How Information Literacy Influences Student's Online Risk Mitigation

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Abstrak— **The emergence of the COVID-19 pandemic has changed the learning system in higher education which is becoming distance learning using information technology. In addition to providing good opportunities, online learning poses risks that can threaten students. The risks encountered can be sourced from the information aspect. This study aims to determine the level of the role of information literacy which includes skills to obtain, analyze, and evaluate information, on students' awareness of online risk exposure. In this study, a survey was conducted to 264 undergraduate students at various universities in Indonesia. Data analysis was carried out using the SEM-PLS method with the help of SmartPLS 3.0 software to measure the construct of the hypothetical model. The results show that information literacy has a positive relationship with students' awareness of online risks. The relationship is mediated by the existence of self-control and awareness of information privacy by the individual. Therefore, the relationship means that the higher the level of information literacy, the students will be more aware of the online risks that can occur, especially in online learning**

Kata Kunci— **Information literacy, Online risk, Online learning, Coivd-19, Self-control, Privacy awareness**

I. INTRODUCTION

The Covid-19 pandemic has changed many sectors in life, including education. It has forced the government to make various policies to suppress the spread of the virus, such as social restriction. One of the policy changes in higher education, caused by Covid-19 pandemic, is the learning method.

Over the decades, traditional learning environments have shaped the type of educational process that prevails in higher education. The shift of learning method that occurred is the use of information technology as a medium for teaching-learning process.

Online learning is delivery of learning content through internet media in class, both synchronously and asynchronously where students can interact with instructors and other students to participate in learning [1] . Online learning has some positive sides, primarily for students. The adoption of online-based learning provides opportunities for students to enhance their competencies. Online learning provides a significant opportunity for further widening of participation in higher education [2]. The existence of the internet provides a different learning experience for students. Some students stated that they had the ease of access to resources, especially when they were looking for knowledge references [3]. The Internet also allows students to communicate and to obtain the information that drives different perspectives in knowledge.

Despite its positive's sides, the distance learning using the internet also poses online risks for its users. Young people (including students) have a tendency to disclose information about themselves in the online environment, which can be considered as evidence that they do not care about their privacy [4]. The ability to obtain and share information is an easy thing to do since the existence of the internet. Therefore, the ability of individuals to evaluate and use information adequately has become an issue[5]. Misinformation can spread quickly because anyone can say almost anything to anyone. It has spread across multiple digital sources and can easily be trusted or taken seriously even in the absence of accountable editorial oversight [6].

In research conducted on middle school students, many students failed to evaluate the truth of information, both text and image information [7]. Almost none of the students asked about who created the online resources where the information content was available. Students made judgments about the reliability of information based on factors such as the content of the post and the surface appearance of the page on which the post appears. These risks are also very likely to be faced by students in higher education.

The ability to think critically and carefully in an online environment needs to be possessed by students to face those risks, primarily in responding to information circulating. Several studies have shown that many college students have low levels of information literacy [7],[8],[9]. Information literacy is the ability to locate, access, assess and use information from variety sources, and represents a key dimension of digital and media literacy [10]. Information literacy is more than the ability to find and present information, but about high-level analysis, synthesis, critical thinking, and problem solving [11]. Therefore, information literacy may be perceived and experienced in a variety of ways. To perform those abilities, individuals must have a deep understanding and critical thinking of any information obtained, especially from online sources. Therefore, students with high level information literacy should be able to find, filter, and assess the shared information on online environment, primarily references which from reliable sources.

This research aims to understand the role of information literacy in mitigating online risk, especially in online learning for students in higher education. The results of this research are expected to provide scientific information that has the potential to be used by policy makers in formulating policies and making decisions, especially at the higher education level.

II. LITERATURE REVIEW

A. Information Literacy and Self-control

The concept of information literacy is understood as the ability to find, identify, retrieve, evaluate, process and use digital information optimally [12]. Information literacy is an individual's ability in several ways, such as determining keywords when searching for information, developing search strategies, determining the digital tools used, finding the information needed, and critically evaluating the information found [13]. Information literacy emphasizes a person's ability to navigate and find verified and reliable information [14].

