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Application of Soft Skills Among Prospective TVET Teachers to Face the Industrial Revolution 4.0

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ABSTRACT

The development of Malaysia's social and economic capital depends on the younger generation as a result of the country's education system. Education is also the trigger for creativity and the generator of innovation that equips the younger generation with the skills needed to compete in the job market and enable overall economic development. In this regard, in the national education system, teachers play a role as human builders to produce a younger generation in meeting the needs of the ethical industry revolution 4.0 (IR 4.0). Thus, a quantitative study was conducted on final year students who took TVET education programs at IPTAs in Malaysia to review the readiness and knowledge of the soft skills of future TVET teachers to meet the challenges of the Industrial Revolution 4.0. A set of questionnaires containing 62 items including demographics of respondents using 5 Likert scales was constructed using the Google Form application and distributed to a total of 175 respondents. The findings of the study were analyzed using Statistical Package for Social Sciences (SPSS) Version 20 software to identify the mean, standard deviation, and Pearson's correlation coefficient. Overall, it was found that the level of readiness and acceptance of students towards IR 4.0 is still at a moderate level and there is a significant relationship between the level of students' knowledge of soft skills with the readiness of prospective TVET teachers to face the challenges of the Industrial Revolution 4.0.

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Contribution/Originality: This career readiness guide can be used as a reference for students to apply career readiness more effectively and to increase their confidence to compete in the industry

1. Introduction

The purpose and goals of education can be achieved with the combination of effective teaching and learning process and soft skills possessed. This can be proven in the study by Kasim dan Husain (2008) that effective teaching and learning are the basis of human capital formation. Therefore, the process of soft skills ability should be honed from the beginning until the end of the teaching program. This shows that soft skills must be present in teachers in Malaysia. In 2050, it is hoped that the development of Malaysia will be a better country by implementing Technical and Vocational Education and Training (TVET) with knowledge and skills by the needs of the industry. TVET as a body produces employees needed by the industry to face RI 4.0. Indirectly, it can produce knowledgeable and highly skilled human capital. According to Sheridan (2019), soft skills are still important in the era of IR 4.0. In 2016, new obstacles have penetrated all parts of the country's services and industries in the middle of the IR 4.0 outbreak which involved technology. All parties were asked to innovate in line with digital transformation to dynamically drive competitive advantage and accelerate the modernity of a country. This is because it will have a direct impact on the employment sector in the future. The country that has made extensive and complete preparations in facing this digital change in Malaysia. As a result, data from Department of Statistics explains that until 2019, Malaysia contributing 18.5 percent in digital economy. The growth was driven by the increase of gross value added of ICT to RM182.4 billion, especially for applications such as technology-related programs (The Sun Daily, 2019).

The creation of the world's first digital free trade zone by a body responsible for regulating the zone is MDEC which oversees boosting buying and selling activities in face-to-face or virtual services. The Outreach Program is also conducted on various platforms which are appropriate to provide to human beings in achieving development and progress in the relevant IR 4.0. Robotic technology, internet object network (IoT), artificial intelligence (AI), analytical data, image processing, software, mobile communication systems, three-dimensional (3D) printing, cybersecurity, simulation, and digital system integration are the new components that will replace job roles and existing structures. Indirectly, it has influenced the field of education which is also moving along with the development of this revolution. Among the plans with high importance is the collaboration between IPTA institutions and manufacturing. The ministry of education has prioritized the importance of soft skills to strengthen the human capital framework driven by IR 4.0 (Unit Perancangan Ekonomi Jabatan Perdana Menteri, 2021). Therefore, at the higher education level, new technological, digital, and engineering capabilities and aspects should be developed to plan IPTA graduates for the job market.

