ONLINE JOURNAL FOR TVET PRACTITIONERS
e-ISSN: 2289-7410

OJ-TP

Vol. 9 No. 2 (2024) 60-68
https://publisher.uthm.edu.my/ojs/index.php/oj-tp

Small Medium Industries' Non-Technical Skills Preferences in Facing Industry Revolution 4.0: A Fuzzy Delphi Technique

Sallehudin Ayub[1], Alias Masek[1]*, Saiful Hadi Masran[1]

[1] *Faculty of Technical and Vocational Education,*
Universiti Tun Hussein Onn Malaysia, Batu Pahat, Johor, 86400, MALAYSIA

*Corresponding Author: asallehudin24@gmail.com
DOI: https://doi.org/10.30880/ojtp.2024.09.02.005

Article Info

Received: Day Month Year
Accepted: Day Month Year
Available online: Day Month Year

Keywords

Non-technical skill, SME, FDM

Abstract

Small and Medium Enterprise (SME) sector plays a crucial role in boosting the country's economy. Despite their potentially small size, their impact on economic growth, job creation, and local community development is highly significant. However, SMEs often face challenges related to a lack of non-technical skills among their workforce. This study not only enhances SME's opperational efficiency, it also enhanced the workforce readiness towards Industry 4.0. Employees who posses strong non-technichal skills can adapt to new technologies and process more effectively. Therefore, this study aims to determine the priority of non-technical skills for SMEs. The study employs a two-phase research design, consisting of (1) a Systematic Literature Review (SLR) and (2) the Fuzzy Delphi Method (FDM). In Phase 1, the researcher applies the PRISMA model as a guide to conducting an SLR on 129 articles identified through the Google Scholar database. The results of the systematic literature review indicate the existence of 14 non-technical skills for SMEs in the context of Industry 4.0. The FDM is utilized to obtain expert consensus on these skills. Ten SME owners in the Batu Pahat area are selected as study participants. The FDM analysis reveals that the expert panel agrees that all the non-technical skills identified in previous studies are crucial for SMEs in Industry 4.0. Non-technical skills are prioritized for SMEs based on expert opinions. Creativity is identified as the highest-priority non-technical skill according to the SME owners' perspectives. The implications of this study serve as exposure and guidance for employers, employees, and the community regarding the importance of non-technical skills for SMEs in the current Industry 4.0 landscape.

1. Introduction

SMEs play a significant role in the economic development of the country. Despite their increasing importance in the country's economic growth, the performance of Malaysian SMEs is unsatisfactory, even though the number of entrepreneurs and SMEs has increased over time (A. Wahab et al., 2019). According to Hashim, (2017), productivity is one of the factors contributing to the unsatisfactory performance of SMEs. Based on the data released by the Department of Statistics Malaysia (2022), the Gross Domestic Product (GDP) of Malaysian SMEs increased by 1.0 percent in 2021, but at a slower pace compared to the overall Malaysian GDP, which grew by 3.1 percent. Generally, the growth of SMEs' GDP exceeds that of the overall Malaysian GDP, but since 2020, it has recorded slower growth compared to the overall Malaysian GDP. The contribution of SMEs to GDP decreased to

37.4 percent (2020: 38.1 percent) with an added value of RM 518.1 billion. Weaknesses in terms of worker skills and management are among the factors leading to a decline in productivity among SMEs.

Wahab et al. (2019) argue that a lack of human capital, especially skilled labor, is a major obstacle to business operations and growth in Malaysia. According to a study by Ali et al., (2021), weak non-technical skills are a cause of the lack of skilled human capital issues in SMEs in Malaysia. According to Awang et al., (2006), non-technical skills are generic or life skills that can be acquired outside of formal learning curricula. These skills are highly useful in various types of jobs and mastering them requires regular use and practice. Examples of non-technical skills include communication skills, critical thinking, problem-solving skills, information management skills, self-management skills, work ethics, leadership skills, and entrepreneurial skills (Hanapi & Kamis, 2017).

