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Big Data Analytics Skills for Future Accountants

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ABSTRACT
Big data analytics technology has changed the landscape of the labour market, including in the field of accounting. This study examines the influence of hard and soft skills of big data analytics on three dimensions of employability: human capital, individual attributes, and career development in accounting students. The method used was quantitative, with a questionnaire survey on 286 accounting students, which was analyzed using Structural Equation Modeling (SEM) through SmartPLS 4.0. Hypothesis tests were carried out to determine the influence of hard skills and soft skills on each dimension of employability. The study results show that hard and soft skills have a positive and significant effect on human capital and career development. However, only soft skills have a significant effect on individual attributes, while hard skills do not show a significant effect on this dimension. These results support the theory of job-market signalling, in which technical and non-technical skills serve as signals for employers. The originality of this research lies in testing the combination of hard skills and soft skills of big data analytics in the context of accounting student employability, which has not been widely discussed before.

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INTRODUCTION

In the digital era of the 21st century, technological developments have fundamentally changed the order of human life, especially in terms of employment and education (Özer & Kuloğlu, 2023). Digital technology is now a major pillar of various industries, including accounting, which are increasingly relying on automation and artificial intelligence (Chen et al., 2023). However, with these developments, new challenges arise related to the availability of a workforce that has relevant technological skills (López González et al., 2024). In the accounting sector, the need for a workforce that can utilize technology such as Big Data Analytics is very urgent, especially in an increasingly competitive global context(Qu, 2024). Meanwhile, digital transformation in the education sector, especially accounting education, still faces challenges in preparing graduates with skills that match the demands of the industry (Irfansyah et al., 2023).

Theoretically, this research is based on the *Job-Market Signaling Theory* proposed by (M. Spence, 1973). This theory states that individuals use a variety of signals (e.g., education and technical skills) to attract the attention of employers (Shahid et al., 2024). In this context, the ability of Big Data Analytics can be considered an important signal that shows the readiness and competence of graduates to enter a job market that is increasingly integrated with technology (Pham, 2024).

However, one of the significant challenges is how the combination of *hard skills* (technical skills such as big data analytics) and *soft skills* (interpersonal skills such as communication and collaboration) can affect the *employability* level of graduates (Forman et al., 2023). Previous research has examined the importance of *hard skills* in the field of technology, but there are limitations in looking at how *soft skills* play a key role, especially in the field of accounting (Xu et al., 2022).

From a practical point of view, this study tries to answer the challenges faced by accounting graduates in Indonesia, especially in the context of the gap between the skills acquired in college and the demands of the industry. A survey by the World Bank in 2022 predicts that Indonesia needs an additional 600 thousand digital talents every year until 2030, which shows the urgency to improve the digital skills of accounting graduates. On the other hand, 80% of companies have difficulty finding talent who has the required combination of technical and interpersonal skills(Kusnilawati et al., 2024).

In the accounting profession, the role of technology such as *cloud computing*, *artificial intelligence*, and *big data* is now becoming more and more central. However, future accountants not only need to master technology but also need to be able to adapt to a collaborative and dynamic work environment (Friday & Japhet, 2020). It creates an urgent need for accounting education to ensure graduates have a balance between *hard skills* and *soft skills* that can be applied directly in the workplace (Labobar & Malatuny, 2023).

The novelty or novelty of this study lies in a more in-depth exploration of how the combination of *hard skills* and *soft skills* in Big Data Analytics affects the *employability of* accounting students, especially in Indonesia. Previous research, such as those conducted by (Xu et al., 2022), has indeed highlighted the importance of Big Data Analytics in improving the employability of accounting graduates. However, this study specifically explores the context of Indonesia, which has unique characteristics in terms of workforce readiness and digitalization challenges. In addition, the study not only looks at the influence of *Big Data Analytics hard skills* but also how *soft skills* play a significant role in improving a graduate's ability to adapt and succeed in a complex, technology-integrated work environment (Sheh et al., 2020).

In practical terms, this study makes two main contributions. First, this study provides recommendations for accounting education institutions in Indonesia to integrate Big Data Analytics teaching that not only focuses on technical aspects but also the development of important interpersonal skills. Second, this research can be a guide for the accounting industry and companies in looking for talents who are not only competent in technology but also have *soft skills* that can support success in teams and organizations. Through this research, it is hoped that there will be a deeper understanding of how accounting graduates can be better prepared to face the digital job market, which ultimately increases their competitiveness.