While undergoing teaching training programs, trainee teachers not only teach in the classroom but are also exposed to other skills that can be acquired outside the classroom. These skills called soft skills are important so that trainee teachers can adapt quickly and be able to face challenges in the workplace (Khoo, 2008). Their opportunities in improving these soft skills are wide open and should be utilized in building a superior self-personality. Soft skills that include elements of communication

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skills, teamwork, problem-solving skills, adaptability, lifelong learning, and self-satisfaction as well as ethics, and morals are important elements (Rozanis, 2006). The main agenda in the education system is to produce efficient, knowledgeable, and skilled students to help the workforce. The hurdle in IR 4.0 is to ensure new employees have technical skills and are not forgotten with soft skills. Innovation in the job market and high skill demand are the effects of the technological transformation of IR 4.0 (Kergroach, 2017). However, the knowledge of IR 4.0 and the soft skills and readiness of students to face the obstacles of IR 4.0 is at a declining level. This situation is worrying because more workers are laid off due to economic resistance and the adaptation of new technologies. Therefore, a study was conducted in Malaysian public universities to apply soft skills among prospective TVET teachers to face IR 4.0.

1.1. Objectives

The objective of this study are:

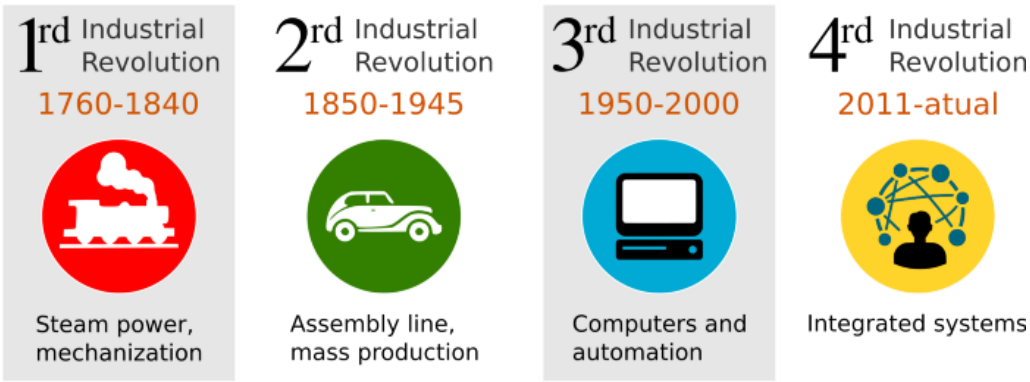
i. To identify the level of knowledge of prospective TVET teachers on the soft skills of IR 4.0
ii. To identify the level of readiness of prospective TVET teachers to take on the challenge of IR 4.0
iii. To identify the relationship between the knowledge of prospective TVET teachers on the soft skills of IR 4.0 with the readiness of prospective TVET teachers to face the challenges of IR 4.0

2. Literature Reviews

2.1. Chronology of Industrial Circulation

Circulation is a transition that will have an impact on passing the development. It occurs when new technologies emerged. All these technological changes occur by creating a framework for future reference. A country can achieve fame when technological advances develop comprehensively. Figure 1 shows the circulation of the industry occurred from IR 1.0, followed by IR 2.0, IR 3.0, and IR 4.0.

Figure 1: Chronology of the Industrial Revolution



Source: Cherri (2018)

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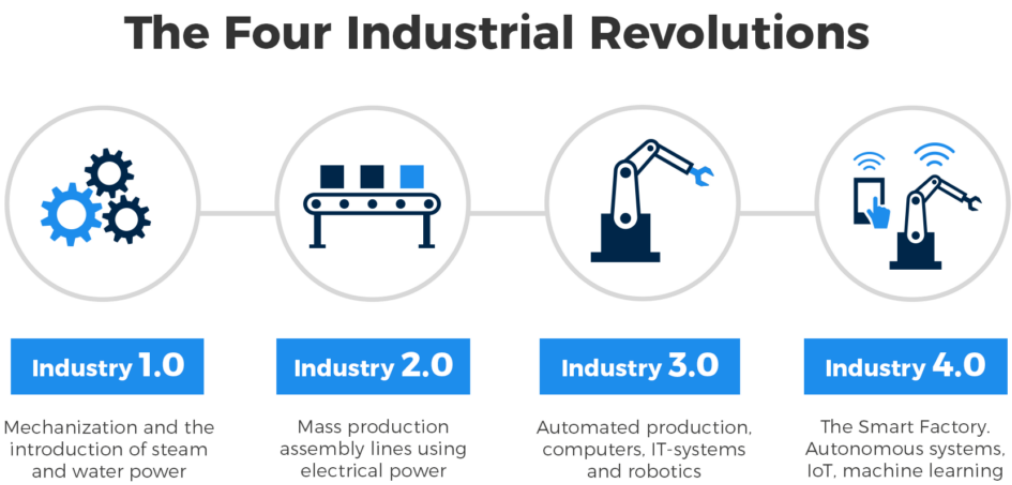
2.2. The Concept of Industrial Revolution 4.0

