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The Roles of Digital Literacy, Technology Literacy, and Human Literacy to Encourage Work Readiness of Accounting Education Students in the Fourth Industrial Revolution Era

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Abstract

Industry 4.0 requires workers to have ability in new literacy including digital literacy, technology literacy, and human literacy. The objective of this study is the roles of digital literacy, technology literacy, and human literacy to encourage readiness of students to access work world. This research is a quantitative research. The population of this study was 100 students of education study programs, Universitas Negeri Semarang with 80 students as samples calculated by Slovin formula with 5% error rate. The data collection techniques use questionnaires. The data analysis techniques use analysis of multiple regression with SPSS version 21. The results of this study shows that multiple regression analysis obtained equation $Y = 6.173 + 0.308X_1 + 0.264X_2 + 0.230X_3 + e$. Simultaneously, digital literacy, technology literacy, and human literacy have positive and significant 54.7% influence to the work readiness. Partially, digital literacy affects 14.9%, technology literacy affects 7.9%, and human literacy affects 6.6% to work readiness. Suggestions from this research are university could enhance literacy in the digital, technology, and human fields. For digital literacy, university must make a habit and culture for students to access various information through the internet. For technology literacy, university could introduce and understand the use of the latest technology for students who are relevant to the department and work world. For human literacy, university could require students to join an organization to build spirit of leadership, teamwork, etc., so that they are more motivated and ready to face the work world.

Keywords: digital literacy, human literacy, technology literacy, work readiness

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1. Introduction

The world is now in the process of a new wave of industrial revolution driven by the development and diffusion of digital technology that we call as fourth industrial revolution. With the coming of the 4th industrial revolution, new technologies such as the

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Internet of Things, Artificial Intelligence, and autonomous vehicles are becoming embedded into everyday life and adopted in the industrial sector (Fu, 2017). The emerging technologies in the 4th industrial revolution have rapidly transformed the way individuals live and work.

Employers and work industry in today increasingly require validation of digital literacy skills and employability. According to The British Computer Society survey, 90% of Human Resources professionals and employers said that operating a digital device as important to the majority of roles in their organization. Today almost every job relies on some aspect of technology: whether it's sitting at a PC in an office, working at a check-out or delivering parcels. Employers want people to have the skills to be productive straight away in a new role and believe digital skills improve employee efficiency and increase business productivity. Key findings in its survey showed that 81% of employers regard digital skills to be an important requirement when employing people and 97% felt email skills are important to the majority of roles in their organization, along with: Word processing (92%), Spreadsheets (89%), Social media (71%). They said that 68% rated increased efficiency as one of the top two benefits of digital literacy for employees. Besides that, Cunningham (2016) said that the employees need to be able to think in technological terms and know what and how solutions can be achieved through the use of technology. Furthermore, there is other needs for modern workforce. It is Leadership and management capability that drive to enable companies to steer the interconnectivity between systems, machines and people - across companies, countries and value networks.

The Australian Industry Group in Report with title Developing the Workforce for a Digital Future (2017) state that need managers develop the digital strategies required, develop workforces with proficiency in problem solving in technology rich environments and ensure workers continue to utilize their information processing skills.

The number of Asia Pacific employers reporting difficulties due to a lack of qualified talent has risen from 45% in 2014 to 48% in 2015. This is the second highest increase since 2006 according to Manpower report (2015). Other regional studies have revealed skills gaps in various occupations and industry sectors, notably in relation to skilled trades, sales representatives, engineers, technicians, accountants, information technology workers and managerial categories (Manpower, 2015; Montague, 2013; Nankervis et al., 2012). Brown et al. (2011) suggest that 'only 13% of university graduates' from the twenty-eight low-wage Asian nations were considered to have the required skills and competencies required for their jobs. This notion of 'suitability', or underdeveloped work competencies, emphasizes the desire for graduates to possess a range of generic skills

and attributes that ensure that they are 'ready' for the workforce (Casner- Lotto et al., 2006; Goldin, 2015).

The fourth industrial revolution era also bring the new challenges for student in university who are prepared to enter the work world, including students of accounting education programs. Students of Accounting Education Study Program have an opportunity to work in the education world that require them to have basic competencies based on the Law of the Republic of Indonesia No. 14 of 2005 include pedagogic, professional, personal and social competencies. Pedagogic competency is related to understanding the dynamics of the learning process that requires educators to follow the technology development to support learning strategies.

