



The Role of 21st Century Skills in Undergraduate Employability: An Investigation of Students' and Employers' Perceptions in Indigenous Related Disciplines

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ABSTRACT

The rapid growth of technology industries has led to a demand for new skill sets, but education and job training have struggled to keep up, creating a skills gap. To address this, universities must focus on developing 21st-century skills to better prepare students for the evolving workforce. This study aims to investigate the critical role that 21st-century skills play in improving undergraduate students' employability. This study used a quantitative research method. Data for the structural questionnaire were gathered through social media platforms such as Instagram, WhatsApp, and Telegram. The study used a multi-stage sampling technique, beginning with purposive sampling to select 61 employers from various indigenous-related institutions. In the second stage, 108 second-year undergraduates were chosen through simple random sampling to ensure a representative student sample of Gampaha Wickramarachchi University of Indigenous Medicine. Descriptive analysis was the data analysis method. The findings illuminate that the most important 21st century employability skills are teamwork, communication, and interpersonal skills. Additionally, data literacy has come to be recognized as a critical skill for success in the modern workplace. Overall, the study shows a discrepancy between the competencies employers demand and the skills taught in universities highlighting the significance of incorporating these competencies into curricula to improve employability. Furthermore, to prepare students for success in a workforce that is changing quickly, it will be crucial for educators to continue their professional development and to support lifelong learning. Moreover, university courses would need to be updated to better reflect the changing needs of the labor market.

1. Introduction

For recent graduates, skills like employability are extremely important because they are essential requirements to meet the changing demands of the job market (Pellizzari et al., 2015; Bejakovic & Mrnjavac, 2020). Historically, the U.S. Department of Labor endorsed three competency categories, comprising work maturity skills, fundamental educational proficiencies, and occupation-specific expertise, under the Job Training Partnership Act (JTPA) programs, aptly catering to the twentieth-century job market (Bhaerman & Spill, 1988). Back then, possessing occupation-specific skills and a strong academic background sufficed for graduates to enter the workforce seamlessly.

However, as the late twentieth century witnessed the rapid ascent of technological advancements, the criteria for selecting employees underwent a significant transformation (Griffin & Care, 2014). Furthermore, contemporary employers exhibit a notable preference for individuals equipped with 21st-century skills, encompassing traits such as independent work capability, adept problem-solving, effective verbal communication, efficient time management, and the ability to thrive in high-pressure environments (McGunagle & Zizka, 2020).

Due to technological advancements like artificial intelligence, big data, extended reality robotics, the internet of things, 3D printing, and blockchain, these 21st-century talents have smoothly evolved into essential components of employability traits (Marr, 2019). The need for workers with these abilities as well as for data-literate professionals increased as a result of this transformational technology wave (Pirzada & Khan, 2013).

The capacity to gather, organize, analyze, forecast outcomes, perform experiments, summarize findings, and effectively communicate results are all skills

professionals with 21st century skills have (Yahya et al., 2017). Economic growth is hampered by the lack of these abilities in a sizable section of the workforce because their skill sets are no longer in line with the changing needs of the labor market (Alshare & Sewailam, 2018).

The main goal of this study is to investigate the critical role 21st-century skills play in improving undergraduate students' employability. The research problem is the mismatch between the skills taught in universities and the 21st-century skills demanded by the job market, especially in Indigenous-related disciplines (Chandrasiri, 2008). Despite technological advancements and changing job market needs, many higher educational institutions continue to rely on conventional curricula, resulting in a skills gap. This gap leaves graduates underprepared for the modern workforce, limiting their employability and economic prospects (Akdere et al., 2019). It is crucial that 21st-century employability skills ought to be inculcated among students in indigenous related disciplines.

Employers now prioritize skills like teamwork, communication, critical thinking, and digital literacy, which are not always emphasized in university programs (Romgens, 2019). This creates a discrepancy between what graduates are taught and what employers need. Traditional educational systems are slow to adapt to the rapid changes in technology, leading to graduates entering the workforce without key skills like data literacy and creativity. This misalignment hinders the ability of graduates to secure and thrive in modern job roles.

This addresses the gap between university curricula and the 21st-century skills demanded by employers, particularly in Indigenous-related disciplines. It offers insights to enhance graduate employability by integrating modern competencies like digital literacy, teamwork, and communication. The findings will guide

curriculum reforms and foster stronger collaborations between universities and industries. This, in turn, can contribute to better job market readiness and economic development.

Digital literacy stands out among these abilities as a crucial component in bridging the gap between the analogue and digital worlds. Digital literacy is a multidimensional skill set that enables people to explore, harness, and utilize the immense digital resources and technologies of the current era. It goes beyond simply knowing how to use a computer. Digital literacy has become essential in a time when information is everywhere, and technology supports almost every aspect of professional life (Pirzada & Khan, 2013).