Recently, the industry of the 4.0 revolution or known as Industry 4.0 has been introduced as a popular term to describe the trend toward the increasing use of information technology and automation in almost all industrial sectors (Oesterreich & Teuteberg, 2016). Figure 2 shows the concepts of the industrial revolution from Industry 1.0 to Industry 4.0.

Figure 2- The Concept of the Industrial Revolution



Source: Spectral Engines (2018)

2.3. Soft Skills

According to Brewer and Comyn (2015) Australia refers to soft skills as 'key competencies' or 'employability skills', the British uses the term 'key skills' or 'core skills', while the United States uses the term 'necessary skills' or “employability skills”. The skills that have been applied in the curriculum of all levels of study from the Kementerian Pelajaran Malaysia (2016) are:

i. interpersonal and communicative,
ii. teamwork
iii. information technology,
iv. entrepreneurship.
v. Professional ethics and morals
vi. Leadership

2.3.1. Interpersonal and Communicative

Interpersonal skills are skills used when communicating and collaborating with others which are currently on the rise in the workplace. Interpersonal skills are abilities that can transform the entire spectrum of one’s life because they can help a person communicate and connect with others. What marks good interpersonal skills are active listening, collaboration, problem-solving, conflict resolution, empathy, diplomacy, adaptability, leadership, mediation, and patience. Communication is a process of conveying information. When communicating, there are many messages conveyed either through speech or non-verbal responses. It is also the process of conveying thoughts from one mind to another (Muhammad, 2001).

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2.3.2. Teamwork

According to Chien, Wan, & Chen (2012), teamwork is a group that works together with each other to achieve the goals set by the team. In the team, each member should have specific knowledge, skills, and attitudes which are required so that the team can organize its members according to their skills in specific areas (Zaccaro, Rittman, & Marks, 2001). Moreover, Luca and Tarricone (2002) states that teamwork is highly dependent on everyone involved in the group to cooperate with each other to achieve objectives through the sharing of knowledge and skills. Thus, in achieving the desired goal, everyone in the team also needs to share every knowledge and skill available so that the team is constantly growing and moving forward. Their study in 2001 also stated that each team member also needs to be flexible and always adapt to the surrounding environment because the goal can be achieved with cooperation and dependence between group members and not just individually. In teamwork, personal problems and personal opinions should be set aside first so that the team can achieve the set goals on the right track (Morgan et al., 2014).

2.3.3. Information Technology

Philosophically, technology is produced for two reasons. Firstly, people invented tools to ease their daily tasks based on the imitation of things that happen in natural surroundings. Secondly, people are trying to simplify their tasks short-term and long-term, and this implies that people are trying to make their daily tasks become more efficient (Mohamad Ali & Peyman, 2016). Information technology can be defined as a method used to transfer, disseminate and display information. Such information can exist in various forms whether in physical form for example paper and books, voice forms, visual displays, movements, or bits. Information Technology or IT and Information and Communication Technology or ICT is the technology required for data processing. The scope of the title is very wide, which is about all aspects of information management and processing. Accurately and simply, the use of computers and software is to modify, store, protect, process, transfer, view, and obtain information regardless of place and time.

2.3.4. Entrepreneurship

Entrepreneurship can be defined as a process of innovation and creation through four dimensions, namely individuals, organizations, the environment, and processes, with network collaboration within government, education, and institutions (Kuratko, 2004). Entrepreneurs are individuals who run a successful business with the motive of making a profit as well as practicing strategic practices to succeed (Abdul Aziz et al., 2013). While entrepreneurship has been a constant show throughout human history, it should be noted that in recent times as well as in economic crisis scenarios, where they most often occur, they emerge on the low economic horizon as a way out for those who lose their jobs, for example, generating their businesses and recovering lost income due to unemployment.

