



## **Digital Literacy Analysis on Online Learning Outcomes for Macroeconomics with Gender-Mediated and Family Socio-Economics as Moderating Variables**

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**Abstract:** This study aims to analyze whether digital literacy simultaneously and significantly affects academic learning outcomes mediated by gender in students, whether digital literacy simultaneously and significantly affects academic learning outcomes moderated by the socio-economic family of students, and whether digital literacy simultaneously and significantly affects academic learning outcomes mediated by gender and family socio-economics as a moderator for macroeconomics students. By using a quantitative method with the Conditional Process Analysis process using the SPSS Macro Process, the instrument used is saturated sample is a census, where all members of the population are sampled. the population in this study amounted to 272 from Mahaputra Muhammad Yamin University, STKIP Cokroaminoto Pinrang, Mataram University and Sheikh Yusuf Islamic University. The result is int\_1 has a P value of 0.5379 where the value is greater than a significance value of 0.05. This means that there is no moderating effect of socio-economics on the relationship between digital literacy and learning outcomes, the P-value = 0.0467 less than 0.05, meaning that line a (digital literacy variable to gender) here states that there is a gender effect (male/gender). female) in mastering digital literacy and the P value of 0.5146 is greater than 0.05. This means that there is no mediating effect of gender and socio-economic moderators on digital literacy on learning outcomes. has implications for students in improving their soft skills, hard skills and also improving learning outcomes by providing facilities.

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## **Introduction**

The Minister of Education and Culture of the Republic of Indonesia issued Notification Number 3 of 2020 on March 3, 2020. The contents are related to preventing Covid-19 in education units and changing lecture activities into web-based activities. Online-based learning is a learning system that is not carried out indoors, so there is no physical interaction between lecturers and students (students), and virtual learning is carried out face-to-face. The most important thing in making quality human beings is learning. According to Khoirun Nisa, (2017) Learning is part of education, thus the main purpose of these elements is none other than so that students can get the desired good learning outcomes. Learning Outcomes are changes in behavior that include the cognitive, affective, and psychomotor fields that students have after getting their learning experience (Hayati, 2016).

Learning outcomes in macroeconomics courses can be seen from the learning process. Based on the results of interviews with lecturers in macroeconomics courses, students feel that they are lacking in dealing with analytical problems. For example, when students present material about market demand and supply. Students are able to state definitions, but when students are asked about the analysis of demand and supply curves or balance, students are

confused when answering or even wrong in answering. In addition, student learning outcomes can be seen from the results of the UTS and UAS. For counting questions, graphs and case studies that require a high level of analysis, students find it difficult to work on them. This has an impact on student learning outcomes that are less than satisfactory

This phenomenon is a new challenge for lecturers and students to prepare for online lectures, which requires all work to be based on online technology (Khasanah et al., 2020). According to Magfirah et al., (2015) there are two factors that influence learning success, namely internal factors and external factors. Internal factors are created from within students, including their abilities, learning motivation, interests and attention, attitudes and study habits, self-concept, perseverance, socio-economic, physical and psychological factors. Meanwhile, the external factor is the environment.

The things that affect learning outcomes according to Olelewe & Agomuo, (2016) are the integration of technology into classroom teaching, teaching methods, learning styles, student workloads, and previous programming experience. In addition, there are also those who state that student learning outcomes can be influenced by various factors, one of which is the literacy program (Handayani, 2018; Tuamsuk & Subramaniam, 2017). The literacy in question (Turnadi, 2018) is literacy, including: Health Literacy, Financial Literacy, Information Literacy, Data Literacy, Critical Literacy, Visual Literacy, Technology Literacy, Statistical Literacy, Digital Literacy. Higher levels of digital literacy positively affect high learning outcomes on students' academic performance Yustika & Iswati, (2020). Regarding digital literacy in education, it is very important today, because the ability of graduates in digital literacy is needed in all disciplines (Reyna et al., 2018).

In the academic realm, there are various approaches to studying gender. In general psychology explains how norms regarding sexuality and gender shape individual thoughts, feelings and behavior Nur A, (2020a) Psychological studies on gender suggest that there are no significant differences between men and women in terms of mathematical ability, and many at least saying. In other words, there are other variables that are more influential than gender which determines intelligence and communication skills, such as education, home environment, reading and so on. Therefore, the differentiation of rights between men and women on the grounds that men are smart (because they are men) cannot be justified (Mullen, 2014). The thing that actually becomes a problem regarding gender is when there is a structure of injustice caused by differences in gender roles that apply in that society. The main argument used is that the biological differences between men and women show that there are differences in the rights and opportunities for both (Rusdi Zubeir, 2012).