The weak mastery of non-technical skills among SME workers is due to a significant gap between the skills of workers and what employers are looking for in SMEs (Lian, 2017). According to Lim & Wah, (2023), the absence of non-technical abilities among students who have completed their practical programs is a major factor why most of the employers are not hired them. Lack of non-technical skills is not experienced by the graduates only, the employees who have been years in industry also got this problem. The changing job landscape, in line with the Fourth Industrial Revolution (IR4.0), has gradually replaced traditional operations in SMEs with automation-based operations. Xing and Marwala, (2017) argue that IR4.0 is a platform for society to cultivate self-potential, providing opportunities for positive change. This view contradicts Saari et al., (2021), who argue that IR4.0 has negative effects on society. This is because, in IR4.0, many people lose their jobs because they cannot adapt to the changes brought about by IR4.0. In addition to mastering the technical skills required by workers to apply the latest technologies, workers also need to master non-technical skills to enable them to adapt to dynamic changes in the work environment (Invent, 2020). Therefore, SME workers need to be aware of the non-technical skills that are a priority for SMEs and improve their mastery of these skills to enhance their performance and play a more proactive role in business success in the era of IR4.0. Recognizing the importance of mastering non-technical skills among SME workers, researchers conducted a study on non-technical skills based on the priorities of SMEs in IR4.0.

2. Literature Review

2.1 SME Employee Skills Issues

All tables should be numbered with Arabic numerals. The shortage of educated and skilled human capital is one of the major obstacles to the operations and growth of companies in Malaysia (Wahab et al., 2019). This perspective aligns with Abu et al., (2015), who state that SMEs are less efficient in their operations, and the development of their products is hindered by the low skill levels among workers. The critical nature of this issue is based on the low level of mastery of skills among both workers and management. As understood, the government also takes this issue seriously. This is evidenced by the government organizing various skill development programs for SMEs with the aim of enhancing product development, branding capabilities, market mastery, and quality improvement (Wahab et al., 2019).

SMEs should focus on training programs to enhance the skills of their workers (Anuar et al., 2016). The problem of skill levels in SMEs is partly due to a lack of training. Training is crucial for SMEs to improve the skill levels of their workers. Through training, workers will find it easier to master the skills required in the workplace. However, SMEs also need to identify the training needs of their workers to avoid causing losses to the company. Abu et al. (2015) emphasize that top leaders should provide training programs that are suitable for the needs of their staff. Therefore, SMEs cannot overlook the provision of training programs as an initiative to improve the skill levels of their workers. However, it is undeniable that many SMEs still neglect this initiative because spending money on training for employees is considered wasteful (Anuar et al., 2016).

The problem of skills in SMEs is also due to the gap between the skills possessed by workers and the skills sought by employers (Lian, 2017). Employers expect to have employees with skills that match the needs of their companies. Furthermore, most SME operations have been automated with the use of advanced machines. If we revisit the study by Wahab et al., (2021), retraining and skill enhancement must be carried out by workers in the current IR4.0 landscape. Moreover, workers must adapt to technological changes. This indicates that the current technological changes, where traditional operations used in SMEs have shifted to automation using the latest technology, demand that workers master skills based on IR4.0. Enhancing the mastery of technical and non-technical skills becomes a priority for companies so that workers can improve their ability to work in a more challenging workspace (Wahab et al., 2021).

The issue of skills in SMEs also arises due to rapid technological advancements. As discussed in the previous paragraphs, the skills gap between workers and employers is caused by the use of more advanced technology. Employers tend to use the latest technologies to facilitate their company's operations and improve performance. Therefore, employers require workers who have these technological skills. Workers in SMEs who lack skills in using these technologies will impact the performance of the SME (Prasanna et al., 2019). This viewpoint is strongly

Online Journal for TVET Practitioners Vol. 9 No. 2 (2024) 60-68

supported by Horváth & Szabó, (2019), who argue that all SME workers must enhance their skills in line with technological advancements.

