

How Does Economic Education Promote Students' Learning Creativity?

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Abstract: Preparing students' learning creativity is essential for developing learning literacy in the fourth industrial era. This research aims to determine how economic education shapes university students' learning creativity in the industrial revolution 4.0 era in Indonesia. Exploratory factor analysis and confirmatory factor analysis of AMOS 25 were employed as the method of research, while primary data was gathered through a survey using a questionnaire. The sample in this research involved 187 university students of the Faculty of Economics, Universitas Negeri Jakarta, Indonesia. The results indicated that economic education significantly and positively affects digital economic literacy and students' learning creativity. Additionally, the findings show that digital economic literacy can drive students' learning creativity. Lastly, this study confirms that digital economics literacy can mediate the effect of economic education on students' learning creativity. The practical and managerial implications are designated to involve entrepreneurship education as the driver for students' learning creativity.

Keywords: Digital economic literacy, economic education, students' learning creativity, industrial revolution 4.0

INTRODUCTION

The industrial revolution began with the socio-economic era of hunting, agrarian, industrial, and information. These developments involved changes in the processes of the light industry, heavy and chemical industry, internet and computers, digital information, and artificial intelligence (Sima et al., 2020). Industrial revolution 4.0 is marked by the presence of four things, namely supercomputers, artificial intelligence, cyber systems, and manufacturing collaboration. The Industrial Revolution 4.0 was marked by the emergence of supercomputers and Artificial Intelligence (Rojko, 2017; Khan & Turowski, 2016; Kite et al., 2018), many lost jobs will be replaced by robots or artificial intelligence (Afrianto, 2018; Grenčíková et al., 2020), but new jobs will also emerge (Fonseca, 2018; Koleva, 2018). The challenge in education is how to prepare innovative, creative human resources (Gan & Yusof, 2019; Shamim et al., 2016) so that it needs to be anticipated, including Indonesia as a developing country (Malik, 2019; Rosmadi et al., 2019).

Industrial revolution 4.0 requires students' competence in economic education, which focuses on the learning process and emphasizes the development of creativity, problem-solving analysis, critical thinking skills, and discovery. Along with this phenomenon, global trends and challenges faced in the future are urbanization, economy and halal economy, aging society, new business models, gen Y, big data information, technology and innovation, value-chain base, and knowledge-base (Nagy et al., 2018; Xu et al., 2018). Learning as a process of human education, gaining knowledge is important to form students' thinking abilities

(Saptono et al., 2020). Hence, preparing students' learning creativity is urgent for the development of learning literacy in the Industry 4.0 era (Suparno & Saptono, 2018) and the change in human work, skills, and job requirements, especially when new technologies emerge (Afrianto, 2018; Grenčíková et al., 2020). Therefore, economic digitization accelerates socio-economic change that needs creativity and literacy.

Future education and learning foster optimal potential and curiosity (Afrianto, 2018), which may be developed through family economic education. Social learning theory (Bandura, 1971) states that learning is based on building oneself for the future (Bandura & Walters, 1963) through the social environment and knowledge to achieve a change (Bandura, 2001). Building competence is a 21st-century requirement, which is why many countries and competency certification agencies exist today. With the mobility of labor and markets in the products and services industries, state borders are becoming increasingly porous. Constructivism theory encourages learners to build new experiences based on knowledge to answer future challenges, and it has strong characteristics in nationalism, entrepreneurship, and religion (Suparno, 2018), strengthened by cognitive learning theory in assembling various knowledge into new experiences (Biddle, 1986). Therefore, not only permanent knowledge but also experience are required to answer the challenges of 21st-century life.