Additionally, creativity is prioritized as a fundamental skill for employability. The ability to come up with original ideas, picture non-traditional solutions, and think beyond the box has grown in value in a world where innovation drives progress. People who are capable of creative thinking can not only adjust to change but also take the initiative to create new industries and methodologies (Marr, 2019).

Beyond these skills, data literacy emerges as a transformative skill that transcends traditional disciplinary boundaries. Data literacy empowers individuals to decipher the language of data, make data-driven decisions, and critically evaluate the information-rich environment in which we operate. As data becomes the cornerstone of decision-making across industries, the ability to derive insights, ask the right questions, and interpret data meaningfully is indispensable (Alshare & Sewailem, 2018).

However, an acute challenge arises from the evolving demands of the job market: the widening skills gap. Traditional educational programs, often entrenched in conventional curricula and pedagogical approaches, face the daunting task of adapting to this new

reality (Bunshaft et al., 2015). A misalignment between what educational institutions offer and what businesses require has led to a significant skills deficit, affecting young professionals' aspirations and hindering future prosperity.

The transformative forces reshaping the employability landscape underscore the urgency of this research. In an age where the ability to navigate the digital realm, think critically, and harness data are the new imperatives, understanding the dynamics of 21st century skills and their alignment with educational practices becomes paramount. This research aims to illuminate this critical intersection, providing insights to bridge the skills gap and empower the workforce of tomorrow.

1.2 Literature Review

The evolving demands of the 21st-century job market have brought employability skills to the forefront of educational discussions. Traditional academic qualifications are no longer sufficient for securing employment, as employers increasingly seek graduates equipped with a broader set of competencies such as communication, teamwork, critical thinking, and digital literacy.

1.2.1 Seizing Data Opportunities for Enhanced Employability

Critical thinking, as defined in this context, signifies the capacity to comprehend, dissect, and assess information while drawing logical conclusions from a given dataset. It entails effective rational and logical thinking, effectively employing information, facts, and data to navigate place of work challenges (Casner-Lotto & Barrington, 2006; Rios et al., 2020). Employees endowed with critical thinking skills tend to exhibit innovation, often devising novel approaches that contribute value to their workplace and enhance overall operational efficiency (Tang, 2019). Employers frequently anticipate that their workforce will possess critical thinking

skills to provide insights and value to the company. Additionally, critical thinking is essential for developing leadership skills, encouraging teamwork, and accelerating the speed and power of making decisions.

In contrast, digital literacy refers to the capacity to carry out activities effectively in a digital setting where data is presented quantitatively by computers. It encompasses reading and interpreting media, creating data and images, and evaluating and applying newfound knowledge gleaned in the form of digital domains (Bejakovic & Mrnjavac, 2020; Jones & Flannigan, 2006). Individuals equipped with digital literacy, computer proficiency, and information and communication technology (ICT) skills are highly employable, as they can adeptly adapt to the dynamic shifts in the modern work environment. These skills empower them to navigate and harness the potential of ever-evolving digital tools and resources.

1.2.2 Communication, Collaboration, and Problem-Solving: Keys to 21st Century Skills

A deficiency in digital literacy can yield consequences beyond unemployment, extending to reduced productivity and diminished efficiency, and even affecting one's prospects of securing a job, earning promotions, or receiving salary raises (Bejakovic & Mrnjavac, 2020). This aligns with findings from the Programme for the International Assessment of Adult Competencies (PIACC) data, revealing an amount of 5.4% of participants across numerous EU member territories cited insufficiency of digital literacy and computer skills as impediments to job opportunities, career advancement, and financial growth (Bejakovic & Mrnjavac, 2020; Pellizzari et al., 2015). This underscores the pivotal role of digital literacy in one's career trajectory.

Mahmud and Wong (2016) emphasize the significance of conversation and interpersonal abilities in acquiring

intercultural competence. This aptly mirrors the challenges that graduates may encounter when transitioning to the workforce. By honing these essential skills during their academic journey, graduates can significantly reduce the sense of uncertainty associated with entering the professional realm.

Communication skills emerge as fundamental building blocks for future career success. Past research has consistently demonstrated communication expertise is positively correlated with employability of the graduates (Rukuni et al., 2018; Hossain et al., 2020). Effective communicational skills extend beyond verbal interactions, encompassing proficient listening, the art of asking pertinent questions, and the ability to craft professional written communication, even though social media channels (Suarda et al., 2017). These skills ensure that messages are conveyed and received with precision, mitigating potential confusion in the workplace. Furthermore, adept communication enables constructive feedback exchanges among colleagues, leading to performance improvement and contributing directly to an organization's success. Graduates armed with robust communication skills are often regarded as invaluable assets to their employers (Page, 2021), thus bolstering their employability prospects.

