Digital Literacy and Study Performance: The Case of Students in Ho Chi Minh City

Dien H. Pham[1], Thy T.A. Nguyen[2]
[1,2] Banking University Ho Chi Minh City, Vietnam

ABSTRACT: *Challenges in measuring digital competence among the higher education students from different disciplines and universities in Ho Chi Minh city is confronted in this study. The results confirm that the scales proposed and applied in foreign studies can also be able to apply in the context of Vietnam. The first effort was paid to measure digital competence using a quantitative method among Vietnamese students in 2021 with the emerging of E-learning alternative which is clearly triggered by the Covid 19 pandemic. The significant components that construct the digital competence levels of observed students include the skills in understanding and using information, the skills in using technology and computers, the skills in communicating via E-learning channel, and the skills in effectively using images. All the above skills are presented in the activities within the higher education context. The results provide some insights into the differences in digital literacy between the groups of students whose English levels are different as well as the students who attained different study performance. The better literacy the higher GPA that students obtain. By providing empirical evidence to policy implications, contribute to the sake of technology development benefiting study performance and working competencies of the graduates in the digital era.*

KEYWORDS: digital literacy, study performance, higher education institutions

INTRODUCTION

In the digital world nowadays, digital competencies are becoming highly demanded in the labor market. Indeed, the benefits of digital transformation are recognized to be dependent on the digital competencies of the labor forces. The fact however reveals that the investment in technology does not take full advantage. That reality remains a profound problem for many organizations laying significant pressure on the human resources recruiters and trainers. In addition, awareness as well as assessment of the level of digital knowledge and skills at the individual level is limited, while there is noted low labor productivity, low ability to adopt technology into their organizations. To improve the current situation, it is extremely important to properly assess the level of digital competence of the graduates who are contributing to the future labor force to find appropriate solutions. As a result, it directs the international human resource strategy, training orientation at the higher education institutions and at the enterprises. This study aims to answer the following research questions. First, what level will the individual's digital competence be. Second, what factors are involved in an individual's level of digital competence? As a result, this study aims to fill in the gaps in practice and theory with a simple and easy-to-understand approach. University-level students are selected as survey subjects in this study.

By choosing those subjects, we will be able to conduct the research in the most objective and natural way in the hope that they will bring the most realistic understanding of the issue. The research will apply knowledge from many fields in science and practice to uncover unknown issues, which will serve as a basis for future research and policy making. In this study, we measure digital competencies (DC) in related subjects to get an overview of digital competence among students. Within the limits of this study, the authors focus on undergraduate students. This research will focus on the following specific objectives. First, we measure the level of digital awareness in students (differences between disciplines and learning stages) and then we determine the factors and the extent of their impacts on the digital competence of those students and the relationship between digital competence and students' learning outcomes.

This study expects to contribute to the current literature in the following ways. The study sheds some light on the state of digital competence of the future workforce. It is expected to be a positive contribution first and foremost to the use of technology in improving the learning efficiency of university learners at the same time. After that, the study assesses the reality of technology application level of the future workforce to guide the labor market and employers. Furthermore, the study is expected to provide suggestions for education managers in building technology-centric training programs to take advantage of available technology to enhance learners' digital capabilities.

LITERATURE REVIEW

Digital literacy

The concept of digital literacy (DL) includes the following concepts: selective use of parameters and evaluation, interest in managed media or 'infotention'., ethical research collaboration, collaboration in knowledge-creating networks, and digital citizenship (Rheingold, 2012). Interestingly, there are still many people today who think that these skills are innate, most of them are made up of the needs and learning styles of the so-called "digital native" people. Many recent studies have shown that people mentioned above (digital native) tend to only value technologies that have an immediate impact on people's personal lives more than technology's contribution to efficiency of learning (Kennedy, Judd, Churchward, Gray, & Krause, 2008; Ladbrook & Probert, 2011). However, there is a large consensus that DL is essential for future success (Chase & Laufenberg, 2011). In fact, people still lack basic skills such as internet search skills, etc., even though they are living very dependent on online connections (Marupova & Garcia, 2007).

Futher more, some studies tried to clarify the demensions of DL. We are revisiting some of them in the following. First, according to the European DigCompEdu, digital literacy contains six dimensions including (1) Professional engagement; (2) Digital Sources resources (3) Teaching and learning; (4) Assessment within assessment strategies; (5) Empowering learners; and (6) Facilitating learners' digital competence. According to The UK JISC (Joint Information System Committee) digital literacy includes six overlapping elements (1) ICT proficiency; (2) Information; (3) Digital creation; (4) Digital Communication and Collaboration; (5) Digital Learning and Development; and (6) Digital Identity and Wellbeing. In this study, we adopt the

definition proposed by Ng (2012) a three-dimensional framework based on cognitive (i.e., choosing technology, searching information, and critically evaluate the information), technical (i.e., technical awareness of technology), and socioemotional (i.e., support through online communities and protect oneself from harm in digitally environment) areas. The latter definition is suitable for measuring digital literacy of the students that excludes the external dimensions that might come from the learning environment and teachers as mentioned in the former definitions.