From the description above, researchers are interested in examining the measurement of digital literacy on student learning outcomes mediated by gender and socio - economic as a moderator. Researchers are interested because the previous researcher Irhandayaningsih (2020) only explained the measurement of digital literacy in online learning, and Meiriza (2020) only explained the effectiveness of the online lecture model in macroeconomic studies with pluralism without combining it with learning outcomes for macroeconomic subjects with gender mediation (Khurshid, 2015; Mullen, 2014) in one study. This research is important to improve soft skills, hard skills and also improve student learning outcomes.

## Research Method

This type of research is descriptive research using quantitative methods with the Conditional Process Analysis process to estimate as a whole between the independent variables, the dependent variable, the mediating variable and the moderator variable, using the SPSS Macro Process (Hayes, 2012; Hayes & Rockwood, 2020). This research was

conducted at the Economic Education Study Program, Teacher Training and Education Faculty, Sheikh Yusuf Islamic University, Economic Education Study Program, Mahaputra Muhammad Yamin University, Mataram University Business Economics Study Program, and Economics Education at STKIP Cokroaminoto Pinrang. The population in this study were 272 students who took online macroeconomic learning. Meanwhile, according to the sample is part or representative of the population studied. The sample is determined using saturated sampling according to (Noor, 2017) the saturated sample is a census, where all members of the population are sampled.

This study used a questionnaire instrument with measurements of the guttmens scale and likert scale. Data collection techniques through filling out online questionnaires were distributed via google form. The analysis technique uses Conditional Process Analysis with moderating relationships using SPSS 25 Macro Process software. The calculation of validity with r table 0.4575 and reliability test 0,840 can be seen in table 1.

**Table 1. Instrumental Grid and Test Validity**

Variable	Indicator	No Question	rHit	Ket.
Dependent variable				
Learning outcomes (Carini et al., 2006; Van Poeck et al., 2020)	Someone has learned that there will be a change in behavior in that person, for example from not knowing to knowing and from not understanding to understanding	2	0,615	Valid
Independent Variable				
Digital Literacy	1. Basic digital literacy skills	3	0,283	Invalid
(Irhandayaningsih, 2020; Silamut & Petsangsri, 2020; (Bawden, 2001)		4	0,687	Valid
	2. Information knowledge background	5	0,771	Valid
		6	0,625	Valid
	3. ICT skills	7	0,771	Valid
		8	0,544	Valid
	4. Attitudes and perspectives of information users.	9	0,529	Valid
		10	0,574	Valid
Mediation Variable				
Gender	1. Male	1	0,507	Valid
(Chandra, 2017; Mullen, 2014)	2. Female			
Moderator Variables				
Family Socio-Economic	1. Income	11	0,781	Valid
(Ingleby et al., 2021; Jennings et al., 2009; Hye Jeong Kim et al., 2019b; Hyun Ju Kim & Chung, 2020b)		12	0,494	Valid
	2. Education	13	0,566	Valid
		14	0,541	Valid
	3. Job	15	0,755	Valid
		16	0,525	Valid

## Results and Discussion

Research Hayes & Rockwood, (2020) explains that conditional process analysis is a modeling strategy that is carried out with the aim of describing the conditional or contingent nature of a mechanism that with one variable transmits its effect on other variables and tests hypotheses about the contingent effect.

a). Equation 1 digital literacy on learning outcomes moderated by socio-economic family (MODEL 1 Hayes)

**Table 2. Socio-Economic Table of Digital Literacy Moderators on Learning Outcomes**

	coeff	se	t	P	LLCI	ULCI
constant	86,0848	20,7144	4,1558	0,0001	44,8009	127,37
X	-0,0252	0,2437	-0,1036	0,9178	-0,5109	0,4604
W	-0,3543	0,3271	-1,0833	0,2822	-1,0062	-1,0062
Int_1	0,0024	0,0039	0,619	0,5379	-0,0053	0,0101

Based on table above, it can be seen that the results of the analysis show that int\_1 has a P value of 0.5379 where the value is greater than 0.05. This means that there is no moderating effect of socio-economics on the relationship between digital literacy and learning outcomes.

