Graduate employability in the double challenge of the post-covid labor market and digital transformation: The role of graduate’s capitals, 4.0 skills, attributes, and perceived labor market

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ABSTRACT

The economy is experiencing double disruption with the emergence of Covid-19 and businesses’ urgent demand for digital transformation. These create challenges for new graduate students in equipping themselves with the necessary capitals, skills, attributes, and psychological preparedness to deal with the current situation’s instability and meet the criteria of recruiters. Therefore, this paper is one of the first attempts to validate the importance of all the above-mentioned determinants on graduate employability in a relatively comprehensive framework and provide fresh evidence to today’s world employability taking 4.0 skills and psychological capital into account. The study firstly aims at exploring the role of various types of graduates’ capitals, a set of 4.0 skills, individual attributes, and today’s world perceived labor market on graduates’ perceived employability. Then the paper also investigates whether or not perceived employability and currently perceived labor market matter for actual employability. By employing PLS-SEM to analyze the primary data collected from the sample of 350 recent graduates in Ho Chi Minh City, the study finds that human capital, individual behaviors and attributes, social capital, and 4.0 skills all have a favorable impact on perceived employability. Besides, the substantial effects of perceived employability and today’s world labor market perception on graduate actual employability have also been found. The paper also provides some implications for students and the managerial level of universities/institutions on improving graduates’ employability in today’s world labor market.

1. Introduction

Stakeholders are paying increasing attention to the function of universities in society. Universities are under pressure to provide practical and measurable outcomes of the effectiveness not only from students but also from governments and businesses to guarantee that they give adequate skills and knowledge to help them gain employment. The government wants them to be able to have a workforce that is willing to put what they’ve learned into practice and contribute to their economy in a tangible way. On the other hand, recruiting organizations require universities to send them graduates who are ready and willing to contribute to the workplace right away.
Employers want graduates who can demonstrate not only their knowledge and expertise in their subject of study but also a diverse set of skills and knowledge for each position (Harvey, 2000).

Furthermore, the pressure to find work is increasing for recent grads. Today, universities are moving toward financial autonomy, causing tuition fees to skyrocket compared to previous years. This has increased the pressure on students to find a job after graduation in order to partially reimburse the tuition fees, while growing job instability and labor market volatility have decreased graduate job prospects. Every year, more students graduate from universities, according to the General Statistics Office of Vietnam (n.d.) analysis of data from 2016 to 2019. There were more than 1.1 million new graduate students during this period.

Even so, only a handful of them is able to get work, as employers have detected a lack of abilities in them and are unwilling to hire them. The exertions marketplace of the twenty-first century wishes college students to have present-day talents and trends similarly to exact instructional success as measured through Grade Factor Average (GPA) or diploma class (Suarta, Suwintana, Sudhana, & Hariyanti, 2017). Fajaryati, Budiyono, Akhyar, and Wiranto (2020) additionally said that employers presently count on to look a few interpersonal talents along with verbal exchange talents, problem-fixing abilities, and vital questioning ability in addition to technical skills, including both soft and hard talents to help a job seeker boost their productivity offered by schooling.

Following a preliminary examination of methods for increasing student employability, we will determine what factors influence students’ perceived employability and, as a result, boost actual employability. This paper will categorize the independent elements into three types: employability capital, individual traits, and perceived labor market. Capitals in the employment context refer to a set of personal assets-or capital—that can affect an individual’s capacity to find work (Trevor, 2001).

Aside from the practical and soft skills that education provides to help job seekers boost productivity, another relevant subject is what variables encourage businesses to hire over two graduates with the same degree. The result is “employability capital,” as defined by Peeters et al. (2019). That is, “personal resources that improve a person’s employability” (Peeters et al., 2019, p. 81). These personal resources include human capital, social capital, and psychological capital. While they are all linked to a person, human and psychological capital come from the individual, whereas social capital comes from interpersonal ties and relationships. According to Rothwell, Herbert, and Rothwell (2008), these variables are difficult to replicate because they are intrinsic to the individual, and their combination is obviously more intangible.

Nonetheless, they have been shown to be essential for finding work (Pool, Qualter, & Sewell, 2014; Pool & Sewell, 2007; Vargas, Sánchez-Queija, Rothwell, & Parra, 2018). Employers have stepped forward from reading college students’ curricula and coming across their desires in man or woman to approving curricula and accomplishing interviews to apprehend the character and institution traits of college students in several situations that restrict their cap potential to combine with a company (de Guzman & Choi, 2013; Jackson & Tomlinson, 2020; Pool & Sewell, 2007). Employers demand the possession and increase of employability capital, as seen by the evolution of job interviews. In addition, Donald, Baruch, and Ashleigh (2019) have established the positive relationship between human capital, social capital, and psychological capital with students’ perception of employability.

Individual traits group includes individual attributes and behaviors. In this paper, we will explore the attributes and behaviors of an individual through their adaptability, flexibility, how
they manage their career. Adaptability and flexibility help people handle changes (Fugate, Kinicki, & Ashforth, 2004; Heijde & Van Der Heijden, 2006), while optimization and adaptability help people prepare for future job problems (Heijde & Van Der Heijden, 2006) and, as a result, successful career outcomes. As a result, most of the broad study on employability has concentrated on its characteristics and how they might be cultivated and preserved on a personal level to assure stable job opportunities. Harvey (2000); Heijde and Van Der Heijden (2006) are some examples to illustrate this.