Thus, this research not only contributes theoretically to expanding the understanding

of employability in the digital era but also provides practical solutions to the challenges faced by the world of education and industry in preparing graduates who are technologically and interpersonally competent. The focus on the balance between *hard skills* and *soft skills* is what makes this study different from previous studies. It offers a new perspective on the employability literature in Indonesia.

THEORETICAL FRAMEWORK AND HYPOTHESES

Job-Market Signaling Theory

Spence (1973), in his theory of *Job-Market Signaling,* assumes that hiring new employees is like investing in uncertainty. The attributes that applicants have, such as education and training, serve as signals for employers to assess an applicant's productive abilities (Maier, 2022). These credentials demonstrate relevant qualifications, thus helping to increase the employability of applicants in the labour market who do not have complete information about them (Brown et al., 2024). In this context, the employability of accounting students can be seen as their ability to use signals such as Big Data Analytics skills to demonstrate their job readiness.

Employability

Employability is a set of skills and achievements that make a person more likely to obtain a job and thrive in his or her career (Yorke, 2004). According to Hillage and Pollard (1998), employability includes the knowledge, skills, and attitudes that a person possesses and how they present those assets to employers (Wang et al., 2022). Xu et al. (2022) divide employability into three main dimensions: human capital (knowledge and skills), individual attributes (adaptability, flexibility), and career development (career management and self-reflection).

Big Data Analytics and Human Capital

Human capital in the context of accounting students includes the technical knowledge and skills needed for professional work (Jackson et al., 2022). With technological advancements, accounting students are also expected to have skills in Big Data Analytics to solve problems and make data-driven decisions (Suarta et al., 2023). Big Data Analytics allows students to gain a deeper understanding of complex financial data analysis, as well as improve their technical competence (Mahmudi, 2024).

Xu et al. (2022) showed that *hard skills* and *soft skills* in Big Data Analytics contribute significantly to increasing student human capital. In addition, Jackson et al. (2022) emphasized the importance of technological skills and critical thinking in improving the employability of accounting students. Proposed hypothesis:

H1: *Hard skills* Big Data Analytics have a positive effect on increasing the human capital of accounting students.

H2: Soft skills Big Data Analytics have a positive effect on increasing the human capital of accounting students.

Big Data Analytics and Individual Attributes

Individual attributes such as adaptability, flexibility, and innovation are key in facing the challenges of the dynamic world of work (Clarke, 2017). Mastery of Big Data Analytics allows accounting students to develop critical thinking, innovation, and collaboration in solving problems that arise in the work environment (Xu et al., 2022). Effective collaboration and communication in using big data are important skills that help students in various complex work situations (Janssen et al., 2017).

Research by Suarta et al. (2023) found that interpersonal skills, including communication and teamwork skills, are very important in improving the *individual attributes* of graduates. Mastery of technology such as Big Data also has a positive impact on flexibility and lifelong learning abilities (Xu et al., 2022). Proposed Hypothesis:

H3: *Hard skills* Big Data Analytics have a positive effect on improving the individual attributes of accounting students.

H4: *Soft skills* Big Data Analytics have a positive effect on improving individual attributes of accounting students.

Big Data Analytics and Career Development

The career development of accounting students depends not only on technical skills but also on the ability to manage their careers independently (Zhu, 2023). Students who master Big Data Analytics

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can leverage data insights to make better career decisions, as well as develop sustainable leadership and career management skills (Jackson et al., 2022). Data-driven decision-making also allows students to be more competitive in the ever-changing job market (Ceschi et al., 2017).

Xu et al. (2022) showed that Big Data Analytics has a positive influence on career development, especially in decision-making and effective communication. Research by (Jackson et al., 2022) adds that understanding future technology can improve accounting students' career opportunities. Proposed Hypothesis:

H5: *Big Data Analytics hard skills* have a positive effect on improving the career development of accounting students.

H6: Big Data Analytics *soft skills* have a positive effect on improving the career development of accounting students.

