DIGITAL LITERACY, TECHNOLOGICAL LITERACY, AND ECOLOGICAL LITERACY AS PREDICTORS OF ATTITUDES TOWARDS ICT G-READINESS [AS RECOMMENDATION TO THE DRAFTING OF THE PERSONAL DATA PROTECTION LAW (PDP)]

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***Abstract:* -** G-Readiness is a framework used to measure or assess the readiness, ability of an organization to adopt and implement information and communication technology in a sustainable and environmentally friendly manner. This research aims to analyze the influences of digital literacy, technological literacy, and ecological literacy as predictors of attitudes toward ICT G-Readiness. Relational descriptive models are used to detect the presence and level of covariance. The participants in this research were 368 students. Exploratory and confirmatory factor analyses of the scale were conducted. The research hypothesis was tested using structural equation modeling. The research results show that digital literacy, technological literacy, and internet literacy simultaneously have a significant influence and explain students' attitudes towards ICT G-Readiness. Different suggestions have been developed based on research results.
Keywords: *Digital Literacy, Technology Literacy, Ecological Literacy, ICT G-Readiness.*

1. INTRODUCTION

The very rapid development of information technology has influenced all aspects of human life. The Industrial Revolution 4.0, which has made information technology the 'commander' now, was past history[1], [2]. Meanwhile, the Industrial Revolution 5.0, which humanizes information technology, is also on the verge of its influence. The IoT (Internet of Things) innovation that is divined in Industry 5.0 has experienced a paradigm shift[3]. This transition promises to change the way people live, work, and interact with each other and or with the environment. The most visible changes can be seen in the business environment. The business environment is becoming more dynamic and hypercompetitive. Businesses that can survive are businesses that rely on innovation. The business environment is entering the Industry 6.0 era[4], [5], [6].

Industry 6.0 makes a major contribution to the transformation of society towards Society 6.0 by providing technological solutions that support society's needs. Society transforms linearly following technological developments. Industry 6.0 helps humans reduce the burden of life, as what previously took a long time becomes faster; technology becomes more sophisticated and instantaneous. The sole aim of Industry 6.0 is to utilize new technologies applicable worldwide. Technology can provide wealth and prosperity without having to work and provide growth to countries in the world. This revolution will encourage harmony in life with nature. This paradigm can be understood by examining the key elements that define Society 6.0, as follows: sustainability, inclusivity, and digital transformation[7], [8].

However, it cannot be denied that the fact that ICT also has a negative impact, namely increasing carbon emissions from the use of ICT. Currently, carbon emissions from ICT infrastructure still contribute 2-3% of overall greenhouse gas emissions [9]. In universities, apart from investing in initial costs which are quite large to build and develop information systems, universities also provide costs which are no less large to ensure the continuity of an information system, including the cost of using electrical energy, so that ICT equipment can continue to function for 24 hours a day continuously. ICT systems account for around 25% of electricity use in commercial buildings and can reach 60% for ICT service buildings[9]. On a global scale, several analytical reports have calculated that the services and ICT industry accounts for 2-2.5 % of carbon emissions or the equivalent of the global aviation industry. So various ideas emerge to innovate and develop various

ICT components that have as little impact as possible on the environment [51]. These various methods and approaches have become known as Green ICT [10], [11][12].

In the world of education, the need for paper is the main thing for the scientific documentation process. Books made from wood also reduce the number of trees in the world. It takes one five-year-old tree to produce one ream of paper and if an organization consisting of 100 people can save three sheets of paper every day, then in a year 156 trees can be saved. This condition requires efforts to save the environment in educational activities[13]. The application of green concepts and ecological technology in campus development and construction is termed Green Campus[14], [15]. Green ICT Council Indonesia has held conferences and seminars for outreach involving stakeholders related to environmentally friendly ICT. The University of Indonesia started a World University Ranking in 2010 which became known as "UI GreenMetric World University Rankings" to determine the campus's sustainable efforts. This is intended to look at sustainable programs and policies at universities around the world. Ninety-five universities from 35 countries have taken part in GreenMetric 2010, namely 18 from America, 35 from Europe, 40 from Asia and 2 from Australia. In 2022, 1,050 universities from 85 countries around the world will participate[16]. The University of North Sumatra was the first to participate in the international ranking for Green Campus in 2017 until now[17][18][15].