2.3.5. Professional Ethics and Morals

Ethics are the principles of behavior that will determine whether the actions taken by an individual are morally acceptable or otherwise. Every individual needs to have an ethic that is acceptable to every member of society around him. Individuals who do not have

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ethics will lead to the existence of social conflicts such as corruption, breach of trust, irresponsibility, negligence in duties, and so on. Professional means the ability and competence in performing a responsibility based on knowledge, training, and expertise. Professional ethics refers to ethics in a profession and professional field. According to Mohd Janib (2001), professional ethics is a social control tool for professionals that allows organizations and communities to monitor and evaluate their behavior from time to time. In short, professional ethics can be summarized as a set of guidelines and procedures that determine the moral, professional qualities, and values of an individual or an organization. Morality is defined as teachings or beliefs related to the good of an act, attitude, or behavior that is measured in terms of the good and bad of amorality. According to Manshuruddin (2003), morality in the context of Islam carries the meaning of morality and character. The term moral means the state of one's human action, either individually or in groups (Mohd Ghazali, 2007).

2.3.6. Leadership

A leader is defined as a person recognized by one or more than one person, in which the leader is influential, authoritative, and has authority. According to Kabeyi (2018), leadership style is the orientation or method practiced by a leader in motivating others, giving instructions, and implementing plans to achieve organizational excellence. According to the study of Nanjundeswaraswamy and Swamy (2014), leadership style will affect the performance and culture of an organization. Leading is an action or a series of activities performed by an individual, and the individual plays a leadership role, using his influence on others that are his followers towards the achievement of goals.

3. Methodology

This study was conducted using a quantitative method used to obtain answers to the research questions. The collection of information and data was done by distributing questionnaires. Using a questionnaire in collecting data is an appropriate method because the process of analyzing data is easier to do than the direct observation method which requires efficiency and is carried out over a long period of time.

This research utilizes questions to obtain data on the application of soft skills among prospective TVET teachers to face the challenges of the Industrial Revolution 4.0. Sampling was taken from the final year population of TVET education courses in public universities throughout Malaysia. In this study, the data was distributed virtually, and the language used was Bahasa Malaysia because the majority are Malaysian students. SPSS 20.0 (Statistical Package for Social Science 20.0) was used to obtain and analyze the data in the form of percentage, mean, frequency, and standard deviation. Table 1 shows the mean score analysis used for this study. In addition, Pearson's correlation coefficient was used to check if there was a significant relationship.

Table 1- Mean Score Analysis

Mean	Level
3.68 – 5.00	High
2.34 – 3.67	Middle
1.00 – 2.33	Low

Source: Yunos, Lai and Hamdan (2016)

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Questionnaires were distributed using Google Forms through the WhatsApp application to all respondents involved. The researcher has selected all 4th Year students who are in their final year of TVET education courses in public universities throughout Malaysia. The study population included students from the field of Construction, Electrical and Electronics, Mechanical Engineering, Life Skills, Economics or Home Science, Agricultural Science, Welding and Fabrication Metals, Creative Multimedia, Catering, Refrigeration and Air Conditioning, and General Machining. All the students have undergone teaching training and are involved in supervision by the supervising lecturer.

4. Findings

Table 2 shows the descriptive statistics of the level of knowledge of prospective teachers, namely; mean scores and standard deviations for each component of soft skills. The results show that students are skilled in teamwork with results at a relatively high level of mean score value, namely; (M = 4.45, SD = 0.36), with ethics and professional morals as their second skill with a mean score (M = 4.42, SD = 0.44). Next are continuous learning and information management skills (M = 4.41, SD = 0.35), followed by leadership skills at a moderately high level of use (M = 4.33, SD = 0.42). While critical problem-solving skills at a moderate level is lesser (M = 4.32, SD = 0.36), followed by entrepreneurial skills (M = 4.21, SD = 0.42). The item with the lowest mean score is communication skills (M = 4.08, SD = 0.31).