The final group is the perceived labor market, this one consists of today’s context that affects students’ skills and how they perceive them to prepare well for changes in the future. Starting with the fourth industrial revolution, as well as the integration of robotics and artificial intelligence into the production chain, will result in the creation of new jobs. Robots and artificial intelligence will eventually replace people in many different industries, according to the World Economic Forum (2018), from conventional fields like administration and accountancy to modern ones like information technology and data processing. This report also predicts that the percentage of working hours completed by robots will increase over the next few years. Along with the technological advancements in the 4.0 industry, globalization and economic integration also create many career prospects for everyone, particularly students. Still, this trend also comes with its own set of problems that workers must overcome. Vietnam joined the ASEAN Economic Community (AEC) at the end of 2015, which will allow people to work and study in other AEC countries but it will also increase job competitiveness when international workers are allowed to work in Vietnam. Employers in today’s national and global markets prefer to hire strong, soft skills graduates. As a result, most employers today require applicants with some Information Communication Technology (ICT) abilities to meet the challenges of greater competition in fieldwork in the twenty-first century (Ibrahim & Dandago, 2013). Also, in this study, Ibrahim and Dandago (2013) also stated that the complexity of skills required by today’s workforce has expanded due to changing labor market characteristics, threatening the position of graduates who lack knowledge of new knowledge technology.

Aside from technological advancements and globalization, the Covid-19 pandemic is another prominent issue in the 21st-century workplace. The epidemic has caused a crisis in many areas of life, including the economy, healthcare, production, and tourism, since the early days of 2020. The viral strains have created new issues for the world, particularly in Vietnam, where the number of contagious cases and deaths has risen dramatically. According to the International Labour Organization (2021), the exertions marketplace disaster due to the Covid-19 epidemic is some distance from resolved. The employment boom will now no longer be enough to offset the damage until at least 2023. In the countrywide context, the 4th Covid-19 wave, which started in April, threatened the momentum of employment healing and salary increase within the second quarter, specifically in big towns along with Hanoi, Ho Chi Minh City, and neighboring provinces. The findings of the Q2/2021 Labour Force Survey (LFS) (General Statistics Office of Vietnam, 2021) indicate that the labor market has not improved since the first quarter. On the contrary, the labor force participation rate, informal employment prevalence, unemployment rate, and time-related underemployment rate have all grown quarter on quarter. As reported by the General Statistics Office of Vietnam (2021), the Covid-19 pandemic substantially impacted 12.8 million human beings’ elderly 15 and up withinside the 2nd area of 2021, which includes individuals who misplaced their jobs, had been furloughed, labored different shifts, had fewer operating hours, had decreased income, and so on. As a result, while compared to the primary area of 2021, the Covid-19 pandemic has impacted a minimum of 3.7 million extra workers. Workers aged 25 to 54 are the maximum critically affected, accounting for seventy-five percent of those afflicted. This also
results in the highest unemployment rate for Vietnam’s working-age population in general, and the young working-age group in particular, in the last two years, since 2019, according to the statistical report of Trading Economics (n.d.).

Based on the less-studied aspects of employability issues, it is vital to undertake research on graduate employability, considering a comprehensive picture of graduates’ heterogeneities. Thus, the paper firstly explores whether various types of graduates’ capitals, skills, and attributes really matter for their perceived employability and actual employability. The paper then investigates the role of labor market perception in today’s world on perceived employability and actual employability. Finally, the paper examines to what extent the perceived employability contributes to the graduates’ actual employability.

2. Literature review

2.1. Theoretical literature review

2.1.1. Graduate employability

Graduate employability is defined by Hillage and Pollard (1998) as the “knowledge, abilities, and qualities that graduates are expected to be able to demonstrate they have gained in higher education.” (Clarke, 2018, p. 3). Other explanations distinguish between graduates and non-graduates based on aptitude sets and qualities that increase the likelihood of graduates finding work, according to Boden and Nedeva (2010); Yorke (2006). This article has synthesized from research papers of scientists in finding out the factors affecting the actual employability of students after graduation. The first was Holmes (2013), who came up with and helped differentiate interpretations of competing concepts for student recruitment, including possession (human capital); position (social capital); and process (career self-management). However, in today’s world, the foregoing is no longer sufficient to assure that students enhance their employability. The industrial collaboration, international interchange, and diversity within the organization all aided students in developing new skills needed to find work after graduation. As seen by industry 4.0, the Internet of Things (IoT), and cloud computing, the rapid growth of technology has resulted in the emergence of several other new industry groupings and growing demand for career-ready graduates prepared to work in these fields. Stakeholders expect that a graduate-ready student for a career beyond professional skills and knowledge will be equipped with the technical skills to operate machines efficiently. Pinzone et al. (2017) referred to the above as skills in the period of industrial revolution 4.0, or 4.0 skills, and it impacts students’ actual employment after graduation. Employers nowadays like to locate brilliant applicants using exams examining their ability and problem-solving skills; they want to find innovative and dynamic individuals. Employers desire to identify the best candidates that are versatile, continually changing due to the long search time and high training expenditures for workers. Therefore, students must not only demonstrate the value they bring to the company, their current capabilities but also show their potential for future development.

2.1.2. Perceived employability

Berntson and Marklund (2007) discovered that perceived employability refers to an individual’s appraisal of his or her prospects of getting and keeping a job. It is a concept that describes the combination of individual and systematic characteristics that influence how people perceive their potential for success in the job market and go about looking for work. It also recognizes the significance of both subjective and objective indicators of employability (Veld, Semeijn, & Vuuren, 2015). Rather than objective measures of employability such as education level, qualification, or professional position, the subjective idea of employability is especially
essential for assessing employee behaviors (De Cuyper, Van der Heijden, & De Witte, 2011).