The model for implementing Green IT in higher education[19][14] explains that the foundation of Green IT in higher education is the academic community which is the most important element in higher education. Therefore, the development of Green IT in higher education must be supported by skilled, trained and empowered human resources to develop knowledge and creativity. Students as the largest component of the academic community must have environmental skills and literacy, especially those related to ICT[19], [20].

Efforts to improve people's life skills are part of empowerment. However, many empowerment programs have not been utilized optimally because they fail to adapt to community needs. Environmental literacy is termed eco-literacy. Eco-literacy describes humans who have achieved a high level of awareness about the importance of the environment[21], [22]. Several studies on eco-literacy have been conducted to show that eco-literacy awareness influences students' understanding of green behaviour[22]. Best practice eco-literacy based on socio-culture contains four items, namely: Learning objective eco-literacy, media and resources of learning, learning methods, and implementing of eco-literacy learning. These four aspects will be used in developing an ICT-based eco-literacy model for a green campus[23]. A framework that can be used to measure the extent to which an organization is ready to adopt and implement greenGIT initiatives is g-readiness. The g-readiness framework includes indicators or criteria related to energy use, e-waste management, and use of hazardous materials, energy efficiency, and various other factors.

The first IT-based Green Campus has four Ten elements[14], namely: green master plan and construction, green operation and management, green technology and regional outreach, green education. Then in other research it developed into six components, namely: soft documents (paperless), online documents, e-books/online books, IT support, HR support, and regulatory support[13], [24]. The model for implementing green IT in higher education is a combination of the Triple Helix Framework with pillars that adopt the RMIT G-Readiness Framework[19]. In research, g-readiness is conceptualized as a measure of higher education IT readiness to be environmentally responsible and competitive.

On the other hand, the world's paradigm is preparing to welcome Industry 6.0. Especially for countries that really care about the periodization of the internal revolution along with the stages and generations of human resources that are born. Industry 6.0 is characterized by: (1) manufacturing resources managed using a computerized system; (2) the transformation of human life from a wealth-based system to a cellular-based needs and artificial intelligence management of resources; (3) efficiency is carried out in all sectors; (4) Human creativity, thoughts and discoveries will spread globally very quickly. In Industry 6.0, humans will again become the epicentre served and the driving force for all the tools they create[4], [25]. Globally connected artificial intelligence will facilitate a human population of more than 15 billion. Effective management of natural resources such as wood, water, steel, food, education, robotics and energy for an interconnected world. Most industrial tools and mechanical fabrication will be handled by 3D printing, nanotechnology, and computer-aided manufacturing (CAM) processes.

Based on the above phenomenon, if it is related to the use of technology in the learning environment, it requires the acquisition of Industry 6.0 era skills including digital literacy, technological literacy and ecological literacy[26]. Therefore, to welcome Industry 6.0, students need to improve skills such as digital literacy, technological literacy, and ecological literacy to meet the new requirements in IT G-readiness. Therefore, there is an opinion that the relationship between digital literacy, technological literacy, ecological literacy, and IT Greadiness attitudes must be considered to survive in the Industry 6.0 era [4][25].

This research aims to analyze the influence of digital literacy, technological literacy, and ecological literacy as predictors of ICT G-Readiness, their explanation ratio, and their statistical significance. The biggest difference with similar research in the literature is that there is no research conducted regarding the relationship between the two, the influence of digital literacy, technological literacy, and ecological literacy as predictors of ICT G-Readiness, the ratio of their explanations to each other. Therefore, it is important to determine which variables influence students' attitudes towards IT G-readiness and the extent to which changes in attitudes are explained based on which variables, in order to present a robust model.

2. THEORETICAL FRAMEWORK

In this section, significant aspects that influence IT Greadiness attitudes will be explained.