Self-control is defined as an important ability that helps individuals deal with desired temptations [15]. According to self-regulation theory of Bandura's (1991), self-regulation helps individuals to become aware of their behavior and control themselves, and the environment, including in obtaining information. Therefore, individuals with adequate information literacy skills should be able to control themselves to respond the information obtained, including from online sources. Individuals with high information literacy are more sensitive to the adoption of information so that they can change behavioral awareness [16].

B. Information Literacy and Information Privacy Awareness

In the digital age, personal privacy has taken on a new meaning when users are willing to share so much information online. The definition of information privacy awareness is the level of understanding and awareness of a person about how information is tracked and used in the online environment and how that information can retain or lose its personal nature. Information privacy focuses on understanding the responsibilities and risks associated with sharing information online [17].

Information literacy is one of important skill in the proliferation of free information dissemination in the digital era. Information literacy is meant as a critical understanding of the flow of data and its implicit rules for users to act on. Literacy can serve as a principle to support, encourage, and empower users to exercise control over their digital identity [18]. In short, to take appropriate action against potential personal data, users may need to be able to understand the flow of data in cyberspace and acceptable exposure limits.

Information literacy skills can be assumed that someone will use technology and synthesize information in expressing himself in digital media. Information literacy is divided into several basic components, namely determining, accessing, evaluating, combining, using, and understanding information [19]. In a previous study, person who had a higher level of understanding of online content, such as identifying prejudice or bias in the media and discriminating against reliable information, were more likely to be aware of online data privacy.

C. Information Privacy Awareness, Online Control, and Online Risk

Personal privacy has taken on new meaning in collaborative social settings when users are willing to share so much information online. Protecting privacy and online reputation is increasingly important in the context of user-generated content and information sharing. Risks may arise from adolescents' desire to disclose personal information, their confidence in online relationships, or the setting up of sites that are confusing or poorly designed [20].

Although social media platforms often provide some kind of notification that is meant to inform their users of the risks of disclosing personal information, many people overlook the dangers of uncontrolled disclosure of their (and others') personal data. Thus, the role of self-awareness of the privacy of personal information is a very important element in carrying out online activities.

Self-control is defined as the self-initiated regulation of thoughts, feelings and actions when the goals to be achieved conflict with the more temporarily satisfying goals [21]. According to Bandura (1991), self-control mechanisms that determine an individual's level of self-control over behavior could also be relevant to Internet addiction. Self-control theory is influential in explaining behavioral problems, especially antisocial behavior. In addition, the theory suggests that low self-control is a major cause of various violent and risk-taking behaviors [22]. Self-control is an important ability for every individual. As technology advances, these abilities are not only needed by individuals to face life in the real world, but also life in the virtual world.

III. METHODOLOGY

Several early stages of research have been carried out, such as identifying problems, conducting literature studies, and developing hypothetical models. In the process of proposing a proposal, the next steps to take are instrument development, data collection, data analysis, results discussion and drawing conclusions. The complete research workflow is depicted on Figure 1.
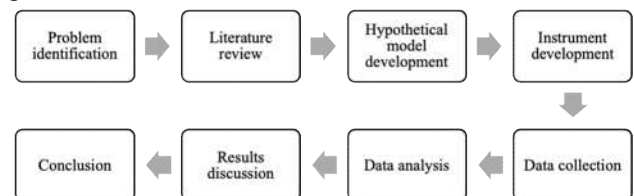

Fig. 1. Research Workflow

A. Research Design

The method used in this research is a quantitative method using survey. The instrument uses a structured questionnaire

to determine the relationship of the framework proposed. A structured questionnaire was designed with demographic items and main questionnaire items. This research attempts to propose a model that information literacy as the antecedents of self-control and information privacy awareness which in turn facilitate the student's online risk.