The results of the study stated that there was no socio-economic moderating effect on digital literacy on learning outcomes. This is in contrast to the research of Scherer & Siddiq (2019) which states that the findings of this meta-analysis indicate that students' information and communication technology (ICT) literacy differs between groups of socioeconomic status, thus indicating a gap in the value of information and communication technology (ICT) literacy. Hadiyanto (2017) also has the same opinion as Scherer & Siddiq (2019) which explains that parents' work and income have a significant effect on economic learning achievement. In addition, it is also contrary to the results of research by Nur Chotimah et al., (2017) which states that there is a significant influence of the socioeconomic status variable of parents on student achievement and also Panjaitan Doris & Afrila, (2020). significant to the level of Education.

The results of the research on model 1 test using Conditional Process Analysis show that there is no moderating effect/effect of socio-economics on the relationship between digital literacy and learning outcomes with a significance value of  $0.00 > 0.05$  then  $H_a$  can be rejected and  $H_o$  is accepted, so that from the results of the analysis it can be proven that there is no effect / no socio-economic effect of the family on digital literacy on learning outcomes. In addition, it refutes the theory in the literature review, and becomes a novelty in socio-economic theory that does not have an effect on digital literacy on learning outcomes. It is evident from student learning outcomes in Indonesia, represented by students from Mahaputra Muhammad Yamin University (Solok), Sheikh Yusuf Islamic University, STKIP Cokroaminoto Pinrang (South Sulawesi), Mataram University (Mataram) having a GPA between 3.00 - 3.50 with the majority of the income of parents (father) and mother) of less than 3,000,000.

b). Equation 2 Digital literacy on learning outcomes mediated by gender (MODEL4)

Based on table, it states that the P value = 0.0467 is less than 0.05, meaning that line a (digital literacy variable to gender) here states that there is a gender effect (male/female) in digital literacy mastery.

**Tabel 3. Model Path a (x to m)**

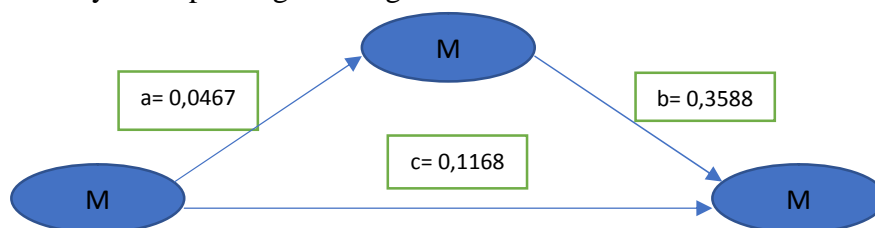
	coeff	se	t	P	LLCI	ULCI
constant	61,1813	6,6797	9,1593	0	47,8746	74,4881
X	-0,157	0,0776	-2,0226	0,0467	-0,3117	-0,0024

Based on the table above, it states that the value of  $P = 0.3588$  is more than 0.05, meaning that the line b (gender to variable learning outcomes) here states that there is no effect of gender (male/female) on learning outcomes.

**Tabel 4. Model Path c (Direct Relationship between X to Y)**

Effect	se	t	P	LLCI	ULCI
0,1168	0,0806	1,4482	0,1518	-0,0439	0,2774

Based on the table above, it states that the value of  $P = 0.1168$  is more than 0.05, meaning that the line c (digital literacy to learning outcomes) here states that there is no direct effect of digital literacy on improving learning outcomes.



**Figure 1 Model 4 Hayes**

The picture above shows a direct relationship between (a) learning literacy and gender, (b) gender and learning outcomes, (c) digital literacy and learning outcomes.

**Table 5. Indirect Relationship Between Digital Literacy and Gender-Mediated Learning Outcomes**

	Effect	BootSE	BootLLCI	BootULCI
M	0,0169	0,0244	-0,0289	0,0709

The table above shows that the result of the effect of 0.0169 is less than 0.05, meaning that there is an indirect and positive influence with the presence of gender mediating digital literacy on learning outcomes.

The results of this study are in line with the results of Rai's research (2019) which explains that there is a significant gap between women's and men's digital use in several countries in Asia. In addition, Munthe (2021) shows that the trend of categorical results indicates that women tend to show better digital citizenship skills than men, but men are more often involved in the digital world (Gayatri et al., 2015).

c). Digital literacy on learning outcomes mediated by gender and socio-economic as a moderator (MODEL 5).