RESEARCH METHOD

Population and Sample

The population in this study is students of the Accounting Study Program who have an understanding of Big Data Analytics. Since the exact number of the population is unknown, the sampling technique uses the Lemeshow formula with a confidence level of 95% and a margin of error of 5% ((Adam, 2020). Based on these calculations, the minimum sample needed in this study is 286 respondents.

Research Instruments

The instrument is in the form of a questionnaire, consisting of several parts designed to measure independent variables, namely *hard skills* and *soft skills* in Big Data Analytics, as well as dependent variables, which include three dimensions of employability: human capital, individual attributes, and career development. Each item in the questionnaire is measured using a 4-point Likert scale: *Strongly Agree (SS), Agree (S), Disagree (TS),* and *Strongly Disagree (STS).* Neutral options were not included to avoid response bias from respondents who might choose a middle answer (Raaijmakers, 2000).

Research Respondent

The respondents in this study are students of the Accounting Study Program who already have an understanding of Big Data Analytics. The selection of respondents was carried out using the purposive sampling technique, where respondents were selected based on the criteria that they had been exposed to the concept of Big Data Analytics through relevant courses or training.

Data Collection Techniques

Data collection was carried out through a survey distributed online using Google Forms. This method was chosen because of its efficiency in reaching respondents in a relatively short time and its ability to allow extensive data collection without geographical constraints. The survey was disseminated through student social networks and relations to ensure that the questionnaire was accepted by respondents under the research criteria.

Data Analysis Techniques

The data collected was analyzed using descriptive and inferential statistical methods. Descriptive analysis was used to describe the respondents' profiles and research variables. This study uses the Structural Equation Modeling (SEM) method with SMART-PLS software (Borkowski, 2022) to test the hypothesis. The SEM approach was chosen because of its ability to evaluate the relationships between variables simultaneously, including the measurement of latent variables and causal relationships between hypothesized variables (Limberg et al., 2021). The model used in this study is based on a strong theory and validation from previous research.

RESULT AND DISCUSSION

Table 1 shows that the majority of respondents in this study are women, with a percentage of 71.7%. Meanwhile, male respondents only represented 28.3% of the total respondents. Judging from the batch, most of the respondents came from the class of 2021 (72.7%), while the rest came from the class of 2020 (27.3%). This demographic data provides an initial overview of the characteristics of the respondents involved in the study, which can help in understanding the context of the research results and considering the representativeness of the sample used.

Table 1. Respondent Demographics

Characteristic	Frequency	Percentage
Gender		
Male	81	28.3%
Female	205	71.7%
Total	**286**	**100%**
Force		
2020	78	27.3%
2021	208	72.7%
Total	**286**	**100%**

Source: Data Processed (2024)

Table 2.Descriptive Analysis

Variable	Amount of Statement	Mean	Category
Hard Skills	**5**	**3,1**	**Agree**
Soft Skills	**7**	**3,2**	**Agree**
Human Capital	**5**	**3,3**	**Agree**
Individual Attributes	**8**	**3,1**	**Agree**
Career Development	**5**	**3,4**	**Agree**

Source: Data Processed (2024)

Descriptive Analysis

The results of the descriptive analysis show that the mean value of each variable is in the category of "Agree." It shows that respondents feel that they have good hard skills and soft skills and consider that the quality of their human capital, individual attributes, and career development is also good.

Outer Model

The initial measurement model is shown through the following path diagram generated from SmartPLS before eliminating some invalid indicators.

After eliminating several indicators with loading factor values below 0.60, the measurement model is improved, as seen in Figure 2 below.