2.1.3. Graduate capitals

Graduates’ employability is primarily determined by collecting and applying diverse capitals. Capitals in this capital, as mentioned above, are characterized as the resources that promote competitiveness and offer graduates an edge. These resources are accumulated via the process of accumulating experiences that students gain through study, practice, and life lessons in a variety of sectors, including education, psychology, social life, culture, and behavior (Tomlinson, 2017). The main types of capital analyzed in this article include Human Capital, Social Capital, and Psychological Capitals.

a. Human capital

While human capital is vital for graduate employability, it does not guarantee a successful job (Clarke, 2018). Human capital refers to the information and skills that university students obtain and that serve as the foundation for their labor-market success (Fugate et al., 2004; Peeters et al., 2019; Tomlinson, 2017). Human capital, according to Becker (2009); Fugate et al. (2004); McArdle, Waters, Briscoe, and Hall (2007), is described as the set of productive skills that an individual gets as a consequence of the accumulation of general or particular information that may impact one’s professional development. Therefore, Berntson, Sverke, and Marklund (2006) mentioned that investments in human capital by university students would be crucial variables in affecting their judgments of acceptable job options.

b. Social capital

In terms of graduate employability, Tomlinson (2017) defined social capital as the sum of social hyperlinks and networks that assist graduates in prompting their gift human capital and joining them to the exertions marketplace and its possible structures. This form of capital may be gained through student-to-student and student-to-neighborhood networks that boost (on a personal level) students’ employability and prospects to locate acceptable occupations (Fugate et al., 2004; Mouw, 2003; Peeters et al., 2019; Tomlinson, 2017). When combined with human capital, networking’s social capital aspect has the potential to greatly boost real employment results.

c. Psychological capital

Employability, in actuality, refers to the ability to adapt and respond proactively to job difficulties (Tomlinson, 2017). These traits and behaviors are related to the concept of psychological capital (Williams, Dodd, Steele, & Randall, 2016). For students, psychological capital, including self-efficacy and optimism, is a vital resource that allows them to perceive greater employability (Luthans, 2002). It is especially crucial for new grads since it will enable them to withstand pressures and interruptions in the early stages of their careers in today’s volatile labor markets (Tomlinson, 2017; Williams et al., 2016).

2.1.4. Individual attributes and behaviors

Individual attributes and behaviors had largely been disregarded in graduate employability discourse, even as being extensively mentioned as vital to expert achievement in control and psychology literature (Fugate & Ashforth, 2003). Because job search is primarily self-managed, job seekers must govern their behavior and deal with unpleasant occurrences along the way (Kanfer, Wanberg, & Kantrowitz, 2001) noted that personality is critical in defining the job search process. Adaptability and flexibility assist people in coping with constant change (Fugate et al., 2004; Heijde & Van Der Heijden, 2006), whereas ‘adaptation and optimization’ assist in
preparation for future job issues (Heijde & Van Der Heijden, 2006) and, as a result, a successful career outcome. Individual behaviors in this study are strongly related to self-management skills, career resilience, and cultural competencies. Self-management skills reflect students’ employability to a considerable extent. These talents are linked to a person’s self-perception and assessment in phrases of values, abilities, passions, and objectives (Bridgstock, 2009). Career-self management entails soliciting feedback from others and employing networks to advance professionally; developing career objectives and action plans; and a proclivity for innovation and taking risks in capitalizing on opportunities in the workplace, according to Bezuidenhout (2011). In terms of career resilience and cultural competencies, Bezuidenhout (2011) stated that career resilience is a human quality that encourages adaptability, the ability to profit on change, self-confidence, openness to new opportunities and connections, self-reliance, and a belief in one’s ability to handle events despite adverse career circumstances. According to a research paper conducted by Bezuidenhout (2011), cultural competency refers to a person’s capacity and willingness to successfully find out about and paintings with human beings from different cultural groups. In the face of adversity in their careers, persons with professional resilience demonstrate a high level of adaptation, flexibility, and competence (Fourie & Van Vuuren, 1998).

Personality qualities such as self-efficacy, adaptability, and tenacity, as well as one’s internalized cultural values, conventions, and beliefs, are included in the personal attributes dimension. Because of substantial changes in the workforce’s demographic mix as well as an increase in foreign assignments, people will increasingly contact and work with culturally diverse people (Ang, Van Dyne, & Koh, 2006); and those who wish to thrive in a changing world of work must be culturally competent. Johnson, Lenartowicz, and Apud (2006) also delivered comprehensive definitions of all the factors in the cross-cultural competence factor, based on what Johnson et al. (2006) defined, culture, languages, values, norms of interaction, cultural distinctions, customs, and the history of various cultural groups are all part of the knowledge dimension. Following the logical statements above, Greenhaus, Callanan, and Godshalk (2010) stated that career success in many businesses will be determined by an individual’s ability to succeed in a multicultural workplace.

Despite the fact that a person’s personality is thought to be relatively stable throughout life, people are encouraged to grow and change, adapting flexibly to each situation, in order to be able to actively search for and manage work more effectively, as well as to hone and acquire new job-related skills.