Digital literacy and Study outcome
Researching the relation between digital literacy and academic performance is important in terms of seeing the differentiation among digital literacy competence levels of the new generation and to explain the predictiveness of their digital competence level on work performance.

Firstly, digital literacy has a significant impact on various kinds of students' skills. The findings of Mirza (2020) showed that digital literacy had influenced communication skills, research skills and confidence of the students. The same result was found out in an online education study by Wei & Chou (2020). They concluded that college students who self-reported their computer/Internet self-efficacy (e.g., confidence in how to manage software for online learning, confidence in using the Internet to find or gather information for online learning) more positively as higher had higher online discussion score. The research of Le Hai Nam and Tran Yen Nhi (2021) about the student satisfaction with e -learning of students in economics faculties in Ho Chi Minh city found that e-learning had a positive impact on academic performance.

Besides, digital literacy is considered influencing the overall learning performance. The result of Pagani et al. (2016) indicated that informational digital skills had a positive and significant effect on academic performance. Amiri (2009) through The Make It-Take It After-School program, also found that the development in digital literacy had a great impact on academic performance. Likewise, the online survey conducted by Vrana (2016) at the Faculty of Humanities and Social Science in Zagreb, Croatia showed that students perceived digital literacy had a strong influence not only on their academic performance but on their quality of education. Some researchers also found a variety of impacts on different characteristics of students. Particularly, it was said that digital literacy had a stronger impact on students with lower school achievement and socio-economic background (Pagani et al., 2016; Amiri, 2009).

In addition, some researchers suggested that students should control the time they spent on smart devices because this would result in exhaustion which led to negative effects on their academic performance (Yildiz, 2018a; Ellison, Lampe, and Steinfield, 2010). Therefore, this study aims to identify the impact of digital literacy on the learning outcomes of students and determinate the aspects of this competence to thoughtfully benefit learning purpose.

Research Model

The authors proposed the research model presented in Figure 1 below.
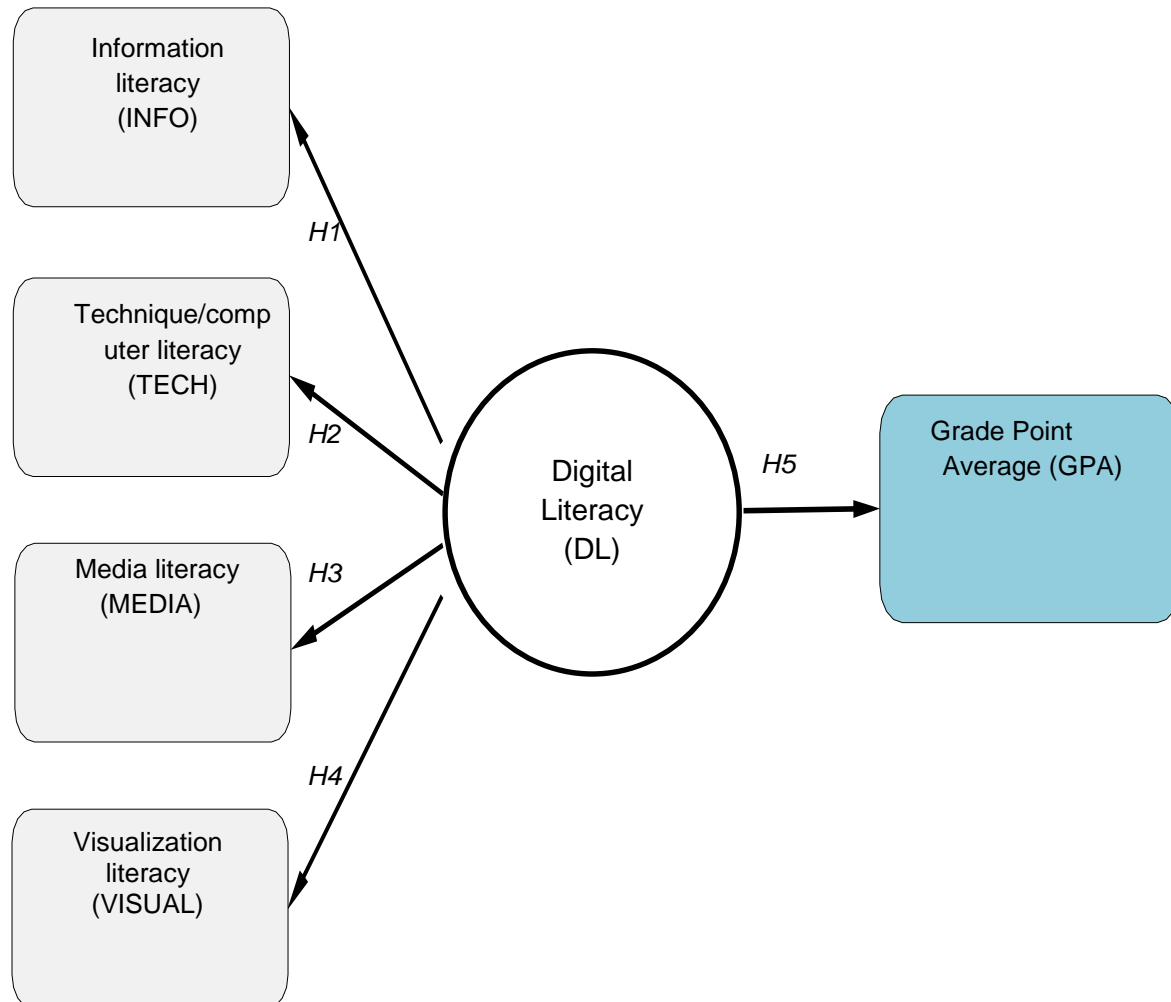
Figure 1. Research Model

