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ORIGINAL ARTICLE

Employability of Engineering Technology Graduates at a Vietnamese University: An Assessment from Employers' Perspectives

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ABSTRACT
Employer feedback plays a crucial role in setting developmental directions for higher education and keeping university courses and curricula adaptive to the growing needs of the industry. This paper aims to analyze employers' perspectives on the employability of engineering technology graduates after six months of working at the enterprise. An online survey of 47 items and sample characteristics was sent to employers who worked with graduates of seven engineering technology majors from a public Hanoi-based university. After two months, 234 answers were accepted and analyzed with the SPSS 26.0 software. The results showed that four components of graduates' employability were at a medium level. Additionally, the graduates' attitudes and other attributes were evaluated the best, followed by technical skills. Technical knowledge and generic skills were found to be at the lower level of employability. There was no difference in employability assessments by employers' different age groups, but a significant difference was discovered in employability assessment between foreign-owned and private-owned enterprises.

1. INTRODUCTION

Employers can take part in different activities in the quality enhancement of higher education institutions and students' professional development. Employers are identified to be an influential stakeholder in setting developmental directions for higher education (Cheng et al., 2022). Employers can participate in higher education reform by making their voices of the job market's demands heard by universities. Besides, the employers can create opportunities for students to explore their full potential (Cheng et al., 2022). They can engage the students in work experience so that students can realize that employers need work-readiness capabilities beyond subject knowledge. Employer feedback on university graduates is crucial to revisiting curriculum content and fostering enterprise and university links (Shah et al., 2015). Many international studies have been conducted on employers' assessments (Cheong et al., 2016; Chen et al., 2018; Khoo et al., 2020; Zaheer et al., 2020; Aliu & Aigbavboa, 2020; Hosain et al., 2021; García-Aracil et al., 2022).

In the Vietnamese context, employment opportunities for undergraduates have received more attention from universities due to a compulsory requirement of educational quality accreditation activities in the last ten years. However, graduates' employability development after leaving universities seems to be less studied. Several empirical studies concentrate on employers' assessments of university graduates, e.g. law graduates (Mai, 2018) or economics graduates (Le, 2021) and two majors in engineering and engineering technology (Nguyen & Nguyen, 2015). Little

research has reported on employers' evaluation of only engineering technology graduates, especially in the post-COVID pandemic period.

The study aims to fill in this gap and find the answers to the following questions: What levels are identified for engineering technology graduates' employability? How do the employers' assessments differ among employers' age groups and among the kinds of enterprises they worked for? This study covers the introductory part, three content parts and the conclusion. The introductory part presents the importance of employers' assessment of graduates' employability in international settings as well as in the Vietnamese context and the gap for the study. The next part is a literature review, which discusses the employability components and the previous studies relating to employers' assessments. Methodology is the second content part showing the study sampling, instrument, data collection and analysis. The third content part presents the study results, which depict the participants' assessments of graduates' components, sub-components and the tests of differences in employers' assessments based on the sample characteristics. Furthermore, the study discussion compares the research findings with the prior related studies. The last part is the conclusion, which summarizes the main findings and limitations of the study and suggests feasible directions for future studies.

2. LITERATURE REVIEW

This section aims to discuss employability components and research related to employers' assessment of graduates' employability.