Unicorn startups have sprouted up in emerging nations (Saptono et al., 2020), becoming decacorns and hectocorns. Economic history recounts successful entrepreneurs through several generations, but today many great entrepreneurs are attained at a young age. Digital economic literacy includes a broad range of market access, the availability of digital information, the capacity to compare policies across nations, and the willingness to take risks. It can receive knowledge of the world's economic progress without regard to time or geography, and we may make decisions to participate as successful individuals. Advances in digital technology have changed the order of various aspects of life (Reis et al., 2018; Boud et al., 2016), and education is no exception (Afrianto, 2018; Sharma, 2019; Ismail et al., 2020). Hence, both skills, creativity, and innovation are crucial for supporting students' development.

In addition, to deal with the industrial 4.0, creativity is essential for students due to its ability to develop new ideas and ways of solving problems and finding opportunities for thinking new things (Saada, 2011). Creativity is actively involved in innovation, which requires learning skills and application at the right time (Vygotsky, 1992). For this matter, learning activities should elaborate on the ability to analyze economic problems and their solutions in policymaking (Hanushek & Woessmann, 2008; Pertiwi et al., 2019). Various learning processes change in response to future needs, and student skills move into complicated problem-solving social, process, and system skills. This implies that cognitive learning needs practical and relevant information. Students must also be creative and inventive, communicative, critical thinkers, and entrepreneurial. This remarks that economic education places a premium on the contextual development of students' creativity.

In this regard, economic education can be prepared in schools and family environments since family as the initial environment forms a good attitude, role model, and positive character. Education can shape students' knowledge and

promote a good personality, economic literacy, and economic behavior (Narmaditya, 2013, Rahmawati et al., 2019; Novitasari & Septiana, 2021). Economic education is learned through habituation of various activities (Novitasari & Septiana, 2021), verbal explanations, demands of appropriate behaviors, and discussions of relevant cases (Theodora & Marti, 2016). Meanwhile, economic literacy consists of understanding economic concepts and financial literacy, which is the knowledge needed in the current policy debate, given that this knowledge involves understanding debt, investment, and spending patterns (Lusardi & Mitchell, 2014). The lack of economic literacy is a condition that can be very detrimental and will increase costs significantly.

This research is intended to fill the existing gap and complements previous research on the theme of economic literacy (Hunt, 1941; Dilek et al., 2018; Yasmin, 2014; Walstad et al., 2013), financial literacy (Xiao, 2015), digital literacy (Chan et al., 2017; Tang & Chaw, 2015; McGuinness & Fulton, 2019; Spires et al., 2018), and digital economy (Afonasova et al., 2018; Zimmermann, 2015). Learning creativity as a 21st-century student's competency and even the industrialization of higher education will be urgent today (Wastiau et al., 2009). This requires attention from family economic education, which prepares students to study with digital economic literacy and creativity since the future is founded on the intelligence of ideas that never run out and perish as inventions (Teza et al., 2016; Reguia, 2014). New literacy in facing the era of the industrial revolution 4.0 includes data literacy, technological literacy, and human literacy.

Digital economic literacy is a supplement to the literacy required for higher education students and is covered in educational curriculum programs. Students must be economically literate to perceive economic potential and manage financial resources effectively to support the optimization of economic growth as well as mastery of economic literacy will have an impact on the quality of life (Nurjanah et al., 2018). Economic education directly has an impact on the formation of student creativity, but how the process is studied in this study through the digital economic literacy variable.

This research study contributes to the economic education literature on shaping student learning creativity in the era of the industrial revolution 4.0. In the next stage, this research contributes to answering the process of developing students' creativity in learning. Although economic education directly impacts creativity, in the era of the industrial revolution 4.0, it is necessary to study the process through digital economic literacy. Therefore, this study also examines the model and its perceptions and measurements of economic education, digital economic literacy, and student learning creativity. Specifically, this study examines the role of digital economic literacy in utilizing digital information to find out about the economy, the latest online economic science data in analyzing economic problems, and digital market information in providing information in making economic decisions. This is a special concern for economic education policymakers to develop economic learning based on digital information, economic science data, and digital markets in the era of the industrial revolution 4.0.

