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21st Century Skills' Dimension on Graduate Employability Towards Industrial Revolution 4.0: Systematic Literature Review

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Abstract - This paper conducts a systematic literature review to identify, analyze, and summarize how the 21st Century Skills' Dimensions affect graduate employability within the framework of the Industrial Revolution 4.0. The review involved searching through accessible online databases like Google Scholar, Emerald Insight and ScienceDirect. The criteria were: (i) Publication dates from 2019 to 2025 and (ii) Articles or journals pertinent to the research domain. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow chart was employed to guide and report the narrative synthesis and systematic reviews according to the selected reporting items. Several critical dimensions of 21st Century Skills can improve graduates' employability and help them thrive in the job market. These include critical thinking and problem-solving, digital competency and AI literacy, collaboration and communication, adaptability and lifelong learning, entrepreneurial skills, innovation and creativity, as well as self-motivation and leadership. While this research focuses on 21st Century Skills and graduate employability, other subjects and criteria should also be considered in the broader discussion of graduate employability. Mastery of these skills is crucial for graduates to effectively navigate their educational journeys and prepare for the workforce while enhancing their social engagement. The effective development of these 21st-century skills can significantly enhance individual well-being and promote the growth of social and emotional abilities. As a result, graduates well-versed in a comprehensive set of 21st-century skills will be better equipped to tackle job market challenges, thus increasing their chances of securing employment.

Keywords**:** *21st Century Skills, Graduate Employability, Industrial Revolution 4.0, Job Market*

1. Introduction

In the 21st century, the growth of higher education and graduates' career opportunities are closely linked to the knowledge and skills acquired and the capacity to meet the demands of today's job market, which is heavily shaped by economic, social, and competitive influences (Mohd Izwan et al., 2016). Higher education encompasses a foundational curriculum designed to provide graduates with tertiary-level knowledge alongside skill development over a set timeframe, preparing them to address the current job market's requirements.

The job market's demand during the 4.0 Industrial Revolution is constantly evolving. As noted in (Institut Penyelidikan Pendidikan Tinggi Negara (IPPTN), 2003; Ishak et al., 2008; Ismail, 2012; Mohd Izwan et al., 2016), graduates lack the necessary knowledge and skills to meet the current job market's needs. Consequently, graduates must develop a variety of 21st-century skills to navigate this challenging landscape, with the support of higher education institutions. These institutions must take proactive steps and fulfill their roles to ensure graduates are well-informed about the job market conditions while equipping them with relevant 21st-century skills through a curriculum that aligns with industry demands. Mastering 21st-century skills is vital for enhancing graduates' employability in today's highly competitive and innovative job market.

The essential skills consist of critical thinking, digital literacy, collaboration, communication, innovation, and more, all classified as 21st-century skills. These abilities not only enhance graduates' employability but also prepare them to adapt and compete effectively in an evolving technological, economic, and social landscape. As

highlighted in (Institut Penyelidikan Pendidikan Tinggi Negara (IPPTN), 2003; Kementerian Pengajian Tinggi Malaysia, 2012; Mohd Izwan et al., 2016), industries and the job market demand language skills, communication skills, critical thinking skills, management skills, and proficiency in information and communication technology. Additionally, graduates' capacity to take risks, identify opportunities, and tackle challenges signifies a critical aspect of developing proactive and competitive individuals.

A literature review highlights a disconnect between the skills that graduates have and what employers expect (Tushar & Sooraksa, 2023). Graduates who possess 21st-century skills will find themselves more competitive in the job market, allowing them to adapt to complex and technologically advanced work environments swiftly. Thus, this study examines the identified list of 21st-century skills, which can effectively address this gap.

2. RESEARCH METHODOLOGY

This study employs a descriptive methodology, incorporating a systematic literature review. Key search engines, including Google Scholar, Emerald Insight, and ScienceDirect, are utilized to locate articles and journals published between 2019 and 2025. This method holds significant promise for producing genuine and transparent outcomes while emphasizing the importance of empirical evidence (Khairi et al., 2020).