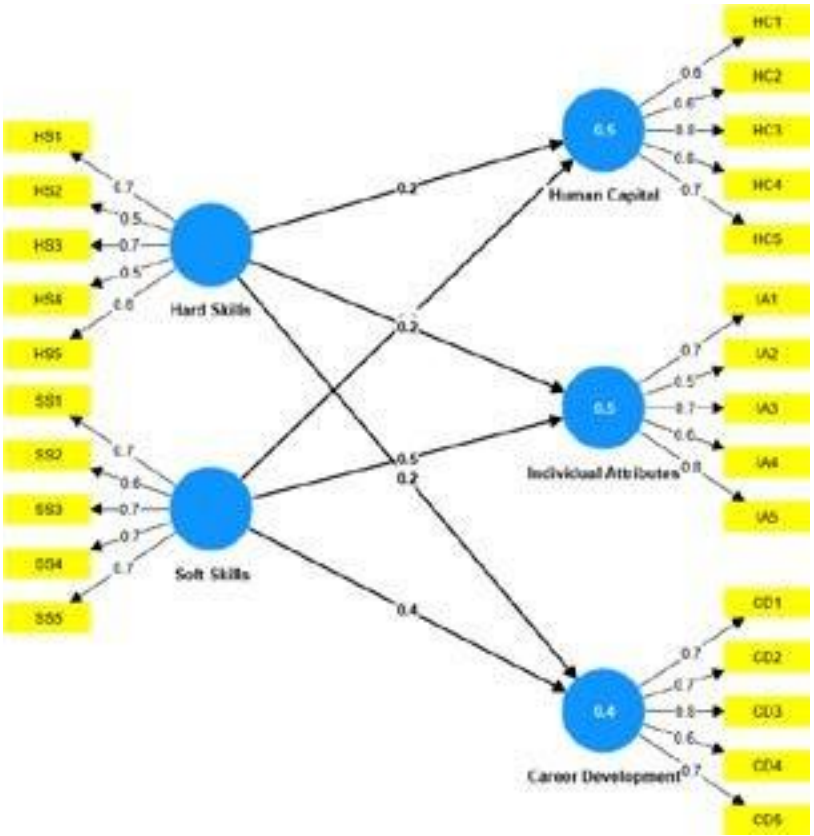

Figure 1. Outer Model Before Elimination

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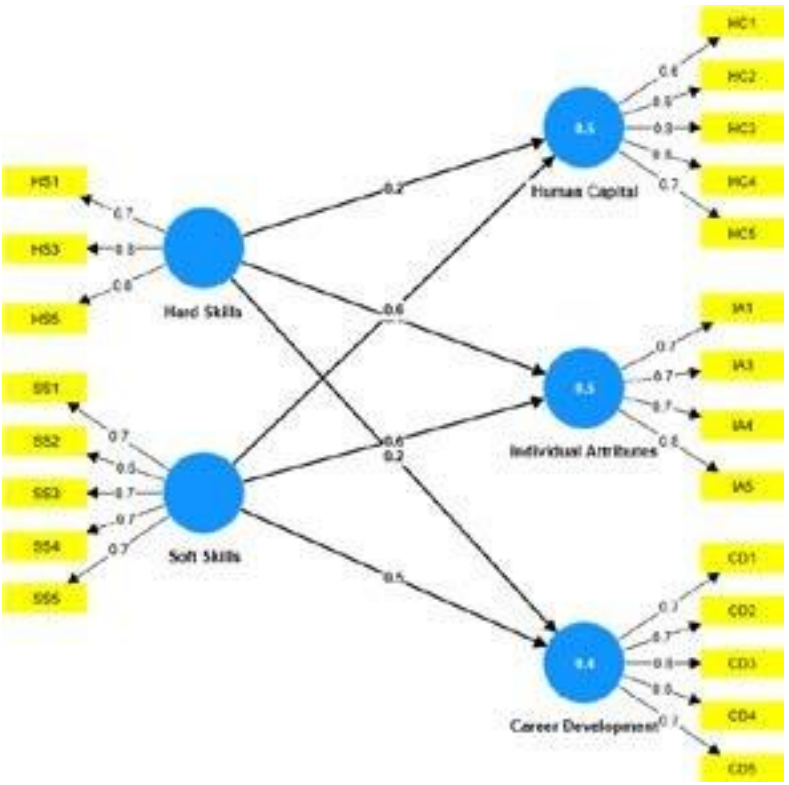

Figure 2. Outer Model After Elimination

The eliminated indicators are HS2, HS4, and IA2, so all remaining indicators have a loading factor value above 0.60. Thus, all indicators can be declared valid for use in further analysis.

Validity and Reliability of Constructs

The results of the convergence validity test through outer loading analysis show that some indicators with values below 0.60 have been eliminated. After elimination, all remaining indicators showed an outer loading value above 0.60, which means they are valid for further analysis.

In addition, the validity of discrimination is tested through cross-loading, where each indicator has a higher correlation value with the variable it measures compared to other variables. It shows that each variable has good discriminatory validity.

For reliability testing, the results of composite reliability show that all constructs have a reliability value above 0.80, which indicates that each construct in this study is reliable and reliable for further analysis.