Collaboration skills represent yet another crucial employability attribute that graduates must possess to excel in the workforce. Research substantiates the positive impact of collaboration skills on graduates' employability as they transition into professional roles (Habets et al., 2020). These skills empower individuals to function effectively within a team, facilitating the efficient exchange of experience and understanding (Suarda et al., 2017). Individuals that are adept at collaborating can seamlessly distribute workloads and inspire their team members, fostering a productive and harmonious working environment.

In essence, as the 21st century job market continues to evolve, graduates who invest in enhancing their communication and collaboration skills stand poised for success. These competencies not only enrich their employability but also position them as assets to organizations seeking dynamic and adaptable professionals in an ever-changing landscape. This research seeks to delve into the multifaceted realm of employability skills, shedding light on their vital role in shaping the future of the workforce.

Problem-solving skills, a cornerstone of employability, hold a pivotal place in the contemporary workplace. Research consistently indicates that employers highly value candidates possessing strong problem-solving abilities (Fajaryati & Akhyar, 2020). In the current dynamic work environment, problem-solving, critical thinking and collaboration are deemed critical (Suarda et al., 2017). Employers increasingly expect their employees to not only identify challenges but also generate innovative and appropriate solutions. Recent occurrences, like the pandemic, have highlighted the importance of strategic thinking and problem-solving skills among students, as shown in a comprehensive review by Mahmud et al. (2021). These abilities make people flexible and resilient in the face of job changes. Employees that are proficient in problem-solving techniques also aid in organizational innovations and improvements, keeping a competitive advantage (Stottler, n.d.). Therefore, problem-solving abilities are essential for improving graduates' employability since they enable them to handle complicated problems and promote continual improvement.

1.2.3 Addressing Disparities in Skills: Bridging the Employability Gap

The rapidly developing technology that started in the twentieth century is evidenced by the highly technical society we live in today. As this revolution took place, a new

paradigm in the labour market began to develop. A rising number of businesses started looking for workers who had an additional level of proficiency—21st century skills—rather than just those with good academic credentials and occupation-specific skills (Gryphon & Care, 2014). These skills, in contrast to job-specific qualifications, are not confined to any particular industry or occupation; they possess the remarkable ability to transcend across diverse sectors.

However, a disconcerting gap has emerged between the skills typically acquired within the university setting and those in demand within the contemporary workforce (Alshare & Sewailem, 2018). Many fresh graduates find themselves lacking these essential 21st century skills because they are often overlooked in university curricula. This growing divide has profound implications for both graduates and employers, prompting a critical reevaluation of the educational landscape.

The need for combining 21st century skills into university education becomes evident when considering their remarkable transferability across the industries and job market (McGunagle & Zizka, 2020). Unlike "hard skills," which are susceptible to obsolescence as technology evolves, "soft skills" maintain their relevance in the job market regardless of the changing technological landscape. Graduates must not solely rely on "hard skills" but must equip themselves with these adaptable and enduring "soft skills" to navigate the complexities of the modern workforce.

Similar to problem-oriented learning and interactive instruction involves learners in practical activities as opposed to passive reading or attending lectures. Their understanding of the course's principles and goals is deepened by this method, which is in line with the growth of 21st-century skills (Nghi & London, 2018). Evidence from North Carolina State University (2017) demonstrates the efficacy of this strategy.

Assessment scores dramatically increased with the inclusion of real-world experience, role-playing games, advanced assignments and group projects in the curriculum.

2. Materials and Methods

The study adopts a quantitative approach as literature provides sufficient tools to measure perceptions in a numerical format, such as through the use of surveys or questionnaires. The research is grounded in positivism, a philosophical stance that emphasizes the objective and measurable nature of reality. Approaches are deductive and explanatory, hence, it is inherently quantitative in nature.

The study uses a quantitative approach because it allows for the collection of numerical data that can be statistically analyzed, providing objective insights into the relationship between 21st-century skills and employability. By using a structured survey, the research can gather data from a larger sample, making it easier to generalize the findings. (Pellegrino & Hilton, 2012). The quantitative method also enables the researcher to measure specific variables (such as communication, teamwork, and digital literacy skills) and assess their impact on employability. This approach ensures a systematic and reliable way to identify trends and correlations between the constructs drawn from previous research.

The study employed a multi-stage sampling technique. In the first stage, 61 employers from Ayurveda hotels and resorts, spa centers, Ayurveda wellness centers, yoga consultants, Ayurveda pharmacies, and the Gampaha Wickramarachchi Ayurveda Hospital were selected through purposive sampling. In the second stage, 108 second-year undergraduates were selected using a simple random sampling technique covering 25% of the population. Furthermore, the undergraduates comprise from Faculty of Indigenous Social Sciences and Faculty of Indigenous Technology at Gampaha

Wickramarachchi University of Indigenous Medicine. The newly established faculties at the Gampaha Wickramarachchi University of Indigenous Medicine provide a unique opportunity to study this gap. These faculties, with their Indigenous focus, are emerging in a context that demands a balance between traditional knowledge and modern skill requirements.