2.1.5. Present situation of the labor market

a. 4.0 Skills

Industry 4.0 is now considered embryonic, as it differs from previous industrial revolutions in terms of speed, scale, complexity, and revolutionary potential (Xu, Jeanne, & Suk, 2018). Therefore, being aware of the changes and the rate at which they are occurring is crucial for survival in the Industry 4.0 age. From research papers conducted by Popkova and Sergi (2018); Morrar, Arman, and Mousa (2017); Sung (2018), industry 4.0 will have an impact on not only manufacturing industries but also the social, economic, and academic sectors, as past industrial revolutions did. As a result, in order to obtain the majority of jobs, the necessary skills must be instilled in persons through the proper channel of education at higher education institutions (Benešová & Tupa, 2017).

b. Perceived of Labor Market in today’s world

Labor market variables have become a critical driver of graduate job success; nevertheless,
the massification of higher education has resulted in an oversupply of graduates in many industries (Piróg, 2016; Tomlinson, 2012). Students must continually develop and manage their employability in a worldwide and demanding work market. Higher education may boost or limit students’ career chances; thus, it’s critical to learn about and comprehend their opinions on educational programs. However, their perspectives are not commonly recognized or examined (Donald et al., 2019; Jackson, 2015; Tymon, 2013). Along with the globalization trend in all industries, the fourth industrial revolution also creates millions of new work possibilities worldwide. They can open up new opportunities and create new employment while also eradicating unhealthy and challenging working conditions. The Covid-19 epidemic has transformed the character of several professions, such as utilizing the technological advancements for working online. While the sector’s unemployment rate has dropped significantly in the last decade, Covid-19 has made a huge impact on the labor market, with no clear long-term consequences (Huang, Makridis, Baker, Medeiros, & Guo, 2020). As a result of the current situation, even highly qualified and seemingly marketable graduates may be unable to find suitable employment immediately after graduation or may be compelled to accept a position outside their field of expertise or at a lower level than planned.

As a result, in order to have a full picture of actual employability, the perception of the labor market in today’s world should be incorporated for extensive examination to assist well-prepared students in improving employment outcomes.

Based on the empirical evidence and research conducted by many authors, we have come up with the following research model and hypotheses.

2.2. Research model

![Research Model](image)

**Graduate Capitals and Skills:**
1. Human Capital (H1)
2. Social Capital (H2)
3. Psychological Capital (H3)
4. 4.0 Skills (H6)

**Individual Traits:**
5. Individual Behaviors (H4)
6. Individual Attributes (H5)

**H1:** Human Capital has a substantial beneficial impact on the Perceived Employability

**H2:** Social Capital has a significant positive influence on the Perceived Employability

**H3:** Psychological Capital has a great positive influence on the Perceived Employability
H4: Individual Behaviors has a significant positive influence on Perceived Employability
H5: Individual Attributes has a great positive influence on Perceived Employability
H6: 4.0 Skills has a great positive influence on the Perceived Employability
H7: Perceived Employability has a large positive influence on Graduate Employability
H8: Perception of Labor Market in today’s world has a positive influence on Perceived Employability
H9: Perceived Labor Market in today’s world has a positive influence on Graduate Employability

3. Methodology

3.1. Sampling, data collection, and analysis

Our primary replies are final-year students looking for an internship opportunity and recent graduates aged from 0-5 years looking for their first job or intending to change jobs in Ho Chi Minh City - where there have lots of universities and career prospects. This paper used the non-probability sampling method, specifically is convenience sampling, to collect data. The questionnaire included items that measured the scales of latent variables as well as the respondents’ demographic information. The dimensions utilized to measure the constructs proposed in this study were thoroughly evaluated in the literature and found to be valid and reliable measures. Before sending the official questionnaire to the research participants, several sample questionnaires were sent to close friends to check the accuracy of the sentences and understanding of the assessment questions, as well as to get feedback on how the words could be adjusted to fit the Vietnamese academic context while maintaining the correctness and sense of the entire sentence. The final version of the questionnaire was given out to the targeted respondents via Google form after being reviewed numerous times online with an adviser to identify any possible deceptive statements using the instruments and make any necessary modifications. We believe that online surveys are the most appropriate technique for collecting data at this time because the situation with Covid-19 has worsened, and we are unable to go to colleges for offline data collection due to lockdown laws. Furthermore, online surveys allow us to save money on printing and shipping, as well as time spent entering data and receiving/processing results.

Due to the lockdown scenario and the spread of the pandemic, it is difficult for us to achieve the appropriate sample size of 425 as planned within the limited time frame because the intended participants of this research were new graduate students from institutions. Regardless, the sample size of 350 is close to the optimal size and is within the acceptable sample range, according to (Hair, Black, Babin, & Anderson, 2010, 2014).

As the data used in this study is primary data obtained with the goal of providing empirical evidence for the research model and enriching the extra components in the employability sector, we employed questionnaires to conduct the survey research. The study has built the constructs using the reflective measurement model. In this way, the structural model is analyzed by PLS-SEM procedures with SmartPLS3 software.

3.2. Measurement

The recommended questions are based on instruments that were used in previous research to assess the latent variables presented in the literature reviews; each item is graded on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The items were somewhat adjusted when translated into Vietnamese to meet the native context and minimize misreadings and
misunderstandings among the intended respondents.

To obtain an overall estimate of Human Capital, three components were represented in a framework. It was expected that these components would not exist in isolation based on the literature review. In this article, human capital is described as an individual’s traits in terms of knowledge, skills, abilities, and attitudes conducive to personal development. This study eliminated some things that were not important to the setting of Vietnam, the residence country where this work was done, for the sake of cultural fit. The items used for measuring Human Capital were adopted from Lee, Cornwell, and Babiak (2013); Pool et al. (2014); examples include “I have good problem-solving skills in my daily activities.” and “I manage my time effectively.”