Professional competency related to mastering material that can be obtained Personality competency is related to good behavior that can be replicated and social competency that is related to the ability to interact with student. from various sources. Both require mastery of human literacy. Walsh (2017) support this statement that changes in digital communication technologies have impacted on society so rapidly that educational researchers, policy makers and teachers are challenged by the application of these changes for curriculum design, pedagogy and assessment. This condition indicates that literacy in the digital, technology, and human fields is important to help educators to master basic teaching competencies. Students who have high literacy levels are expected to be better prepared to face the challenges of the workforce in fourth industrial revolution era.

Based on the complexity of work competency challenges that require a person to follow the development of science and technology and a positive attitude of humanity, the authors is interested in conducting research about how the influence of mastery three new literacy, namely digital literacy (X1), technology literacy (X2), and human literacy (X3) toward the statement of student work readiness (Y). In addition, this study also describes how the three variables affect the statement of work readiness in students so the hypothesis formed in this study are:

H1 Digital literacy has a significant influence to the work readiness

H2 Technology literacy has a significant influence to the work readiness

H3 Human literacy has a significant influence to the work readiness

H4 Digital literacy, technology literacy, and human literacy has a significant influence simultaneously to the work readiness.
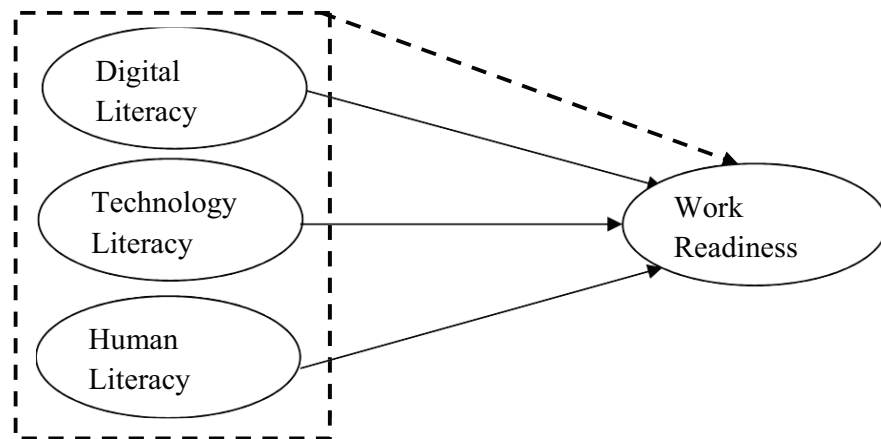
Figure 1: Theoretical framework of the study. (Source: Authors, 2018.)

2. Literature Review

2.1. Digital literacy

The digital literacy term was first put forward by Gilster (1997) as the ability to understand and use information from various digital sources in various contexts, academic, career, and everyday life. Bawden (2001) broadens new understanding of digital literacy rooted in computer literacy and information literacy. Computer literacy was developed in the 1980s while the literacy of information is widespread in the 1990s when information is more easily accessed, and disseminated through network information technology.

Martin (2006) formulates the definition of digital literacy as follows.

Digital literacy is awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyze and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations, in order to enable constructive social action.

According to the UNESCO concept, digital literacy becomes foundation for understanding ICT devices. The difference between technology and digital literacy is if technology literacy is an appropriate skill and competence with using technology while digital literacy requires fluent in digital communication, understanding, filtering and manipulation to become successful in the future. Aoun (2017) explains that difference where is digital literacy directed at the goal of enhancing abilities read, analyze and use information in the Big Data but technology literacy is directed to provide understanding on how the engine and technology applications work.

2.2. Technology literacy

Technology literacy related to Information and Communication Technology (ICT). Markauskaite, L. (2006) said, technological literacy as part of ICT literacy that falls into the category of inter-literacy perspectives includes the ability to use ICT as an integral part of basic literacy. Basic literacy includes ICT fundamental knowledge perspective, namely understanding of theoretical concepts and principles of computers, information systems, digital information, algorithmic thinking and programing, technological limitations, and social impacts and, basic ICT skills perspective includes the ability to use ICT tools such as word processing and numbers. Next, Maryl (2005) said that technology literacy is the ability to use, understand, regulate and assess an innovation that involves processes and knowledge to solve problems. According to the National Academy of Engineering and the National Research Council, literacy technology is understanding of technology at a level that enables effective use consisting of three main components, namely knowledge, ability and critical thinking, and decision-making. Based on the above definition, technology literacy can be interpreted as an ability consisting of aspects of science, critical thinking skills, and decision-making in an effort to effectively utilize technology/innovation of human works.