The study used multi-stage sampling technique because it specifically targets a unique group of second-year undergraduates in the Faculty of Indigenous Social Sciences and Faculty of Indigenous Technology at Gampaha Wickramarachchi University of Indigenous Medicine and employers in the Indigenous context. The population of the study was 220. The population of employers was 70. And the sample for employers was 61. The population for undergraduates was 150 and the sample was 108. The sample was selected from Krejcie and Morgan's table (1970). The sample of the study was 169. The students represented the first cohort in newly established faculties, making them ideal for assessing how well the curriculum integrates 21st-century skills. Multi-stage sampling allowed the researcher to focus on this specific group, which was directly relevant to the research question and provided meaningful insights into the gap between education and job market demands.

Multi-stage sampling was used to pick respondents, and the research's intended audience placed certain requirements on the selection process. The chosen respondents were required to meet specific qualifications, such as being of a certain age, affiliated with educational institutions, holding graduate status, or having professional experience as employers in the indigenous-related context. This strategic selection aimed to gain valuable insights into their perceptions regarding the significance of 21st century skills in today's job market.

This study used a quantitative approach, with a structured survey serving as the main tool

for gathering data. The poll was carefully planned, using pertinent constructs found in the body of prior research. The initial section concentrated on gathering demographic information about the respondents, including their age, gender, occupation, and country of origin. The remaining four sections were designed to collect data on the perception of undergraduate and employers towards the key employability skills and 21st-century skills.

In this context, the research required the respondents to meet specific criteria, including being of a certain age, institution-affiliated, and representing either graduates or employers to elicit information on crucial skill qualities necessary for employability. In this context, the research necessitated that respondents meet specific criteria, such as belonging to a certain age group, being affiliated with an academic institution, and representing either graduates or employers. The survey also looked for information on potential approaches to narrowing the skill discrepancy between what educational institutions teach and what is required in the business. Additionally, it sought to determine how graduates regarded the value of data literacy given its rising prominence in the contemporary workforce.

The poll was distributed via diverse social media channels, including Instagram, WhatsApp, and Telegram, enabling a wide audience and a varied participant base. Using Microsoft Excel, all the obtained data were painstakingly organized into data tables that were ready for a later statistical study.

Data analysis involved cross-tabulating the collected data to unveil potential correlations or patterns that may not have been immediately evident from the closed-ended survey questions. Descriptive statistics, including frequencies and percentages, were employed in the analysis. These data were crucial in laying a strong foundation for informing findings about stakeholders' viewpoints on the value of 21st century skills,

a subject that will be further investigated and discussed in the next sections of this study.

3. Results and Discussion

3.1 Results

A total of 169 people responded to the survey, offering a wide range of viewpoints for examination. Some interesting patterns became apparent when the respondents' ages were examined. 29% of those who responded to the survey, or a sizable chunk, were between the ages of 50 and 57. In comparison, the respondents aged 58 to 65 represented a lesser proportion of the total respondents, making about 6.5% of them.

Following further age demographic disaggregation, the distribution was as follows:

Participants between the ages of 18 and 25 made up 15.4% of the total, those between the ages of 26 and 33 contributed 24.9%, those between the ages of 34 and 41 made up 10.7%, and those between the ages of 42 and 49 made up 13.6% of the total.

This distribution gives a thorough overview of the age distribution of the respondents, emphasizing the greater representation of people between the ages of 50 and 57 and the necessity of taking a variety of age groups into account in the analysis and discussions on employment trends, skill requirements, and language proficiency needs in the job market.

The data presented in Table 1 indicates that a significant portion of the respondents, specifically 70.4% (n = 119), expressed strong agreement with statement S1, while 61.5% (n = 104) showed a similar strong agreement with statement S2.

Across the responses, the range in average percentages noted from 0.89% to 65.98%. Consequently, it can be inferred that the participants indeed acknowledge the significance of twenty-first century skills as

vital factors for enhancing employability and fostering career advancement.