The authors proposed the following hypothesese:

H1: Digital literacy of the students is formed by their information literacy

H2: Digital literacy of the students is formed by their technology and computer literacy

H3: Digital literacy of the students is formed by their media literacy

H4: Digital literacy of the students is formed by their visualization literacy

H5: Digital literacy of the students has positive impact on their GPA.

The above hypotheses will be examined by the methodology presented in the following section.

METHODOLODY

Sampling

A comprehensive questionnaire was used to collect data from students who come from different study fields in four different universities in Ho Chi Minh city. Due to the Covid 19 pandemic, the survey had to be conducted by using Google form. The data collection process includes 2 stages. In the first stage, the survey was given to 11 students in the Banking University as a pilot survey to assess the suitability of words and the understanding of the surveyed subjects. The second stage was the formal survey, which was conducted through the spread of the questionnaires in Google form and then, 414 responses were collected. Eventually, we got 407 well – responded observations. According to Hair et al (2014), the number of observations is 5 times the number of items in the questionnaire, Because the items of the dependent variables and the independent variables in the study are 28 items, the size of the sample is appropriate for the next analyses.

Measurement scales

The scales were formed by referring to previous studies and translated from English into Vietnamese and adjusted to suit the survey objects. After that they were adjusted by experts, who work in the INet company which supplies the services to many universities like Hutech, FPT, through email consultation before designing into a complete survey.

In terms of independent variables, firstly, we adopted the scale of Ukwoma (2016) to measure information literacy. The scale has 21 items related to the knowledge and skills of digital literacy. Howerer, 3 items were chosen because they are relevant to information literacy and the study context. Respondents gave agreement on a scale from 1 "totally disagree" to 5 "totally agree". The scale's items are described as the ability to use computers and the internet to find out information, ability to find out the documents needed and being able to assess the reliability of sources of information.

Secondly, to examine the technology and computer literacy, we used the scale of Boot (2013), which is named Computer Proficiency Questionnaire with 12 items. The questions were translated into Vietnamese after reducing into 6 items to suit the research context. Respondents gave their proficiency on the scale from 1 "never try" to 5 "very easy" to the self assessments about the ability to connect the computer to the printer, to operate with keyboard shortcuts, to use all the functions on LMS, to complete the tasks assigned by the lecturers when studying online and to install the basic software like Microsoft Office, Acrobat, WinRAR. These are prominently the computer skills for students to excel in their classes effectively.

Thirdly, media literacy and communication literacy were measured through the ability of students to use the LMS – an e-learning platform to study in the university environment. Both scales were rated from 1 to 5, with 5 being the highest level. While the media literacy was measured by the combination of suggestions from Alliance for a Media Literate America (2010) and the improvisation in the Vietnam education context, it examined 5 aspects of competence in using

35

LMS - the most popular platform for studying online. The communication literacy was measured by the ability of process information .

The last independent variable is visual literacy - the ability to interpret and convert information from and into visual forms. This literacy was measured using the scale suggested by - Visual Literacy Survey of USF Libraries, including 7 items. Respondents gave agreement on a scale from 1 "totally disagree" to 5 "totally agree". The scale is illustrated by these items: Understanding and using images/tables, finding out imagines illustrating for your learning documents, understanding and interpreting images, charts for learning, ability to assess which images/tables are suitable for learning, using, creating images/tables for learning purpose effectively and citing pictures from the Internet clearly.

Furthermore, digital competence, the dependent variable was measured by the five-item scale by Abbas et al (2019) with 5 items. This variable is used to measure the self-assessed digital literacy of students based on their competencies that are evaluated in their study. Respondents were asked to choose the level of their agreement on the statements rating on the scale from 1 "poor" to 5 "very good" to the student's ability of Research skills (finding information, evaluating and analyzing information, ..), the ability to use computers for the necessary tasks, understanding and using the media in learning, visual or video design skills for presentations and assignments and the level of self-assessment of academic performance.

Control variables

The study outcome of the students is measued by using Grade Point Average (GPA). Given that all study fields and universities in our sample use this measure to evaluate their students every semester. We asked students to report their GPA in the questionnaire.