The analysis data is conducted using SEM-PLS technique. PLS-SEM can be used to analyze the proposed research model containing formative constructs and reflective constructs [23]. SmartPLS3.0 software is used as a tool to analyze the research data. In the process of data analysis, the developed models and hypothesis were also tested.

B. Conceptual Model

After conducting a literature study, we developed a hypothetical model as depicted in Figure 2.
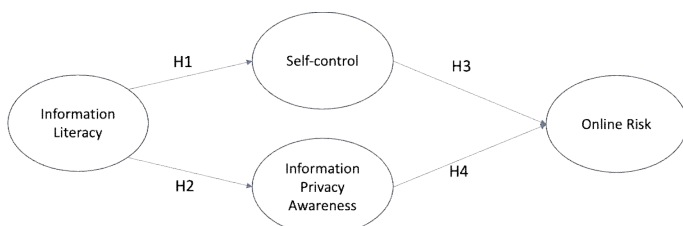

Fig. 2. Conceptual Model of Hypothesis

In general, this study aims to determine the role of Information Literacy on Online-Risk faced by students with the mediating variables of Self-control and Information Privacy Awareness.

According to information literacy ability, a person should be able to understand which information is public and which is private. In a previous study, users who had a higher level of understanding of online content, such as identifying prejudice or bias in the media and discriminating against reliable information, were more likely to be aware of online data privacy [19].

According to the self-regulation theory of Bandura (1991), self-control helps individuals to be aware of their behavior and its impact on themselves, others, and the environment, including doing activities in the cyberspace. Thus, with sufficient information literacy skills, a person can control himself to respond the information dissemination, including from online source.

Finally, risks may arise from adolescents' desire to disclose personal information, their confidence in online relationships, or the setting up of sites that are confusing or poorly designed. Many people overlook the dangers of uncontrolled disclosure of their (and others') personal data. Thus, the role of self-awareness of the privacy of personal information is a very important element in carrying out online activities. Additionally, low self-control is a major cause of various violent and risk-taking behaviors [24]. Therefore, the hypothesis are as follows:

H1: Information literacy has a positive impact on self-control

H2: Information Literacy has an influence on Information Privacy Awareness
H3: Self-control has an influence on online-risk
H4: Information privacy awareness affects online risk

The definition of each variable is shown in Table I.

TABLE 1 DEFINITION OF VARIABLES

Variable	Definition	Source
Information Literacy	Information literacy is an individual's ability to recognize, use, and evaluate the information obtained.	[25]
Self-control	Self-regulatory mechanisms that determine an individual's level of self-control over behavior.	[26]
Information Privacy Awareness	A person's ability to accurately perceive potential privacy threats.	[27]
Online-risk	Perceived risks faced in cyberspace.	[28]

C. Instrument Development

The instrument of survey is adopted from several previous studies that have been tested for validity and reliability. Question items are adjusted to make them relevant to the research context. The questionnaire consists of two parts. The first part is demographic information about respondents, namely students, including gender, age, average device usage per day, and average internet usage per day. The second part of the questionnaire measures the constructs in this research model. Five-point likert scale with "strongly disagree" (1) to "strongly agree" (5) is used.

The variables tested in the questionnaire instrument include the Information Literacy variable as many as 20 questions, the Privacy Awareness variable as many as 9 questions, the Self-control variable 20 questions, and the Online Risk variable as many as 10 questions. The questionnaire items listed in Table II.