This study employs the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) to ensure comprehensive, clear, and precise reporting, meeting all established criteria. Furthermore, the PRISMA framework enhances the quality of reporting by facilitating a thorough evaluation of systematic literature reviews, assisting reviewers and editors in assessing systematic reviews, and guiding authors in improving their reporting practices.

The PRISMA model consists of four key phases: identification, screening, eligibility, and inclusion. This structured approach ensures that only articles meeting the specified criteria are examined in the systematic literature review, thereby improving the quality and accuracy of the research outcomes. The flow process outlined in the PRISMA model statement aids the study in developing a systematic search method (Ghani et al., 2021; Moher et al., 2015). The PRISMA model has also been used to produce a reliable, accurate, and systematic overview of the study (Gillath & Karantzas, 2019).

2.1. Identification

The first step involves identifying all possible studies through database searches. For this research, we utilized the Google Scholar, Emerald Insight, and ScienceDirect databases to locate relevant articles and journals on the topic. The materials include content in both Malay and English. The keywords include "21st century skills", "graduate employability", and "4.0 Industrial Revolution". The results show that 271 articles and journals were found, as shown in Figure 1.

2.2. Screening

The researcher selected articles and journals based solely on established criteria. These articles must pertain to 21st-century skills and graduate employability within the framework of Industry 4.0. During this screening phase, any duplicate articles or journals found in all the databases will be removed. The analysis involves reviewing both the titles and abstracts that are closely aligned with the research topic. At this screening stage, 152 articles and journals were chosen.

2.3. Eligibility

Seventy-five articles were re-screened and re-evaluated through a detailed reading of their title and abstracts. Concurrently, the methodology, findings, and discussions were thoroughly analyzed and examined. This ensured that the selected articles and journals were consistent and met the research objectives. As a result, 37 articles were eliminated because they did not adequately address 21st-century skills related to graduate employability in the context of the 4.0 industrial revolution. Furthermore, some articles were discarded due to unclear discussions in the findings section, while others focused primarily on model development.

2.4. Inclusion

Ultimately, 30 articles met the research's selection criteria and were chosen for complete analysis at this stage (Table 1).