Employability components

Employability can be defined from individual glances and organizational perspectives. Employability components are diverse among authors and organizations. From the individual perspective, Hillage and Pollard (1998) indicate that each individual should possess employability assets, including knowledge, skills, and attitudes to (i) the ability to obtain first employment, (ii) the ability to keep employment and transfer between positions at the same organization, and (iii) the ability to gain employment from a new organization. Moreland (2006, p. 21) identifies employability as "a set of skills, knowledge and personal attributes that make an individual more likely to secure and be successful in their chosen occupation(s) to the benefit of themselves, the workforce, the community and the economy." From an organizational perspective, the Confederation of British Industry (2009, p. 8), which is on behalf of the voice of employers from every sector of the economy in the United Kingdom, defines employability as a set of knowledge, skills, and attributes that graduates are expected to possess to meet the industry requirements for the satisfaction of themselves, their labor users, and the general economy. Knowledge in the Confederation of British Industry definition is related to strong academic and technical expertise (p. 2). Similarly, the European Higher Education Area uses employability to refer to the ability to purposefully use all the different competencies in order to fulfill given professional tasks and/or to reach own professional targets and to adapt these competencies to new environments and requirements (European Higher Education Area, 2022). The European Higher Education Area mentions different competencies to refer to knowledge, skills and competencies which need to be cultivated and expanded to match the outside world's rapid changes. The above definitions and classifications by the authors and organizations suggest that employability is a critical concept which could be investigated based on personal assets or individuals' possession of capabilities, skills, and attitudes to satisfy employers' requirements. Accordingly, employability might include knowledge, skills, and attributes to make graduates sustain their chosen jobs and create values for their organizations.

As regards human capital, employability is the individual competency which covers knowledge, skills and attitude or KSA. As indicated in Table 1, knowledge is what graduates know, and skills are related to what graduates can do. Attitudes concern what graduates want. KSA includes three types: job-related, career-related and development-related competencies. Job-related competencies are personal resources to perform a job. They cover specific job competencies (for example, occupational expertise and technical competencies), which are vital for good performance in the present job and generic-job competencies (for example, communication and problem-solving), which are necessary to transfer to the new jobs. Career-related competencies are personal resources to make transitions between jobs and organizations. Development-related competencies, personal resources to make individuals grow over time, focus on the need to engage in lifelong learning.

Table 1. Human capital matrix for employability (Peeters et al., 2019)

Categories	Job-related		Career-related	Development-related
	Specific	Generic		
Knowledge "I know"	Knowledge needed to perform one's current job	Knowledge needed to perform jobs	Knowledge needed to manage a transition and one's career	Knowledge needed to adapt or develop oneself
Skills "I can"	Skills needed to perform one's current job	Skills needed to perform jobs	Skills needed to manage a transition and one's career	Skills needed to adapt or develop oneself
Attitude "I want"	Attitudes that are needed to perform a job		Attitudes needed to manage a transition and one's career	Attitudes needed to adapt or develop oneself

Competence-based approaches to employability have widely been used in higher education and the workplace. Higher education aims to prepare students for the "uncertainties, changes and challenges" (Römgens et al., 2020, p. 2590) they can encounter during their careers. In contrast, the workplace focuses on identifying and improving the knowledge, skills, and attitudes for effective performance in the labor market. In summary, competency-based approaches to employability concentrate on students' learning at universities and their growth in the enterprise's working environment. In the light of competence theory, employability viewed at an individual level can cover personal elements: ability, personality, attitudes, motivation, and is "the combination of specific and more generic competence" (Van Der Heijde & Van Der Heijden, 2006, p. 453). Froehlich et al. (2018) insist that the components of employability can exist independently and develop based on each other.

Various categories of graduate employability have been reported. The noticeable similarity was that such studies mentioned knowledge, skills and attributes. The following is the summary of studies on graduate employability (Table 2), which include four constructs: (1) technical knowledge, (2) technical skills, (3) generic skills, (4) attitudes and other attributes:

Table 2. Four employability components and their reference sources

No.	Employability components	Sources
1	Technical knowledge	Zaharim et al., (2010), Ye and Jiang (2014), Aliu and Aigbavboa (2020), Tran et al. (2022)
2	Technical skills	Zaharim et al., (2010), Ye and Jiang (2014), Hosain et al. (2021), Zaheer et al., (2020)
3	Generic skills	Robinson (2006), Ye and Jiang (2014), Chen et al. (2018), Tran et al. (2022), Leandro Cruz and Saunders-Smits (2022), Pažur Aničić et al. (2023)
4	Attitudes and other attributes	Su and Zhang (2015), Ye and Jiang (2014), Dipboye (2018), Park and Hill (2018), Tran et al. (2022), Steurer et al. (2023)

Employers' assessments of graduate employability

Shah et al. (2015) clarify four reasons why employer feedback on university graduates is crucial. Firstly, it ensures that university courses and curricula are adaptive to the growing needs of employers and industry. Secondly, it is used to foster links between employers and education suppliers. Thirdly, universities could recognize that graduate skill and attribute levels are rated highly important but lowly satisfactory. Lastly, it includes information on trends and changes outside the university environment that could somewhat affect education providers.

