

Fostering Teacher's Digital Competencies And Innovative Work Behavior In Facing Merdeka Belajar Policy: Digital Informal Learning As A Mediator

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Abstract.

Digital competence is the important issue of education where information technology is growing rapidly through computer networks and online media. The challenge of digitalization is the basis for teachers to develop their digital skills. The Merdeka Belajar Policy is a strategy towards a future education system to adapt on those issues. This study purposes to examine the mediators of digital informal learning between teachers' digital competencies and innovative work behavior. The sampling technique used purposive sampling with criteria of samples that teachers who have taught virtually. The number of samples are 175 teachers. Data analysis in this study used second-order construct of SEM PLS with model repeated indicator approach. The result shows that the teacher's digital competencies significantly influence on digital informal learning and innovative work behavior. The indirect effect gets the result that digital informal learning partially mediates between teacher's digital competencies and innovative work behavior. The contribution of this research is to provide an overview of current education about the importance of teachers adapting to the digitalization so they can develop innovative work behaviors in teaching and learning.

Keywords: Digital competence, digital informal learning and innovative work behavior.

I. INTRODUCTION

The development technology of information and communication in the digitalization era has an impact on human life. Information and communication are increasingly accessible through social media connected to the internet. According to We Are Social and Hootsuite reports, the number of internet users worldwide has reached 63.45% of the global population. This resulted in the creation of new conditions for the knowledge society as digital competence (Zhao et al., 2021). Digital competence is a recent concept that describes abilities related to ICT skills as well as information literacy and digital literacy (Ilomäki et al., 2016). Digital competence is the focus of education where information technology is growing rapidly through computer networks and online media such as Zoom, Google Meet, YouTube and Ruang Guru. Digital competence must be owned by the knowledge society, especially at the time of the Covid-19 outbreak which changed the world order of education in the distance learning process. The necessity to create distance learning during made internet use among teenagers in Indonesia increase at pandemic. As many as 76.63% of respondents in this age of 13-18 years old admitted that they experienced an increase in the frequency of internet use (Pahlevi, 2022). Hence, since the plague Covid-19, there has been a growing public interest in the need for digital skills, especially in education. The challenge of digitalization is the basis for teachers to develop their digital skills. The Merdeka Belajar Policy is a strategy towards a future education system, in this case teachers and students must be able to achieve educational goals by adapting on the development of communication and information (Yuhastina et al., 2020). Teachers must play an active role in developing capacities regarding new teaching methods and making changes in order to adapt to new teaching environments (Zhao et al., 2021).

The development of digital technology in the field of education has stimulated a strong interest among scholars to using technology not only facilitates learning in a formal setting (Farrokhnia et al., 2019; Heidari et al., 2020; Seo et al., 2021) but also informally or outside the classroom (Mehrvarez et al., 2021). Increased attention to digital informal learning and innovative learning as an impact of technological and information developments (Reinders & Benson, 2017). Informal digital learning is more flexible because there are no space and time restrictions (Yang, 2020). Digital informal learning provides new opportunities for learners to learn anywhere at any time. In changing the conventional teacher paradigm through Merdeka Belajar policy, teachers are required to be more independent and creative in the process of learning (Yuhastina et al., 2020). The idea of Merdeka Belajar provides space for freedom in learning, independent,

innovative, and active. Learning Innovation in education depends on the behavior of teachers, as it can support the student by promoting through communication between them and develop problem-solving strategies (Gkontelos et al., 2022). Innovative behavior is the practice of new ideas and concepts related to processes, products, and procedures in carrying out activities of members within the organization (Jong & Hartog, 2010).