Table 2- Mean values of study data findings

Soft Skills (Item)	N	Mean	Std. Deviation	Min	Max
Communication	175	4.0807	0.3174	2.65	5.00
Solve problems critically	175	4.3229	0.3677	2.83	5.00
Teamwork	175	4.4567	0.3630	3.00	5.00
Continuous learning and information management	175	4.4190	0.3537	3.00	5.00
Entrepreneurship	175	4.2126	0.4243	1.80	5.00
Professional ethics and morals	175	4.4257	0.4416	1.83	5.00
Leadership	175	4.3303	0.4254	1.60	5.00
Total	175	4.32	0.38	2.38	5.00

The results of the research using Pearson Correlation in Table 3 show that there is a significant relationship between the readiness variable with the soft skills variable with a significant value, p <.05. Moreover, there is a moderately strong and positive correlation between the readiness variable with the variables of soft skills items namely communication skills p = .000, r = 0.467, critical problem-solving skills p = .000, r = 0.393, teamwork skills p = .000, r = 0.447, continuous learning and information management p = .000, r = 0.398, professional ethics and morals p = .000, r = 0.444, leadership skills p = .000, r = 0.365. Meanwhile, there was a weak and positive correlation between readiness and entrepreneurial skills with a significant value, p = .00 and a coefficient value, r = 0.270.

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Table 3 – Correlations

		Readiness
Readiness	Pearson Correlation	1
	Sig. (2-tailed)	
	N	175
Communication	Pearson Correlation	.467**
	Sig. (2-tailed)	.000
	N	175
Solve problems critically	Pearson Correlation	.393**
	Sig. (2-tailed)	.000
	N	175
Teamwork	Pearson Correlation	.447**
	Sig. (2-tailed)	.000
	N	175
Information management	Pearson Correlation	.398**
	Sig. (2-tailed)	.000
	N	175
Entrepreneurship	Pearson Correlation	.270**
	Sig. (2-tailed)	.000
	N	175
Ethics and morals	Pearson Correlation	.444**
	Sig. (2-tailed)	.000
	N	175
Leadership	Pearson Correlation	.365**
	Sig. (2-tailed)	.000
	N	175

5. Discussion

5.1. The Readiness of Prospective TVET Teachers to Meet the Challenges of the Industrial Revolution 4.0

The summary of the study shows that the level of readiness of prospective TVET teachers to face the resistance of IR 4.0 is at a high level. This is because the questions answered are all under the mean interpretation of 4.01 - 5.00 which is a high level. The results of the analysis found that almost all respondents agreed that they had heard about the Industrial Revolution 4.0 and they were ready to receive related information, showing that they were interested in the Industrial Revolution 4.0. Next, they understand the meaning of Industrial Revolution 4.0 and understand things related to Industrial Revolution 4.0 but not in-depth. In addition, respondents understand the challenges related to IR 4.0 and they are ready to go through the era of IR 4.0, but they are less ready to go through the challenges of the Industrial Revolution 4.0 in this job because they show the lowest degree of agreement. This can prove the results of a study from Ilyana and Paliza (2018) on the level of awareness of students at Kolej Komuniti Temerloh, Pahang to face the transformation of education towards the Industrial Revolution 4.0. The study found that the students have awareness in facing the transformation of education in the era of Industrial Revolution 4.0 in line with government measures such as TVET Transformation that will provide human capital for overcoming the new obstacles of Industry 4.0 and the emergence of the Digital Economy.