In the context of "major changes in knowledge, equipment, tools, systems and management" (Zaharim et al., 2010, p. 92, p. 921), Malaysian newly graduated engineers are required to perform engineering-related skills and

knowledge effectively. To help Malaysia's engineers become ready for international and local labor markets, Zaharim et al. (2010) proposed a measurement tool for engineering employability skills based on national accreditation criteria and employers' perspectives. The instrument covered three components: knowledge, personal skills, and personal attributes. Knowledge is related to scientific and technological principles. Personal skills refer to generic skills (e.g. Communication skills, Teamwork, Problem-solving skills) and personal attributes (e.g. Professionalism).

Nguyen and Nguyen (2015) developed an instrument for Vietnamese graduates in engineering-technology majors. They were interested in both engineering majors and engineering technology ones because graduates from such majors were vital human resources for mastering and innovating manufacturing technology, which ensured high labor performance and fostered business competitiveness. The instrument covered three factors: (i) technical skills, (ii) cognitive skills, (iii) social and behavioral skills (mainly generic skills). The study findings indicated that different gaps existed between the graduates' current knowledge, skills and employers' requirements. Employability of the engineering-technology discipline graduates did not meet employers' expectations. They explained that job characteristics of engineering-technology disciplines required more practical skills, while engineering-technology programs covered theory-focused subjects.

Tran et al. (2022) interviewed employers across Vietnam's six provinces in the Northern Mountainous region on graduate employability. They presented graduates' employability with knowledge, generic skills, and attributes. However, they did not develop a questionnaire to measure the employability levels of graduates.

3. MATERIALS AND METHODS

Context of the study

The study was conducted at a Vietnamese university based in Hanoi, with a long history of 126 years (University A). University A is also one of the leading application-oriented universities in the modern period. Among higher education programs at University A, engineering technology disciplines were selected by the most significant number of students to enroll each year. In terms of enterprise cooperation, University A established a functional unit supporting employment for undergraduates in 2014. After ten years, more than 3.000 enterprises have set up cooperation relationships with University A in many ways, such as welcoming groups of students for field trips and internships and recruiting graduates. The enterprises that recruit engineering technology graduates maintain win-win long-term relationships with University A due to the demand for high-quality technicians and engineers.

Sampling

The study data was taken from the graduates' employment survey at the phase of receiving Bachelor's degrees in August 2023 at University A. The employment survey sought the information of 350 engineering technology graduates who claimed to have jobs and provided enterprises' information on which they were working. The study used a convenient sampling technique by sending the questionnaire to employers who recruited 350 engineering technology graduates in two ways. The first way was to call and email the enterprise's human resources department and ask them to send the questionnaire to the leader of technical groups or divisions where graduates are working to assess. The second way was to call graduates to contact the head of technical groups or supervising divisions. In case graduate managers' email or phone numbers were collected, the questionnaire was sent to them after the researcher called and asked for agreement.

Employability instrument

The employability instrument was developed by exploiting the Delphi method (Pham et al., 2023) in January and February 2024 with the participation of twenty experts of enterprise employers and university lecturers. From the initial instrument of 51 items collected from prior academic studies, after two rounds of expert feedback, two items were deleted; three items were added; several items were adjusted, and the instrument was revised to cover 52 items. Afterwards, this instrument was validated in three months by using the PLS-SEM technique with a dataset of 153 employers' responses to test the reliability and validity. Five items which were not reliable were rejected, and the official instrument retains 47 items. The survey questionnaire (https://bit.ly/KSSVTN2023) includes the first part of 47 rating items and the second one of respondent information-related questions. The first part of the questionnaire covers five items for technical knowledge, five items for technical skills, 22 items for generic skills (communication

skills, problem-solving skills, teamwork, adaptability, and lifelong learning), and 15 items for attitude and other attributes (attitude, dependability, thoughtfulness, and initiative).