2.2 Non-Technical Skills

Section headings should be left justified, bold, with the first letter capitalized and numbered consecutively, starting with the Introduction. Non-technical skills are generic or life skills that can be acquired outside formal learning curricula (Awang et al., 2006). According to Straub, (1990), non-technical skills represent common aspects of all jobs and tasks, such as following instructions, effective communication, and collaborating with others in teamwork. These skills are highly valuable in various types of jobs, and mastery of these skills requires regular use and practice. In the author's opinion, non-technical skills are an added value that workers need to have to help them adapt in the workplace. Besides technical skills, employers also seek non-technical skills in employees and job seekers. The role of non-technical skills in employability has indeed become an important aspect (Firmansyah & Soeharto, 2020).

Communication skills are among the crucial non-technical skills for SME workers. According to Hamburg (2020), communication skills are required to interact properly with the public while maintaining good eye contact. These skills also involve an individual's ability to convey ideas, listen effectively, write clearly and concisely, and work well in groups. Good communication skills help workers promote themselves or their products or services (Sousa & Wilks, 2018). Customers are more likely to be interested in purchasing products or using services when workers are adept at interacting with them. In the workplace, employees need good communication skills to deal with other colleagues. Khan et al., (2021) show that workers face challenges in their communication skills. Therefore, communication skills are a crucial skill for workers today.

Critical thinking is also one of the important non-technical skills for SMEs (Hamburg, 2020). SME workers need critical thinking to make quick decisions and solve problems in the workplace. Khan et al. (2021) argue that critical thinking is a necessary skill in the context of IR4.0. According to Saleh et al., (2022), SMEs in Malaysia are not adequately prepared for IR4.0 in terms of humanity and facilities, where their readiness level to face IR4.0 is still at a moderate level. Furthermore, critical thinking is one of the skills that SMEs need to emphasize to meet the challenges of IR4.0.

Problem-solving skills are a critical non-technical skill that needs to be categorized as a critical skill in SMEs. Most employers complain that their workers have problems with problem-solving skills (Patacsil & Tablatin, 2017). The results of the study by Sousa and Wilks, (2018) show that problem-solving skills are skills that SMEs will need. Looking back at previous studies, Hamburg, (2020) states that tasks in problem-solving include identifying and defining problems, prioritizing problems based on size, potential impact, and urgency, developing various solutions, evaluating possible solutions to problems, and deciding which is most effective, and planning and implementing solutions. In short, mastering problem-solving skills is based on an individual's ability to carry out and master these tasks.

Failure to manage and retain employees in a company leads to employees leaving the organization and carrying intellectual capabilities that can result in leakage of business information to competitors (Olander et al., 2015). This situation will have a critical impact on the organization in achieving business goals. Therefore, information management skills are required in a company to avoid such problems (Makhbul & Latif, 2020). Teamwork skills are crucial for employees in the workplace. The study by Hanapi & Kamis (2017) shows that teamwork skills are the second most important skills after work ethics from the industry's perspective. This study proves that these skills are highly emphasized in the workplace. According to Noor and Abdullah, (2020), teamwork elements are evaluated through cooperation in the team, tolerance, and contribution to the team. Therefore, workers can enhance their teamwork skills through mastery of these elements. Additionally, self-management skills are also important in the workplace (Hanapi & Kamis, 2017). This view is consistent with Patacsil and Tablatin (2017), who argue that self-management skills are highly emphasized in a company.

3. Methodology

This study employed a two-phase research design: 1) Phase 1: Systematic Literature Review (SLR), 2) Phase 2: Fuzzy Delphi Method (FDM). The study utilized SLR to develop a survey questionnaire while FDM method for the purpose of obtaining expert consensus on the items non-technical skills that are important for SMEs in IR4.0 which was developed based on the findings from the previous phase 1. The process of developing the questionnaire script is similar to constructing a regular survey script, but its uniqueness lies in its structured nature and incorporation of sources such as literature. In Phase 1, the researchers conducted an SLR to explore the non-technical skills essential for SMEs in the context of Industry 4.0 (IR4.0). Once all the skills were identified, the researchers formulated a 7-point expert survey questionnaire. Subsequently, in Phase 2, the questionnaire was distributed to 10 experts and analyzed using the Fuzzy Delphi Method (FDM).