TABLE II QUESTIONNAIRE ITEMS

Variable	Code	Item	Source
Information Literacy (IL)	IL1	I feel I am able to define the information I need	[29], [30]
	IL2	I feel I am able to find various potential sources of information	
	IL5	I am able to determine where and how to find the information I need	
	IL7	I am familiar with and use relevant and high-quality information sources	
	IL9	I am able to use various sources of information (websites,	

Variable	Code	Item	Source
		databases, e-books, books, academic papers, etc.) effectively and efficiently	
	IL11	I feel I am able to assess information sources analytically and critically	
	IL12	I feel I am able to determine the authority of the source or origin of the information	
	IL15	I am able to combine newly collected information with previous information	
	IL20	I feel I am able to learn from past experiences in finding the right sources of information so that my literacy skills improve	
Self-control (SC)	SC4	Sometimes I can't stop myself from doing something, even if I know it is wrong*	[31]
	SC6	I never allow myself to lose control	
	SC9	I change my mind quite often*	
	SC16	I need to think before I act	
Information Privacy Awareness (IPA)	PR6	I am concerned that my personal information on social networks may be used in a way that I am not aware of	[32][33]
	PR7	Compared to other people, I am more sensitive about how online companies handle my personal information	
	PR8	I am concerned that my personal information on social networks may be used for wrong purposes	
	PR9	It is important for me to have awareness and knowledge of how my personal information will be used	
Online Risk (OR)	OR3	In the last 12 months, I have seen or received any kind of sexual message on the	[34]

Variable	Code	Item	Source
		internet*	
	OR4	In the last 12 months, I have seen sexually explicit images or videos on any website*	
	OR5	I have acted in a way that may have been painful or unpleasant to another person in the past 12 months through a cell phone call, text message, or picture/video text*	
	OR6	I have met someone you meet on the internet for the first time*	

*.reversed questions

D. Sample and Data Collection Method

The research was conducted in Indonesia. The samples consist of Indonesian undergraduate students at various universities. The data in this survey was collected from online questionnaire which was distributed to respondents voluntarily. Simple random sampling is used as sampling technique which means members of the population have an equal chance of being selected into the sample. The results of the questionnaire data collection obtained as many as 264 respondents that are eligible to proceed to the data analysis process.

IV. RESULTS

This part consists of respondent demographics, SEM analysis, hypothesis testing result, and the mediation effect.

A. Respondents Demographics

The total collected data are 264 samples. As depicted in Table 3, the final sample data consist of 42% males and 58% females, which most of the respondents are 17-20 years old, that is 70%. Table III summarizes the sample demographics of the respondents.

TABLE III SAMPLE DEMOGRAPHICS

	Items	Frequency	Percentage
Gender	Male	111	42%
	Female	152	58%
Age	17-20 years old	186	70%
	21-24 years old	65	25%
	25-28 years old	13	5%
Average device usage per day	Less than 30 minutes	10	4%
	1-3 hours	84	34%
	More than 3 hours	130	53%

	Items	Frequency	Percentage
Average internet usage per day	Less than 30 minutes	11	4%
	1-3 hours	43	16%
	More than 3 hours	191	72%

B. Model Measurement

The measurement of the model is done by looking internal consistency reliability, convergent validity, and discriminant validity of the predefined construct. Internal consistency reliability is evaluated by computing Composite reliability and Average Variance Extracted (AVE).

Composite Reliability value on each variable is declared reliable if it reaches a value > 0.70 [35]. This study shows that the four variables are declared reliable with a composite reliability value above 0.7. Furthermore, to evaluate discriminant validity, it can be known by looking at the Average Variant Extracted (AVE) for each construct. A construct with an AVE value of 0.5 and higher indicates a sufficient degree of convergent validity [36]. This Average Variant Extracted (AVE) value can describe the magnitude of the variance of the indicators owned by the construct variable. In this study, all variables also showed that the value is above 0.5. The details of the internal consistency reliability are shown in Table IV.

TABLE IV INTERNAL CONSISTENCY RELIABILITY

Variable	Composite Reliability	Average Variance Extracted (AVE)
Information Literacy	0.955	0.580
Online Risk	0.829	0.549
Information Privacy Awareness	0.808	0.513
Self-control	0.827	0.547

Convergent validity is used to determine the validity of each relationship between each indicator and its construct. Convergent validity was evaluated by computing loading factor for each item within the construct. Items with the loading of 0.7 or above are considered significant items. The details of the loading factor value for all items are shown in Table V.