Data collection and analysis

The list of engineering technology (ET) graduates in 2023, which matched the name of their enterprises, was provided by the Information Technology Center and Center for Enterprise Partnership of University A after the proposal to use the graduate database had been approved by the Rector of University A. The survey was sent to employers in two ways. The first way was to call and email the enterprise's human resources department and ask them to send the questionnaire to the leader of technical groups or divisions where graduates are working to assess. The second way was to call graduates to contact the head of technical groups or supervising divisions. In case graduate managers' email or phone numbers were collected, the questionnaire was sent to them after the researcher called and asked for agreement.

After six weeks, from 26th February to 3rd April 2024, 321 answers were recorded. 43 responses were unusable because they were sent twice by the same participants, and the other 44 responses were excluded because the respondents only selected one answer for forty-seven items, which was contradictory to survey instructions. 234 usable responses, which assessed 234 graduates, were used to analyze the data. This sampling size exceeds the minimum of 184 from a population size of 350 (confidence level: 95%) (Calculator.net, 2024).

The advantage of collecting data is that the researcher has worked at a university department in charge of enterprise partnerships and international cooperation. Additionally, the university's Rector approved the researcher's proposal of using graduate employment data extracted from the survey of graduate employment at the time of graduation in 2023. However, there were two main disadvantages of getting an assessment from employers. Firstly, many graduates worked in enterprises which are private firms and recruited only one or two graduates. They were not ready or refused to take their time answering the questionnaire. Secondly, some graduates who got a job at graduation stopped their careers to learn further and upgrade their competency or return to their hometown to look for new employment opportunities.

The SPSS (version 26) was used to analyze the data. Firstly, descriptive statistics were performed to present the results of sample characteristics and employers' assessments of employability components and subcomponents. Creswell (2015) indicates that descriptive statistics can provide general tendencies (for example, "mean" value) or percentages. Specifically, sample characteristics were analyzed in terms of percentage of respondents' gender, qualification, number of working years, name of working division, kind of enterprise, working address at enterprises and graduate's discipline. Employers' assessments of employability components and subcomponents were evaluated through the mean values of employers' ratings from 1 to 5, equivalent to the increasing competence assessment level from "Very low" to "Very high". Secondly, inferential statistics could be exploited to "test hypotheses about the differences in the groups or the relationships of variables" (Creswell, 2015, p. 181). In this study, inferential statistics were applied to test whether the differences were found in employers' assessments of employability means based on the participants' characteristics, namely their four age groups and two kinds of enterprises (private-owned and foreign-owned). The study selected the statistical significance at $p < 0.05$.

4. RESULTS AND DISCUSSION

4.1. Results

Sample characteristics

Table 3 shows the sample characteristics. Most participants were male (177 out of 234), accounting for 75.64 per cent. They mostly earned Bachelor's degrees before entering the enterprises and maintained their qualifications until the survey time (175; 74.79%). The second largest participants were those with advanced diplomas (36; 15.38%). Over 90% of the participants finished tertiary education before joining the enterprises' working environment. It can be assumed that higher education and vocational education are both suitable to work at the enterprises.

Regarding working years, the participants have worked for up to 25 years. It is noticeable that the most significant number of respondents have five to ten years of experience (90; 38.46 %), followed by three groups of 10 to 15 years of experience (58; 24.79%), below five years (43; 18.38%), and 15 to 20 years (35; 14.96%).

Concerning working divisions in enterprises, most respondents (over 76%) worked for three departments: designing, research and development, manufacturing techniques, and human resources. Specifically, nearly 30% of respondents worked in designing, research, and development; 27.35% worked in manufacturing techniques, and 19.23% in human resources. For some companies, assessing the employability of graduates was implemented by human resource departments after taking feedback from technical and other related divisions. Due to the regulation of employee data security, the respondents' demographic data were replaced by human resource departments' heads or staff, for example, an enterprise which manufactures LED and OLED TV monitors in Hai Phong or a tech company which produces electronic components for Apple and Samsung in Bac Giang.