Analytical method

Firstly, we used Cronbach's Alpha coefficient of each variable to test the scale's reliability. According to Nunnally and Bernstein (1994), when Cronbach's Alpha is greater than 0.70 will present good reliability, and items of a variable have a total correlation coefficient being bigger than 0.30, we can conclude the variable is reliable to use for the deep analysis.

Secondly, we utilized the exploratory factor analysis (EFA) with the purpose to check the reliability of each structure and thereby establish representative variables. Thirdly, we apply Structural Equation Model (SEM). SEM was developed by the the logic of causal modeling using path analysis (Wright, 1918). In this study, SEM model to test the relationship between students' digital literacy and their study outomce. Finally, we used the ANOVA one way test as well as the Kruskal–Wallis to test the influence of variables on the dependent variable of the model. While ANOVA is suitable to group the sample with the homogeneity of variances, the Kruskal–Wallis is to the one with heterogeneity variances.

RESULTS AND DISCUSSION

Sample Description

During the Covid pandemic, an online-based survey was ideally applied. To randomize the sample, we hired a group of students from different universities to send the questionnaire form. We received 417 responses from students studying in humanities, technology, economics, communication. After cleaning the data, we got a final sample size of 407 accepted observations representing students from various universities in Ho Chi Minh city. Furthermore, these universities were deliberately chosen to represent the diverse study majors and study cohorts to challenge the digital literacy measuring method. The details of the research sample are summarized in the table 1 below.

Table 1. Descriptive statistics

		Frequency	Percent	Valid Percent	Cumulative Percent
GENDER					
Valid	Male	186	45,7	45,7	45,7
	Female	221	54,3	54,3	100,0
	Total	407	100,0	100,0	
COHORT (academic year)					
Valid	First	25	6,1	6,1	6,1
	Second	68	16,7	16,7	22,9
	Third	273	67,1	67,1	89,9
	Four	41	10,1	10,1	100,0
	Total	407	100,0	100,0	
MAJOR OF STUDY					
Valid	Economics and Management	195	47,9	47,9	47,9
	Technology	145	35,6	35,6	83,5
	Humanity and Padagogy	37	9,1	9,1	92,6

	Communication and Journalism	30	7,4	7,4	100,0
	Total	407	100,0	100,0	
ENGLISH LANGUAGE SKILLS					
Valid	Very bad	17	4,2	4,2	4,2
	Bad	58	14,3	14,3	18,4
	So so	244	60,0	60,0	78,4
	Good	77	18,9	18,9	97,3
	Excellent	11	2,7	2,7	100,0
	Total	407	100,0	100,0	
HAVING PART-TIME JOB					
Valid	No	182	44,7	44,7	44,7
	Yes	225	55,3	55,3	100,0
	Total	407	100,0	100,0	

Scale Reliability Testing

Scale reliability testing is to investigate the properties of the measurement scales and the items composing those scales. Many researchers suggested that the Cronbach's Alpha above 0.70 is acceptable while equals 0.80 or greater is preferred and the higher is the better (Cortina, 1993). The following will report the tests for scales of independent variables in our research model. First is the scale of information literacy. The overall Cronbach's Alpha is 0.820 indicating the high level of consistency among the items (the details of the tests presented in the Appendix).

The Cronbach's Alpha index of each item is more than 0,7 and highly consistent indicating the appropriation of the measurement of overall dimension. Therefore, we take all items into the model afterwards.

While testing the reliability of the scale of Computer and Technology literacy we found Cronbach's Alpha over 0.8 that suggests the accepted consistency among the items representing this scale. In the Correlated Item Total Correlation there is no item with index lower than 0.5 that means all items are valid to be included in this factor.

The reliability of the Media Literacy scale is demonstrated in the table 3 above. The overall Cronbach's Alpha is 0.957 indicates the excellence of the scale. Even though some might argue that the Cronbach's Alpha over 0.9 is too high and the scale needs to be shortened but in this case our scale includes a moderate number of items of 7 we will not adjust the scale but include all items into the further analysis.

The reliability of the Visual literacy in the table 3 is also highly confirmed because it got the overall Cronbach's Alpha of 0.887 and the reality index of each item is no less than 0,6. This scale is considered approriate to the next analytical method.