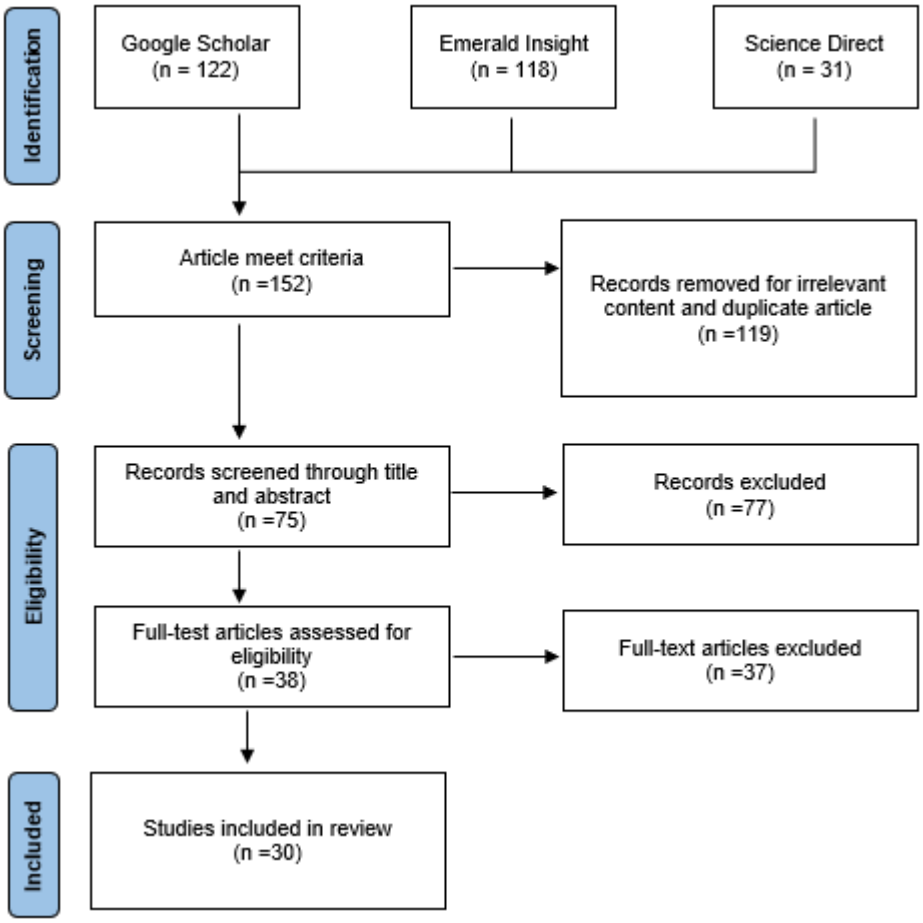

Fig.1 PRISMA Flow Chart

Table 1 List of Selected Articles

#	Author	Critical Dimensions of 21st Century Skills Discussed in Their Study					
		Critical Thinking & Problem Solving	Digital Competency & Artificial Intelligence (AI) Literacy	Collaboration & Communication	Adaptability & Lifelong Learning	Entrepreneurial, Innovation, and Creativity	Self-Motivation & Leadership
1	Abelha et al. (2020)	x			x		
2	Aboderin & Havenga (2024)					x	x

3	Al-Shehab et al. (2021)		x				x
4	Amarathunga et al. (2024)			x	x		x
5	Birru (2024)			x			x
6	C Ah Gang et al. (2020)	x		x		x	
7	Fathima et al. (2022)					x	
8	Hammer & Karmakar (2021)	x	x	x	x	x	x
9	Hizam-Hanafiah et al. (2020)	x	x	x	x		
10	Ishamuddin Mustapha et al. (2023)				x	x	x
11	Kumar (2019)	x	x			x	x
12	Li (2024)	x	x	x	x	x	x
13	Madhavan et al. (2022)	x	x	x	x	x	
14	Mahmud & Wong (2022)	x			x		
15	Manda & Ben Dhaou (2019)				x		
16	Marguerita & Anne (2021)	x	x		x	x	x
17	McGunagle & Zizka (2020)	x					x
18	Mohamad et al. (2024)			x			
19	Mulyono et al. (2023)		x				
20	Nandeesh et al. (2021)		x	x	x		x
21	Ping Yong & Ling (2023)			x			
22	Rakowska & de Juana-Espinosa (2021)	x		x			
23	Razalli et al. (2025)		x				x

24	Saleem et al. (2024)	x			x		
25	Satpathy et al. (2020)	x	x	x			x
26	Shazaitul Azreen Rodzalan et al. (2022)	x	x	x	x	x	x
27	Smith (2023)	x					
28	Tushar & Sooraksa (2023)	x		x	x		x
29	Vargas-Saritama et al. (2024)	x		x		x	x
30	Yeoh et al. (2024)		x		x	x	

3. STUDY FINDINGS AND DISCUSSION

In the era of Industrial Revolution 4.0, graduates must master 21st-century skills to improve their employability. Research Mahmud & Wong (2022) indicates that many institutions are now incorporating these skills into their curriculum in response to the demands of our rapidly evolving world, preparing graduates for workplace success and a lifelong career journey. The various dimensions of 21st-century skills are crucial for thriving in an increasingly competitive job market. According to Smith (2023), essential competencies such as critical thinking, problem-solving, collaboration, creativity, and digital literacy are key skills that contribute to success in various career paths. This study also shows that 21st-century skills include critical thinking and problem solving, digital competency and artificial intelligence (AI) literacy, collaboration and communication, adaptability and lifelong learning, entrepreneurial skills, innovation and creativity, as well as self-motivation and leadership. A literature review utilizing the PRISMA flow chart identifies the involved dimensions as follows:

3.1. Critical Thinking & Problem Solving

In the age of the 4.0 industrial revolution, having skills relevant to the 21st-century workforce, especially critical thinking and problem-solving, is essential for enhancing graduates' employability. Critical thinking involves evaluating information and making decisions based on detailed analysis. Graduates who possess critical thinking skills play a vital role in effective decision-making in organizations. As highlighted in Aboderin & Havenga (2024), critical thinking skills are essential for meeting the future demands of the 4.0 industrial revolution. Problem-solving entails identifying challenges, analyzing related factors, and finding and applying the most effective and innovative solutions. Research shows that employers place a high value on problem-solving skills in graduates. Individuals who troubleshoot efficiently are more equipped to handle the complexities of today's job market. According to Mahmud & Wong (2022), critical thinking skills can emerge from problem-solving experiences and help cultivate creative thinking abilities. Graduates who can perform thorough analyses, pinpoint root causes of challenges, and develop and apply innovative solutions will excel in the dynamic and competitive workplace (Abelha et al., 2020; Saleem et al., 2024; Tushar & Sooraksa, 2023). These skills are becoming increasingly crucial as many routine tasks become automated or enhanced through artificial intelligence, while the need for higher-order thinking skills (HOTS) persists (Hammer & Karmakar, 2021; Marguerita & Anne, 2021). Moreover, graduates must acquire the ability to make data-driven decisions, evaluate information from various sources critically, and adapt flexibly to new challenges (Kumar, 2019; Li, 2024). In this context, the emphasis on graduates' employability for the 4.0 industrial revolution underscores the need for analytical skills, strategic problem-solving, and effective utilization of collected data (Hizam-Hanafiah et al., 2020; Shazaitul Azreen Rodzalan et al., 2022).

In contrast, graduates' participation in problem-based learning, collaborative learning, and industrial training is crucial for developing critical thinking and problem-solving skills (Smith, 2023; Vargas-Saritama et al., 2024). Madhavan et al., (2022) & Satpathy et al., (2020) claim that nurturing creative problem-solving typically promotes innovation in both organizational and educational settings environments. From the perspective of employers, the ability to pinpoint issues, evaluate situations, and proactively address problems is vital when hiring new employees (McGunagle & Zizka, 2020; Rakowska & de Juana-Espinosa, 2021). Moreover, a comprehensive literature review and bibliometric analysis of current research reveal that these skills are crucial and must be prioritized to enhance graduates' global competencies, which are essential for succeeding in the fast-evolving and demanding job market of the 21st century (Saleem et al., 2024). Therefore, higher education institutions must develop a solid framework focused on practical teaching strategies to enhance 21st-century skills among graduates.

3.2. Digital Competency & Artificial Intelligence (AI) Literacy

Digital competency and AI literacy significantly enhance graduate employability by enabling adaptation to digital automation, data analysis, and digital transformation. Simultaneously, digital literacy can boost productivity. Graduates equipped with these technological advancements are more proficient in problem-solving, meeting the demands of modern industries, which enhances their competitiveness in the job market. This is highlighted in (Razalli et al., 2025), where these two components are recognized as crucial for improving graduate employability. It is increasingly evident that digital competency and AI literacy are essential for increasing employability potential among graduates in the context of the 4.0 industrial revolution. Research indicates that graduates proficient in digital technologies like automation systems, artificial intelligence integration, big data analytics, IoT, cloud computing, and digital collaborative tools have a greater likelihood of securing jobs in high-tech, industrial sectors (Hizam-Hanafiah et al., 2020; Li, 2024; Madhavan et al., 2022; Shazaitul Azreen Rodzalan et al., 2022). Furthermore, the capacity to effectively use virtual learning platforms, including Learning Management Systems (LMS), Massive Open Online Courses (MOOCs), webinars, and corporate training software, has been demonstrated to enhance employability rates among graduates (Mulyono et al., 2023; Nandeesh et al., 2021). Additionally, understanding cybersecurity issues, digital ethics, and social responsibility is vital and should be integrated into the development of digital competency and AI literacy (Marguerita & Anne, 2021; Razalli et al., 2025).