Both students and employers recognize the importance of 21st-century skills, with the majority strongly agreeing on their relevance to employability. However, employers show a slightly higher level of agreement overall, suggesting they place even greater emphasis

on these skills in the workplace compared to students. This highlights the need to better align educational outcomes with industry expectations. Table 2 provides a summary of the abilities that hold the most significance in terms of employability and underscores the vital significance of twenty-first century skills in this context. The findings from this analysis reveal noteworthy patterns

Table 1 Skills attributed to employability

Items	Group	SD	D	N	A	SA
S1: Importance of 21 st century skills	Students	1	1	4	12	54
	Employers	1	0	6	25	65
	Total	2	1	10	37	119
S2: 21 st century skills and employability opportunity	Students	1	0	6	10	30
	Employers	2	2	10	24	74
	Total	3	2	16	44	104
Average percentage		1.48%	0.89%	7.69%	23.96%	65.98%

Note: SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree

Table 2. Ranking of important skills

Twenty-first century skills	Rank	N	Mean
Communication	38.5%	65	0.385
Critical thinking	18.9%	32	0.189
Problem solving	11.8%	20	0.118
Collaboration	10.7%	18	0.107
Productivity	7.7%	13	0.077
Creativity	7.1%	12	0.071
Digital literacy	5.3%	9	0.053
Other skills			
Interpersonal skills	36.7%	62	0.367
Learning skills	24.9%	42	0.249
Personal skills	12.4%	21	0.124
Technical skills	11.8%	20	0.118
Adaptation skills	10.7%	18	0.107
Entrepreneurial skills	3.6%	6	0.036

Communication emerged as the skill deemed most crucial, garnering the highest percentage at 38.5%. This indicates that a significant portion of respondents identified a deficiency in communication skills among

employees as they enter the job market. Conversely, digital literacy received the lowest percentage, standing at 5.3%. This result suggests that the participants did not

accord the same level of importance to digital literacy in the employment context.

When respondents were queried about additional skills contributing to enhanced employability, the majority indicated interpersonal skills as paramount, with a notable percentage of 36.7%. In contrast, entrepreneurial skills received the lowest ranking, registering at 3.6%.

These findings provide valuable insights into the perceived significance of various skills in

the context of employability, shedding light on areas where employees may need further development and emphasizing the prominence of communication and interpersonal skills in the modern workforce.

The findings presented in Table 3 shed light on the impact of communication, teamwork, and problem-solving abilities on employability of graduates. The responses from the participants reveal notable trends, with the majority expressing agreement or strong agreement with the statements

Table 03. Communication, teamwork, and problem-solving abilities affect employability.

Items	SD	D	N	A	SA
S6: Communication skills and productivity	0	2	9	47	111
S7: Collaboration skills for better employability opportunity	0	2	17	61	89
S8: Employees with problem-solving skills are innovative thinkers, adaptable, with lateral mindset.	0	2	14	45	108
S9: Employers prefer to hire graduates with the ability to collaborate, communicate, and solve problems.	0	0	12	45	112
S10: Graduates must be well equipped with communication, collaboration, and problem-solving skills before entering the workforce	0	1	23	53	92
Average percentage	0	0.83%	8.88%	29.70%	60.59%

Table 04. Skills gap (data- ordinal).

Items	SD	D	N	A	SA
S11: University-taught career specific skills are no longer sufficient for graduates in order to satisfy the demands of the employment market.	4	14	44	49	58
S12: A recent graduate can find employment with just their academic credentials.	48	53	35	15	18
S13: To avoid teaching out-of-date skills, university courses, subjects, curriculum, and syllabuses should be updated..	0	2	18	53	96
S14: The skills that are taught at educational institutions and the skills that are needed in the workforce differ significantly.	2	6	21	56	84
Average percentage	7.99%	11.09%	17.46%	25.59%	37.87%

Specifically, a vital number of participants agreed or strongly agreed with the statements outlined. Notably, a substantial consensus was observed for items S6, with 93.5% (n = 158) of respondents in agreement, S7, with 88.8% (n = 150) in agreement, and S8, with 90.5% (n = 153) in agreement. These high levels of agreement resulted in an average agreement rate of 90.9% for items S6, S7, and S8, compared to a mere 1.2% average disagreement.

Furthermore, a noteworthy proportion of respondents expressed strong agreement with item S9, amounting to 66.3%. Importantly, it is noteworthy that none of the respondents registered disagreement with this particular item.

These findings underscore the widespread recognition among participants regarding the positive influence of communication, teamwork, and problem-solving abilities on employability of graduates, with a particularly strong consensus on the value of these skills in enhancing career prospects.

Table 4 provides insights into the responses pertaining to items S11 through S14. The responses reveal a range of perspectives on the alignment of university education with the demands of the job market.

63.3% of respondents, specifically those who chose alternatives 4 or 5, agreed with the statement made in response to item S11 that graduates no longer possess the necessary job-specific abilities to satisfy the demands of the modern labor market. 10.7% either disagreed or strongly disagreed with the remark, while 26% remained neutral on the subject.

59.8% of respondents to item S12 disagreed or strongly disagreed with the claim that academic knowledge alone is adequate to prepare recent graduates for the workforce. 19.6% of respondents either agreed or strongly agreed with the statement, while 20.7% expressed no opinion.