Regarding types of enterprise, 100% of the participants served foreign-owned and private-owned companies. Specifically, more participants worked for foreign-owned companies (197; 84.19%) than those in the private sector (37; 15.81%).

Regarding enterprise addresses, the respondents reported working for the enterprises located in 11 provinces in Vietnam. Ha Noi, Bac Giang, Hai Duong and Hai Phong are five provinces where 95.3% of the graduates of engineering technology selected to work after leaving university, in which Hanoi (98; 41.88%) attracted the largest number of graduates of engineering technology, followed by Bac Giang (84; 35.90%). It is noteworthy that many FDI companies changed their working locations from China to northern Vietnam after the COVID-19 pandemic, which has brought many job opportunities for university graduates.

Lastly, 234 graduates of seven ET majors were recruited by enterprises. The survey received the employers' most extensive responses for employability assessment of electronics and telecommunication technology graduates (47; 20.09%) and the smallest number for graduates of thermal engineering technology (12; 5.13%).

Table 3. Sample characteristics

Characteristics	**Category**	**Overall (N=234)**	
		N	**%**
Gender	Male	177	75.64
	Female	57	24.36
Qualifications	Doctorate	1	0.43
	Master's degree	5	2.14
	Bachelor's degree	175	74.79
	Advanced Diploma	36	15.38
	Diploma	17	7.26
Working years	Below five years	43	18.38
	5 ≤ 10 years	90	38.46
	10 ≤ 15 years	58	24.79
	15 ≤ 20 years	35	14.96
	20 ≤ 25 years	8	3.42
Name of working division	Design/ R&D	69	29.49
	Maintenance	5	2.14
	Manufacturing technique	64	27.35
	Production management	25	10.68
	Quality management/Quality assurance	6	2.56

Characteristics	Category	Overall (N=234)	
		N	%
	Production	19	8.12
	Human resource	45	19.23
	Others	1	0.43
Kinds of enterprises	Foreign-owned	197	84.19
	Private-owned	37	15,81
Enterprise address	Ha Noi	98	41.88
	Bac Ninh	20	8.55
	Bac Giang	84	35.90
	Vinh Phuc	3	1.28
	Hai Duong	6	2.56
	Hai Phong	15	6.41
	Hung Yen	1	0,43
	Ha Nam	2	0.85
	Hoa Binh	1	0.43
	Thai Nguyen	3	1.28
	Thanh Hoa	1	0.43
Used graduates	Mechanical Engineering Technology	23	9.8
	Mechatronic Engineering Technology	44	18.80
	Automotive Engineering Technology	31	13.25
	Thermal Engineering Technology	12	5.13
	Electric, Electronic Engineering Technology	41	17.52
	Control and automation Engineering Technology	36	15.38
	Electronics and telecommunication Engineering Technology	47	20.09

Employers' Assessment

Engineering technology graduates' employability covers four components with eleven subcomponents: technical knowledge (one subcomponent), technical skills (one subcomponent), generic skills (five subcomponents), and attitude and other attributes (four subcomponents).

Employers' assessment of graduates' employability components

The engineering technology graduates received a positive assessment of general employability (Mean=3.54, SD=0.48). As seen from Table 4, attitude and other attributes were evaluated to the highest (Mean=3.65, SD=0.53), followed by technical skills (Mean=3.55, SD=0.50) and generic skills (Mean=3.51, SD=0.52). Technical knowledge (Mean=3.45, SD=0.55) was assessed to achieve the lowest level of employability among the four constructs. It can be assumed that technical knowledge, technical skills, and generic skills can be retrained when graduates enter enterprises' workforce. What enterprises need and emphasize the most are graduates' attitudes and other attributes.