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Two other studies are showing that the readiness of students in facing RI 4.0 is at a moderate level, namely Kamaruddin and Che Aleha (2018) on semester six students of Institut Pendidikan Guru, Ipoh Campus and Sharita, Norfidah and Asmah (2018) for semester four students of POLIMAS. Prospective teachers are students who are pursuing a bachelor's degree in education and are required to undergo teaching training to expose them to the duties, responsibilities, and roles of a teacher in the institution. These students are culturally heritage and knowledgeable and will be educators for the future progress of the country. They have an important role to play where they are not only teaching but must also have a good and purely personal, professional, and social character. Another study by Nazrie (2018) on the awareness of lecturers of Politeknik Kuching, Sarawak on the industrial revolution 4.0 presented a moderate level. This study explains that students do not understand the method of implementation of IR 4.0 in Malaysia, but they know about Industrial Revolution 4.0. It, therefore, suggests that there should be a comprehensive understanding of Industrial Revolution 4.0 in the field of education. The method that can be used is to hold an intensive IR 4.0 workshop that emphasizes the implementation of IR 4.0 by the government so that lecturers understand the implicit and explicit implementation of IR 4.0.

5.2. Knowledge of Prospective TVET Teachers About RI 4.0 Soft Skills

The overall findings show the level of readiness of IPTA students to face the resistance of IR 4.0 at a high level. While the level of knowledge of soft skills IR 4.0 is at a moderately high level, there is a significant relationship between knowledge and readiness for IR 4.0. The study by on IPTA students illustrated the level of soft skills of IR 4.0 is at a high level (Kamaruddin et. al., 2018; Esa, Padil & Selamat, 2013; Pua, 2014). Additionally, Siti et. al. (2017) found that the level of mastery of soft skills for students majoring in Islamic studies is high, especially teamwork skills but not entrepreneurial skills. This shows that students are more comfortable working in groups because it allows them to build good relationships, work effectively and show commitment to the group as well as possess leadership characteristics. In addition, Pua (2014) showed that the soft skills of premier polytechnic students are also at a high level such as communication skills, critical problem-solving skills, and teamwork. This is further reinforced by the study of Fairuz and Farahidatul (2018) who found that readiness to face the Industrial Revolution English language performance is important for IT students. This is also concurred with Kamaruddin et. al. (2018) on students at the University of Malaya and IPG who showed that there is a significant relationship between the soft skills of Industrial Revolution 4.0 with readiness for Industrial Revolution 4.0.

In Thailand, it has targeted 10 major economic sectors towards IR 4.0 and has been supported by Ph.D. graduate researchers. Thai government policy also uses technology and innovation as tools to develop the quality of life of the people (Jones & Pimdee, 2017). Mohd Fairuz (2017) also supports that to face the challenges of the Industrial Revolution 4.0, university students need to have the courage to think outside the box and act other than routinely. Furthermore, the World Economic Forum (2016) outlined the importance of mastering the 4C element, which is one of the soft skills in public universities. Students must have soft skills to take advantage of all the opportunities available. Not only that, but the teaching staff also need to prepare themselves with all the values of soft skills because they are an example to students. Educators also need to be prepared to innovate teaching and learning.

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6. Conclusion

In the shift of Industrial Revolution 4.0 highlighted the importance of learning the humanities even to prospective engineers because students need to understand the importance of morals and ethics, especially when squeezed by the boom of the industrial revolution which the progress and morality should move in parallel. This concern was also shared by Dzulkifli (2017) through his writing, '*Revolusi Industri Ke-4: Mampukah Menginsankan Teknologi?*' concerns about the value of humanity that may decline when humans fail to humanize technology, instead 'converted' into the automated machinery that controls the world without spirit and conscience**.** The existence of the Industrial Revolution 4.0 has caused human beings to pursue speed, efficiency, speed, and intelligence and forget about humanity, concern, justice, universality, friendliness, and well-being.

This annoyance can be alleviated by the way lecturers need to do classes with the concept of active learning such as flipped classrooms, blended learning should not just talk but should be implemented in actual teaching and learning to ensure future graduates do not set aside soft skills. In conclusion, this career readiness guide can be used as a reference for students to apply career readiness more effectively and to increase their confidence to compete in the industry. For lecturers, the implementation of the learning process will have a profound effect on students. This is because it provides guidance related to the elements of career readiness based on the needs of lecturers for the marketability of students after graduation, thus helping IPTA graduates to compete in the industry with graduates from various institutions.

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Conflict of Interests

The authors declare no conflict of interest in this study.

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