With a large majority (88.2%) agreeing or strongly agreeing that courses offered in universities, subjects, curriculum, or syllabi should be revised to prevent teaching outmoded skills, item S13 attracted broad agreement. Only 1.2% of respondents disagreed with the statement, none strongly disagreed, and a small percentage (10.7%) took no position.

4.8% of respondents disagreed or strongly disagreed with the claim that there is a significant discrepancy between the skills taught and offered in higher educational institutions and those the skills and expectations required by the workforce and employment market in item S14, while 12.4% of respondents were indifferent. This suggests that there are various points of view on this gap.

These findings underscore the complex and multifaceted perspectives surrounding the alignment of university education with the evolving needs of the job market, highlighting areas of consensus as well as divergence in respondent opinions.

Table 5 presents the ranking of responses regarding the most effective and efficient methods for accomplishing twenty-first century skills. The findings reveal clear preferences among respondents for various means of skill acquisition.

Topping the list with 93 responses is the integration of twenty-first century skills through learning, indicating that this method is perceived as the most effective by most respondents. Following closely, the working experience is ranked as the second most effective means for acquiring these skills, signifying its significant importance in skill development. Joining external courses and programs secured the third position on the list, with respondents acknowledging its value to enhance their skill set.

These rankings provide valuable insights into the perceived effectiveness of different

strategies for acquiring twenty-first century skills, with a strong prominence on the integration of these skills into the learning process.

Table 6 provides an overview of the perceived importance of data literacy in

relation to employability, as indicated by respondents' responses to various statements. Most respondents either agreed or strongly agreed with all statements, except for S4, which exhibited a more balanced range of responses.

Table 05. Ranking based on the most effective and efficient methods for accomplishing 21st century skills.

Means	Frequency of each response
Integrated learning in education system	93
Work experience	47
External courses/programs	21
Others	8

Table 06. The importance of data literacy for employability.

Items	SD	D	N	A	SA
S1: Employability skills are also required along with technical skills in order to succeed in the industry	1	1	21	56	90
S2: Skills like collecting and manipulating data effectively are needed for today's industry	3	6	25	74	61
S3: Systematically analyzing data and using it for analyses are valuable skills for organizations in every industry	0	3	40	54	72
S4: Fresh graduates are capable of collecting, organizing, and interpreting data, predicting outcomes, and communicating the results	9	36	65	38	21
S5: Soft skill training (e.g., communication, problem solving) at the university level is crucial	1	12	19	59	88
Average percentage	1.66%	5.68%	20.12%	33.25%	39.29%

38% of participants (n = 65) adopted a neutral stance on statement S4, with 34% (n = 59) in agreement and 26% (n = 45) in disagreement. Statement S4 seems to elicit mixed opinions regarding the sufficiency of technical skills alone for success in today's market and industry.

However, it is noteworthy that a significant majority of respondents (53%, n = 90)

strongly agreed that technical skills are unable to stand alone and are inadequate for employees to excel in the contemporary industry. This underscores the widely held belief among respondents that data literacy and additional competencies beyond technical skills are crucial for success in today's professional landscape.

The analysis from **Table 06** shows that stakeholders—both employers and graduates—recognize the importance of 21st-century skills like communication, problem-solving, and data literacy for employability. However, the perceived gap in preparedness, particularly with respect to data literacy, aligns with the objective of exploring how various stakeholders view these skills. The findings indicate that while soft skills and data literacy are considered essential, universities may not be adequately preparing students in these areas, reflecting differing expectations and needs from educational institutions and employers.

Thus, **Table 06** supports the research objective by highlighting the disparity between stakeholder expectations and the actual skill sets graduates possess, emphasizing the necessity for universities to focus more on integrating these 21st-century competencies into their curricula.

Descriptive statistics, such as frequencies and percentages, help to identify patterns and trends in the data, providing insights into how respondents perceive certain issues. For example:

How important are 21st-century skills for employability? By analyzing the frequency of responses, we can see that 70.4% of respondents strongly agreed with the importance of 21st-century skills (Table 1). This indicates that most respondents recognize these skills as vital for securing employment.

How do communication, teamwork, and problem-solving skills impact employability? In Table 3, we see that 93.5% of respondents agreed that communication skills are linked to productivity. The high percentage of agreement shows that these skills are viewed as critical for job success.

How effective are university programs in preparing students for the job market? Table 4 shows that 63.3% of respondents

agreed that university-taught career skills are insufficient. This percentage helps us understand that many respondents believe current educational programs need to be updated to meet job market requirements.