The teacher's innovative behavior is an effort to respond the changes that occur in society quickly by trying to keep up with developments regarding knowledge, and new technologies that require the teacher's ability to combine them in learning methods (Gkorezis, 2016). Teachers who have innovative behavior will tend to be more able to achieve the goals of school education services because they can find solutions to problems with their innovation abilities (Dwi Ismiantri & Prabandini Muyaana, 2021). Previous research has explored the significant impact of student digital competence on learning and achievement in digital formal learning (Nyikes, 2018; Elstad & Christophersen, 2017). In further research, Mehrvarz et al. (2021) showed that digital competence of students in higher education influences digital informal learning. The results of the study highlight digital competence and technological expectations are the important role in digital informal learning. Han & Yi (2019) showed that digital competence influences technological expectations of higher education students and impacts the interaction of digital competence and technological expectations with cultural differences and digital informal learning. However, in general, empirical studies investigating the influence of teachers' digital competencies on their digital informal learning are scarce (He et al., 2018; Meyers et al., 2013). Few studies have examined the indirect effects of digital competence along with students' technological expectations (He & Li, 2019) and attitudes on outcomes and acceptance of digital informal learning (He & Zhu, 2017). Thus, we propose the hypothesis:

H1: Teacher's digital competencies have a positive impact on digital informal learning.

The teacher's digital competencies are not only limited to the use of digital technology, but also how technology is implemented in teaching and learning processes to identify, acquire, and organize digital information relevant to a particular subject. is also related (Knutsson et al., 2012). It has the capacity as a link between teachers and students in communicating, sharing, interacting, participating, collaborating; and identify online resources and solve problems. Several countries have used digitization of education into the learning process and it has become a general phenomenon to study in different online environments for teachers and students (Viberg et al., 2020). Thus, the use of digital learning is a necessity for teachers as teaching capital especially during the Covid-19. Innovation in education is not only aimed at achieving academic output but how innovation can improve learning to be effective and enjoyable. This is a challenge for teachers who have never used digital information and technology in the field of learning innovation (Perifanou et al., 2021). Technology plays a role in supporting learning innovation for example use of laptops or smartphones, applications, and website for education (Serdyukov, 2017). It is difficult to integrate pedagogy with technology to improve learning behavior when technology is poorly receptive by teachers (Tondeur et al., 2019). Applying variations to learning methods supported using information technology can help students get excited about learning because they receive lessons in new ways (Hardianto et al., 2021). Thus, we propose the hypothesis:

H2: Teacher's digital competencies have a positive impact on innovative work behavior.

Learning increased the accumulation of knowledge and experience that are supported to create a new idea (Kang et al., 2022). Previous study has found this to be a prerequisite for innovation is resource availability or the ability to acquire resources through learning (Li et al., 2021). Learning resources can increase knowledge and foster innovation. The process of acquiring new knowledge at work takes place informally (Manuti et al., 2015). Informal learning is so pervasive that it is embedded in employees' daily routines and often unconsciously (Caruso, 2016). Informal work-based learning is associated with adaptability to learning situations, rapid transition to practice, and resolution of work-related problems through regular review of work practice and performance (Manuti et al., 2015). Innovative behavior explores ideas that requires informal learning rather than formal learning. Knowledge and experience beneficial for individuals to foster innovative behavior. In addition, informal learning is more effective and flexible on innovative problem solving. Informal learning allows flexible adaptation of domain knowledge according to

the problem. Research shows that active learning impacts innovation given the need to acquire new knowledge in order to generate and implement new ideas (Park et al., 2014). Informal learning is a continuous self-directed process, aimed at using the cognitive resources gained from informal learning to demonstrate more innovative behaviors. While informal learning, individuals get interaction with their social environment by actively obtaining feedback and exchanging work experience. Thus, we propose the hypothesis:

H3: Digital informal learning mediates in the relationship between teacher's digital competencies and innovative work behavior.