3.1 Study Participants

Jamil et al. (2021) state that studies utilizing the Fuzzy Delphi Method (FDM) are focused on decision-making processes, explicitly indicating that the study participants are based on expert groups. Highlighting Adler & Ziglio's (1996) perspective, the suitable number of experts for the FDM method is between 10 to 15 individuals. Therefore, this study will involve 10 experts consisting of small and medium-sized enterprise (SME) owners in the Batu Pahat region. The study will apply a non-random purposive sampling method. Jamil et al. (2021) emphasize that not all respondents can be selected as study participants. Furthermore, the selection and criteria for determining study participants in FDM require them to be knowledgeable, skilled, possess high validity, and be considered experts based on previous research and literature reviews. Among the criteria set by the researchers for study participants are that the experts in this study must have at least a diploma as an academic qualification and a minimum of five years of experience in the field. The criteria for selecting these experts align with Berliner, (2004), who suggests that individuals are considered proficient in a particular field if they have more than five years of experience in that field; Gambatese et al., (2008) argue that experts must have high academic qualifications.

3.2 Instrument

The research instrument is a tool or technique used to collect, measure, and analyse data related to the study. In this study, the researcher chose to use a survey questionnaire method to gather data. The development of this research instrument is based on a systematic literature review. The survey questionnaire consists of 2 parts, namely Part A and B. Part A is the demographic section of the study participants, which includes gender, ethnicity, work experience in SMEs, and the highest level of education. The survey questionnaire method used is closed-ended, where structured questions are presented, and respondents only need to choose predefined answers. Parts B cover non-technical skills identified through the analysis of documents in the systematic literature review process. The survey questionnaire items in Parts B are measured using a 7-point Likert scale. Participants are required to indicate their level of agreement on the Likert scale, ranging from 1, indicating strongly disagree, to 7, indicating strongly agree. Table 1 shows the example of survey questionnaire from Part A.

Table 1 *Example of survey questionnaire from Part A*

Item	Level of agreement						
	1	2	3	4	5	6	7
Communication skills							
Critical thinking							

3.3 Data Analysis Based on the FDM Method

Data analysis is conducted after the survey questionnaire, which has been answered, is returned by the expert group to enable the researcher to analyse and interpret the data to answer the research questions. The researcher uses Microsoft Excel to process the collected data from the respondents. The gathered data is then analysed and interpreted to obtain accurate information that provides answers to the research questions. According to Jamil et al. (2021), there are two main aspects in the Fuzzy Delphi Method (FDM), namely fuzzy triangle numbering and fuzzy assessment processes. Fuzzy Triangle Numbering consists of the average fuzzy number values, namely m_1, m_2, and m_3, usually represented in the form (m1, m2, m3). The value m1 represents the minimum value, m2 represents a reasonable value, while the value m3 represents the maximum value. The number of stages for the fuzzy scale is an odd number. The higher the fuzzy scale, the more accurate the obtained data. Figure 1 illustrates the triangular graph against the minimum value of the triangular.

Online Journal for TVET Practitioners Vol. 9 No. 2 (2024) 60-68

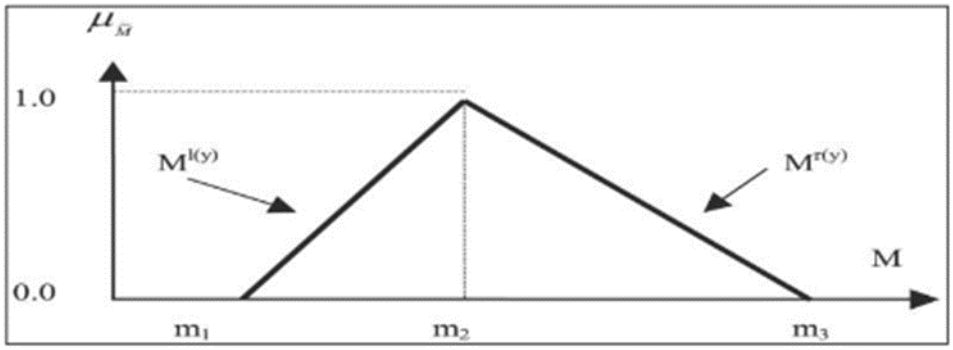

Fig. 1 *Triangular graph of mean against triangular value*

In the fuzzy triangle numbering stage, there are two conditions that must be met to determine the acceptance of a studied item by expert consensus. The first condition involves the threshold value (d), and the second condition is the percentage of expert agreement for a particular item. The value of d should be less than or equal to 0.2, while the percentage of expert consensus should be equal to or greater than 75.0%. Figure 2 illustrates the formula used to calculate the d value for each item.