Table 4. Employers' assessment of four employability constructs

No.	Construct	Mean	SD
1	Technical knowledge	3.45	0.55
2	Technical skills	3.55	0.50
3	Generic skills	3.51	0.52
4	Attitude and other attributes	3.65	0.53
	Total	3.54	0.48

Employers' assessment of graduates' employability sub-components

The graduates' employability was evaluated based on eleven subcomponents. Technical knowledge and technical skills consist of one sub-construct for each. Meanwhile, generic skills comprise five sub-constructs. Attitude and other attributes cover four sub-constructs. As shown in Table 5, the graduates' employability competencies were at a medium level. All employability sub-constructs have a mean value above 3. Additionally, the standard deviation of element criteria (SD=0.55; 0.5; 0.54; 0.59; 0.59; 0.58; 0.56; 0.58; 0.58 and 0.6, and 0.62) were below 1, which indicates that the response options had low variation, so the assessment level of the survey participants was close to each other.

Table 5. Employers' assessment of eleven employability sub-components

No.	Employability subcomponents	Mean	SD
1	Technical knowledge	3.45	0.55
2	Technical skills	3.55	0.50
3	Communication skills	3.48	0.54
4	Problem-solving skills	3.39	0.59
5	Adaptability	3.65	0.59
6	Teamwork skills	3.57	0.58
7	Lifelong learning skills	3.50	0.62
8	Attitude	3.73	0.56
9	Dependability	3.69	0.57
10	Thoughtfulness	3.55	0.58
11	Initiative	3.64	0.60

Among eleven employability sub-constructs, the graduates' attitude (Mean=3.73, SD=0.56) obtained the highest evaluation from employers' perspectives. It is assumed that a good attitude can ensure that graduates are ready to change their mindset, learn new things, and sharpen untrained skills, essential for work positions at enterprises. Furthermore, graduates' dependability (Mean=3.69, SD=0.58) and adaptability (Mean=3.65, SD=0.59) were ranked the second and third in the employability competencies list. It was noteworthy that graduates' thoughtfulness and their technical skills were all rated to be in the sixth position. Their mean values were the same (Mean=3.55).

Problem-solving skill (Mean=3.39, SD=0.59) was the weakest and only skill with a mean value below 3.4 among eleven employability elements. It could be argued that the graduates' low problem-solving skills were due to the employers' high expectations for engineering technology graduates. The employers expected engineering technology graduates to be ready to apply and implement technology in the product. However, these graduates shortly after university graduation still had limited competencies in identifying, analyzing and solving technical problems. Noticeably, technical knowledge (Mean=3.45, SD=0.55) and communication skills (Mean=3.48, SD=0.54) had their mean values below 3.5. They were rated as the second and third lowest employability among eleven sub-constructs.

Difference testing

Difference in graduates' employability evaluation based on the age groups

The Levene test can test whether several groups have the same variance in the population. If the p-value for the Levene test is more than 0.05, there is no significant difference between the variances. In this case, the F test was performed to test the quality of the means. In other words, if the p-value for the Levene test is smaller than 0.05, variances are significantly different from each other. In this situation, the Welsh test is applied instead of the F test.

Table 6 shows that the Sig of the Levene test for whether there was a difference based on the age groups towards the employers' assessments of graduates' employability was 0.004 < 0.05. It means that variances were found in the difference between the age groups. In the next step, the Welch test was performed. The Sig of the Welch test was 0.66 > 0.05 (Table 7), indicating that no significant differences in employability assessment were identified among the participants who belonged to four age groups at the p < 0.05 level. As shown in Table 9, the employability means for the four groups of age were closer to each other (M=3.58, 3.47, 3.56, and 3.55), which means that all age groups highly judged graduate employability.

