study used the WBL model Malaysia as it is relevant to the Malaysian context for enhancement and implementation (Ismail et al., 2015). The WBL model Malaysia includes learning theory in class (25%), supervision by industry teachers, and learning in the industrial sector (75%).

The instrument can validly be examined through five sources: 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 (Almanasreh et al., (2019). This study adopted a content validity process to check the instrument validity. The survey instrument's content validity was completed based on Lynn (1986). The procedure includes two phases; phase 1 involves the development of the survey indicators, and phase two consists of judgment and evaluation of the indicators (as cited in Halili et al., 2022).

Data Collection

The data collection for this study was completed using a survey questionnaire via Google form due to the COVID-19 pandemic since all universities functioned online. The data was collected to identify required employability skills and student readiness in employability 4.0 WBL. The data collection process was completed in three months. The researcher conducted students and a few academic staff

to distribute the survey questionnaire among their respective undergraduate students (Halil et a., 2022).

Data Analysis

This study used **SPSS version 23 to complete initial analyses. Moreover,** partial least squares (PLS-SEM) use SMART-PLS version 3.3 to test the proposed hypothesis and to explore essential skills for employability 4.0 from the perspective of student readiness. PLS-SEM analysis starts from the measurement model and is then followed by testing the structural model (path analysis) to identify the hypothesized relationships of the model (Hair et al., 2019).

FINDINGS AND DISCUSSION

This research explores essential employability skills from the perspective of students' readiness for employability 4.0 WBL. The instrument was designed based on existing literature on employability skills, student readiness and work-based learning. Before distributing the survey, six experts validated it for content validity, including three academicians and three experts from the industry based on their experience. For this research, a content validation form was sent to the experts through email with the instructions to follow the process.

The content validity form was reviewed by experts using three criteria. Each instrument item was evaluated by relevance, clarity, and simplicity. As mentioned above, The indicators of the instrument were placed on a 4-point scale (1 not relevant/not transparent/ not simple (Lynn, 1986). The experts were requested to evaluate whether the indicators covered all associated aspects or if anything was missing in the components. Based on the experts' comments, the instrument's items were reviewed. After completing their reviews on the domain and items, the experts requested a score for each item based on the provided relevant scale. (Halili et al., 2022). Refer to Table 2 for expert details based on academia and industry.

Table 2 : Expert details

Expert designation	Sector	Years of experience
Professor	Education	18
Associate Professor	Education	15
Statistician & Educational Researcher	Education	10
HR manager, Service Business Planner	Industry	25
Chief Financial Officer, HR head	Industry	25
Senior Enterprise Architect	Industry	20

7.1 Indirect (mediation) Effect Analysis

For the mediating analysis, the bootstrapping technique suggested by Hair et al. (2013) was applied to this research. Bootstrapping is a robust technique for testing the mediation effect, a nonparametric resampling procedure that has manifested itself (Zhao et al., 2010; Shrout & Bolger, 2002; Hayes, 2009). The effect of independent variables on dependent variables through students' readiness, where the mediation effect was confirmed to be statistically significant. The supported significant paths are COM -> Students Readiness -> REWBL, IS -> Students Readiness -> REWBL, PSS -> Students Readiness -> REWBL, and EN -> Students Readiness -> REWBL. However, two mediating paths, such as ITS -> Students Readiness -> REWBL and SM -> students readiness -> REWBL, were not statistically significant from the perspective of students 'preparation for employability 4.0. The findings of the hypotheses are as follows

H1: student readiness plays a significant role in the relationship between communication and readiness for employability 4.0 in WBL.

The data analysis of this research found that student readiness has an influential mediator role between communication (COM) and readiness for employability 4.0 in work-based learning (REWBL). The p-value of communication (COM) toward readiness for employability 4.0 in work-based learning (REWBL) is less than 0.05 (0.002), while both LL (0.017) and UL (0.067) are in the positive range. It shows that student readiness is significant as a mediator between communication (COM) and readiness for employability 4.0 in work-based learning (REWBL). However, the direct effect of communication (COM) towards readiness for employability4.0 in work-based learning programs (REWBL) revealed insignificant.

H2: student readiness plays a significant role in the relationship between interpersonal skills and readiness for employability 4.0 in WBL.