TABLE V CONVERGENT VALIDITY USING OUTER LOADING

Variable	Items	Outer Loading
Information Literacy	IL1	0.764
	IL2	0.778
	IL5	0.762
	IL7	0.794
	IL11	0.769
	IL12	0.767
	IL15	0.773
	IL19	0.780

Variable	Items	Outer Loading
	IL20	0.771
Self-control	SC4	0.819
	SC6	0.755
	SC9	0.706
	SC16	0.762
Information Privacy Awareness	PR6	0.729
	PR7	0.796
	PR8	0.773
	PR9	0.763
Online Risk	OR3	0.709
	OR4	0.742
	OR5	0.824
	OR6	0.782

Discriminant validity reflects the extent to which constructs are significantly different from other constructs. This test is assessed based on the cross loading value. The results of the cross loading are declared valid if the indicator construct measured by the correlation is greater than the other indicator constructs. In this research, all items for each construct do not reflect another construct. The summarize of the cross-loading value is shown in Table VI.

TABLE VI CROSS-LOADING VALUE

	IL	OR	IPA	SC
IL1	0.764	0.124	0.258	0.293
IL2	0.778	0.162	0.253	0.344
IL5	0.762	0.189	0.273	0.317
IL7	0.780	0.102	0.277	0.279
IL11	0.769	0.171	0.267	0.308
IL12	0.767	0.138	0.249	0.261
IL15	0.773	0.117	0.314	0.252
IL19	0.780	0.079	0.324	0.249
IL20	0.771	0.154	0.326	0.340
OR3	0.069	0.709	0.107	0.204
OR4	0.145	0.743	0.040	0.270
OR5	0.146	0.824	0.043	0.357
OR6	0.153	0.682	0.065	0.295
IPA6	0.263	0.105	0.736	0.109
IPA7	0.252	0.011	0.690	0.052
IPA8	0.284	0.079	0.769	0.100
IPA9	0.252	0.026	0.665	0.082
SC4	0.194	0.375	0.056	0.816
SC6	0.221	0.338	0.071	0.756

	IL	OR	IPA	SC
SC9	0.453	0.104	0.107	0.610
SC16	0.266	0.330	0.122	0.761

C. Structural Model

The structural measurement of the model is examined based on the calculation of the path coefficient value (β). The path coefficient value is measured based on the model construct that has been developed. In this research, the construct of the model measures the relationship between the four variables, including the information literacy variable on the privacy awareness variable, the information literacy variable on the self-control variable, the privacy awareness variable on the online risk variable, and self-control variables on online risk variables.

The value of the path coefficient (β) of a relationship is stated to be significant if the value is greater than 0.1 or lower than -0.1. The results of the calculation of the path coefficient value in this study can be seen in Table 7. All tested variable relationships show that path coefficient is more than 0.1. Therefore, it proves that all tested relationships are significantly related.

D. Hypothesis Testing Result

In the hypothesis test, the value of t-statistics is used to determine whether the hypothesis that has been set in this study is accepted or rejected. Meanwhile, the value of R square shows how much the independent variable affects the dependent variable. Since all hypotheses in the research are directional, a one-tailed t-test is used. The corresponding t-values denote significance of the coefficients where t-values > 1.96 represent significance level $p < 0.025$. The result of hypothesis testing is also shown in Table VII. According to Table VII, all of the hypothesis are accepted which means information literacy was positively related to self-control (β=0.383, t=6.173). Information literacy was also positively related to information privacy awareness (β=0.367, t=6.909). Self-control was positively related to online risk (β=0.387, t=6.078). The last hypothesis, information privacy awareness was positively related to online risk (β=0.133, t=2.544).