Table 2. Reliability tests of independent variables

Cronbach's Alpha = 0.820				
INFOR1	7,31	2,398	,639	,785
INFOR2	7,46	2,165	,719	,704
INFOR3	7,66	2,294	,663	,763
Cronbach's Alpha = 0.815				
TECH1	15,09	9,081	,560	,798
TECH2	14,97	9,494	,722	,746
TECH3	15,14	9,839	,553	,794
TECH4	14,67	10,275	,609	,779
TECH5	14,84	9,611	,614	,775
Cronbach's Alpha = 0.957				
know_LMS	21,02	54,229	,821	,953
nec_LMS	20,68	53,352	,850	,951
fre_LMS	20,87	50,179	,877	,949
fre_self_LMS	21,06	49,290	,900	,947
pro_LMS	21,00	50,961	,904	,946
info_received_LMS	21,06	52,664	,861	,950

info_send_LMS	21,21	54,962	,763	,957
Cronbach's Alpha = 0.887				
Visual1	22,68	18,356	,636	,881
Visual2	22,98	18,012	,677	,876
Visual3	23,10	17,497	,736	,869
Visual4	23,13	17,524	,717	,871
Visual5	23,12	17,168	,759	,866
Visual6	23,16	17,138	,700	,874
Visual7	22,96	17,868	,596	,887

Testing the adequacy of the sample

Before conducting factor analysis, some tests must be conducted to examine the adequacy of the sample and the suitability of data for Factor analysis (Burton & Mazerolle, 2011). The sampling adequacy can be assessed by examining the Kaiser-Meyer-Olkin (KMO) (Kaiser, 1970). KMO is suggested when the cases to variable ratio are less than 1:5. It ranges from 0 to 1, while according to (Hair, Anderson et al. 1995a; Tabachnick & Fidell 2001), 0.50 is considered suitable for Factor analysis. On the other hand, (Bearden et al., 2003) stated that a KMO correlation above 0.60 - 0.70 is considered adequate for analyzing the EFA output. After the processing, it was found out that the KMO test result was at 0.839 that falls between 0 and 1 and above 0.7 as below. We conclude that our sampling is suitable for factor analysis.

Table 3. Testing the adequacy of the sample

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.839
Bartlett's Test of Sphericity	Approx. Chi-Square	706.751
	Df	10
	Sig.	.000

Exploratory Factor Analysis (EFA)

Factor analysis is a significant instrument which is utilized in development, refinement, and evaluation of tests, scales, and measures (Brown et al. 2010). Regarding the sample size, in this

40

study the authors are applying factor analysis that requires a large sample size because factor analysis is based on the correlation matrix of the variables involved. Tabachnick and Fidell (2001, page 588) cite Comrey and Lee (1992)'s advice regarding sample size to be 300 or above to be good. As a rule of thumb, a bare minimum of 10 observations per variable is necessary to avoid computational difficulties. We have above 400 observations that sample is a sufficient sample.

To explore the factors that can be formed by the items that have been created based on the literature review while considering the research situation, we conducted an exploratory factor analysis. We test the formation of the five dimensions of Digital Competence namely information literacy, technology and computer literacy, visual literacy, media literacy and communication literacy by adding all items representing those five dimensions into an EFA test. According to the results found, we concluded that out of expected five dimensions we found four significant components created by 21 items.

We named the newly created components by Information, Technology and Computer, Media, and Visual literacy. Information literacy is formed by 3 items. The Technology and Computer literacy is measured by 4 items, the Media literacy is created by 7 items and finally the Visual literacy is composed by 7 items. To interpret, Information literacy shows the knowledge in digital sources and the skills in searching and using that information for study. The Technology and Computer component represents the knowledge of and skills in understanding and using computers and related technological innovation on study purpose. Media literacy indicates the knowledge and skills in using media networks for study purposes. Due to the rise of using the E-Learning system in the Covid pandemic, in this study the chosen media network is LMS (Learning Management System). Finally, Visual factor presents the knowledge and skills of students in learning and using visual tools for study. Four components account for roughly 70% of the total variance. The four components need to go through a reliability test to assure that they are appropriate scales to measure the factors. We also conducted EFA to test the component of Digital Competence created by its items. The result confirmed one single component created by five measurement items that fits our expectation. We concluded the measurement of the dependent variable in our research model is sufficient.

Table 4. Rotated Component Matrix[a]

	Component			
	1	2	3	4
Fre_self_LMS	.926			
Pro_LMS	.911			
Fre_LMS	.906			
Info_received_LMS	.881			
Nec_LMS	.864			
Know_LMS	.824			
Info_send_LMS	.783			
Visual3		.785		
Visual5		.785		
Visual4		.746		
Visual6		.733		
Visual2		.712		
Visual1		.661		
Visual7		.610		
TECH2			.780	
TECH5			.771	
TECH1			.702	
TECH4			.534	
INFOR2				.818
INFOR3				.771
INFOR1				.660

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

The relationship between digital literacy and learning outcomes

To affirm the importance of digital proficiency to student learning outcomes is also to affirm the importance of the research results presented above, we evaluate the relationship between digital proficiency in students and their academic performance.