Additionally, AI literacy is recognized as a vital skill for ensuring career sustainability across various sectors in the future. Graduates are encouraged to develop fundamental programming skills, logical reasoning, algorithmic thinking, and a solid understanding of intelligent systems, including automation technologies. These skills are crucial for success in the ongoing digital and industrial transformation impacting industries such as banking, information technology, education, and management (Hammer & Karmakar, 2021; Kumar, 2019; Yeoh et al., 2024). Higher education institutions play a significant role in crafting a curriculum that meets industry needs by emphasizing practical technology-enhanced learning (TEL) through a continuous reskilling and upskilling approach (Al-Shehab et al., 2021; Hizam-Hanafiah et al., 2020; Satpathy et al., 2020). Therefore, proficiency in digital competency and AI literacy not only enhances graduates' employability but also serves as a crucial driver for transformation and innovation in shaping the future workforce.

3.3. Collaboration & Communication

In contemporary work culture, graduates need to collaborate effectively within diverse teams and contribute to shared goals. A graduate who engages successfully with peers from various backgrounds and areas of expertise demonstrates adaptability and openness, which employers highly value. Additionally, strong communication skills involve clearly and effectively expressing ideas and information, whether in spoken or written form, across different contexts and audiences.

Employers greatly value graduates who possess a strong set of communication skills to enhance the workplace. A graduate who engages with colleagues from diverse backgrounds demonstrates the openness and adaptability that employers highly desire. These two aspects of workplace competencies are essential to employers. The ability to collaborate effectively and interact positively with customers is a key element that graduates can offer,

leveraging their communication skills to enhance their value in the workplace. As noted in McGunagle & Zizka (2020), collaboration and communication rank among the top five skills, alongside self-motivation, problem-solving, and proactivity. Mastering these skills will foster teamwork within global organizations. These skills have been recognized as pivotal in enhancing a graduate's employability amid the 4.0 industrial revolution. Graduates must be adept at working in collaborative environments that are multidisciplinary, culturally diverse, digital-focused, and aligned with current technological trends that constantly evolve (Amarathunga et al., 2024; Mohamad et al., 2024; Tushar & Sooraksa, 2023; Vargas-Saritama et al., 2024). Research indicates that effective communication, whether written or verbal, is crucial for conveying both technical and non-technical information across various audiences (Ping Yong & Ling, 2023; Rakowska & de Juana-Espinosa, 2021; Satpathy et al., 2020; Shazaitul Azreen Rodzalan et al., 2022).

Currently, the ability to communicate digitally is increasingly important in the workforce. Graduates should hone their professional communication skills using virtual platforms like Zoom, Slack, and Microsoft Teams, while being capable of crafting clear messages and emails suitable for a digitally equipped workplace (Hizam-Hanafiah et al., 2020; Li, 2024; Madhavan et al., 2022; Nandeesh et al., 2021). The experience gained during industrial training is crucial for developing these skills as it exposes graduates to a real work environment that demands strong interpersonal and collaborative abilities in various situations (Birru, 2024). Therefore, higher education institutions bear the responsibility of designing a curriculum that focuses on enhancing collaboration and communication skills, in line with evolving work structures, technology, and global demands (Hammer & Karmakar, 2021; Ping Yong & Ling, 2023; Satpathy et al., 2020). Additionally, they should offer initiatives to organize programs at the institutional level that promote and develop collaborative and communication skills among graduates.

3.4. Adaptability & Lifelong Learning

Adaptability refers to an individual's capacity to adjust effectively to changes within their workplace environment. Graduates who exhibit flexibility and can navigate quickly through the evolving job market become valuable assets to their organizations. This is supported by (Tushar & Sooraksa, 2023), which indicates that problem-solving communication, teamwork, adaptability, and lifelong learning are consistently recognized as essential skills. In the context of the 4.0 Industrial Revolution, adaptability and lifelong learning are particularly crucial in enhancing graduates' employability. The ability to respond to technological innovations, shifting organizational structures, and the dynamic demand of the global workforce reflects an urgent necessity (Abelha et al., 2020; Amarathunga et al., 2024; Ishamuddin Mustapha et al., 2023; Manda & Ben Dhaou, 2019; Saleem et al., 2024). Research conducted by Madhavan et al. (2022) emphasizes that graduates with high adaptability can successfully address the challenges brought about by automation and innovation, including the rapid changes in digital technology and organizational requirements. Furthermore, flexibility enables graduates to actively contribute to organizational innovation and meet the evolving industrial needs (Hizam-Hanafiah et al., 2020; Yeoh et al., 2024). Moreover, practical industrial training greatly improves graduates' ability to adjust to the ever-evolving work environment, while Shazaitul Azreen Rodzalan et al. (2022) stress that self-directed learning, time management, and openness to acquiring new knowledge are essential characteristics of adaptability in graduates.