Difference in graduates' employability evaluation based on types of enterprise

The Sig of the Levene test for whether there was a difference in employers' assessments of graduates' employability based on types of enterprise was 0.16 > 0.05, so there was no difference in variance between the two kinds of enterprises. In the next step, the F test was performed. The Sig of F test was 0.003 < 0.05 (Table 8), i.e. significant differences were found between the participants from foreign-owned and private-owned enterprises regarding the employability assessment at the p < 0.05 level. Table 9 goes on to clarify that the employability means for two types of enterprises were at medium levels, and significant differences in employability assessment were identified between the participants who worked for private-owned enterprises (M=3.76) and those for foreign-owned enterprises (M=3.50).

Table 6. Test of Homogeneity of Variances in the age groups and kinds of enterprises

		Levene Statistic	**df1**	**df2**	**Sig.**
Age groups	Based on Mean	4.54	3	230	**0.004**
Kinds of enterprises	Based on Mean	1.97	1	232	**0.16**

Table 7. Welch test in the age groups

	Statistic[a]	**df1**	**df2**	**Sig.**
Welch	0.53	3	83,851	**0.66**

a. Asymptotically F distributed.

Table 8. ANOVA in kinds of enterprises

		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Employability	Between Groups	2.03	1	2.03	9.24177	**0.003**

Table 9. Descriptive statistics in the age groups and kinds of enterprises

Group	**Sub-group**	**N**	**Mean**	**Std. Deviation**
Age	<25	22	3.58	0.31
	25 <30	56	3.47	0.50
	30 <35	102	3.56	0,43
	40 <45	54	3.55	0,58
Kinds of enterprises	Foreign-owned	197	3.50	0.48
	Private-owned	37	3.76	0.40

4.2. Discussion

Employers' assessment of graduates' employability components

Nguyen and Nguyen (2015) indicates that different gaps exist between graduates' current knowledge, skills, work-related attitudes and employers' requirements, and the employability of engineering-technology graduates does not meet employers' expectations. They explain that job characteristics of engineering-technology disciplines require more practical skills, while engineering-technology programs cover theory-focused subjects. However, in the Belarusian context, García-Aracil et al. (2022) share a similar result regarding graduates' employability competencies. Young graduates aged between 21-25 years were assessed based on 24 items designed to compare graduates' present competencies and their required competencies for their current work from employers' perception. The findings revealed that young graduates in Belarus achieved a lower level of competency (all the items were rated higher than three on average) than required for the job (most items higher than four on average). However, they were not weak in knowledge and ability for the workplace, as assessed by 261 Belarusian employers in an online survey.

Employers' assessment of graduates' employability sub-components

The graduates' attitude in this study obtained the highest judgment from employers' perspectives. There are similarities between the roles of attitudes found in this study and those described by Su and Zhang (2015) and Steurer et al. (2023). Working attitude is one of the five critical components extracted from interviews with career experts and questionnaires with 100 employers in China. Similarly, Steurer et al. (2023) stated that managers and supervisors in South Africa valued the new graduates with a positive attitude towards life and work. Some participants also emphasized that they hired graduates for attitudes instead of skills which could be trained. The study's findings on employers' assessment of Vietnamese public university graduates are similar to those of Vietnamese non-public university graduates by Dang et al. (2019). They reported that non-public university graduates' attitudes were evaluated the best by employers compared with graduates' skills, job achievement, and appropriateness between the trained expertise and employment.

In this study, problem-solving skill was found to be the weakest and only skill with a mean value below 3.4 among eleven employability elements. P. T. Nguyen et al. (2022) reported that problem-solving skills are among the top skills affecting Vietnamese higher education quality after conducting two rounds of the expert assessment process. These results seem to differ from Nguyen and Nguyen's (2015) conclusion on employability of engineering-technology graduates assessed by enterprises in Northern and Southern Vietnam. Vezi-Magigaba and Utete (2023) reported that the surveyed employers regarded problem-solving and the ability to learn as the most important non-technical skills.