$$d(m,n) = \sqrt{\frac{1}{3}\left[(m_1 - n_1)^2 + (m_2 - n_2)^2 + (m_3 - n_3)^2\right]}$$

Fig. 2 *The formula for calculating the threshold value (d)*

In this study, the researcher will use the fuzzy triangle numbering process to assess expert acceptance of important technical and non-technical skills for SMEs in the context of Industry 4.0 (IR4.0). The fuzzy assessment process refers to determining the ranking or priority for each item. The goal of this process is to assist the researcher in understanding the levels of necessity, agreement, importance, and the degree of each variable and sub-variable required in the conducted study (Jamil et al., 2021). It is also known as the fuzzy score, symbolized by A_max. There are three formulas that can be used to obtain the fuzzy score value, and the researcher can choose any of these three formulas. The three formulas in this process are as follows:

i. A_max = 1/3 * (m1 + m2 + m3)
ii. A_max = 1/4 * (m1 + 2m2 + m3)
iii. A_max = 1/6 * (m1 + 4m2 + m3)

The α-cut value is the median value between '0' and '1,' where α-cut = (0 + 1) / 2 = 0.5. If the resulting value of A_max is less than the α-cut value of 0.5, the item will be rejected because it indicates expert consensus in rejecting that item. However, if the value of A produced exceeds the α-cut value of 0.5, the item will be accepted because it indicates expert consensus in accepting that particular item. In this study, the fuzzy assessment process is used to determine the prioritized list of technical and non-technical skills according to the preferences of SMEs.

4. Results

4.1 Result Based on Systematic Literature Review

Based on the SLR, there are 14 non-technical skills essential for SMEs in the context of IR4.0. Only 28 documents were chosen for analysis out of the total of 129 related studies collected because they are related to study patterns that dominated discussions related to non-technical skills in a single research. Table 1. shows list of non-technical skills essential for SMEs in the context IR4.0.

Table 2 *List of non-technical skills essential for SMEs in the context IR4.0*

No.	Non-Technical Skills	Source
2	Critical thinking	
3	Problem solving	
4	Information management skills	
5	Teamwork	
6	Self-management skills	

7	Work ethic skills
6	Self-management skills
8	Leadership
9	Presentation skill
10	Creative
11	Safety
12	Customer service management skills
13	Skills in using social media
14	Entrepreneurship skill

4.2 Result Based on *Fuzzy* Delphi Method

Table 2 presents the findings of the expert consensus study on the important non-technical skills for SMEs in the context of Industry 4.0 (IR4.0). Referring to the table, 10 expert panels have indicated their level of agreement on 14 non-technical skills.

Table 3 *Expert consensus analysis of non-technical skills*

No.	Item	*Threshold* value, d	Percentage of Experts Group Consensus, %	Experts Consensus
1	Communication skill	0.212	90.0%	Accept
2	Critical thinking	0.238	80.0%	Accept
3	Problem solving	0.103	90.0%	Accept
4	Information management skill	0.238	80.00%	Accept
5	Teamwork	0.051	100.00%	Accept
6	Self-management skill	0.205	90.00%	Accept
7	Work ethic skill	0.205	90.00%	Accept
8	Leadership	0.094	100.00%	Accept
9	Presentation skill	0.157	90.00%	Accept
10	Creative	0.076	100.00%	Accept
11	Safety	0.082	100.00%	Accept
12	Customer service management skill	0.101	100.00%	Accept
13	Skill in using social media	0.082	100.00%	Accept
14	Entrepreneurship skill	0.082	100.00%	Accept

Based on Table 2, all non-technical skill items were agreed upon by the expert panel as important skills for SMEs in the context of Industry 4.0 (IR4.0) based on the criteria set in the FDM analysis, i.e., the construct threshold value (d construct) ≤ 0.2 and expert group consensus ≥ 75%. Table 3 shows the fuzzy score values (A) and rankings for the importance of each non-technical skill for SMEs in the context of Industry 4.0 (IR4.0) based on the level of expert consensus.