Previous studies have examined the student's digital competence in shaping informal digital behavior experience (Mehrvarz et al., 2021) and (Han & Yi, 2019). That results highlight the important role of student's digital competence in higher education and technology expectations. However, the research on teacher's digital competencies and digital informal learning have not been widely studied. Mehrvarz et al. (2021) also showed that informal digital behavior significantly mediates the relationship between digital competence and student academic achievement. However, no studies have yet examined the role of digital competence in informal digital learning and innovative behavior, especially in teacher's learning behavior of pre-school, primary and secondary school. Consequently, this study aims to examine the relationship between teacher's digital competencies and innovative work behavior mediated by digital informal learning.

II. METHODS

This study was conducted on teachers in preschool, elementary and secondary education environments using a purposive sampling. The sample criteria that teachers who have taught virtually. The number of samples are 175 respondents. Demographic of respondents is shown in Table 1. This study is based on self-assessment and might have the common method bias. Harman's single factor test single was used to examine this effect. The results show that one factor variance, so it is still on below the 50 percent threshold. Test result shows that a single factor explained 30.3% of the variance, common method bias was not an issue in this study.

Table 1. Demographic of Respondents

View Sample	Frequency	%
Gender		
Pria	46	26,29
Wanita	129	73,71
Institution		
Pre-Elementary	19	10,86
Elementary School	19	10,86
Junior High School	67	38,29
Senior high School	70	40,00
Born (year)		
< 1964	4	2,29
1965 -1980	55	31,43
1981 - 1994	87	49,71
Experience		
< 10 years	66	37,71
10 - 20 years	81	46,29
> 20 years	28	16,00
Total	175	100

The variables of models were measured using five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. Digital Competence (DC) is measured by He & Zhu (2017) questionnaire consists of three dimensions include 11 items of technical skills (TS), 12 items of Cognitive Skills (CS), and 6 items of Ethical Knowledge (EK). Digital Informal Learning (DIL) is measured by He & Li (2019) questionnaire consists of three dimensions include 4 items of Cognitive Learning (CL), 4 items of Metacognitive Learning (MCL), and 4 items of Social and Motivational Learning (SML). Innovative Work Behavior (IWB) is measured by Janssen (2000) questionnaire consists of three dimensions include 3 items of Idea Generation (IG), 3 items of Idea Promotion (IP), and 3 items of Idea Realization (IR).

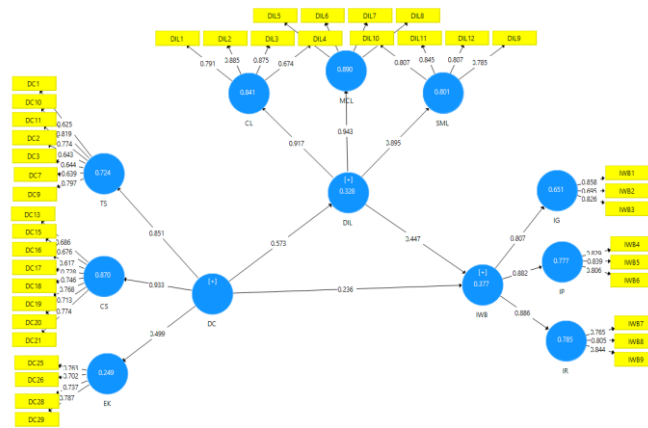


Fig 1. Model Structural

III. RESULT AND DISCUSSION

Measurement Models

Data analysis in this study used second-order construct of SEM PLS with model repeated indicator approach. First, this study is tested for validity and reliability for measurement models in the first and second orders. Construct convergent validity and reliability are assessed by composite reliability (CR), Cronbach alpha and AVE value. CR and Cronbach alpha with values above the threshold value of 0.70 and the AVE value for each variable is greater than 0.5 (Hair et al., 2019). In the first-order measurement model, CR and Cronbach's Alpha values are above 0.7 and the AVE value for each variable is greater than 0.5 so that convergent validity and reliability are met. The measurement model of convergent validity was also calculated using confirmatory factor analysis. The results show that the factor loadings of the variables: digital competency, digital informal learning, and innovative work behavior in the measurement model ranges from 0.50 to 0.94. In the second order, the dimensions of TS, CS, EK, CL, MCL, SML, IG, IP and IR are determined with all indicator items. For these variables, CR values range from 0.84 to 0.94. In the second-order measurement model, CR and Cronbach's alpha values are all above 0.7 and the AVE value for each variable is greater than 0.5 as required by Hair et al. (2019) so that convergent validity and reliability are met. The structural model that contains the loading factor is shown in Figure 1. Discriminant validity was measured by the Fornier and Lacker criteria (Hair et al., 2019) where the root of the AVE variable is greater than the correlation between variables (Table 2).