Social Capital, which is indicated by networking behaviors, includes five items selected from the eighteen-item behaviors of networking scaled identified by Ferris et al. (2005) adapted for the university context. Examples of items used include “I know a lot of significant individuals and am well connected at university”. This research used the scale of Luthans, Youssef, and Avolio (2007) to measure Psychological Capital. We adjusted the wordings of the original items to meet the context of this study because the original psychological capital scale was meant to measure and enhance the psychological capital of employed persons. To measure respondents’ confidence in their skills to satisfy the work demands of their new job upon reemployment, we inserted the word “future employment” to the self-efficacy subscale wherever it was suitable. “In my future employment, I am confident in my ability to assist in the establishment of targets/goals in my work area.”, for example. We also introduced the word “job hunt” to questions assessing respondents’ positive sentiments regarding the job search process. “When it comes to my job hunt, I usually try to see the good side of things.” is an example.

In terms of “4.0 Skills” measurement item, this paper adopted from many authors, including Jackson (2012), Pool et al. (2014), and Mayer and Salovey (1997). “I am open to fresh ideas at all times.”, for example, is one of the elements in this measurement. To boost the accuracy of the scale and for thorough analysis, we need to integrate numerous items from different authors for assessing the “4.0 Skills” item.

In addition to the items produced by Bateman and Crant (1993) and Beltrán-Martín, Roca-Puig, Escrig-Tena, and Bou-Llusar (2009) for the “Individual Attributes” item, this paper additionally introduced items linked to adaptability in the 4.0 environment, which were indicated by Sözbilir (2021). An example item is “I enjoy working with digital equipment.” to assess a fresh graduate’s adaptability in the digital world and to provide a more in-depth explanation for the study’s objectives.

“Individual Behaviors” is measured by the items developed by Bezuidenhout (2011). These items are carefully selected to measure the components of individual behaviors, from career self-management with an example “I am constantly looking for information about what a certain job entails.” to cultural competence such as “I am confident in my capacity to communicate across cultural boundaries”.

The perception of the employment environment, or more precisely, the “Perceived Labor market in today’s world”, includes five items developed by Tsai, Hsu, and Hsu (2017) to measure the attitude of students toward the fluctuation of the labor market in the future. We introduced the word “The Covid-19 pandemic” and “AI and robot” to questions to assess students’ perception about today’s employment environment and provide the practical implications for this study. An
example item is “Because of the rising number of Covid-19 cases, I am concerned about my future career”.

Three items were chosen from a list to assess employability from Berntson and Marklund’s study (2007) to measure perceived employability. Respondents were asked to determine how much they agreed with three different topics ranging from “My abilities and knowledge are in high demand in the work market.” to “My skills are in high demand in the work market”.

This study assesses Graduate Employability using the (Rothwell et al., 2008) questionnaire, which has demonstrated strong reliability as well as construct and criterion validity in undergraduate contexts, with statements like “This university’s reputation is a huge help to me in my career search.” Furthermore, based on a study of the literature, in order to ensure the accuracy of graduate employability and satisfy the aims of this study, this research proposes two newly constructed items for measuring the length of the job search and the transition to full-time work. These two newly developed items are “It didn’t take me too long to find a job/internship that matched my qualifications and major”, and “I got a full-time job in line with my specialty after completing my probation period/internship”.

The characteristics of the respondents are shown in Table 1. We polled participants from several universities in Ho Chi Minh City for demographic information in order to ensure that the research findings were as universal as possible. It’s worth noting that fresh graduate students aged 0 - 03 years accounted for more than 46% of replies, those aged 03 - 05 years accounted for 31%, and those aged beyond 05 years accounted for 22%. Our research focuses on recent graduates since they are familiar with the challenges of finding a suitable job in the current environment and have had experience identifying their strengths and shortcomings during their time at university.

Table 1
Demographic characteristics (N = 350)

| Items                  | Description              | Sample | Percentage |
|------------------------|--------------------------|--------|------------|
| Status of respondents  | Graduated from 0 - 03 years | 163    | 46.6       |
|                        | Graduated from 03 - 05 years | 110    | 31.4       |
|                        | Graduated more than 05 years | 77     | 22         |
| Job-status             | Full-time position        | 350    | 100        |
| Income level           | From 05 - 10 million VND | 192    | 54.9       |
|                        | From 10 - 20 million VND | 96     | 27.4       |
|                        | More than 20 million VND | 62     | 17.7       |
| Searching job length   | Less than 01 month        | 57     | 16.3       |
|                        | From 01 - 03 months       | 59     | 16.9       |
|                        | From 03 - 06 months       | 91     | 26         |
|                        | More than 06 months       | 143    | 40.8       |
| Job satisfaction       | Yes                       | 220    | 62.9       |
|                        | No                        | 130    | 37.1       |

Source: The researcher’s data analysis
4. Results

To evaluate the convergence value of latent variables, the index of outer loading and the “Average Variance Extracted” (AVE) are utilized. If a variable’s outer loading is more than 0.7, it is regarded as an ideal index; otherwise, a range of 0.4 to 0.7 should be evaluated before deletion (Henseler, Ringle, & Sarstedt, 2012).