Table 4 *Ranking of non-technical skills based on fuzzy score value (A)*

No.	Item	*Fuzzy* Score *(A)*	Ranking
1	Creative	0.917	1
2	Problem solving	0.910	2
3	Customer service management skill	0.900	3

Online Journal for TVET Practitioners Vol. 9 No. 2 (2024) 60-68

4	Leadership	0.890	4
5	Safety	0.880	5
6	Entrepreneurship skill	0.880	5
7	Skill in using social media	0.880	7
8	Self-management skill	0.890	8
9	Work ethic skill	0.867	9
10	Teamwork	0.860	10
11	Presentation skill	0.807	11
12	Communication skill	0.803	12
13	Information management skill	0.800	13
14	Critical thinking	0.800	13

5. Discussion

Based on the findings of the analysis conducted, the researcher was able to observe the position of each non-technical skill item based on the agreement provided by experts. The analysis results indicate unanimous agreement among experts that all non-technical skills identified through the SLR are crucial for SMEs in Industry 4.0. According to the fuzzy score analysis (A) conducted, creativity holds the highest position, proving that SMEs prioritize these non-technical skills. SMEs require employees capable of thinking creatively to generate new ideas. According to Hamburg (2020), creative workers in SMEs are those who can solve complex problems or find interesting ways to perform tasks. Additionally, creative employees can assist SMEs in producing more appealing products that attract a larger customer base.

Next in line is problem-solving skills, which occupy the second position. Patacsil & Tablatin (2017) state that most SME workers face challenges in problem-solving skills, emphasizing the importance of these skills for SMEs in Industry 4.0. Problem-solving skills involve creativity and innovation in SMEs. Employees who can create innovative solutions to complex problems or find new ways to improve operational processes add value to the business. Thus, the development of these skills not only addresses the ability to handle existing problems but also the capacity to proactively design and implement improvements to enhance productivity, efficiency, and competitiveness in the SME market. Consequently, problem-solving skills play a critical role in maintaining and enhancing the sustainability and growth of SMEs.

Experts also agree that customer service management skills are crucial non-technical skills for SMEs in Industry 4.0. In fact, this skill ranks third in terms of expert consensus. Although the level of customer service management skills among SME workers is high, they still struggle to effectively use social media as a medium for customer interaction. On average, employees can only communicate with customers through phone calls and emails. The widespread use of social media is still approached cautiously due to the risk of exposure to criticism in open discussion spaces, such as comment sections, which can impact business reputation (Othman & Gani, 2021). This study also shows that entrepreneurship skills and leadership skills are skills that must be present among small and medium industry workers. According to Negeri et al., (2023), entrepreneurship skills and leadership skills have enormous effect towards SMEs business performance.

SMEs work environment involving many people who have their own work and expertise with the aim of increasing the operational efficiency of the industry. For sure, in today's world of work, employers interested in employees who are capable of working in team (Shillie & Nchang, 2023). This mission is involving teamwork and communication skill among the employee. They must be capable communicate with each other, sharing their opinions and motivating each other in creating effects on individual employee job performance. This study showed that teamwork placed at ten while communication skill at twelve according to expert consensus. Even though, the expert puts this skill at a level not to high, this skill still seen as an important skill in SMEs based on the literature review.