3.2 Discussion

The high level of agreement with S1 and S2 among respondents demonstrates their comprehending of the significance of 21st-century skills for boosting employability and encouraging professional progression. This is consistent with the viewpoint presented by McGunagle and Zizka (2020), who stressed the importance of STEM students having twenty-first century skills. Students who possess these abilities can successfully communicate their thoughts, understand personal and professional ethics, improve their social skills, and work effectively in multicultural teams in professional contexts.

As per Suarta et al. (2017), effective communication skills help create solid relationships between staff members and clients, which are essential for both individual career success and an organization's overall success. According to earlier studies (Maxwell et al., 2009; McGunagle and Zizka, 2020), employers in the STEM disciplines have high expectations for recent graduates to enter the profession with advanced communication skills.

It is significant to note that the respondents did not express a sense of urgency regarding the necessity of digital literacy in the workplace. Contrastingly, the current work market is seeing an increase in need for digital literacy, proficiencies, and abilities, a trend that is backed by numerous research (OECD Development Centre, 2014; Donlevy et al., 2016). Employees are increasingly required to use information and communication technology (ICT) and have digital skills due to the changing nature of the workplace (Bejakovic & Mrnjavac, 2020). The development of skills including problem-solving, teamwork, communication,

interpersonal skills, and job-specific knowledge is now given more weight by employers (Bhagra & Sharma, 2018).

Table 1 shows that a substantial majority of respondents (70.4% for S1 and 61.5% for S2) strongly agreed on the importance of 21st-century skills, such as communication, critical thinking, and problem-solving, for employability. These findings strongly support the hypothesis that 21st-century skills are perceived as critical for employability. The skills ranked highest, particularly communication (38.5%), suggest that employers are increasingly prioritizing these competencies. The high levels of agreement across skills like communication and critical thinking (Table 2) indicate a gap in the traditional education system's ability to equip students with these crucial skills. This highlights the importance of integrating these competencies into educational curricula, aligning with the research objective of exploring how these skills affect job prospects.

Table 3 demonstrates that a majority of respondents (90.9% average agreement across items S6 to S8) acknowledge that communication, teamwork, and problem-solving are key to employability. S6 and S9 received particularly strong agreement, with 93.5% and 66.3% respectively. This overwhelming agreement reflects the importance of these soft skills in today's job market. The data clearly show that employers prioritize candidates who excel in communication, collaboration, and problem-solving abilities. These findings provide strong evidence that the employability of graduates is highly dependent on their proficiency in these skills. Given the global shift towards teamwork and adaptability in the workplace, these competencies are now as important as technical knowledge. It has been demonstrated that these abilities are interrelated and that they cooperate to increase workers' total output. These results suggest that these competences are equally important, and employers frequently give

preference to applicants who have a well-rounded mix of these skills rather to those who excel in just one of them (Fajaryati & Akhyar, 2020). This highlights how important it is for undergraduate students to acquire their entire set of skills.

Table 4 highlights that 63.3% of respondents believe that university-taught skills are no longer sufficient to meet employment market demands (S11). Similarly, 88.2% of respondents agreed that university courses need to be updated to avoid teaching outdated skills (S13). This data underscores a critical skills gap, where academic qualifications alone are no longer sufficient. A majority of respondents feel that the skills taught at universities do not align with those required by employers, justifying the need for curriculum reform. These findings point to the mismatch between academia and industry, supporting the need for institutions to revise their curricula to include more relevant and up-to-date skills. The fact that 88.2% support updating university courses emphasizes the necessity of this change to meet evolving job market demands, which directly ties into the research objective.

The results from Table 6 show that 53% of respondents strongly agree that technical skills alone are not sufficient, and 39.29% recognize the importance of soft skills like data literacy for employability. However, responses to S4 (whether graduates are prepared to handle data) were mixed, with 26% disagreement and 38% neutrality. The mixed responses indicate that while data literacy is important, graduates are perceived as lacking in this area. This suggests that educational institutions may not be adequately preparing students to work with data, an essential skill in many industries today. These results align with the research objective of understanding the role of data literacy in employability. While technical and analytical skills are acknowledged as important, the mixed opinions on graduates' preparedness highlight the need for

enhanced data literacy training in academic programs.

According to the data, improving undergraduate students' communication, teamwork, and problem-solving abilities can significantly improve their chances of getting employment (Rasul et al., 2013). Furthermore, there is high agreement among respondents recognizing the significance of these skills in the context of employability, as evidenced by the mean scores for "agree" and "strongly agree," which are 50.2 and 102, respectively.

To genuinely become data-centric in the current era of big data, businesses must invest in more than simply technology (Pothier and Condon, 2020). According to 36% of 63,000 employers surveyed by Strauss (2016), freshly hired graduates frequently lack fundamental data analysis abilities, including knowledge of programs like Excel, Tableau, and R. The need for workers who can use data to promote business growth, cost savings, improved customer experiences, and maximizing the potential of data assets is also rising in the corporate sector (Pothier & Condon, 2020). As a result, the capacity for data analysis and comprehension stands out as a key competency for the twenty-first century.