METHODS

Study Design, Population, and Sample

This research employed quantitative methods with data collection through surveys conducted at the Faculty of Economics, Universitas Negeri Jakarta, Indonesia. As a university with economic education that develops data science courses and big data economics as compulsory subjects for all students. This condition is also supported by various digital economy facilities that support student learning, such as digital laboratories, capital markets, digital entrepreneurship, and digital business study programs. Universitas Negeri Jakarta becomes the focus of the study of digital economy learning in student learning creativity. Data were obtained from all students of the Faculty of Economics, 60 students of Economics Education Study Program, 60 students of Accounting Education, 60 students of Business Education Study Program, and 49 students of Office Administration Education. The respondents in this study were 187 students of the Faculty of Economics, Universitas Negeri Jakarta, in 2021. The questionnaires are distributed randomly to respondents based on the consideration that they have taken data science and big data economy courses. A 5-choice Likert scale questionnaire is used to determine the model through exploratory factor analysis (EFA) followed by confirmatory factor analysis (CFA). The detail of the research framework is provided in Figure 1.

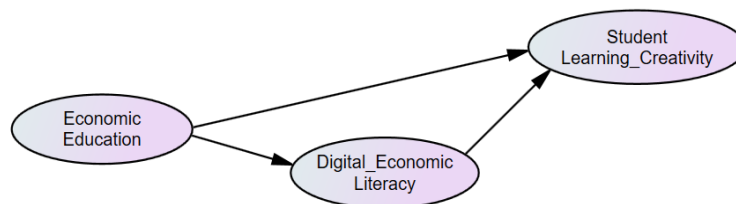


Figure 1. Research Framework

Measurement and Data Analysis

In particular, this study develops a model that is based on theoretical studies and analysis of research frameworks in the study of economic education to measure family economic education (EE), digital economic literacy (EL), and learning creativity (LC). Therefore they are tested for validity and reliability before testing the hypothesis. Data were analyzed by exploratory factor analysis followed by confirmatory factor analysis using AMOS 25. The validity of the research variable instrument is obtained on the coefficient λ (loading factor) significant and standardized (λ) criteria of 0.50, ideally not less than 0.70 (Hair et al., 2010). Reliability is obtained from the coefficient of Construct Reliability (CR) and Average Variance Extracted (AVE). The criteria for the CR value are 0.60, and the AVE value is 0.50 (Hair et al., 2010).

To estimate the causality between variables based on the theory, the validity and reliability of construct measurement models were tested with the Cronbach alpha score criteria equal to or higher than 0.6 with an acceptable more than 0.5 (Hair et al., 2010). Then, the hypothesis test was carried out by testing the

prerequisites for data normality, linearity, and significance of the regression coefficient and correlation. Several measurement criteria should be accomplished with probability > 0.5 (Schermelleh-engel et al., 2003), RMSEA < 0.05 (Hu & Bentler, 1999), CFI > 0.95 (Hu & Bentler, 1999), and CMIN / DF values < 2 (Tabachnick & Fidell, 2007) to test the goodness of fit model. Therefore, the Hayes model is used with the V3.4 process (Hayes, 2015), which can measure the partial and total effects of research with moderator and mediator variables (Hayes, 2018) to measure the mediating effect of digital economic literacy variables. The hypothesis in this study was performed from previous studies and relevant literature, which are presented as follows:

- H₁: Economic education influences students' digital economic literacy
 H₂: Economic education influences students' learning creativity
 H₃: Digital economic literacy influences students' learning creativity
 H₄: Digital economic literacy mediates the impact of economic education on students' learning creativity.

RESULTS & DISCUSSION

The demographic statistics of the participants are provided female respondents represented 73.3%, while male participants were 26.7%. Respondents in this study came from the DKI Jakarta area, with students from various regions in Indonesia currently studying in the economic education program. There are four study programs, namely Accounting Education, Economics Education, Business Education, and Office Administration Education. Judging from the age distribution, most respondents were students aged 21 years at 40.6% and aged 22 years with a percentage of 59.4%.