2.3. Human literacy

Study on human literacy are still very difficult to find. According to Aoun (2017) human literacy directed at improving communication skills and mastery of design science. The Ministry of Research, Technology and Higher Education of Indonesia or Kemenristekdikti (2017) asserts that human literacy is part of the General Education that students must be mastered. The components of this literacy include leadership and team work, cultural agility namely students with various backgrounds able to work in different environments (inside/outside the country), Entrepreneurship including social entrepreneurship which is the capacity owned by all students.

2.4. Work readiness

There have been various terms used to define work- readiness. According to Mason et al. (2009), 'Work readiness' refers to the possession of a set of fundamental skills, knowledge, attitudes and practical comprehension that enable new graduates to make

productive contributions to organizational objectives. Work readiness describes a graduate's perception of acquired attitudes and attributes that enable success in the workplace (Caballero & Walker, 2010). Because of that, Kardi et al. (2009) asserted that global competition in the workplace demands that Higher Educational Institution should better equip their graduates, not only with fundamental knowledge in a specific domain but also with work readiness skills.

The study result of Verma et al. (2018), the Work-readiness competency challenges in Indonesia for employer are organized, responsible, critical/analytical thinking/problem solving, interpersonal skills, it skills, effective communication, involvement/commitment, motivation, business acumen, numerical abilities, negotiation skills, emotional intelligence, innovation/creativity, multitasking skills, team-work, presentation (grooming), initiative, taking pressure while in education environment the challenges are added with low self-esteem, time management, willingness to learn, and collaborative skills.

2.5. Research method

This research is a quantitative research. The population of this study is 100 students of accounting education study programs, Universitas Negeri Semarang with 80 students as samples from 100 students as population. Determination of sample numbers are calculated by Slovin formula with 5% error rate as follow.

n = N/(1 + (N x e^2)) = 100/(1 + (100 x 0,05^2))

n = 100/(1 + (100 x 0,0025))

n = 100/(1 + 0,25)

n = 100/1,25

n = 80

The selection of respondents was done by random sampling technique. According to Sugiyono (2017) simple random sampling is the taking of a member of a sample of a population that is carried out randomly without regard to the strata that exist in the population. The data in this study are sourced from primary data. The data collection techniques use questionnaires, conducted using the self-developed questionnaire which is the question items in the questionnaire derived from the theories and concepts that exist as described in the literature review section. The questionnaire was assessed with a Likert scale, 5 presented strongly agreed, 4 presented agreed, 3 presented disagreed, 2 presented disagree, and 1 presented strongly disagree. The collected data was then analyzed by multiple regression analysis using Statistical Package for Social Sciences

(SPSS) version 21.0. Before the data is analyzed, validity and reliability tests are carried out.

3. Result and Discussion

3.1. Validity test

Test Validity is a measure that indicates the validity level or validity of an instrument. The significance test is done using r table. r value of r table for sample 80 with significance level 5% indicates 0.219 (df = n–2 = 80–2 = 78). If r count is greater than r table and the value of r is positive then the question is said to be valid. The following is the result of the validity test for each item of question asked.

TABLE 1: Validity test result.

Question Item	r table	r count	Description	Question Item	r table	r count	Description
X1.1	0.438**	0.219	Valid	X3.1	0.479**	0.219	Valid
X1.2	0.422**	0.219	Valid	X3.2	0.526**	0.219	Valid
X1.3	0.621**	0.219	Valid	X3.3	0.470**	0.219	Valid
X1.4	0.503**	0.219	Valid	X3.4	0.464**	0.219	Valid
X1.5	0.523**	0.219	Valid	X3.5	0.453**	0.219	Valid
X1.6	0.448**	0.219	Valid	X3.6	0.327**	0.219	Valid
X1.7	0.340**	0.219	Valid	X3.7	0.395**	0.219	Valid
X1.8	0.340**	0.219	Valid	X3.8	0.210	0.219	Invalid
X2.1	0.425**	0.219	Valid	Y1	0.729**	0.219	Valid
X2.2	0.573**	0.219	Valid	Y2	0.724**	0.219	Valid
X2.3	0.506**	0.219	Valid	Y3	0.671**	0.219	Valid
X2.4	0.313**	0.219	Valid	Y4	0.756**	0.219	Valid
X2.5	0.453**	0.219	Valid	Y5	0.709**	0.219	Valid
X2.6	0.458**	0.219	Valid	Y6	0.754**	0.219	Valid
X2.7	0.437**	0.219	Valid	Y7	0.731**	0.219	Valid
X2.8	0.307**	0.219	Valid	Y8	0.735**	0.219	Valid

Source: Processed data (2018).