Inner Model

The R-Square test was conducted to assess the predictive strength of the model used. The test results showed that the variables of hard skills and soft skills were able to explain career development by 40%, human capital by 50%, and individual attributes by 40%. It means that there are still other variables that affect the individual's career, human capital, and attributes that were not studied in this study.

Table 3. R-Square and Q-Square

Variable Dependent	R-Square Adjusted	Q^2 Predict	Conclusion
Career Development	0.4	0.3	Good
Human Capital	0.5	0.4	Good
Individual Attributes	0.4	0.4	Good

Source: Data Processed (2024)

The Q-Square test shows that the predictive values for all dependent variables are more than

0, which indicates that the model has good and relevant predictions. Furthermore, the research hypothesis was tested using a bootstrapping approach. The test results (see Table 4) show that hard skills have a significant influence on human capital and career development but not individual attributes. Meanwhile, soft skills showed a significant influence on the three dependent variables, namely human capital, individual attributes, and career development.

Table 4. Hypothesis Test Results

Hypothesis	Relationship Between Variables	Loading factors	T-Statistics (> 1,64)	P-Values	Conclusion
H1	Hard Skills → Human Capital	0.2	2.3	0.0	Accepted
H2	Soft Skills → Human Capital	0.6	8.3	0.0	Accepted
H3	Hard Skills → Individual Attributes	0.1	1.5	0.1	Rejected
H4	Soft Skills → Individual Attributes	0.6	7.6	0.0	Accepted
H5	Hard Skills → Career Development	0.2	1.9	0.0	Accepted
H6	Soft Skills → Career Development	0.5	5.3	0.0	Accepted

Source: Data Processed (2024)

The results of the hypothesis test show that hard skills and soft skills in big data analytics have a significant influence on human capital and career development. However, hard skills did not show a significant influence on individual attributes, indicating that technical skills were not always related to individual attributes. Soft skills, on the other hand, have a significant influence on all three variables, underscoring the importance of interpersonal skills in improving the employability of accounting students.

The Effect of Hard Skills Big Data Analytics on Human Capital

Based on the results of the hypothesis test, hard skills in big data analytics have a positive and significant influence on increasing the human capital of accounting students. The better the hard skills of big data analytics, the better the quality of human capital. Skills in analyzing and using big data platforms help students gain diverse knowledge, not only limited to accounting but also in understanding analytics technology and data-driven decision-making. By understanding big data analytics, students can develop critical thinking skills, which are very useful in solving complex accounting problems (Ahmed et al., 2017; Jackson et al., 2022).

These results support the job-market signalling theory, which explains that hard skills can be a signal for employers to assess the quality of students' human capital (Spence, 1973). This study supports the findings of Xu et al. (2022), which shows that hard skills have a significant effect on human capital.

The Effect of Soft Skills Big Data Analytics on Human Capital

In addition to hard skills, hypothesis tests show that soft skills in big data analytics also have a positive and significant influence on increasing the human capital of accounting students. Soft skills, such as communication, collaboration, and critical thinking skills, are essential in the world of analytics. The ability of students to interpret and communicate data clearly through big data analytics helps them understand information in depth and interpret it into more applicable knowledge (Tsiligiris & Bowyer, 2021; Xu et al., 2022)

This increase in human capital through soft skills supports the theory of job-market signalling, which states that soft skills can be used as a signal for employers to assess students' ability and potential to adapt and develop in a dynamic work environment. These results are also in line with the findings of Xu et al. (2022), who found that soft skills have a significant effect on the human capital of accounting students.

The Effect of Hard Skills Big Data Analytics on Individual Attributes

The results of hypothesis testing show that although hard skills in big data analytics have a positive influence on the individual attributes of accounting students, the influence is not significant. It means that even though students have good hard

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skills, this does not necessarily affect aspects of their personalities, such as adaptability, flexibility, or creativity (Clarke, 2017)

Hard skills tend to be related to technical and practical abilities in completing tasks but are not directly related to the individual's personality. Therefore, these results do not support the job-market signalling theory in the context of individual attributes because hard skills cannot be a strong indicator to measure a person's personality qualities. This finding is in line with the study of Xu et al. (2022), which also found that hard skills do not have a significant influence on the individual attributes of accounting students.