Analysis of the SEM model showed that the model's suitability indicators showed that the model achieved good values such as cmin/df= <2, GFI, TLI, CFI all greater than 0.9, RMSEA<0.5, PCLOSE> 0.05 all showed that the model was very suitable (Hu & Bentler, 1999).The normalized regression coefficient of 0.338 at p<0.001 is statistically significant as confirming the impact of digital literacy on learning outcomes
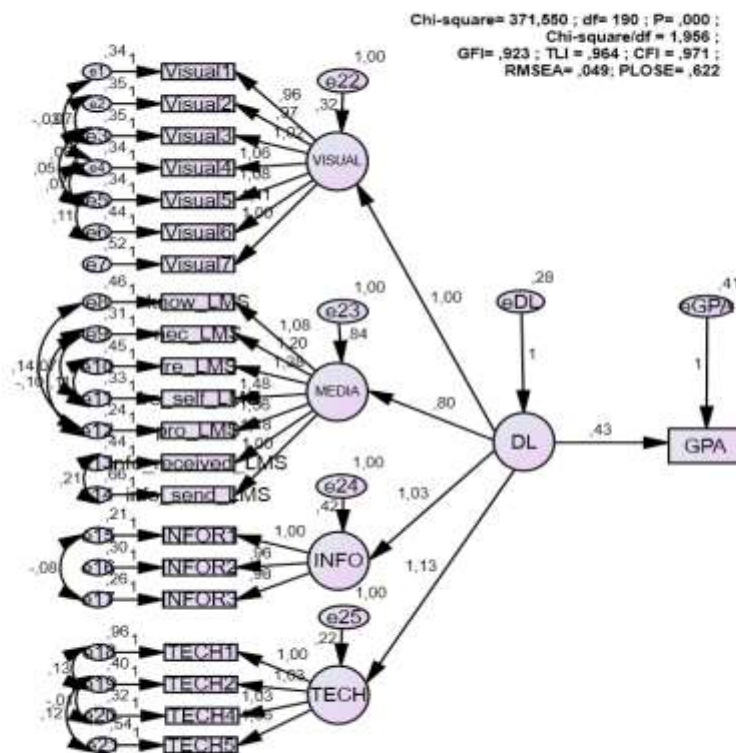

Figure 2: SEM model and the research hypotheses

Table 5: The non-standardized test results

			Estimate	S.E.	C.R.	P
VISUAL	<---	DL	1,000			
MEDIA	<---	DL	,803	,111	7,208	***
INFO	<---	DL	1,027	,099	10,366	***
TECH	<---	DL	1,130	,134	8,418	***
GPA	<---	DL	,431	,073	5,936	***

Also when analyzing differences in the relationship between digital literacy and academic performance among different groups of students. Specifically, the influence of digital literacy on student learning outcomes increases from the first-year group to the third-year group according to a normalized coefficient of: 0.228<0.319<0.392. In other words, the impact of digital literacy on student learning outcomes tends to be stronger from the first year to the third year group. This relationship with the group of fourth-year students compared with students of other years is not confirmed.

The influence of digital literacy on the learning outcomes of technology students is also stronger than that of students majoring in economics and administration (0.448>0.303).

Table 6: The standardized results

			Estimate
VISUAL	<---	DL	,855
MEDIA	<---	DL	,454
INFO	<---	DL	,797
TECH	<---	DL	,937
GPA	<---	DL	,338

CONCLUSIONS

Digital competencies are widely accepted as the most critical working competencies in the digital era. The race is becoming more aggressive among the companies to push the technology adoption and put pressure on the program learning outcomes of the higher education institutions all over the world. This study plays a role of assisting the higher education institutions first in Vietnam to recognize the digital literacy among their students and how the teaching and studying activities contribute to that. With our efforts to conduct a survey-based measure of digital literacy with more than 400 students around Ho Chi Minh city. The study sample is relatively diverse from the study disciplines to the study environment that allows us to strengthen the power of the measurement. The results confirm the validity of the scales that were proposed and applied in foreign studies that can also be applied in the context of Vietnam. The significant components constructing the digital literacy of the students include the skills in understanding and using information, the skills in using technology and computers, the skills in communicating via E-learning channel, and the skills in

44

effectively using images. All those skills are related to the studying context at the higher education institutions.

The results also shed light on the insights into the diversity in the digital literacy between the groups of students who are studying in different cohorts of the study program, the students whose English levels are different as well as the students who attained different performance. While believing in the importance of digital literacy in the students' employability, encouraging digital skills among the students will provide students more opportunities to find jobs and to be more successful in working after graduation. This study provides empirical evidence to suggest to the higher education institutions the ways to boost the digital literacy among their students in such a way to improve the digital competence that contributing to stronger employability of the students and the quality of study programs Finally, later studies can investigate the relationship between the digital literacy and the study performance of the students to strengthen the findings of the research. Further studies can tackle several limitations of this research such as the sample can be expanded to be better representative in terms of study disciplines and cohorts as well as larger in size to dig deeper into the differences among subgroups of students. Later study can be applied in the working environment to explore the relationship between digital literacy and working performance that will strengthen the measurement proposed in this study and to emphasize the role of digital literacy.

REFERENCES

Abbas, J., & Sağsan, M., (2019). Impact of knowledge management practices on green innovation and corporate sustainable development: A structural analysis. *Journal of cleaner production*, *229*, 611-620.