TABLE VII HYPOTHESIS TESTING RESULT

Hypothesis	Path	Path Coefficients β	T-Statistics	P Values	Status for Hypothesis
H1	Information Literacy → Self-control	0.383	6.713	0.000	Accept
H2	Information Literacy → Information Privacy Awareness	0.367	6.909	0.000	Accept
H3	Self-control → Online Risk	0.387	6.078	0.000	Accept
H4	Information Privacy Awareness → Online Risk	0.133	2.544	0.000	Accept

V. DISCUSSION

We surveyed higher education students in Indonesia to test our model. All hypotheses we proposed are accepted and briefly discussed our findings. Information literacy is positively related to the dimensions of self-control and privacy awareness (H1 and H2). It indicates that the higher the student's information literacy, the higher the understanding of which online information is considered public and which information is considered private.

Students can be considered to have good self-control when they do not share too much personal information on the internet. The college students who are able to identify relevant online sources have a critical understanding of the flow of data and its implicit in acting in cyberspace. Therefore, students should be able to control themselves in carrying out activities related to sharing information and communication on the internet. These results are supported by Averill's theory (1973) about self-control in the previous study that self-control includes an individual's ability to carry on unwanted information by clarify and taking action based on what they believe [37].

Self-control significantly affects the online risk faced by college students (H3). This is in line with previous research which states that as technology advances, self-control is not only needed when someone faces situations that have risks directly in the real world, but also in the virtual world [38]. The role of self-awareness of the privacy of personal information is a very important element in conducting online activities.

Finally, privacy awareness has a strong influence on online risk (H4). This condition explains how a college student who has an understanding of personal data privacy will understand the impact of sharing so much data in cyberspace. Therefore, understanding will become a skill in preventing behavior that brings them at online risk [20], [22].

VI. CONCLUSIONS

The impact of the COVID-19 pandemic has dramatically changed the sustainability of life in various sectors, including the education sector. The shift from face-to-face learning to online learning is one of the policies in the education sector to reduce the spread of the virus. In the process of implementation, this policy has an impact on the dangers of online risk. This study was conducted to determine whether information literacy competence, self-control, and privacy awareness have an impact on online risk. Information literacy for college students is defined as the ability to search, find, and assess information circulating in the online environment that comes from various sources. College students in this study showed that knowing and using relevant sources of information and the ability to combine some information were the two most important dimensions in information literacy.

Also, student with higher level of information literacy, they will more aware to any risks in online environment.

Researchers are aware of several limitations in this study that have the potential to be developed in further research. This study focuses on mitigating online risk in college students without further defining online risk. Therefore, it will be interesting to explore other factors in online risk mitigation in future research. Next, the sample in this study is limited to college students. Therefore, online risk mitigation is also limited to this sample. Future research can use samples from various levels of education so that online risk mitigation can be classified according to education level.

REFERENCES

[1] V. Singh and A. Thurman, "How Many Ways Can We Define Online Learning? A Systematic Literature Review of Definitions of Online Learning (1988-2018)," *Am. J. Distance Educ.*, vol. 33, no. 4, pp. 289–306, Oct. 2019, doi: 10.1080/08923647.2019.1663082.

[2] C. Stone, "Online learning in Australian higher education: Opportunities, challenges and transformations," *Stud. Success*, vol. 10, no. 2, pp. 1–11, Aug. 2019, doi: 10.5204/ssj.v10i2.1299.

[3] K. Syauqi, S. Munadi, and M. B. Triyono, "Students' perceptions toward vocational education on online learning during the COVID-19 pandemic," *Int. J. Eval. Res. Educ. IJERE*, vol. 9, no. 4, p. 881, Dec. 2020, doi: 10.11591/ijere.v9i4.20766.

[4] E. Hargittai and M. Micheli, "Internet skills and why they matter," *Soc. Internet Netw. Inf. Commun. Are Chang. Our Lives*, vol. 109, 2019.

[5] E.-A. Dumitru, "Testing Children and Adolescents' Ability to Identify Fake News: A Combined Design of Quasi-Experiment and Group Discussions," *Societies*, vol. 10, no. 3, p. 71, Sep. 2020, doi: 10.3390/soc10030071.