The Effect of Soft Skills Big Data Analytics on Individual Attributes

On the contrary, the results of the hypothesis test show that soft skills in big data analytics have a positive and significant influence on the improvement of individual attributes of accounting students. The ability to collaborate, communicate, and think creatively in a big data analytics environment encourages the development of a more adaptive and innovative personality (Xu et al., 2022).

Big data analytics also help students improve communication skills and emotional intelligence, which is important to avoid miscommunication and strengthen teamwork (Tsiligiris & Bowyer, 2021). These results support the job-market signalling theory, where soft skills are considered a strong signal to demonstrate the quality of individual student attributes to employers. The results of this study are also consistent with the findings of (Xu et al., 2022), which found that soft skills have a significant effect on the individual attributes of accounting students.

The Influence of Hard Skills Big Data Analytics on Career Development

Hypothesis testing also shows that hard skills in big data analytics have a positive and significant influence on improving the career development of accounting students. Students who have hard skills in analyzing data and utilizing big data technology can understand relevant trends and strategies for their career development (Jackson et al., 2022).

Hard skills help students better plan career steps and provide a solid foundation in professional decision-making (Xu et al., 2022). This result is in line with the theory of job-market signalling, where students can use hard skills to show their readiness to pursue a career, thereby increasing their chances of being hired. This study supports the findings of Xu et al. (2022), which stated that hard skills have a significant effect on the career development of accounting students.

The Influence of Soft Skills Big Data Analytics on Career Development

Soft skills in big data analytics are also proven to have a positive and significant influence on improving the career development of accounting students. The decision-making, communication, and collaboration skills developed through big data analytics allow students to face career challenges with more confidence and skills (Xu et al., 2022). Soft skills also help students identify their strengths and weaknesses and promote themselves in the job market more effectively (Tsiligiris & Bowyer, 2021). These results support the theory of job-market signalling, which states that soft skills can be used as a signal to show students' career readiness and professionalism to employers. This research is in line with the findings of Xu et al. (2022), who concluded that soft skills have a significant effect on the career development of accounting students.

CONCLUSION

This study investigates the influence of hard skills and soft skills of big data analytics on the improvement of employability, which is measured through three main dimensions: human capital, individual attributes, and career development. The results of hypothesis testing show that both hard skills and soft skills have a positive and significant influence on human capital and career development.

However, only soft skills have a significant influence on individual attributes. This research supports the job-market signalling theory, which states that technical and non-technical skills can serve as signals by which employers can assess the quality and potential of workers. Overall, these findings reinforce the importance of developing a balance between hard skills and soft skills in the face of the demands of a labour market that is increasingly oriented towards digital technology, especially in the field of accounting.

The implications of this study include both theoretical and practical aspects. Theoretically, this study strengthens the theory of job-market signalling in the context of big data analytics and the employability of accounting students. This research provides new insights into how a combination of hard skills and soft skills can affect three key dimensions of employability, with a particular emphasis on the stronger influence of soft skills on career development and individual attributes.

In practical terms, this study guides educational institutions to pay more attention to the development of soft skills through a curriculum that combines technical aspects, such as big data analytics, with interpersonal skills, such as communication and leadership. For the industry, the results of this study indicate that students' non-technical skills should also be a priority in the recruitment process, in addition to technical skills directly related to the field of accounting.

To boost student employability, colleges should integrate big data analytics training into the accounting curriculum, emphasizing the development of relevant soft skills. They should also offer extra training programs focused on communication, leadership, and collaboration to enhance student attributes further. Finally, adopting project-based learning and case studies will allow students to apply their big data analytics skills in realistic scenarios. For employers, big data analytics capabilities can be a valuable indicator of potential employee performance. However, it is equally crucial to assess interpersonal skills and the ability to adapt and work effectively within a team.

This research has several limitations. First, this research is limited to accounting students, so the generalization of results for students in other fields may be limited. Second, this study uses a questionnaire-based survey method, which may influence the subjective bias of the respondents. Third, this study only focuses on hard skills and soft skills without taking into account other variables, such as environmental factors or external support, that may affect employability.

Further research is suggested to include samples from various study programs and expand the research variables to provide a more comprehensive picture of the factors that affect employability in the digital era.