Based on the statistical data analysis, exploratory factor analysis was obtained from 12 factors that were valid, reliable, and met the factor loading criteria in the research variable test. In detail, the distribution on economic education (10), digital economic literacy (8), and student creativity (8). Each variable studied has a loading factor acceptable of more than 0.5 (Hair et al., 2010), Cronbach alpha between 0.85-0.92. An acceptable factor loading value is more than 0.5, and when it is equal to 0.7 and above, it is considered good for one indicator. The coefficients of Construct Reliability (CR) are 0.881, 0.873, 0.927 and Average Variance Extracted (AVE) 0.583, 0.677 and 0.680 (see Table 1). Criteria for CR value 0.60 or 0.70 and AVE value 0.50.

Table 1. Result of Exploratory Factor Analysis

Variable and indicators	λ	α	CR	AVE
1 Economic_Education				
EE1 My economic value is high	0.504	0.89	0.881	0.583
EE3 Economics education trains me to solve economic problems	0.512			
EE5 I have taken quite a lot of lessons to evaluate the economy	0.713			
EE7 I actively participate in congresses, conferences, symposiums on economics	0.743			

EE9	Economic experience has taught me to difficult decisions	0.557			
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2	Digital Economic Literacy				
DE3	I use digital information to know economic developments	0.746	0.85	0.873	0.677
DE6	I use the latest online economic science data to analyze economic problems	0.921			
DE7	Digital market information provides a lot of information and new knowledge for me in making decisions	0.793			
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3	Students Learning Creativity				
LC1	I dare to convey new ideas in responding to current learning challenges	0.748	0.92	0.927	0.680
LC2	I offer various alternative solutions to dealing with difficult problems	0.522			
LC4	I try to make various changes by modifying and obtaining discoveries	0.758			
LC5	The results of my work are examined carefully, critically, and learn to improve them again	0.735			
LC6	I use various learning resources to find an answer	0.748			

Based on the results of the Structural Equation Modeling test from the proposed research model framework obtained a Chi-square score of 99,032, probability of 0.126, df scores 84, CMIN/DF score of 1.179, CFI score of 0.982, TLI score of 0.202, RMR score 0.123, AGFI score 0.91 and RMSEA score 0.031. Based on the criteria, the goodness of fit model means that the model can be accepted through structural model testing, confirmatory factor analysis of exogenous and endogenous variable indicators, and overall model analysis.