Table 2. Mean, Standard Deviation, Discriminant Validity

Variables	Mean	SD	TS	CS	EK	CL	MCL	SML	IG	IP	IR
1. TS	4.00	0.60	0.71								
2. CS	4.06	0.56	0.69	0.72							
3. EK	3.98	0.39	0.54	0.41	0.75						
4. CL	4.36	0.55	0.60	0.58	0.49	0.81					
5. MCL	4.34	0.60	0.48	0.43	0.43	0.81	0.89				
6. SML	4.15	0.63	0.47	0.49	0.35	0.72	0.77	0.81			
7. IG	3.80	0.69	0.38	0.41	0.24	0.52	0.49	0.41	0.80		
8. IP	3.94	0.55	0.37	0.42	0.15	0.50	0.40	0.46	0.58	0.83	
9. IR	3.97	0.57	0.44	0.46	0.28	0.56	0.49	0.47	0.62	0.65	0.81

The Structural Models

In the structural model to test the hypothesis used path analysis (Table 3). The results show that increasing the teacher's digital competencies have a positive and significant impact on digital informal learning ($\beta = 0.58$; $p = 0.000$) thus H1 is supported. The results also show that increasing teachers' digital competencies have a positive and significant impact on innovative work behavior ($\beta = 0.24$; $p = 0.004$) thus H2 is supported. The quality of the structural model is tested by R-square. R-square aims to see the magnitude of the correlation value of the dependent variable resulting from the PLS estimation in each path. R-square value in this model were low ($R\text{-square} < 0.3$), moderate ($0.3 < R\text{-square} < 0.6$) or high ($R\text{-square} >$

0.6) (Sanchez, 2013). R-square value in this study is moderate. This result explains that 37.7% of the variability of the innovative work behavior variable is explained by the digital competency and digital informal learning variables. The remaining 62.3% are explained by other variables outside the model.

Table 3. Direct effect and Specific Indirect Effect

Hypothesis	β	2.5%	97.5%	<i>t-stat</i>	<i>p-value</i>
Direct effect					
DC → DIL	0.57	0.46	0.70	9.44	0.000
DC → IWB	0.24	0.09	0.40	2.92	0.004
Specific Indirect Effect					
DC → DIL → IWB	0.26	0.15	0.37	4.46	0.000

This study purposes to examine the mediating role of digital informal learning in teachers' digital competencies and innovative work behavior. This result shows that the teachers' digital competencies significantly influence digital informal learning. This result is in line with Mehrvarz et al. (2021) stated that students' digital competence influences informal digital learning. Teachers' abilities to adapt to technology influences how teachers behave outside of formal learning to improve their digital competence. The need for a modern and attractive learning process for students motivates teachers to utilize information media to improve their ability to understand information technology. This encourages teachers' digital informal learning to access information related to the latest learning media. Digital informal learning provides flexibility for teachers to be able to access information wherever and whenever it does not depend on the schedule because teachers are usually preoccupied with teaching.