[6] P. W. Armstrong and C. D. Naylor, "Counteracting health misinformation: a role for medical journals?," *Jama*, vol. 321, no. 19, pp. 1863–1864, 2019.

[7] S. McGrew, J. Breakstone, T. Ortega, M. Smith, and S. Wineburg, "Can students evaluate online sources? Learning from assessments of civic online reasoning," *Theory Res. Soc. Educ.*, vol. 46, no. 2, pp. 165–193, 2018.

[8] M. Correll, "What Do High School Students Know About Information Literacy? A Case Study of One University's Feeder Schools," *Pa. Libr. Res. Pract.*, vol. 7, no. 1, pp. 25–37, 2019.

[9] J. Haider and O. Sundin, "Information literacy challenges in digital culture: conflicting engagements of trust and doubt," *Inf. Commun. Soc.*, vol. 25, no. 8, pp. 1176–1191, 2022.

[10] L. Botturi and L. Negrini, "Less is more: teenager digital information literacy and parental rules," 2018.

[11] L. Yu, D. Wu, H. H. Yang, and S. Zhu, "Smart classroom preferences and information literacy among college students," *Australas. J. Educ. Technol.*, vol. 38, no. 2, pp. 142–161, 2022.

[12] W. Techataweewan and U. Prasertsin, "Development of digital literacy indicators for Thai undergraduate students using mixed method research," *Kasetsart J. Soc. Sci.*, vol. 39, no. 2, pp. 215–221, 2018.

[13] J. T. Boruff and P. Harrison, "Assessment of knowledge and skills in information literacy instruction for rehabilitation sciences students: a scoping review," *J. Med. Libr. Assoc. JMLA*, vol. 106, no. 1, p. 15, 2018.

[14] S. M. Jones-Jang, T. Mortensen, and J. Liu, "Does media literacy help identification of fake news? Information literacy helps, but other literacies don't," *Am. Behav. Sci.*, vol. 65, no. 2, pp. 371–388, 2021.

[15] D. de Ridder, A. van der Weiden, M. Gillebaart, J. Benjamins, and J. F. Ybema, "Just do it: Engaging in self-control on a daily basis improves the capacity for self-control.," *Motiv. Sci.*, vol. 6, no. 4, p. 309, 2020.

[16] J. Wu, R. Zuo, C. He, H. Xiong, K. Zhao, and Z. Hu, "The effect of information literacy heterogeneity on epidemic spreading in information and epidemic coupled multiplex networks," *Phys. Stat. Mech. Its Appl.*, vol. 596, p. 127119, 2022.

[17] C. L. Wissinger, "Privacy literacy: From theory to practice.," *Commun. Inf. Lit.*, vol. 11, no. 2, pp. 378–389, 2017.

[18] Y. J. Park, "Digital literacy and privacy behavior online," *Commun. Res.*, vol. 40, no. 2, pp. 215–236, 2013.

[19] J. Y. LEE and N. Al Khaldi, "Exploring the ethical implications of new media technologies: A survey of online platform users' digital literacy and its effects on digital trust and privacy awareness," in *70th Annual International Communication Association Conference (ICA 2020): Open Communications*, 2020.

[20] S. Livingstone, "Taking risky opportunities in youthful content creation: teenagers' use of social networking sites for intimacy, privacy and self-expression," *New Media Soc.*, vol. 10, no. 3, pp. 393–411, 2008.

[21] A. L. Duckworth, J. L. Taxer, L. Eskreis-Winkler, B. M. Galla, and J. J. Gross, "Self-control and academic achievement," *Annu. Rev. Psychol.*, vol. 70, no. 1, pp. 373–399, 2019.

[22] M. Gillebaart, "The 'operational'definition of self-control," *Front. Psychol.*, vol. 9, p. 1231, 2018.