The ability to link unrelated pieces of information, see patterns among them, and make meaningful connections is included in "soft skills" connected to data. Students can be substantially better prepared for this data-driven century by having a data-driven curriculum in their universities (Oguguo et al., 2020). The survey's mean scores, which ranged from 2.8 to 66.4, show that respondents were generally satisfied. This study emphasizes the critical role that data literacy plays in the labor market of today and highlights the potential advantages of adopting more efficient data literacy programs at the university level, which would give recent graduates access to a wider range of options.

While 21st century abilities are highly valued in a variety of occupations, employees frequently have trouble making the connections between what they study in universities and what they learn in outside courses. It can take years for employees to naturally develop these abilities within their work environment, frequently with little to no direction or support, therefore depending purely on work experience may not be adequate for employees to obtain these critical talents, despite the popularity of external courses.

Employers often give priority to candidates who are already proficient in 21st century skills in today's competitive employment market. Employers are therefore less likely to choose candidates who have little to no proficiency in these abilities. As a result, recent graduates could have trouble finding work soon after they graduate, which makes it difficult for them to start gaining useful work experience.

4. Conclusion and Recommendations

In this study, second-year undergraduate students in the Faculty of Indigenous Social Sciences and Faculty of Indigenous Technology at Gampaha Wickramarachchi University of Indigenous Medicine were evaluated to determine the importance of twenty-first century skills in improving employability. Unmistakably, the results highlight the significance of these abilities in attaining better employment chances. The most important characteristics linked to employability among the talents discovered were communication skills, critical thinking abilities, interpersonal skills, and job-specific skills. These results are consistent with long-held employability theories that have stressed the critical importance of these abilities in the employment market.

The findings strongly affirm that 21st-century skills, especially communication, critical thinking, and problem-solving, are viewed as essential for employability by both

graduates and employers. The high level of agreement (over 70%) demonstrates that these competencies are critical in today's job market and should be prioritized in educational programs.

The survey results reveal a clear disconnect between university-taught skills and the needs of employers, with 63.3% of respondents acknowledging the insufficiency of current academic training. The overwhelming support (88.2%) for updating university curricula underscores the urgency of bridging this gap by aligning educational programs with the evolving demands of the job market.

Another obvious contrast between what is taught in schools and what employers are looking for is the growing gap between the two. According to the report, fresh graduates no longer have enough traditional academic knowledge and occupation-specific skills to be competitive in the labor market. Respondents were overwhelmingly in favor of upgrading university curricula, syllabi, or courses to keep up with the changing needs of the modern labor market in order to address this issue.

While data literacy is recognized as important for employability, mixed responses suggest that many graduates are not adequately prepared in this area. This highlights a critical need for universities to incorporate more comprehensive data literacy training into their curricula, ensuring that graduates are equipped with both technical and analytical skills required by modern industries.

The results highlighted the important necessity for graduates to have data analysis and interpretation abilities in today's economy in terms of data literacy and its impact on employability. Most respondents emphasized the equal significance of these abilities and said that companies favor applicants who have a well-rounded combination of them. In order to properly prepare graduates for the needs of the

workforce, there was also agreement that "soft skills" like data literacy should be incorporated into higher education.

As a recommendation for future research, it would be valuable to delve deeper into respondents' reasoning behind their choice of each option to gain more nuanced insights. Additionally, future research efforts might consider using the cluster sampling method instead of purposive sampling method to ensure equitable representation of respondents from various age groups, thereby minimizing potential bias in the responses.

Limitations in the Study

- 1. Sample Specificity:** The study was limited to second-year undergraduates from two newly established faculties at Gampaha Wickramarachchi University of Indigenous Medicine, which may not represent the broader undergraduate population in Sri Lanka or other Indigenous-related institutions.
- 2. Sampling Bias:** Although multi-stage sampling was used, the purposive selection of employers may introduce bias, as only those affiliated with indigenous-related industries were included, possibly limiting the generalizability of employer perspectives.
- 3. Self-Reported Data:** The data were collected through self-administered questionnaires, which may be subject to social desirability bias or inaccuracies in respondents' self-perceptions.
- 4. Digital Distribution:** Since data collection was conducted via social media platforms (Instagram, WhatsApp, and Telegram), participation was limited to individuals with internet access and technological familiarity, potentially excluding those without such access or digital literacy.

5. Combined Analysis of Two Distinct Groups: While students and employers were both surveyed, the data analysis does not fully separate or compare the groups' perspectives, which may limit the clarity in understanding how their views differ regarding 21st-century skills and employability.

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