Data analysis of this research also found that student readiness is a significant mediator between interpersonal skills (IS) and readiness for employability 4.0 in work-based learning (REWBL). The p-value of interpersonal skills (IS) towards readiness for employability 4.0 in work-based learning (REWBL) is less than 0.05 (0.021); however, both LL (0.009) and UL (0.054) values were in the positive range. It shows that student readiness is significant as a mediator between interpersonal skills (IS) and readiness for employability 4.0 in work-based learning (REWBL).Interpersonal skills need to be developed during college or university study periods and industry work (Narváez et al., 2018). These are not just skills learned only once in a particular place but developing skills throughout life.

Aware of this scenario, the Malaysian education ministry has taken initiatives to increase students' exposure and interpersonal skills. The internationalization of education is a crucial aspect of these initiatives. Although these are essential skills for a graduate during studies and working in the industry, and the education ministry has taken initiatives to develop these skills among students, previous studies found that Malaysian students need to improve these skills. For instance, Nazron et al. (2017) highlight that most Malaysian graduates need to improve their interpersonal skills in their studies soft skills among Malaysian university students. (Deep et al., 2019).

H3: student readiness plays an insignificant role in the relationship between IT skills and

readiness for employability 4.0 in WBL.

The data analysis found that the student readiness in this research does not play a significant mediator role between Information Technology skills (ITS) and readiness toward readiness for employability 4.0 in work-based learning (REWBL). However, the direct effect of information technology skills (ITS) on readiness for employability4.0 in a work-based learning program (REWBL) revealed significance (Halili et al., 2022).

According to the above findings, information technology skills (ITS) may be a minor skill from the point of view of student readiness. However, it is an essential skill from the perspective of employability 4.0 in work-based learning (REWBL) (Halili et al., 2022). This finding is crucial as it questions the perception of students on Information technology skills (ITS) and their readiness for the work industry. Based on this research finding, the students feel that knowledge and training in information technology skills (ITS) are less important.

Rawlinson (2019) stated that the demand for individuals with skills in software program development and IT current technologies would surely increase due to the growing use of software applications, networking, and analytics. On the other hand, the importance of physical labour will decline in favour of IT skills due to new task profiles and unique requirements for training and learning. If the students need to gain knowledge of IT skills, they are aware of the demand for IT skills in IR 4.0. This shows that student readiness for employability 4.0 in work-based learning is insignificant.

This research endorses Mohammed & Haliru's (2019) research output that the perception of IT skills and lack of understanding about the demand of the 4.0 work industry might be another reason for the insignificant effect of IT skills on student readiness.

H4: student readiness plays a significant role in the relationship between problem-solving skills and readiness for employability 4.0 in WBL.

The significant mediator role of student readiness between problem-solving skills (PSS) and readiness toward readiness for employability 4.0 in work-based learning (REWBL) is another finding of data analysis in this research. Since the p-value is less than 0.05 (0.003), both LL (0.031) and UL (0.126) values are positive ranges. This shows that the role of student readiness between problem-solving skills (PSS) and readiness toward readiness for employability 4.0 in work-based learning (REWBL) is significant.

From the above findings, it is clear that problem-solving skills are necessary for employability 4.0 in work-based learning (REWBL) and from the perspective of student readiness.

This research supports the finding of Saeedzadeh et al. (2018) that problem-solving skills are an important factor in students' academic achievement. As academic achievement is the crucial outcome of education and an important method in evaluating the higher education system, preparing students to face this evaluation system in the classroom is essential from the perspective of student readiness.

H5: student readiness plays a significant role in the relationship between entrepreneur skills and readiness for employability 4.0 in WBL.

Student readiness plays a significant mediator between entrepreneurship (EN) and readiness for employability 4.0 in work-based learning (REWBL). It is because the pvalue of entrepreneurship (EN) is less than 0.05 (0.016) while both LL (0.012) and UL (0.063) values are in the positive range. This shows that the role of student readiness between entrepreneurship and readiness toward readiness for employability 4.0 in work-based learning (REWBL) is significant.

From the above findings, it is noted that entrepreneur skills are necessary for employability 4.0 in work-based learning (REWBL) and from the perspective of student readiness. Students generally gain entrepreneurial skills, namely, creative thinking, leadership, critical thinking, planning, and organizing, during their learning period at school or university. However, although they gain these skills, they need to be aware of the implications of these skills in real situations. This may be due to knowledge and exposure. (Hahn, et al., 2020). Hence, the students must enhance these skills to succeed in employability 4.0 in Work-based learning. (REWBL).

Further, students engaged in work-based learning have more opportunities to enhance their entrepreneurial skills. Previous research, like Ahmad et al. (2020), highlighted that learning entrepreneur skills in a real-world scenario can bridge the gap between traditional classroom instruction and service development. In work-based learning (WBL), students can use industry-standard technologies and collaborate with clients and customers (Ahmad et al., 2020).