Moreover, lifelong learning has become a cornerstone in shaping the culture of the future workforce, ensuring a preparedness for ongoing reskilling and upskilling (Hizam-Hanafiah et al., 2020; Li, 2024; Nandeesh et al., 2021). Graduates are not only receptive to this new learning culture but are also adept at recognizing their self-management skill enhancement needs through both digital and non-formal learning methods (Hammer & Karmakar, 2021; Mahmud & Wong, 2022; Marguerita & Anne, 2021). The focus on learnability, as explored in the research by Nandeesh et al. (2021), illustrates an individual's ability to independently acquire, adapt, and apply new knowledge in a personalized manner within a competitive and ever-evolving work environment. Further research by Yeoh et al. (2024) and Saleem et al. (2024) underscores the critical role of higher education institutions in fostering a culture of continuous learning, intellectual resilience, and flexible thinking, preparing graduates to meet the demands of the 4.0 Industrial Revolution both competitively and dynamically.

3.5. Entrepreneurial, Innovation, and Creativity

Introducing innovative ideas, products, and solution processes will enable graduates to adapt to constant industry changes while meeting employers' needs and demands. The ability to think creatively and develop innovative skills in design is essential in today's competitive job market. Graduates who are innovative and creative can contribute fresh ideas to facilitate organizational growth. Entrepreneurship is intrinsically linked to innovation and creativity; thus, these three components are vital for enhancing graduates' employability, particularly considering the 4.0 industrial revolution. Today's graduates should not be restricted to technical skills; they also need creative thinking, proactivity, self-initiative, and the ability to initiate and implement new ideas efficiently (Aboderin & Havenga, 2024; Fathima et al., 2022). In this dynamic and competitive job landscape, graduates capable of identifying opportunities and presenting innovative solutions will have a competitive edge over those who do not possess these skills (Shazaitul Azreen Rodzalan et al., 2022; Vargas-Saritama et al., 2024). Furthermore, an entrepreneurial mindset, which includes self-leadership and the ability to take calculated risks while identifying and capitalizing on opportunities in the digital marketplace, is increasingly essential for graduates, especially in the context of flexible work and the growing gig economy (Hammer & Karmakar, 2021; Li, 2024). This is supported by research from Yeoh et al. (2024), which highlights the connection between 21st-century skills and readiness for employment, particularly regarding the innovation and creativity dimensions of graduate employability within the framework of the 4.0 Industrial Revolution.

Conversely, research by Kumar (2019) and Madhavan et al. (2022) indicates that higher education institutions incorporating technological advancements, such as artificial intelligence (AI) and innovative teaching methods, will produce graduates capable of successfully competing in the global workforce. The COVID-19 pandemic has also fueled the adoption of open innovation among small and medium enterprises (SMEs), necessitating that graduates possess open-minded thinking, collaborate across disciplines, and contribute meaningfully to creating new value (Madhavan et al., 2022). In this context, the ability of individuals to partake in innovative design by continuously developing and generating new ideas remains irreplaceable by AI technology (Marguerita & Anne, 2021). Therefore, the capacity for innovation and creative thinking is not merely an added value; it is a fundamental skill that graduates must develop to adapt to the dynamic, high-tech job market (Aboderin & Havenga, 2024; Ishamuddin Mustapha et al., 2023; Li, 2024).