Amiri, S., 2009. The effects of information and communication technology on at risk children of low economic status: Make It-Take It Case Study. *International Journal of Education and Development using ICT*, *5*(3), 141-147.

Ashcroft, L., & Watts, C., (2005). ICT skills for information professionals in developing countries: Perspectives from a study of the electronic information environment in Nigeria. *IFLA journal*, 31(1), 6-12.

Bartlett, J., & Miller, C., (2011). *Truth, lies and the Internet: a report into young people's digital fluency*, Demos.

Bawden, D., (2001). Information and digital literacies: a review of concepts. *Journal of Documentation*, 57(2), 218-259

Bejaković, P. and Mrnjavac, Ž., (2020). The importance of digital literacy on the labour market. *Employee Relations: The International Journal*.

Boot, W. R., Charness, N., Czaja, S. J., Sharit, J., Rogers, W. A., Fisk, A. D., ... & Nair, S., (2015). Computer proficiency questionnaire: assessing low and high computer proficient seniors. *The Gerontologist*, *55*(3), 404-411.

Chase, Z., & Laufenberg, D., (2011). Embracing the squishiness of digital literacy. *Journal of Adolescent & Adult Literacy*, *54*(7), 535-537.

Chetty, K., Qigui, L., Gcora, N., Josie, J., Wenwei, L., & Fang, C., (2018). Bridging the digital divide: measuring digital literacy. *Economics*, *12*(1).

Cicha, K., Rutecka, P., Rizun, M., & Strzelecki, A., (2021). Digital and Media Literacies in the Polish Education System—Pre-and Post-COVID-19 Perspective. *Education Sciences*, *11*(9), 532.

Cortina, J. M., (1993). What is coefficient alpha? An examination of theory and applications. *Journal of applied psychology*, 78(1), 98.

Developing Digital Literacies, JISC, (2014). https://www.jisc.ac.uk/guides/developing-digital-literacies

Digital Competence and Employability. Telecentre Europe, (2014). http://www.telecentre-europe.org/wp-content/uploads/2015/02/TE_DIGCOMP-policy-paper_FINAL_PDF.pdf

Digital Competence Framework – your questions answered. Welsh Government, (2018). https://hwb.gov.wales/storage/85f69bca-0134-426d-bff1-c46b4c1d067b/digital-competence-framework-your

Ellison, N. B., Lampe, C., & Steinfield, C., (2010). With a little help from my friends: How social network sites affect social capital processes. *A networked self*, 132-153.

Eshet-Alkalai, Y. (2004). Digital Literacy. A Conceptual Framework for Survival Skills in the Digital Era. *Journal of Educational Multimedia & Hypermedia*, 13(1), 93-106.

Garrido, M., Badshah, A. and Coward, C., (2009). Deconstructing ICT skills and employability. *Information Technologies & international development*, *5*(2), pp.pp-iii.

Hải Lê Nam, và Nhi Trần Yến., (2021). Nghiên cứu sự hài lòng của người học đối với hình thức học tập trực tuyến (e-learning): Trường hợp Sinh Viên ngành Kinh Tế tại thành phố Hồ Chí Minh". *Tạp Chí Khoa học Trường Đại học Cần Thơ* 57 (4):232-44

Hair Jr, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G., (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European business review*.

Hair, Jr., J.F., Black, W.C., Babin, B.J., Anderson, R.E., Tatham, R.L., (2006). *Multivariate data analysis (6th Ed.)*, Pearson-Prentice Hall, Upper Saddle River, NJ

Hatlevik, O.E. and Christophersen, K.A., (2013). Digital competence at the beginning of upper secondary school: Identifying factors explaining digital inclusion. *Computers & education*, *63*, pp.240-247.

Hobbs, R., (2010). *Digital and Media Literacy: A Plan of Action. A White Paper on the Digital and Media Literacy Recommendations of the Knight Commission on the Information Needs of Communities in a Democracy*. Aspen Institute. 1 Dupont Circle NW Suite 700, Washington, DC 20036.

ILO. (2019, May 1). Higher-skilled labour force necessary for Viet Nam's further economic development.Retrieve:https://www.ilo.org/hanoi/Informationresources/Publicinformation/comments-and-analysis/WCMS_694938/lang--en/index.htm

Ilomäki, L., Kantosalo, A. and Lakkala, M., (2011). *What is digital competence?. Linked portal*.

Jenkins, H., K., C., Purushotma, R., Robison, A. J., & Weigel, M. (2006). *Confronting the Challenges of Participatory Culture: Media Education for the 21st Century*: MacArthur. The john D. and Catherine T. MacArthur Foundation

Kennedy, G. E., Judd, T. S., Churchward, A., Gray, K., & Krause, K. L., (2008). First year students' experiences with technology: Are they really digital natives?. *Australasian journal of educational technology*, *24*(1).

Koltay, T., (2011). The media and the literacies: Media literacy, information literacy, digital literacy. *Media, culture & society*, *33*(2), 211-221.