REFERENCE

Adam, A. M. (2020). Sample Size Determination in Survey Research. *Journal of Scientific Research and Reports*, 90–97. https://doi.org/10.9734/jsrr/2020/v26i530263

Ahmed, U., Khalid, N., Ahmed, A., & Shah, M. H. (2017). Assessing Moderation of Employee Engagement on the Relationship between Work Discretion, Job Clarity and Business Performance in the Banking Sector of Pakistan. *Asian Economic and Financial Review*, *7*(12), 1197–1210. https://doi.org/10.18488/journal.aefr.2017.712.1197.1210

Borkowski, M. (2022). Institutional equilibrium in EU economies in 2008 and 2018: SEM-PLS models. *Statistics in Transition New Series*, *23*(2), 107–127. https://doi.org/10.2478/stattrans-2022-0019

Brown, V., Carrick, G., Jones, M. R., Pharris-Ciurej, N., Voorheis, J., & Walker, C. (2024). The Impact of Manufacturing Credentials on Earnings and the Probability of Employment. *ILR Review*, *77*(4), 535–561. https://doi.org/10.1177/00197939241256871

Ceschi, A., Costantini, A., Phillips, S. D., & Sartori, R. (2017). The career decision-making competence: a new construct for the career realm. *European Journal of Training and Development*, *41*(1), 8–27. https://doi.org/10.1108/ejtd-07-2016-0047

Chen, L., Lin, M., & Chen, L. (2023). Research on the Impact of Artificial Intelligence on the Development of the Accounting Industry. *Frontiers in Business, Economics and Management*, *11*(3), 262–266. https://doi.org/10.54097/bem.v11i3.13328

Clarke, M. (2017). Rethinking graduate employability: the role of capital, individual attributes and context. *Studies in Higher Education*, *43*(11), 1923–1937. https://doi.org/10.1080/03075079.2017.1294152

Forman, N., Avornicului, M. S., & László, S. (2023). Unlocking Success in IT: A Systematic Exploration of Soft and Hard Skills and Their Collaborative Dynamics across Information Technology Roles. *International Journal of Advanced Natural Sciences and Engineering Researches*, *7*(4), 246–252. https://doi.org/10.59287/ijanser.708

Friday, I., & Japhet, I. (2020). Information technology and the accountant today: What has really changed? *Journal of Accounting and Taxation*, *12*(1), 48–60. https://doi.org/10.5897/jat2019.0358

Irfansyah, A., Suparji, Suprianto, B., Kuntadi, C., & Sudarmaji, H. (2023). Factors That Affect the Quality Of Vocational Education Graduates in the 4.0 Era: Job Readiness, Skills and Digital Services. *Dinasti International Journal of Education Management And Social Science*, *4*(4), 485–496. https://doi.org/10.31933/dijemss.v4i4.1734

Jackson, D., Michelson, G., & Munir, R. (2022). New technology and desired skills of early career accountants. *Pacific Accounting Review*, *34*(4), 548–568. https://doi.org/10.1108/par-04-2021-0045

Janssen, M., van der Voort, H., & Wahyudi, A. (2017). Factors influencing big data decision-making quality. *Journal of Business Research*, *70*, 338–345. https://doi.org/10.1016/j.jbusres.2016.08.007

Kusnilawati, N., Kuswardani, D. C., Utaminingsih, A., Sulistyawati, A. I., & Kusuma, L. (2024). Competency mediates the influence of talent, interpersonal skills, and motivation on work ethic in entrepreneurial students. *Jurnal Ekonomi Dan Bisnis*, *27*(1), 229–248. https://doi.org/10.24914/jeb.v27i1.9049

Labobar, J., & Malatuny, Y. G. (2023). Soft Skill Development of STAKPN Sentani Christian Religious Education Graduates in the Workplace. *Proceedings of the 4th International Conference on Progressive Education 2022 (ICOPE 2022)*, 226–236. https://doi.org/https://doi.org/10.2991/978-2-38476-060-2_23

Limberg, D., Gnilka, P. B., & Broda, M. (2021). Advancing the Counseling Profession by Examining Relationships Between Variables. *Journal of Counseling & Development*, *99*(2), 145–155. https://doi.org/10.1002/jcad.12362