3.6. Self-Motivation & Leadership

Self-motivation and leadership represent essential 21st-century skills that significantly boost graduates' employability, particularly amidst the swiftly evolving workforce spurred by the Fourth Industrial Revolution (Amarathunga et al., 2024; Tushar & Sooraksa, 2023). Leadership encompasses the ability to guide, make informed decisions, and inspire collective action toward common objectives, integrating various components such as motivating and influencing others to achieve shared goals. Graduates equipped with leadership skills are poised to assume greater responsibilities within their organizations in the future. On the other hand, intrinsically motivated graduates can engage in self-directed learning, efficiently manage their time, and demonstrate initiative without needing constant oversight (Birru, 2024; Ishamuddin Mustapha et al., 2023; Nandeesh et al., 2021). In a high-tech and digitalized work environment, the graduates referred to as employees must adeptly navigate their responsibilities and proactively address problems (Al-Shehab et al., 2021; McGunagle & Zizka, 2020; Satpathy et al., 2020). Effective self-management and self-motivation extend beyond personal skills; they are closely intertwined with a strong work ethic, adaptability, and social competence, all of which are crucial for career success (Li, 2024; Marguerita & Anne, 2021; Shazaitul Azreen Rodzalan et al., 2022). A solid foundation in ethical principles and professional behavior is one of the key competencies that employers actively seek.

Besides that, effective leadership significantly aids graduates in successfully adapting to changing job demands, helping them stand out in the workplace. Graduates who can lead teams, assume responsibility, and navigate stress and organizational changes possess a competitive edge in today's work culture (Aboderin & Havenga, 2024; Kumar, 2019; Vargas-Saritama et al., 2024). In an environment increasingly reliant on automation and artificial intelligence (AI), essential skills such as empathy, interpersonal communication, and leadership cannot be replaced by machines (Hammer & Karmakar, 2021; Marguerita & Anne, 2021). Higher education institutions

are encouraged to embed leadership into the curriculum through co-curricular activities, industrial training, and personality development programs (Razalli et al., 2025). Moreover, self-motivation serves as the foundation for lifelong learning and innovation, empowering graduates to remain relevant and competitive in the future workforce landscape (Hizam-Hanafiah et al., 2020; Ishamuddin Mustapha et al., 2023; Nandeesh et al., 2021).

4. CONCLUSION

This study indicates that empowering 21st-century skills is essential for boosting graduate employability in the context of Industrial Revolution 4.0. Graduates equipped with critical thinking and problem-solving capabilities can effectively navigate their environment and address complex challenges, particularly in today's dynamic workplace. Additionally, digital competency and AI literacy enable graduates to adapt adeptly to increasing automation and innovative technologies. Furthermore, collaboration and communication skills foster successful teamwork interactions, while adaptability and a commitment to lifelong learning keep graduates aligned with the evolving needs of modern industries. Moreover, skills such as innovation, creativity, self-motivation, and leadership are crucial in the transformative and technologically advanced landscape that contemporary workplaces demand. By mastering these skills, graduates will be better equipped and more confident in meeting industry expectations, thereby enhancing their global competitiveness. Research findings highlight the pressing need for higher education institutions to incorporate 21st-century skills into their curricula, establishing a strategic foundation for developing future human capital.

Today, the success of graduate's hinges not solely on academic performance; they are increasingly expected to adapt swiftly, demonstrate competitiveness, work independently, and assume leadership roles while effectively navigating dynamic and challenging environments. The research conducted by C Ah Gang et al. (2020) highlights four crucial workforce-related skills—communication, critical thinking, creativity, and collaboration, which are underscored in the context of the 4.0 industrial revolution from both graduates' and employers' perspectives. Consequently, all stakeholders, including higher education institutions and industries, must collaborate to foster the development of these competencies, ensuring that future graduates are not only relevant but also capable of advancing the nation's progress in an increasingly intricate and challenging technological landscape (Aboderin & Havenga, 2024; Amarathunga et al., 2024; Li, 2024; Nandeesh et al., 2021). Ultimately, effectively aligning higher education curricula with industry requirements will augment graduates' abilities to tackle the complexities of the digital age while achieving optimal results. This systematic literature review illustrates that the employability of graduates in the 4.0 industrial revolution is closely tied to their mastery of 21st-century skills, which include technology and digital literacy, interdisciplinary communication and collaboration, critical thinking and creative problem-solving, lifelong learning, and particularly, self-motivation and leadership. Overall, this study provides important insights for graduates to better equip themselves with 21st-century skills, which can catalyze their success in today's challenging, competitive, and ever-changing job market.

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