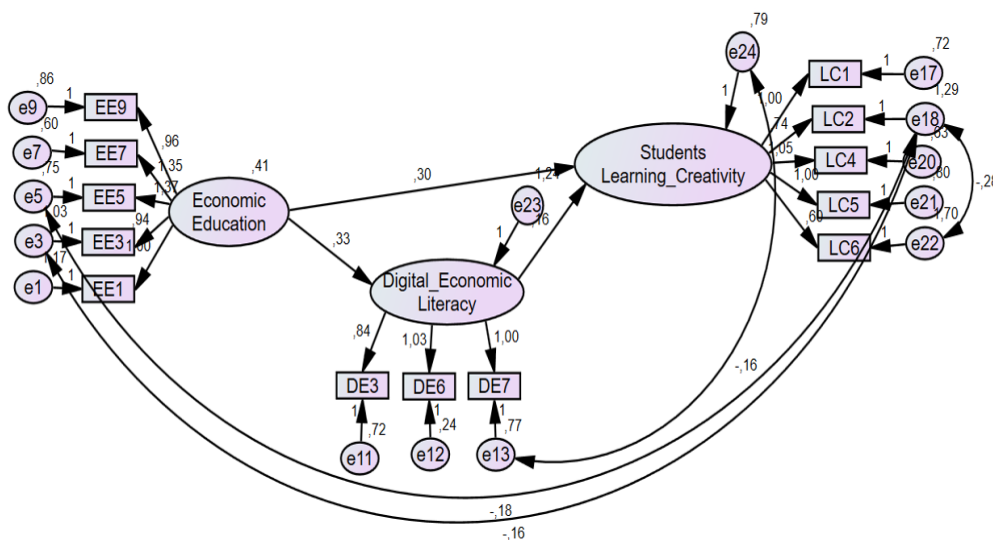


Figure 2. Results of the Structural Equation Research Model

The test results of the student learning creativity measurement model in the fourth industrial era have then carried out an Assessment of normality. The skewness statistic of all manifest variables gives a value of CR between 2.58, and all observed variables are normally distributed. Mahalanobis distance $(2) = 45 < 47.991^2$ can be concluded multivariate in the data set of the model measurement test. There are no cases of outliers. The results of the complete data processing of the Student Learning Creativity Measurement Model with Amos 25 are presented in the full model standardized estimates as follows in Table 2.

Table 2. Result Summary of Hypotheses Testing Hypothesis Testing

Model				Estimate	SE	CR	P	Result
H1	EE	→	DL	0.333	0.163	2,042	0.041	Significant
H2	DL	→	LC	0.165	0.073	2.243	0.025	Significant
H3	EE	→	LC	0.279	0.139	1.999	0.046	Significant
H4	EE → DL → LC = 0.036 (b-score)							Significant

Note(s): EE = economic education; DL = digital economic literacy; LC = students' learning creativity.

Table 2 summarizes the results of the research hypothesis test. The model results have the goodness of fit after modification of the model and trimming. The summary of the results of the test of the effect between variables obtained that the effect of EE on DL, the effect of DL on LC, the effect of EE on LC, and the mediating effect of DL on EE and LC were significant with CR values of 2.1, 2.2, and 1.99. Each above 1.96. The significance test of the effect between variables was obtained at 0.041, 0.027, and 0.048, while the mediating effect of DL on EE and LC was significant with a value of 0.036.

Based on the analysis and data processing, this study answered the four proposed hypotheses. The results of this study are relevant to previous research, e.g., Setyaji et al. (2020); Matraeva et al. (2020); Kupers et al. (2019). In the context of education in Indonesia, the findings of this study also support the findings of (Machali et al., 2021; Putri et al., 2019; Anggraeni, 2019). The newest finding in this study is that the variable developed in literacy is digital economic literacy. It becomes a new finding for further researchers to study more deeply in shaping student creativity in the world of education according to the demands of the Industrial Revolution Era 4.0 in terms of regional and contextual theory. Economic literacy is a condition that describes a person who can effectively understand basic economic problems well so that decisions are taken in economic activities and are efficient. Digital economic literacy in learning can save time, save costs, expand networks, and make better decisions. It also answers and prepares students for the digital economy. This makes digital economic literacy based on theoretical and empirical findings in this study as a model to increase learning creativity in universities.

The direct influence of economic education on the formation of students' learning creativity is significant, which indicates that the economic education program held has been able to form students' learning creativity. To answer how the process of forming this direct influence, this study finds the process through digital economic literacy. Effectively digital economic literacy mediates the effect of economic education on students' learning creativity. Economic education held in

universities can form literacy and creativity. This study found that the more effective the economic education program, the higher the students' digital economic literacy skills and, ultimately, the impact on creativity. Students are expected to be able to solve problems and answer economic challenges through contextual learning. Economic education is expected to be able to create competencies with good learning outcomes, train students to solve economic problems, provide problem-based learning so that students can take sufficient lessons to evaluate the economy, and provide opportunities for students to participate in congress actively, conferences, economics symposia, and train and enable students to make difficult decisions.