[23] J. F. Hair Jr, G. T. M. Hult, C. M. Ringle, M. Sarstedt, N. P. Danks, and S. Ray, "Partial least squares structural equation modeling (PLS-SEM) using R: A workbook." Springer Nature, 2021.

[24] P. Xu and J. Cheng, "Individual differences in social distancing and mask-wearing in the pandemic of COVID-19: The role of need for cognition, self-control and risk attitude," *Personal. Individ. Differ.*, vol. 175, p. 110706, 2021.

[25] S. K. Y. Chow and J. L. K. Wong, "Supporting Academic Self-Efficacy, Academic Motivation, and Information Literacy for Students in Tertiary Institutions," *Educ. Sci.*, vol. 10, no. 12, p. 361, 2020.

[26] A. Bandura, "Social cognitive theory of self-regulation," *Organ. Behav. Hum. Decis. Process.*, vol. 50, no. 2, pp. 248–287, 1991.

[27] B. Könings, C. Bachmaier, F. Schaub, and M. Weber, "Device names in the wild: Investigating privacy risks of zero configuration networking," in *2013 IEEE 14th International Conference on Mobile Data Management*, 2013, vol. 2, pp. 51–56.

[28] S. Purnama, M. Ulfah, I. Machali, A. Wibowo, and B. S. Narmaditya, "Does digital literacy influence students' online risk? Evidence from Covid-19," *Heliyon*, vol. 7, no. 6, Jun. 2021, doi: 10.1016/j.heliyon.2021.e07406.

[29] N. Aharony and T. Gazit, "Students' information literacy self-efficacy: An exploratory study," *J. Librariansh. Inf. Sci.*, vol. 52, no. 1, pp. 224–236, Mar. 2020, doi: 10.1177/0961000618790312.

[30] M. Pinto, D. Sales, R. Fernández-Pascual, and D. Caballero-Mariscal, "Attitudes, perceptions and prospectings on mobile information literacy training: Design and validation of the MOBILE-APP questionnaire," *J. Librariansh. Inf. Sci.*, vol. 52, no. 1, pp. 208–223, Mar. 2020, doi: 10.1177/0961000618788726.

[31] J. P. Tangney, R. F. Baumeister, and A. L. Boone, "High Self-Control Predicts Good Adjustment, Less Pathology, Better Grades, and Interpersonal Success," Blackwell Publishing, 2004.

[32] T. Dinev and P. Hart, "Internet privacy concerns and their antecedents-measurement validity and a regression model," *Behav. Inf. Technol.*, vol. 23, no. 6, pp. 413–422, 2004.

[33] N. K. Malhotra, S. S. Kim, and J. Agarwal, "Internet users' information privacy concerns (IUIPC): The construct, the scale, and a causal model," *Inf. Syst. Res.*, vol. 15, no. 4, pp. 336–355, 2004, doi: 10.1287/isre.1040.0032.

[34] F. Bayraktar, "Online Risks and Parental Mediation Strategies Comparison of Turkish Children/Adolescents Who Live In Turkey and Europe.," *Educ. Sci. Ve Bilim*, vol. 42, no. 190, 2017.

[35]   C.-M. Chiu and E. T. Wang, "Understanding Web-based learning continuance intention: The role of subjective task value," *Inf. Manage.*, vol. 45, no. 3, pp. 194–201, 2008.

[36]   C. Fornell and D. F. Larcker, "Structural equation models with unobservable variables and measurement error: Algebra and statistics." Sage Publications Sage CA: Los Angeles, CA, 1981.

[37]   R. Efendi, S. Indartono, and S. Sukidjo, "The mediation of economic literacy on the effect of self control on impulsive buying behaviour moderated by peers," *Int. J. Econ. Financ. Issues*, vol. 9, no. 3, p. 98, 2019.

[38]   B. Nodeland and R. Morris, "The impact of low self-control on past and future cyber offending," *Int. J. Cyber Criminol.*, vol. 14, no. 1, pp. 106–120, 2020.