The convergence value is used to assess the scale’s stability. To confirm the convergence value, the Average Variance Extracted (AVE) coefficient must be greater than or equal to 0.5, according to Fornell and Larcker (1981).

The testing results shown in Table 2 and 3 indicated that all constructs satisfied all reliability, convergent, and discriminant validity conditions.

Table 2
The findings of the study scale’s reliability evaluation

|                                | Cronbach’s Alpha | Rho_A | Composite Reliability | Average Variance Extracted (AVE) |
|--------------------------------|------------------|-------|------------------------|----------------------------------|
| 4.0 skills                     | 0.847            | 0.86  | 0.89                   | 0.617                            |
| Graduate Employability         | 0.855            | 0.869 | 0.889                  | 0.505                            |
| Human Capital                  | 0.802            | 0.808 | 0.864                  | 0.56                             |
| Individual Attributes          | 0.881            | 0.886 | 0.914                  | 0.682                            |
| Individual Behaviors           | 0.875            | 0.878 | 0.905                  | 0.615                            |
| Perceived Labor Market in today’s world | 0.794   | 0.815 | 0.858                  | 0.548                            |
| Perceived Employability        | 0.751            | 0.757 | 0.857                  | 0.667                            |
| Psychological Capital          | 0.842            | 0.908 | 0.877                  | 0.546                            |
| Social Capital                 | 0.875            | 0.883 | 0.914                  | 0.727                            |

Source: Data analysis result of the research

Table 3
Fornell - Larcker criterion

|                                | (1)  | (2)  | (3)  | (4)  | (5)  | (6)  | (7)  | (8)  | (9)  |
|--------------------------------|------|------|------|------|------|------|------|------|------|
| Graduate Employability (1)     | 0.711|      |      |      |      |      |      |      |      |
| Human Capital (2)              | 0.189| 0.748|      |      |      |      |      |      |      |
| Individual Attributes (3)      | 0.332| 0.37 | 0.826|      |      |      |      |      |      |
The suggested research model is estimated using PLS-SEM. Figure 2 displays the outcomes of the measurement model that was tested. The T (Bootstrap) value was used to establish the statistical significance of each route coefficient, as shown in Table 3. As demonstrated in Figure 2, all pathways had a (+) positive influence on Perceived Employability and Graduate Employability.

Following the examination of the external model, the internal model (structural model) is examined to explicitly estimate the link between latent variables. For endogenous latent variables, R-square analysis and path coefficient values were utilized. It is important to remember that the significance threshold is set at 5% (p-values < 0.05). Non-parametric analysis The research findings were evaluated using a bootstrap technique (Bootstrap test). Bootstrapping is an iterative sampling strategy for calculating standard error while avoiding the need for distributional assumptions, according to Hair, Matthews, Matthews, and Sarstedt (2017). The bootstrap findings are a decent approximation of the normality of the data. It is used to determine how significant the t-statistic is in path coefficients. The table below shows the important values for the path factor determined using the bootstrapping approach.

The results of the path coefficients in Figure 2 and Table 3 showed that with 09 hypotheses being tested for the first time, 07/09 hypotheses were supported in the first test with a significance level of 5% (since p-value < 0.05).
Table 4

PLS-SEM path coefficient and effect size

| Hypotheses | Original Sample (O) | T Statistics | P-Values | Conclusion | f² | Effect |
|------------|---------------------|--------------|----------|------------|----|--------|
| H1         | Human Capital -> Perceived Employability | 0.345 | 9.84 | 0.000 | Supported | 0.055 | Weak effect |
| H5         | Individual Attributes -> Perceived Employability | 0.271 | 5.96 | 0.000 | Supported | 0.237 | Average effect |
| H4         | Individual Behaviors -> Perceived Employability | 0.146 | 3.778 | 0.000 | Supported | 0.138 | Weak effect |
| H9         | Perceived Labor Market in today’s world -> Graduate Employability | 0.318 | 6.241 | 0.000 | Supported | 0.044 | Weak effect |
| H8         | Perceived Labor Market in today’s world -> Perceived | 0.061 | 1.737 | 0.082 | Not Supported | 0.133 | Weak effect |
### Hypotheses Table

| Hypotheses                        | Original Sample (O) | T Statistics | P - Values | Conclusion | $f^2$ | Effect       |
|-----------------------------------|---------------------|--------------|------------|------------|------|--------------|
| Employability                     |                     |              |            |            |      |              |
| H6 4.0 Skills -> Perceived Employability | 0.161               | 4.239        | 0.000      | Supported  | 0.008| No effect    |
| H3 Psychological Capital -> Perceived Employability | 0.059               | 1.369        | 0.171      | Not Supported | 0.162| Average effect |
| H7 Perceived Employability -> Graduate Employability | 0.351               | 6.139        | 0.000      | Supported  | 0.008| No effect    |
| H2 Social Capital -> Perceived Employability | 0.217               | 4.501        | 0.000      | Supported  | 0.098| Weak effect  |

Source: Data analysis result of the research

The statistical results suggest that the factors mentioned in the research model positively impact students’ perceived employability, affecting the ability to be recruited or their graduate employability. This link has also been demonstrated in prior studies by other authors (Becker, 2009; Clarke, 2018; Rothwell et al., 2008; Tomlinson, 2017). The findings of this study contribute to the practical testing of previous research models, implying that, in addition to required academic skills, technological knowledge of the new era also plays an important role in creating student recruitment resources (graduate capitals), particularly for students in the current dual indirect era with the emergence of epidemics and technological transgressions. Hypotheses 3 and 8 were rejected based on the obtained data since the influence on the dependent variables perceived employability and graduate employability was minimal.