6. Conclusion

The results of expert consensus analysis on the crucial non-technical skills for SMEs in Industry 4.0 indicate that creativity is the most important non-technical skill according to SMEs' priorities. The analysis results also show that the expert group agrees that communication skills, critical thinking, problem-solving skills, information management skills, teamwork skills, self-management skills, work ethics, leadership skills, presentation skills, creativity, safety, customer service management skills, social media usage skills, and entrepreneurial skills are important non-technical skills for SMEs in Industry 4.0. While technical skills are crucial in the era of Industry 4.0, the importance of non-technical skills cannot be overlooked by SMEs. Skills such as leadership, communication, and the ability to collaborate are key factors in ensuring business success in this dynamic environment. Leadership

skills help SME workers tackle complex challenges and make strategic decisions. Effective communication also plays a crucial role in building good relationships with customers, suppliers, and employees. In the context of Industry 4.0, proficiency in building social networks and generating business opportunities through social media and digital marketing has become a highly valuable non-technical skill. Additionally, self-management skills, creativity, and critical thinking are crucial aspects for small businesses to continue evolving. Workers with these skills can support innovation, exploit new opportunities, and address challenges effectively. By focusing on building both technical and non-technical skills, SMEs can create a dynamic and responsive work environment to adapt to changes. This not only provides a competitive advantage but also helps businesses succeed in the era of Industry 4.0.

Online License Transfer

Acknowledgement

Thanks to all research members and personnel for continuous effort in completing and contributing input for this research.

Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

Author Contribution

The authors confirm that Sallehudin Ayub, Alias Masek and Saiful Hadi Masran have equally contributed to this paper. All authors reviewed the results and approved the final version of the manuscript.

References

Abu, N. H., Md Deros, B., & Mansor, M. F. (2015). Halatuju dan permasalahan pelaksanaan proses pra pembangunan produk baharu: Perspektif PKS Malaysia. *Jurnal Teknologi*, *77*(4), 191–197.

Ali, G., Jaaffar, A. R., & Ali, J. (2021). STEM education in Malaysia: Fulfilling SMEs' expectation. In *Modeling economic growth in contemporary Malaysia* (pp. 43–57). Emerald Publishing Limited.

Anuar, A. R., Mansor, W. N. J. W., & Din, B. H. (2016). Cabaran meningkatkan produktiviti syarikat berskala kecil dan sederhana di Malaysia: Kajian mengenai isu kemahiran buruh (Enhancing productivity of Malaysia's Small and Medium Scale Enterprises: A study of the labour skills issue). *Geografia*, *12*(4).

Awang, Z., Abidin, H. Z., Arshad, M. R., Habil, H., & Yahya, A. S. (2006). Non-technical skills for engineers in the 21st century: a basis for developing a guideline. *Project Report. Universiti Teknologi Malaysia*.

Berliner, D. C. (2004). Describing the behavior and documenting the accomplishments of expert teachers. *Bulletin of Science, Technology & Society*, *24*(3), 200–212.

Firmansyah, A., & Soeharto, S. (2020). Implementation of soft skills on Automotive Engineering practicum of state vocational high schools in West Lombok Regency. *Jurnal Pendidikan Vokasi*, *10*(2), 214–224.

Gambatese, J. A., Behm, M., & Rajendran, S. (2008). Design's role in construction accident causality and prevention: Perspectives from an expert panel. *Safety Science*, *46*(4), 675–691.

Hamburg, I. (2020). *Facilitating Lifelong Learning in SMEs Towards SDG4*. *7*(9), 262–272.

Hanapi, Z., & Kamis, A. (2017). Analisis Perbandingan di Antara Industri, Pensyarah dan Graduan Terhadap Kepentingan Kemahiran Teknikal dan Kemahiran Employability yang Perlu Dikuasai oleh Graduan Bidang Elektrik di Kolej Komuniti. *Sains Humanika*, *9*(1–5).

Hashim, H., & Koperasi, M. (2017). *Koperasi pks*. 64–71.

Horváth, D., & Szabó, R. Z. (2019). Technological Forecasting & Social Change Driving forces and barriers of Industry 4 . 0 : Do multinational and small and medium-sized companies have equal opportunities ? *Technological Forecasting & Social Change*, *146*(May), 119–132. https://doi.org/10.1016/j.techfore.2019.05.021

Invent, C. (2020). *Supporting specialised skills development: big data, Internet of things and cybersecurity for SMEs: executive summary.*

Khan, N., Khan, S., Tan, B. C., & Loon, C. H. (2021). Driving digital competency model towards IR 4.0 in Malaysia.