H6: student readiness plays a significant role in the relationship between self-management and readiness for employability 4.0 in WBL.

Data analysis also found that student readiness does not play a significant mediator role between self-management (SM) and readiness toward readiness for employability 4.0 in work-based learning (REWBL). The p-value of self-management (SM) is (0.061), which is higher than 0.05, while zero exists between LL and UL, as the LL was (-0.003) and UL was (0.047). Since these values are positive and negative, it confirms no mediating effect of self-management (SM).

Based on the findings, it is revealed that student readiness shows an insignificant relationship between self-management and readiness for employability 4.0 in work-based learning (REWBL).

Although self-management is a vital skill for employability 4.0 (Halili et al., (2022), it is insignificant from the perspective of student readiness.

It shows a clear gap between student readiness and industry. This aspect has been highlighted in some research, such as by Zainuddin et al. (2019), that students with low self-confidence have fewer employment opportunities. For instance, graduates with high self-confidence and the ability to articulate themselves during job interviews are preferred by employers. However, graduates with low self-confidence find it challenging to speak up in interviews and have poorer employment chances than graduates with high self-confidence.

SIGNIFICANCE OF THE STUDY

This research identified relevant employability skills 4.0 from the student's perspective in the work-based learning program. The study is significant as it will contribute to the Ministry of Education Malaysia (MOE), Higher Learning Institutes (HIL), students, and Industry. The study assists the HILs in preparing students with relevant industry skills from the student perspective; once the student is prepared with relevant employability skills, they have a high chance of getting a job soon after graduation. Also, industrial people can appoint employees with relevant employability skills quickly. Further, this employability skills 4.0 based on student readiness can be implemented in other countries by referring to their local context.

CONCLUSION AND RECOMMENDATIONS

Employability skills are essential for graduates to enter and maintain their industry jobs. Every sector has a specific set of employability skills as required by the industry. However, in general, employability skills are necessary for all students to prepare them for the industry according to the needs of the labour market.

Based on the findings, this research identified six employability skills relevant to the student's readiness for employability 4.0 in the WBL (Halili et al., 2022). These skills 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 perception of student readiness and employability 4.0 in WBL.

From the perspective of student readiness, out of six mediator hypotheses, only four were supported. These significant paths are COM -> Students Readiness -> REWBL, IS -> Students Readiness -> REWBL, PSS -> Students Readiness -> REWBL, and EN -> Students Readiness -> REWBL. However, the two mediating paths are not significant. Such as ITS -> Students Readiness -> REWBL and SM -> Students Readiness -> REWBL.

According to the above findings, skills that indirectly contribute to the readiness for employability 4.0 in WBL are Communication (COM), Interpersonal skills (IS), problem-solving skills (PSS), entrepreneur skills (EN); these skills were derived from the PLS-SEM analysis with the required values of p-values, t-values, and beta values. Further, this study rejects the indirect effect of information technology skills (ITS) and Self-Management (SM) from the perspective of student readiness in employability 4.0 WBL. According to the data analysis, the required values for p-values, LL, and UL are in the positive and negative range. This can be due to several reasons. For instance, Most Malaysian universities, particularly research universities, have already included this aspect in their curriculum and adopted classroom training. Therefore, the students are equipped with basic information technology skills (ITS) when they graduate. (Azmi, et. al, 2018). This might be a reason for the insignificant effect of information technology skills (ITS) on student readiness. The perception of IT skills and lack of understanding about the demand of the 4.0 work industry might be another reason for the insignificant effect of IT skills on student readiness (Mohammed & Haliru, 2019).

In addition, students need more self-confidence, and the gap between student readiness and industry increases, which can cause employment issues among graduates. Mncayi (2016) stated that a lack of labour market knowledge and self–confidence are causes of unemployment. In addition to the above

study, researchers like Stewart et al. (2011) stated that students rate their competency (self-management skills) as generally high. However, it is different from the perception of the industries.

Based on the findings and limitations of this study, a few recommendations can be beneficial for future studies. Since this study was based on a small scale and limited, the participants were only undergraduate students from research universities in Malaysia. As a recommendation for future studies, more participants can be included in the study, such as with a large sample size from public or private university students. Further, student readiness and WBL models can be explored more in future research. Moreover, this research recommends that employability skills derived from the findings, communication, interpersonal skills, entrepreneurship and problem-solving skills from the perspective of student readiness need to be focused on by academic institutions to prepare students for future industry.

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