5. Conclusion, implications, and recommendations

5.1. Conclusion and implications

The research model on the relationship between graduate capital and perceived employability was put to the test in this study. This study successfully identified essential elements and the degree of impact of each aspect on students’ job perception skills, affecting their employability after graduation. This has been highlighted over the key study objectives in this research article. First, we identified the elements affecting perceived employability that had previously been researched by other authors using their study approach while also adding additional factors appropriate for the settings, such as skills 4.0 and psychological capital. Second, we have produced empirical test findings on the impact of each of those elements on students’ successful job search, contributing to lowering the time to find a job and reducing the burden of unemployment in Vietnam’s economy and labor market. Third, the association between the perceived labor market, perceived employability, and graduate employability has been demonstrated in this study. Whether perceived employability has a modest link with perceived labor market and graduate employability so that students can better understand the impact of graduate capital and labor market preparation on graduate employability.
From a practical standpoint, the relationship between graduate capitals, perceived employability, and graduate employability can provide useful insights for educational managers in developing a new curriculum and study program to close the gap between employers’ expectations and real abilities of students; as well as assist students in equipping themselves with required skills in today’s situation, and ultimately enhance the entire tertiary education and labor workfare system. Graduate capitals, particularly new ones in the age of pandemics and digital revolution, are crucial to understanding how students may increase their employability. The view of today’s labor market was added into the research model because it is the cause of job creation, a root for the student’s employability, and symbolizes how students grasp the current situation, how they see their surroundings, and how they prepare for their future. As previously said, students should depend on the analysis findings to further improve relevant abilities in each category to speed up their job search, understand what provides value for them when looking for work, and construct a clearer and longer-term plan. In today’s fragile work market, students who prepare early will have a better chance of landing a job.

The findings of this study also revealed solutions to the problem of fresh graduate unemployment in the current situation, where the number of graduates has outpaced recruitment demand and labor market fluctuations due to the dual impact of the Covid-19 pandemic and the introduction of technology into the workplace. On the government’s side, policies focusing on high-tech human resources serving advanced industries should be implemented, both to promote Vietnam’s industrialization and modernization process and relieve the burden on traditional occupations, as the number of students graduating each year from economic occupations far outweighs those graduating from engineering and technology occupations. Furthermore, the government should invest in technology to assist students in grasping new trends and creating enthusiasm for students to interact directly with high-tech items, thereby fostering a love of learning and creating beneficial technical items for people.

Managers of educational institutions can use the findings of this study to adjust the curriculum to match the existing curriculum, improving output quality and increasing the percentage of employable graduates. Integrating practical abilities that today’s companies require in students into the classroom will improve students’ competitiveness, consequently strengthening the status of higher education institutions. Universities should integrate new issues of the times into their teaching to help students be more flexible in how they solve problems, which can combine cases of great change in practice in teaching, both helping students to immediately apply the knowledge they have learned while also training students to think skills and know-how to adapt in each specific case. Furthermore, the school can collaborate with businesses to offer extracurricular activities that will allow students to gain experience in the workplace, develop their skills, and encourage participation in competitions. Practical events hosted by large corporations will help students improve their competitiveness. There should also be teachings on various countries’ cultures to enable children to develop their ability to empathize with people from different cultures. Understanding and accepting cultures from throughout the world not only enriches students’ lives but also assists them in adapting to today’s global workplace.

5.2. Recommendations and limitations

Future studies should focus on issues such as job search behavior and the factors that influence it, such as proactiveness in job looking, active participation in career orientation programs, and so on. In addition, the impact of post-Covid-19 career-related pandemic anxiety on the relationship between these variables and job-search behavior can be examined to provide a more comprehensive picture of a student’s job search, from perceived employability to job-
searching and job-seeking outcomes, which are reflected in the number of offer letters and interview time.

Furthermore, future research can benefit from this work by reproducing it in a new research setting or in a different context in international labor markets. It would be fascinating if a replication in a different nation or culture yielded the opposite results and revealed different perspectives on the factors influencing students’ perceived employability.

The limitations could be due to the questionnaires. Despite the fact that the pilot test was conducted before the final version was delivered, some respondents had difficulty selecting appropriate answers. The cause for this could be a difference in the host country’s context, and the translation words are unable to convey the full meaning of the sentence.

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APPENDIX

The following table shows all the items inherited from the previous study, which are used in this study for evaluating the influence of each factor in the research model. Each of the item was carefully selected and adjusted to ensure the accuracy of the study context, and to ensure that the questions can cover the characteristics of each element in the model.