Kurbanoğlu, S., Boustany, J., Spiranec, S., Grassian, E., Mizrachi, D., Roy, L., & Çakmak, T., (2016). Information literacy: Key to an inclusive society. Vol. 676CCIS. Springer International Publishinghttp://dx.doi.org/10.1007/978-3-319-52162-6 (Retrieved from)

Kusumastuti, A., & Nuryani, A., (2020). *Digital Literacy Levels in ASEAN (Comparative StudyonASEANCountries).*Retrievedfromhttps://pdfs.semanticscholar.org/9988/a21e6a4c ce0bb0136e10d328ea0545bb0ba7.pdf.

Ladbrook, J., & Probert, E., (2011). Information skills and critical literacy: Where are our digikids at with online searching and are their teachers helping?. *Australasian Journal of Educational Technology*, *27*(1).

Li, C.-K. and C.-H. Hung, (2010). An examination of the mediating role of person-job fit in relations between information literacy and work outcomes. *Journal of Workplace Learning* 22(5): 306-318

Marupova, R., & Garcia, S. V., (2007, March). Promoting Information Literacy for Undergraduate Students. In *Society for Information Technology & Teacher Education International Conference* (pp. 1319-1325). Association for the Advancement of Computing in Education (AACE).

Mirza, H. S., (2020). Improving University Students' English Proficiency with Digital Storytelling. *International Online Journal of Education and Teaching*, *7*(1), 84-94

Ng, W., (2012). Can we teach digital natives digital literacy?. *Computers & education*, *59*(3), 1065-1078.

Norušis, M. J., (1995). *SPSS 14.0 guide to data analysis*. Englewood Cliffs, NJ: Prentice Hall.

Nunnally, J. C., (1975). Psychometric theory—25 years ago and now. *Educational Researcher*, *4*(10), 7-21.

Oblinger, D. & Oblinger. J. L., (2005). Educating the Net Generation. Washington, DC: Educause. Retrieved 19 October, 2009, from http://www.educause.edu/educatingthenetgen/.

Oblinger, D., Oblinger, J., Roberts, G., McNeely, B., Windham, C., Hartman, J., Moskal, P., Dziuban, C. and Kvavik, R., (2005). *Educating the net generation* (Vol. 272). Brockport Bookshelf, Book.

OECD (2005). The OECD Program Definition and Selection of Competencies (2005). The definition and selection of key competencies. Executive summary. 30. June, 2005. Retrieved August 10, 2010, from http://www.oecd.org/dataoecd/47/61/35070367.pdf

OECD Skills Outlook, (2015). Youth, Skills and Employability. *OECD: Paris Publising*.

Pagani, L., Argentin, G., Gui, M., & Stanca, L., (2016). The impact of digital skills on educational outcomes: evidence from performance tests. *Educational studies*, *42*(2), 137-162.

Pellizzari, E., Camarero, J. J., Gazol, A., Granda, E., Shetti, R., Wilmking, M., ... & Carrer, M., (2017). Diverging shrub and tree growth from the Polar to the Mediterranean biomes across the European continent. *Global Change Biology*, *23*(8), 3169-3180.

Pellizzari, M., Biagi, F. and Brecko, B., (2015), E-skills Mismatch: Evidence from PIAAC, Digital Economy, Working Paper 2015/10, *Institute for Prospective Technological Studies, Padova*.

Pirzada, K., & Khan, F., (2013). Measuring relationship between digital skills and employability. *European Journal of Business and Management*, 5(24).

Rheingold, H., (2012). *Net smart: How to thrive online*. Mit Press.

Stokes, S., (2002). Visual literacy in teaching and learning: A literature perspective. *Electronic Journal for the integration of Technology in Education*, *1*(1), 10-19.

Thompson, K., (2016). Digital Literacy and the ICT Curriculum. *BU Journal of Graduate Studies in Education*, *8*(1), 10-13.

Ukwoma, S.C., Iwundu, N.E. and Iwundu, I.E., (2016), "Digital literacy skills possessed by students of UNN, implications for effective learning and performance: A study of the MTN Universities Connect Library", *New Library World*, Vol. 117 No. 11/12, pp. 702-720

Vrana, R. (2016, October). Digital literacy as a boost factor in employability of students. In *European Conference on Information Literacy* (pp. 169-178). Springer, Cham.

Wei, H. C., & Chou, C., (2020). Online learning performance and satisfaction: do perceptions and readiness matter?. *Distance Education*, *41*(1), 48-69.

Wright S (1918) On the nature of size factors. Genetics 3(4):367–374

Yildiz-Durak, H., (2018). What would you do without your smartphone? adolescents' social media usage, locus of control, and loneliness as a predictor of nomophobia. Addicta: *The Turkish Journal on Addictions*, 5(2), 151–163.

Zhang, Q., Cheng, L., & Boutaba, R., (2010). Cloud computing: state-of-the-art and research challenges. *Journal of internet services and applications*, 1(1), 7-18.

This paper ends on page 4