2.1 ICT G-readiness

Green ICT or environmentally friendly ICT is a term in the world of Indonesian information technology. Environmentally friendly in this case is how to create a living system with low carbon emissions which affect world climate change. Green ICT can be interpreted as awareness of implementing various technologies, techniques and policies designed to reduce the carbon footprint of the ICT equipment used, as well as using ICT equipment to reduce the carbon footprint of the entire organization. Gartner estimates that 2% of global CO2 emissions are contributed by the ICT sector which includes the use of personal computers (PCs), servers, server air conditioning, mobile, local area networks (LAN), office telecommunications, and printers[27]. This means that with this green ICT concept companies can reduce 2% of carbon emissions caused directly by ICT systems (Greening of IT), however, Green ICT is also a concept of how to use ICT systems as a technology that makes it possible to reduce 98% of the footprint. Carbon is caused by other activities within the entire organization (Greening by IT)[10].

The concept of Green ICT[9] or environmentally friendly ICT is fulfilling current ICT needs while still considering environmental sustainability in the future, by monitoring products, and ensuring that products do not have a polluting or polluting impact on the environment during the period of use and afterwards[10]. Initially, the term Green ICT was still related to reducing electrical energy consumption by ICT systems in companies, to reduce carbon emissions. However, currently, the concept of environmentally friendly ICT is becoming broader and increasing the function of the ICT section or department within the agency. The ICT Department not only designs and uses environmentally friendly ICT, but also provides measuring tools, data storage, reporting mechanisms, and mitigation techniques for the sustainability of the ICT system [9][28].

The term green ICT also called green IT or green computing[29] is defined as the study and application of the design, manufacture, use and disposal of computers, servers and related subsystems such as monitor systems, printers, storage media, and communications and networks efficiently and effectively by eliminating or minimizing negative impacts on the environment. Furthermore, Green IT can also contribute to greening the ecosystem. Green IT is more than just optimizing hardware in the data centre space, but also optimizing algorithms, business processes, governance, and changing user behaviour (Yohannis, nd). The concept of Green ICT can be clarified with the Green ICT taxonomy[10]. Four dimensions can be used as a framework for understanding and implementing Green IT, namely: work dimensions (time, energy, cost, environment); work area level (hardware, software, business processes, governance, behaviour); methods (reduce, reuse, recycle, optimization, virtualization, informing); and actors/stakeholders[11].

The dimensions and measuring tools that universities can adopt to implement a Green Campus[9] are an inventory of all equipment, namely: 1) Desktop end user environment (Desktop, Laptop, Monitor, Thin Client, Printer, Multi-Functional Devices); 2) Telecommunications and networks (Routers, Wireless devices, Amplifiers); 3) Data center (Server, Storage Drive, Every telecommunications equipment placed in the data center, Change gear, Cooling, lighting and other facilities, Backup power supply)[13], [28], [30].

A framework that can be used to measure the extent to which an organization is ready to adopt and implement green IT initiatives is g-readiness. The G-readiness framework includes indicators or criteria related to energy use, e-waste management, use of hazardous materials, energy efficiency, and various other factors. The five dimensions of G-readiness are Attitude, Policy, Practice, Technology, and Governance (Fig. 1).

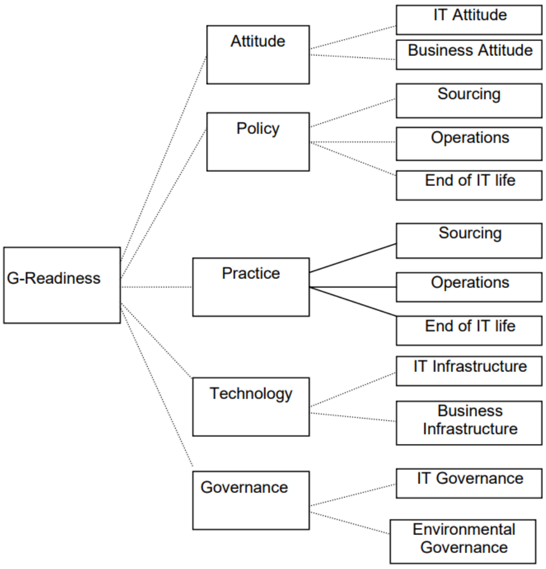

Fig 1. The five dimensions of G-Readiness

This research focuses on student G-readiness by analyzing the influence of digital literacy, technological literacy, and ecological literacy as predictors of student attitudes in supporting the implementation of Green ICT on campus.