### Table 5

Questionnaire constructs and variables

| Construct          | Items          | Observed variables                                                                 | Reference                        |
|--------------------|----------------|-------------------------------------------------------------------------------------|----------------------------------|
| **HUMAN CAPITAL**  | HC1            | I am always developing new knowledge and skills to better my life.                    | (Lee et al., 2013)              |
|                    | HC2            | I have good problem-solving skills in my daily activities.                           |                                  |
|                    | HC3            | I manage my time effectively.                                                       | (Pool et al., 2014)             |
|                    | HC4            | I have good planning and organization skills.                                       |                                  |
|                    | HC5            | I work well independently.                                                          |                                  |
| **SOCIAL CAPITAL** | SC1            | I know a lot of significant individuals and am well connected at university.          | (Ferris et al., 2005)           |
|                    | SC2            | I’m skilled at making things happen at school by using my connections and networks.   |                                  |
|                    | SC3            | When I communicate with people, I aim to be authentic in what I say and do.           |                                  |
|                    | SC4            | I always appear to know instinctively what to say or do to persuade people.           |                                  |
|                    | SC5            | It is simple for me to establish a good relationship with the majority of individuals.|                                  |
| **PSYCHOLOGICAL**  | PC1            | In my future employment, I will be able to confidently represent my field of work in meetings with management. |                                  |
| **CAPITAL**        | PC2            | In my future employment, I am confident in my ability to assist in the establishment of targets/goals in my work area. | (Luthans et al., 2007)          |
|                    | PC3            | I can think of several approaches to achieving my present job objectives.             |                                  |
|                    | PC4            | When I encounter a setback at work, I have difficulty recuperating and moving on.    |                                  |
|                    | PC5            | When it comes to my job hunt, I usually try to see the good side of things.          | (Luthans et al., 2007)          |
|                    | PC6            | In terms of work, I’m enthusiastic about the future.                                  |                                  |
| Construct                        | Items | Observed variables                                                                 | Reference                      |
|---------------------------------|-------|-------------------------------------------------------------------------------------|-------------------------------|
| **4.0 SKILLS**                  | NS1   | I can identify, assess, and remember significant information in a variety of publications and settings. | (Jackson, 2012)               |
|                                 | NS2   | I am a competent user of information and communication technologies (ICT).          | (Pool et al., 2014)           |
|                                 | NS3   | I have a knack for coming up with novel concepts.                                  | (Mayer & Salovey, 1997)       |
|                                 | NS4   | I am open to fresh ideas at all times.                                             |                               |
|                                 | NS5   | I am willing to accept responsibility for my actions.                              |                               |
| **INDIVIDUAL ATTRIBUTES**       | IA1   | I’m constantly searching for better ways to accomplish things.                      | (Bateman & Crant, 1993)       |
|                                 | IA2   | I’m fantastic at turning issues into opportunities.                                |                               |
|                                 | IA3   | I am able to share ideas with people from other divisions inside the firm.         | (Beltrán-Martín et al., 2009) |
|                                 | IA4   | I may apply information from one department to issues and possibilities that exist in another. |                               |
|                                 | IA5   | I enjoy working with digital equipment.                                            | (Sözbilir, 2021)             |
|                                 | IA6   | To obtain a job in the future corporate world, I need to be able to manage data.   |                               |
| **INDIVIDUAL BEHAVIORS**        | IB1   | I am constantly looking for information about what a certain job entails.          | (Bezuidenhout, 2011)          |
|                                 | IB2   | In the context of my career, I am aware of my strengths and weaknesses.             |                               |
|                                 | IB3   | I’m clear about what I want to achieve in my career.                               |                               |
|                                 | IB4   | I generally succeed when I try something new.                                     |                               |
|                                 | IB5   | I am confident in my capacity to communicate across cultural boundaries.           |                               |
|                                 | IB6   | I am familiar with the practices, values, and beliefs of various civilizations.    |                               |
| **LABOR MARKET IN TODAY’S WORLD** | LM1 | Because of the tremendous rivalry in the job market, I am concerned about my future employment. | (Tsai et al., 2017)             |
|                                 | LM2   | I am concerned about my future employment since the working atmosphere will not be as good as planned. |                               |
| Construct                          | Items | Observed variables                                                                                                                                                                                                                                                                                                                                 | Reference |
|-----------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|                                   | LM3   | Because of the rising number of Covid-19 cases, I am concerned about my future career.                                                                                                                                                                                                                                                                  |           |
|                                   | LM4   | Because of the protracted lockout and social distance, I am concerned about my future employment.                                                                                                                                                                                                                                                     |           |
|                                   | LM5   | Because of the rise of robots and artificial intelligence, I am concerned about the future of work.                                                                                                                                                                                                                                                 |           |
| PERCEIVED EMPLOYABILITY           | PE1   | My abilities and knowledge are in high demand in the work market.                                                                                                                                                                                                                                                                                   | (Berntson & Marklund, 2007) |
|                                   | PE2   | I am aware of various organizations/companies where I may obtain my desired position.                                                                                                                                                                                                                                                               |           |
|                                   | PE3   | My skills are in high demand in the work market.                                                                                                                                                                                                                                                                                                    |           |
| GRADUATE EMPLOYABILITY            | GE1   | This university’s reputation is a huge help to me in my career search.                                                                                                                                                                                                                                                                             | (Rothwell et al., 2008) |
|                                   | GE2   | At the moment, there is a high need for graduates in general.                                                                                                                                                                                                                                                                                        |           |
|                                   | GE3   | There are several employment openings in the geographic region where I am seeking.                                                                                                                                                                                                                                                                     |           |
|                                   | GE4   | I can simply learn about job openings in my chosen field.                                                                                                                                                                                                                                                                                           |           |
|                                   | GE5   | I am normally optimistic about my chances of success in job interviews and selection events (Job fairs).                                                                                                                                                                                                                                              |           |
|                                   | GE6   | So long as my talents and expertise are suitably applicable, I believe I could acquire any job.                                                                                                                                                                                                                                                     |           |
|                                   | GE7   | It didn’t take me too long to find a job/internship that matched my qualifications and major.                                                                                                                                                                                                                                                      | Newly developed |
|                                   | GE8   | I got a full-time job in line with my specialty after completing my probation period/internship.                                                                                                                                                                                                                                                   |           |