Tabel of Measurement of Digital Literacy in Online Learning Outcomes for Gender-mediated Macroeconomics and Family Socio - economics as moderating variables

**Table 6. Macroeconomics and Family Socio-Economics as Moderating Variables**

	coeff	se	t	p	LLCI	ULCI
constant	86,2912	6,0676	14,2215	0	74,1955	98,3868
X	-0,0432	0,2477	-0,1745	0,862	-0,537	0,4506
M	-0,0573	0,1168	-0,4907	0,6251	-0,2903	0,1756
W	-0,1431	0,065	-2,2021	0,0309	-0,2726	-0,0136
Int_1	0,0026	0,0039	0,6549	0,5146	-0,0052	0,0104

Based on the above, it shows int\_1 at a P value of 0.5146 which is greater than 0.05. This means that there is no mediating effect of gender and socio-economic moderators on digital literacy on learning outcomes.

According to Rodiah & Sopandi (2021) the digital literacy skills of male and female students during online learning did not show a significant difference. So, it can be said that students' digital literacy skills are equivalent. In addition, according to Goudeau et al (2021)

there is a digital divide to such an extent that some people are more likely than others, such as strong predictors of the digital divide, including the quality of hardware, software, and Internet access (Mohammad Ziaul Hoq, 2020). having access to a computer and an internet connection does not guarantee effective distance learning (Albérola et al., 2019). This is clarified by the results of research that some 48% of students from Mahaputra Muhammad Yamin University (Solok), Sheikh Yusuf Islamic University, STKIP Cokroaminoto Pinrang (South Sulawesi), Mataram University (Mataram) have GPAs between 3.00 - 3.50 with the majority of parents' income (father's) and mother) of less than 3,000,000.

## Discussion

This research was conducted in order to determine the role of the mediating variable and the moderator variable, namely as an intermediary on the influence of digital literacy on learning outcomes. From the results of data processing in the previous discussion, it will be linked to the relevant theory in this discussion.

### 1). Digital literacy on learning outcomes moderated by socio-economic families

Based on the results of data processing obtained  $int\_1$  has a P value of 0.5379 where the value is greater than the significance value of 0.05. This means that there is no moderating effect of socio-economics on the relationship between digital literacy and learning outcomes. The results of the study stated that there was no socio-economic moderating effect on digital literacy on learning outcomes. This is in contrast to the research of (Scherer et al., 2018) which states that the findings of this meta-analysis indicate that students' information and communication technology (ICT) literacy differs between groups of socioeconomic status, thus indicating a gap in the value of information and communication technology (ICT) literacy.

Hadiyanto, (2017) also has the same opinion as (Scherer et al., 2018) which explains that parents' work and income have a significant effect on economic learning achievement. In addition, it is also contrary to the results of research by (Nur Chotimah et al., 2017) which states that there is a significant influence of the socioeconomic status variable of parents on student achievement and also (Panjaitan Doris & Afrila, 2020). significant to the level of education.

The results of the research on model 1 test using Conditional Process Analysis show that there is no moderating effect/effect of socio-economics on the relationship between digital literacy and learning outcomes with a significance value of  $0.00 > 0.05$  then  $H_a$  can be rejected and  $H_o$  is accepted, so that from the results of the analysis it can be proven that there is no effect / no socio-economic effect of the family on digital literacy on learning outcomes. In addition, it refutes the theory in the literature review, and becomes a novelty in socio-economic theory that does not have an effect on digital literacy on learning outcomes. It is evident from student learning outcomes in Indonesia, represented by students from Mahaputra Muhammad Yamin University (Solok), Sheikh Yusuf Islamic University, STKIP Cokroaminoto Pinrang (South Sulawesi), Mataram University (Mataram) having a GPA between 3.00 - 3.50 with the majority of the income of parents (father) and mother) of less than 3,000,000.

### 2). Digital literacy on learning outcomes is mediated by gender

Based on the results of data processing between the direct relationship between digital literacy and the gender mediating variable, the value of  $P = 0.0467$  is less than 0.05, meaning that line a (digital literacy variable to gender) here states that there is a gender effect (male/gender). women) in mastering digital literacy. The results of this study are in line with the results of Rai (2019) which explains that there is a significant gap between women's and

men's digital use in several countries in Asia. In addition, Munthe et al., (2021) shows that the trend of categorical results indicates that women tend to show better digital citizenship skills than men, but men are more often involved in the digital world (Gayatri et al., 2015). It is strengthened by the argument of Zhang & Zhu, (2016) in their research that regarding digital media literacy, although significant differences appear in different classes and age groups, there is no significant difference between female and male students.