Digital economic literacy learning is carried out through digital information to determine economic developments, use the latest online economics data to analyze economic problems, and provide digital market information as information and new knowledge in making decisions. The conditions of the learning process above will positively impact increasing the courage to convey new ideas in responding to learning challenges contextually, being able to create alternative solutions in dealing with difficult problems, innovativeness, thorough, critical in learning, and capable of improving it again. Students will be able to take advantage of various learning resources to find answers.

To strengthen students' abilities to generate new ideas, find solutions, make changes and discoveries, and be critical and inventive in higher education, the economic education curriculum for graduate students should include more than just theoretical instruction. Students must also be taught how to solve economic problems in context, analyze economic situations, engage actively in various economic education activities, and make difficult judgments. Students are required to know contextually about economic changes, digest the most recent economic science data, and make economic judgments based on digital information in digital economic literacy. Educational Personnel Education Institutions as institutions fostered by the Ministry of Education and Culture in providing education for prospective educators and staff need to develop student learning creativity. The demands of the Industrial Revolution Era 4.0 with the digitalization of learning demand effective economic learning that can create contextual, data-based, and information-based economic learning experiences for the digital economy. A good student's digital economic literacy will provide a reference for making quick and appropriate decisions in various economic conditions. This is in accordance with the purpose of education in creating creativity, knowledge, personality, independence, and becoming a more responsible.

Learning in higher education needs to provide digital learning based on digital science and economic data, as well as good digital market information. One such process is big data-driven learning in today's economy. The various economic problems students face today are a basic description of future economic challenges. Students are faced with economic uncertainty, digital economic activity, and even choices about capital investment and debt. Digital economic literacy creates creativity which in the end is expected to be able to shape effective economic behavior. Various methods and learning media can be applied by teachers in the economic learning process based on digital economic literacy. The 21st-century competencies are called 4Cs: creative thinking, critical thinking and problem

solving, and communication. The findings above are part of the results of this study where the effectiveness of economic education can improve students' digital economic literacy skills and impact creativity. On the other hand, digital economic literacy successfully mediates as a process, answering how to increase creativity in learning in the industrial era 4.0 through digital economic literacy-based learning with the dimensions and indicators that shape it in this study.

CONCLUSIONS

This study aims to examine the relationship between variables, either directly or indirectly, economic education and digital economic literacy on students' learning creativity. Based on the results of hypothesis testing, this investigation confirmed the four proposed hypotheses. In more detail, economic education significantly and positively affects digital economic literacy and students' learning creativity, and digital economic literacy mediates positively and significantly the effect of economic education on students' learning creativity. The hypothesis testing with digital economic literacy as a mediating variable answers how the process of forming students' learning creativity through the factors that influence. This research implies that economic education and digital economic literacy can increase students' learning creativity both directly and through the educational process. Higher education needs to encourage economic education programs based on problems and experiences, as well as economic and digital information contextually, to create student learning creativity.

The higher the experience of economic education and digital economic literacy of students, the higher their creativity. The practical implication of the results of this research is that universities can increase student learning creativity in economic education programs in the industrial era 4.0 through learning data science, big economic data, and digital market information. The overall results of the proposed research show that universities need to design and implement various activities in economic education, especially the lecturers who are suggested not to teach theoretically. It is also necessary to train students to solve problems and make economic decisions contextually, evaluate the condition of economists, and be active in economic activities. Learning is also carried out through the ability to process the latest economic science data, making the right economic decisions based on reliable digital economic information. Students will be creative in making new ideas, developing solutions, critical and innovative, and dare to make changes and discoveries. The limitations are various models of economic education patterns and curricula to support student creativity in higher education. It is hoped that it can be implemented in several educational universities so that it can be generalized to represent real conditions in all universities, especially in Indonesia. Suggestions for further studies are to develop studies in broader fields, for example, universities in various regions with more complex data as a basis for increasing student creativity at universities in Indonesia to face the changing demands of the Industrial Revolution Era 4.0 incompetence and competition

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