Based on table 1. can be conclude that question items are valid except question item for X3.8. or question item for third independent variable on human literacy. Then, authors make decision to delete the invalid question items and not included in the next data analysis test because the question items has been adequately represent each indicator to be measured.

3.2. Reliability test

The function of Reliability Test is to determine a reliable instrument as data-gathering device. A variable is said to be reliable if Cronbach's Alpha value > 0.7 According to Sugiono (2017) test reliability measures the consistency of instruments. The reliable instrument means is believed to produce a consistent score, relatively unchanged despite being tested in different situations and conducted repeatedly.

TABLE 2: Reliability test.

Variable	Number of Items	Number of Delete Items	Cronbach's Alpha
Digital Literacy	8	0	0, 848
Technology Literacy	8	0	0, 866
Human Literacy	8	1	0, 871
Work readiness	8	0	0, 867
Source: Processed data (2018).			

Table 2 shows that digital literacy (X1) has Cronbach Alpha 0.847 which means high reliability because it has a value of more than 0.70, as well as technology literacy (X2) human literacy (X3) and work readiness (Y).

3.3. Data analysis

3.3.1. Coefficient of determination

According to Ghozali (2012:97) the coefficient of determination (R2) is a tool for measuring how far the ability in determining the dependent variable.

TABLE 3: Coefficient of determination.

Model Summary				
Mode l	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.751a	0.564	0.547	1.702
Note: ^{a} = Predictors: (Constant), Human Literacy,				
Digital Literacy, Technology Literacy.				
Source: Processed data (2018).				

Based on the above data, it is known that R square is 0.564, which means that the variation of 56.4% of work readiness can be explained by the three variables, namely digital literacy, technology literacy, and human literacy. While the rest is influenced by other variables not examined in this study.

3.3.2. Partial determination coefficient

TABLE 4: Coefficient of determination.

Coefficientsa					
Model		Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.
		B	Std. Error	Beta		
	(Constant)	6.173	2.728		2.263	0.027
	Digital Literacy	0.308	0.073	0.386	4.228	0.000
1	Technology Literacy	0.264	0.087	0.281	3.038	0.003
	Human Literacy	0.230	0.081	0.257	2.850	0.006

Note: [a] = Dependent variable: Work readiness.

Source: Processed data (2018).

Based on Table 4, it can be seen that all variables, namely digital literacy (X1) and technology literacy (X2) and human literacy (X3) contribute influence to students to declare work readiness. Partially the effect of digital literacy (X1) on student work readiness is 14.9%, technology literacy (X2) is 7.9% and human literacy (X3) is 6.6%.

3.3.3. Simultaneous significance test (F-test)

According to Ghozali (2012:98) Test Statistics F basically shows whether all independent variables or independent variables included in the model have a joint influence on the dependent variable or the dependent variable.

TABLE 5: F-test result.

ANOVAa						
Model		Sum of Squares	Df	Mean Square	*F*	Sig.
	Regression	285,237	3	95.079	32.823	0. 000b
1	Residual	220,150	76	2.897		
	Total	505,388	79			

Note: [a] = Dependent variable: Work readiness;

[b] = Predictors: (Constant), Human Literacy, Digital Literacy, Technology Literacy.

Source: Processed data (2018).

Based on that table, can be known that F 32.823 with a probability of 0,000. Basis of decision for the F test can be done by comparing the value of f table and f count and also with consider significance. Based on the table above can be known that f count is 32.823 while the value of f table is known 2.72 with df for N1 is 3 (k–1 = 4–1) and for N2 is 76 (nk =

80–4) so that the f count value is greater than the f table. It means independent variables simultaneously affect the dependent variable. Similarly, a significance value less than 0.05 indicates that the independent variables simultaneously influence the dependent variable. This shows that the higher level of digital literacy, technology literacy, human literacy owned by students will further improve work readiness of student to enter the work world.

3.3.4. Individual parameter significance test (T-test)

According to Ghozali (2012:98) the t-test is used to test how far influence the independent variables used in this study individually in explaining the dependent variable partially. The basis for decision-making used in the t-test is if the sig value < 0.05, the independent variable has a significant effect on the dependent variable.