In this study also obtained the value of  $P = 0.3588$  more than 0.05, meaning that the line b (gender to variable learning outcomes) here states that there is no effect of gender (male/female) on learning outcomes. In line with Nur A (2020a) in his research explains that gender is not a significant factor in determining a person's intelligence capacity. Maslow's theory shows that gender inequality can be an inhibiting factor in fulfilling human self-actualization needs (muhibbin, 2020). The results of the research indirectly obtained a  $P$  value = 0.1168 more than 0.05, meaning that the line c (digital literacy to learning outcomes) here states that there is no direct effect of digital literacy to improve learning outcomes. This is in accordance with research conducted by (fernanda effendi, bustanur, 2019) which explains that there is no influence of digital media literacy on student achievement in the Islamic Religious Education study program at the Islamic University of Kuantan Singingi, this can be due to the fact that digital readiness has not been evenly distributed throughout the world. Indonesia, like Goode, (2010) Digital readiness for academic work is necessary for student academic success.

The results of this study also explain that the effect of 0.0169 is less than 0.05 a significant value, meaning that there is an indirect and positive influence with the presence of gender mediating digital literacy on learning outcomes. then  $H_a$  can be accepted and  $H_o$  is rejected, so from the results of the analysis it can be proven that there is a gender effect mediating digital literacy on learning outcomes.

3). Digital literacy on learning outcomes mediated by gender and socio-economic as a moderator

Based on data processing, the results show that  $int\_1$  at a  $P$  value of 0.5146 is greater than 0.05. This means that there is no mediating effect of gender and socio-economic moderators on digital literacy on learning outcomes. According to Rodiah & Sopandi, (2021) the digital literacy skills of male and female students during online learning did not show a significant difference. So, it can be said that students' digital literacy skills are equivalent. In addition, according to Goudeau et al., (2021) there is a digital divide to such an extent that some people are more likely than others, such as strong predictors of the digital divide, including the quality of hardware, software, and Internet access (Mohammad Ziaul Hoq, 2020). having access to a computer and an internet connection does not guarantee effective distance learning (Albérola et al., 2019). This is clarified by the results of research that some 48% of students from Mahaputra Muhammad Yamin University (Solok), Sheikh Yusuf Islamic University, STKIP Cokroaminoto Pinrang (South Sulawesi), Mataram University (Mataram) have GPAs between 3.00 - 3.50 with the majority of parents' income (father's) and mother) of less than 3,000,000.

## Conclusion

Based on the results of the research, it can be concluded that:

- (1) There is no moderating effect of socio-economics on the relationship between digital literacy and learning outcomes. These results illustrate that regardless of parents' income, digital literacy of students from Mahaputra Muhammad Yamin University

(Solok), Sheikh Yusuf Islamic University, STKIP Cokroaminoto Pinrang (South Sulawesi), Mataram University (Mataram) has an effect on learning outcomes.

- (2) There is an indirect and positive influence with the presence of gender mediating digital literacy on learning outcomes. These results explain that biologically there are differences in the brains of men and women, therefore it affects digital literacy on learning outcomes.
- (3) Simultaneously there is no effect of gender mediation and socio-economic moderator on digital literacy on learning outcomes. The results of this study illustrate that students of economic education at Mahaputra Muhammad Yamin University (Solok), Sheikh Yusuf Islamic University, STKIP Cokroaminoto Pinrang (South Sulawesi), Mataram University (Mataram) in macroeconomics courses have good learning outcomes and digital literacy regardless of gender. and socio economic family.

### Recommendation

With this research, there are recommendation that can be explained based on conclusions and discussions regarding high academic success.

- (1) For Students

With this research, it is hoped that students will further improve their soft skills and hard skills and also improve learning outcomes for all subjects.

- (2) For Lecture

In this study, it is hoped that lecturers can develop cooperative learning models and teaching materials in order to increase student interest in improving achievement.

- (3) For University

For future research, it is hoped that the campus/university can provide facilities for students to improve learning achievement, by using learning methods that are in accordance with current online learning.

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