The primary possible cause for such weaknesses could originate from the rapid development of new technologies. In contrast, engineering technology training programs and textbooks are burdensome to keep continuously updated with enterprises' manufacturing innovations. The second possible reason might be that, in training practices, undergraduates learn in large, crowded classrooms in which lecturers gave lectures to over 40 students, and it was hard for them to implement task-based activities effectively. This finding was also reported by Khoo et al. (2020) in a study in New Zealand. Specifically, Khoo et al. (2020) surveyed and interviewed employers on 26 competencies of engineering and science graduates. Most employers were managers, supervisors, and chief executive managers from enterprises at different levels: small, medium, and enormous. The employers confirmed that problem-solving skill was among the ten most significant gaps in graduates' competency. They also predicted that problem-solving skills could be ranked in the top five competencies in terms of importance in 2030. Khoo et al. (2020) suggested that higher education institutions should take "real problems" (p. 10) from enterprises' "real-world workplaces" (p. 10) so that undergraduates could sharpen their problem-solving skills further. Cases in New Zealand and employers' current assessment results might suggest that graduates' problem-solving skills at University A need to be improved in the coming time to sustain their jobs and become successful thanks to good preparation for employers' expected job skill requirements.

Differences in graduates' employability evaluation based on the age group

No significant differences in employability assessment were found among the participants who belonged to four age groups. All age groups highly judged graduate employability. This finding does not align with the study by Yepes Zuluaga (2024). Her study results of engineering graduates (including electronic engineering, mechatronics engineering and telecommunications engineering) asserted that age was significantly linked with the engineers'

employability skill growth. Specifically, young men aged between 26 and 35 illustrated the highest self-perceived employability skills.

Differences in graduates' employability evaluation based on kinds of enterprise

Significant differences in employability assessment were identified among participants who worked for private-owned enterprises and foreign-owned enterprises. This finding is consistent with that of Nguyen and Nguyen (2015) and Cheong et al. (2016). Nguyen and Nguyen (2015) studied graduate employability assessment from foreign-invested private enterprises and concluded that foreign enterprises rated graduates' employability at lower levels than private ones. Cheong et al. (2016) investigated employers' perception of graduates in a Southeast Asian country, which has a similar area as Vietnam. They confirmed that the employability evaluation of Malaysian employers also differed based on the enterprise type.

5. CONCLUSION

Engineering technology graduates receive a positive assessment of general employability. In this study, attitude and other attributes were evaluated most positively, followed by technical skills and generic skills. Technical knowledge was assessed to achieve the lowest level of employability among the four constructs. Additionally, the findings showed no significant differences between employers who belong to the four age groups. However, significant differences were shown between participants from foreign-owned and private-owned enterprises in terms of employability assessment.

Employers' assessment of graduates' employability can provide valuable references for University A, a Vietnamese public university, in developing training programs to meet the industry's and society's requirements. The study seems to be the first survey that utilized employers' employability measurement for each graduate. The previous surveys mostly looked at graduates in general without considering the differences among each graduate.

The study has two inevitable limitations regarding its scope and sampling. Firstly, the study's scope is restricted. According to MOET (2022), engineering technology is divided into seven groups of disciplines (75101, 75102, 75103, 75104, 75106, 75107 and 75108), in which each group of disciplines can cover one or more specific disciplines. The present study focused on two engineering technology discipline groups: the mechanical group of engineering technology (75102) and the electric, electronic and communication group of engineering technology (75103), which attracted many undergraduates to study at University A and had great demands from the industry and society. The second limitation is the sample size, with 234 participants being involved. Although large enterprises that recruited and employed engineering technology graduates were invited successfully to the study, small enterprises that recruited one or two graduates were not really willing to participate. The study would have been improved if the researchers had taken more time to visit the enterprises directly to explain and persuade them to give feedback.

The study has the following implications for future research. Firstly, the current study measures graduates' employability from a Vietnamese university. Further studies could be conducted using data collected from several universities in Vietnam, such as universities with engineering technology disciplines in the Northern, Central, and Southern Vietnam sectors. Secondly, the present study explores graduates' employability in the Vietnamese context with the application of the human capital theory connected with a competency-based approach to employability. Future studies could examine the same issues in Vietnamese higher education institutions by exploiting other employability capitals as proposed in Tomlinson's (2017) employability capital model.

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