Journal of Physics: Conference Series, *1793*(1), 12049.
Lian, C. S. (2017). *Kemahiran Generik dan Komitmen Kerja Bagi Pekerja di Industri Kecil Sederhana*.
Lim, S. L., & Wah, T. B. (2023). The importance of non-technical skills for graduates' employability during and after covid-19 pandemic. *Global Business Management Review (GBMR)*, *15*(2), 60–76.
Mohamed Makhbul, Z. K., & Abd Latif, M. N. (2020). Mengurus Modal Insan dalam Industri 4.0 Ke Arah Kecemerlangan Negara. *Journal of Social Sciences and Humanities*, *16*(6), 0–13.
Negeri, D. D., Wakjira, G. G., & Kant, S. (2023). Is Strategic Leadership having a mediating role in Ethiopia's SMEs sector when it comes to Entrepreneurial Skill and Motivation? A Multivariate Investigation. *IRASD Journal of Management*, *5*(2), 74–86.
Noor, M., & Abdullah, N. (2020). Persepsi Majikan Terhadap Pelajar Kolej Komuniti Jempol semasa Menjalani Latihan Industri [Employer Perception of Kolej Komuniti Jempol Students during Industrial Training]. *BITARA International Journal of Civilizational Studies and Human Sciences (e-ISSN: 2600-9080)*, *3*(4), 26–35.
Olander, H., Hurmelinna-Laukkanen, P., & Heilmann, P. (2015). Human resources–strength and weakness in protection of intellectual capital. *Journal of Intellectual Capital*, *16*(4), 742–762.
Patacsil, F. F., & Tablatin, C. L. S. (2017). Exploring the importance of soft and hard skills as perceived by IT internship students and industry: A gap analysis. *Journal of Technology and Science Education*, *7*(3), 347–368.
Prasanna, R., Jayasundara, J., Kumara, S., Gamage, N., & Ekanayake, E. M. S. (2019). *Sustainability of SMEs in the Competition : A Systemic Review on Technological Challenges and SME Performance*. 1–18.
Saari, A., Rasul, M. S., Yasin, R. M., Rauf, R. A. A., Ashari, Z. H. M., & Pranita, D. (2021). Skills sets for workforce in the 4th industrial revolution: Expectation from authorities and industrial players. *Journal of Technical Education and Training*, *13*(2), 1–9.
Saleh, N. I., Ijab, M. T., & Hashim, N. (2022). A Review on Industrial Revolution 4.0 (IR4. 0) Readiness Among Industry Players. *International Conference on Computer, Information Technology and Intelligent Computing (CITIC 2022)*, 216–231.
Shillie, P. N., & Nchang, N. N. (2023). Influence of Employee Soft Skills on Job Performance: Evidence from SMEs in Cameroon. *Business Perspective Review*, *5*(1), 1–11.
Sousa, M. J., & Wilks, D. (2018). Sustainable skills for the world of work in the digital age. *Systems Research and Behavioral Science*, *35*(4), 399–405.
Straub, R. (1990). Engineering Students Perceptions of Non-Technical Employment Qualities. *Journal of Cooperative Education*, *27*(1), 45–55.
Wahab, A., Abdul Wahab, D., & Yaakub, M. T. (2019). Cabaran-Cabaran Perusahaan Kecil Dan Sederhana di Malaysia Pasca Merdeka. *Sains Insani*, *4*(2), 65–75. https://doi.org/10.33102/jsi2019.4.2.08
Wahab, S. N., Rajendran, S. D., & Yeap, S. P. (2021). Upskilling and reskilling requirement in logistics and supply chain industry for the fourth industrial revolution. *LogForum*, *17*(3), 399–410.
Xing, B., & Marwala, T. (2017). Implications of the fourth industrial age on higher education. *ArXiv Preprint ArXiv:1703.09643*.