López González, A., Moreno, M., Moreno Román, A. C., Hadfeg Fernández, Y., & Cepero Pérez, N. (2024). Ethics in Artificial Intelligence: an Approach to Cybersecurity. *Inteligencia Artificial*, *27*(73), 38–54. https://doi.org/10.4114/intartif.vol27iss73pp38-54

Mahmudi, B. (2024). Exploring the Landscape of Big Data Analytics in Financial Decision Making. *Accounting Studies and Tax Journal (COUNT)*, *1*(2), 167–177. https://doi.org/10.62207/7spd4813

Maier, T. (2022). Advanced further training or dual higher education study: a choice experiment on the influence of employers' preferences on career advancement. *Journal for Labour Market Research*, *56*(1). https://doi.org/10.1186/s12651-022-00309-4

Özer, M., & Kuloğlu, A. (2023). The Relationship Between Primary School Teachers' Perceptions of 21st Century Skills And Digital Literacy Level. *Malaysian Online Journal of Educational Technology*, *11*(3), 173–183. https://doi.org/10.52380/mojet.2023.11.3.429

Pham, L. T. T. (2024). Work readiness of graduates in the digital age: A literature review. *Ho Chi Minh City Open University Journal of Science Social Sciences*, *14*(2), 113–120. https://doi.org/10.46223/hcmcoujs.soci.en.14.2.2820.2024

Qu, L. (2024). Opportunities and Challenges in Digital Transformation of Education. *Science Insights Education Frontiers*, *20*(2), 3215–3217. https://doi.org/10.15354/sief.24.co261

Raaijmakers, Q. A. W. (2000). Adolescents' Midpoint Responses on Likert-Type Scale Items: Neutral or Missing Values? *International Journal of Public Opinion Research*, *12*(2), 209–217. https://doi.org/10.1093/ijpor/12.2.209

Shahid, Z. A., Tariq, M. I., Paul, J., Naqvi, S. A., & Hallo, L. (2024). Signalling theory and its relevance in international marketing: a systematic review and future research agenda. *International Marketing Review*, *41*(2), 514–561. https://doi.org/10.1108/imr-04-2022-0092

Sheh, Y. S., Hanapi, Z., Mustapha, R., & Kiong, T. T. (2020). Soft Skills Among Hearing Impaired Graduates for Sustainability and Well-Being in Workplace. *International Journal of Academic Research in Business and Social Sciences*, *10*(5). https://doi.org/10.6007/IJARBSS/v10-i5/7187

Spence, A. M. (1973). Time and communication in economic and social interaction. *The Quarterly Journal of Economics*, *87*(4), 651–660,. https://doi.org/10.2307/1882035

Spence, M. (1973). Job Market Signaling. *The Quarterly Journal of Economics*, *87*(3), 355. https://doi.org/10.2307/1882010

Suarta, I. M., Suwintana, I. K., Sudiadnyani, I. G. A. O., & Sintadevi, N. P. R. (2023). Employability and digital technology: what skills employers want from accounting workers? *Accounting Education*, *33*(3), 274–295. https://doi.org/10.1080/09639284.2023.2196665

Tsiligiris, V., & Bowyer, D. (2021). Exploring the impact of 4IR on skills and personal qualities for future accountants: a proposed conceptual framework for university accounting education. *Accounting Education*, *30*(6), 621–649. https://doi.org/10.1080/09639284.2021.1938616

Wang, H., Li, S., Qin, P., & Xing, F. (2022). The Employability of Graduates of National Characteristic Discipline Programs of Study in China: Evidence from Employers. *Sustainability*, *14*(13), 7955. https://doi.org/10.3390/su14137955

Xu, L., Zhang, J., Ding, Y., Sun, G., Zhang, W., Philbin, S. P., & Guo, B. H. W. (2022). Assessing the impact of digital education and the role of the big data analytics course to enhance the skills and employability of engineering students. *Frontiers in Psychology*, *13*, 974574. https://doi.org/10.3389/fpsyg.2022.974574

Yorke, M. (2004). Employability in the Undergraduate Curriculum: some student perspectives. *European Journal of Education*, *39*(4), 409–427. https://doi.org/10.1111/j.1465-3435.2004.00194.x

Zhu, Z. (2023). Personal skills, career needs and employment capability of university Chinese students: Basis for career development program. *International Journal of Research Studies in Management*, *11*(6). https://doi.org/10.5861/ijrsm.2023.1064