TABLE 6: T-test result.

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
	(Constant)	6.173	2.728		2.263	0.027
	Digital Literacy	0.308	0.073	0.386	4.228	0
1	Technology Literacy	0.264	0.087	0.281	3.038	0.003
	Human Literacy	0.23	0.081	0.257	2.85	0.006

Note: ^{a} = Dependent variable: Work readiness.

Source: Processed data (2018).

Based on table, the three independent variables that entered in the regression model have a significant effect to the work readiness. This can be seen from the sig value where digital literacy has value 0.00 and technology literacy has value 0.003, and human literacy has value 0.006.

So the mathematical equation that is formed is as follows: Y = 6.173 + 0.308X1 + 0.264X2 + 0.230X3. Based on the research results, it can be stated that:

H1 Digital literacy has a significant influence to the work readiness was accepted

H2 Technology literacy has a significant influence to the work readiness was accepted

H3 Human literacy has a significant influence to the work readiness was accepted

H4 Digital literacy, technology literacy, and human literacy has a significant influence simultaneously to the work readiness was accepted

The result of study shows that digital literacy, technology literacy, and human literacy have a influences to the student, especially for accounting education students to state that they are ready to enter work world. It can be interpreted that these three literacy have a role and contribute to encouraging student to say they are ready to work.

The importance of mastering digital literacy requires students to use the information they obtain in order to be useful and facilitate work. With the search tool, students can learn quickly about work tasks. In the world of education, mastery of digital literacy is the main requirement for prospective educators. It is not separated from the four basic competencies of teaching that educators must be mastered. Information access to various sources can help educators to find various methods and strategies to be implemented in classroom management. In addition, access to information to various digital sources can also increase educators' knowledge about learning material in a short time relatively.

Then, technology literacy on student work readiness. From the results of the study, it was found that technological literacy had a significant influence on the statement of student work readiness. This can be explained by need of Accounting Education Students to be able to master technology not only theoretically but practically. Accounting Education students must be able to automatically use various software to present financial statements such as zahir, accurate, cloud accounting, Myob and Spreadsheets. Mastery of various software is an important part for students, so that they are not available in circles of technology stutter. This is because almost all companies have used technology applications in financial management. In the world of accounting education, students who have mastered the use of technology will have higher teaching skills. They can process financial transactions and do simulation by using software so that improves students' understanding. This is in line with the results of research conducted by Friska Tianada (2015) which states that technological literacy has a significant influence on teaching competence. This has implications for the readiness of students to enter the workforce, especially as educators.

Human literacy is focused on positive characters that individuals must possess to enter the workforce. The results showed that there was a significant influence on human literacy on student work readiness. This is not surprising because students tend to agree that having a leadership spirit, good cooperative skills, critical thinking skills, the ability to innovate and initialize will help them to survive in the work environment. Especially for prospective educators, human literacy is the basis for improving teaching skills in the sphere of social competence and personal competence. Based on the result, the influence of digital literacy is greater than technology literacy and human literacy. This

is because students have a higher ability in accessing information from digital sources rather than the ability to use technology and the ability to communicate, collaborate and so on or in other words digital literacy encourages students to say they are ready to enter the workforce. From these results, the authors can suggest that technology and human literacy must be improved together with digital literacy so that students are better prepared to face the challenges of the work world. This is because if digital literacy, technology literacy, and human literacy will have a very large role if the three variables are juxtaposed. For digital literacy, a university must make a habit for students to access various information through the internet. For technology literacy, a university could introduce and understand the latest technology for students who are relevant to the department and work world. For human literacy, the university could require students to join an organization to build the spirit of leadership, teamwork, etc., so that they are more motivated and ready to face the work world.

4. Conclusion

Based on the explanation above, it can be concluded that:

1. Simultaneously, digital literacy (X1) and technology literacy (X2) and human literacy (X3) have a significant influence to the work readiness (Y) by 32.8%.

2. Partially, the influence of digital literacy (X1) to the work readiness (Y) reached 14.9%, technology literacy (X2) to the work readiness reached 7.9% while the influence of human literacy (X3) to the work readiness reached 6.6%

3. The influence of digital literacy to the work readiness is the highest. It means the role of digital literacy's student is highest to encourage student express they are ready to face the work world. Therefore, technology and human literacy must be improved more actively by university.

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