This study shows that teachers' digital competencies significantly influence on innovative work behavior. This research is in line with Li et al. (2021) stated that teacher's digital competencies can be an important factor in teaching. Based on the issue of educational innovation of Merdeka Belajar, a teacher must be equipped with competence to apply learning methods. Especially in the digital era, teaching does not only change the form of teaching but also aims to integrate educational technology, teaching methods and strategies (Li et al., 2021). Teachers are required to be able to improve digital competence to be able to increase innovative behavior by using digital technology in daily educational practices to create effective, innovative, and independent learning. In the Merdeka Belajar curriculum, teachers are given the opportunity to improve their abilities so that they have the freedom to access knowledge and the latest learning methods can then be implemented into process of teaching and learning. This is in line with the meaning of innovative behavior to generate, form and realize new ideas to be implemented in the workplace. Therefore, by increasing the teacher's digital competencies, it can influence innovative behavior.

Mediation Analysis

To investigate the mediation and indirect effects, the Bootstrap method was used with 2000 subsamples. The results showed that in an indirect effect, digital informal learning significantly mediated the teacher's digital competencies on innovative work behavior ($\beta = 0.26$; $p = 0.000$) where the 95% confidence interval was between the range 0.15 – 0.37 and did not include zero. The influence of digital informal learning as a mediating variable has succeeded in increasing the influence between teacher's digital competencies and innovative work behavior because the coefficient value increases. The results also show that digital informal learning partially mediates the relationship between teacher's digital competencies and innovative work behavior, so that H3 is supported. The results show that digital informal learning significantly mediates the relationship between teacher's digital competencies and innovative work behavior. Innovative behavior of teacher is in line with the development of knowledge and technology.

In Merdeka Belajar, students are required to be more creative and innovative in the learning process so that the teacher as a facilitator must balance with increased competence. This demand creates challenges for teachers to be able to improve their competence through digital informal learning as a form of technological adaptation. Teachers must be proactive and independent in finding references and learning resources from digital media to increase their knowledge. Digital informal learning is more flexible to be applied for teachers in addition to their busy, allowing them to access content and do more interaction anytime and anywhere according to their preferences. The knowledge will become new insights that can be

applied to learning methods. Teacher creativity formed by utilizing the development of information technology will create innovative work behavior. This opinion is consistent with research Kim & Hong (2018) stated that students' digital experiences significantly influence students' digital competencies and their attitudes towards using digital technology for educational goals.

IV. CONCLUSION

The results show that there is a direct effect of teacher's digital competencies and innovative work behavior. Teachers are required to have digital competence and increase innovative behavior by utilizing digital technology in learning practices in schools so that effective, creative, innovative, and independent. These results also show that there is an indirect effect between teachers' digital competencies and innovative work behavior mediated by digital informal learning. Teachers are required to increase their knowledge and find new learning methods based on the development of information technology. It means that teacher's digital competence can be improved to foster innovative behavior through digital informal learning so that produce better learning in accordance with the Merdeka Belajar curriculum. The contribution of this research is to provide an overview of current education about the importance of teachers adapting to the digitalization so they can develop innovative learning behaviors. Therefore, teachers must improve digital competence in the form of technical abilities, cognitive abilities, and ethical abilities. It is also supported by an increase in digital informal learning strategies in accessing information to enrich knowledge.

The limitations of this study can be developed in further research. First, this study aims to examine teacher's digital competencies in innovative behavior targeting kindergarten to high school levels in response to the development of the new "Merdeka Belajar" curriculum. Future research can be further investigated with lecturer and student as research subjects at the higher to adoption the implementation of "Merdeka Belajar-Kampus Merdeka (MBKM)". Second, this study examines innovative work behavior in general as the dependent variable with a research instrument referring to Janssen (2000) consisting of three dimensions: idea generation, idea promotion and idea realization within an organization so as to benefit individuals, groups and the organization (Janssen, 2000). The further research, innovative work behavior has been developed within the school framework i.e. focusing on teacher innovative work behavior (T-IWB) regarding school practice through each educational context. Future research may be developed using the Greek version of the Innovative Work Behavior Scale: idea generation, idea promotion, idea realization, and idea sustainability (Lambriex-schmitz et al., 2020).

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