2.2 Digital literacy

Literacy refers to skills that can be improved[31]. In general, literacy is a concept related to a person's perception and understanding of the life he lives as well as the objects and events in this life, as well as giving meaning to all relationships in his social life[7]. The broad meaning of the concept of literacy is closely related to the context in which the concept is articulated. The concept of literacy has been articulated with many concepts such as information, media, communication, science, environment, finance, health, language, culture, civility, visuality, and electronics, and has taken a place in the literature[32]. Apart from that, the articulation of the concept of literacy into a digital concept has also given birth to the concept of 'digital literacy; its articulation with technology causes the use of the concept of technological literacy, and its articulation with the concept of environment causes the use of the concept of ecological literacy. All these concepts are starting to be applied both in literature and practice[31].

The idea of digital literacy is not new. Several definitions of digital literacy in the literature state that digital literacy is more than just a functional problem, such as learning to use a computer and keyboard or searching online, but also refers to various competencies related to skills in using computers and information technology, not just functional use of computers [31]. In a broader context, digital literacy is defined as the ability to evaluate information from various sources, assess its appropriateness and usefulness, and complete tasks by finding information, including the ability to investigate, create and communicate through the use of computers to participate actively. Effective in all areas of life including home, school, and society[33], [34]. It was even reported in more detail that digital literacy consists of five literacies, namely photo-visual, reproduction, branching, information and socio-emotional which are related to each other. These skills each include reading or understanding graphic and other multimedia information [33]; combining various information; navigating various information; analysing and evaluating various information; and social sharing of information, following online norms for collaboration and communication on the internet[35]. As a result, there is general recognition that digital literacy is an important competency for students who face challenging demands (technological, informational, cognitive, and socio-emotional) in the digital era[35][34].

In a Scientific Oration entitled "Scholars in the Horizon of the Industrial Revolution 6.0"[36] it was stated that in the Industry 6.0 era, machines will design other machines. The choice of materials and design techniques will continue to develop from generation to generation. It is estimated that quantum computing and resource management will be able to copy and duplicate everything towards stage 6.0. Everyone will have access to all knowledge accumulation sites in the world by prioritizing digital and technological competence[25].

2.3 Technological Literacy

Technological Literacy is defined as the ability to use relevant technology for effective and responsible communication, finding solutions to problems, achieving accurate information, and creating information for a better learning process through technology using problem-solving and critical thinking[37][38]. Knowledge about what can be done with technology, how to use technology well, and deciding on the type of technology and appropriate time/date of use[39]. Technological literacy can also be defined as the ability to adopt, adapt, discover, and assess technology to positively influence life, community, and the environment. It can be said that a technologically literate person is a person who has some basic knowledge about technology and some basic technical abilities, such as identifying and solving simple problems with technological devices, using approaches to solving problems, and thinking critically about technological problems. This is so important, that technological literacy is made the first goal of the National Research Master Plan 2015-2045, namely increasing scientific and technological literacy [7][37].

2.4. Ecological Literacy

Ecological literacy often abbreviated as Eco-Literacy and also called environmental literacy[40], [41], is a term used by Fritjof Capra to describe the highest level of human awareness, namely respect for the environment (ecosystem). The level of eco-literacy is an achievement where someone is very aware of the importance of the environment, and the importance of protecting and caring for the earth, ecosystem, and nature as a place to live and develop life[11]. This concept is one of the preventive efforts to overcome spatial inequality through learning that raises awareness of the importance of the environment[18][23].

Eco-literacy comes from two words, namely Eco and Literacy[21]. The word eco comes from the Greek, oikos, which means household or in a broad understanding means the universe, the earth where all life lives, the habitat or house where all life lives. The term eco is then generally understood and used to refer to the environment. Meanwhile, the word literacy is an ambiguous term. At a basic level, a literate person is someone who is facilitated in reading and writing in his language[42]. Eco-literacy describes humans who reach a high level of awareness about the importance of the environment[28]. Efforts to improve people's life skills are part of empowerment. However, many empowerment programs have not been utilized optimally because they fail to adapt to community needs[41]. Three aspects can be used as a basis for efforts to develop an eco-literacy learning model for the community, namely: natural potential, surroundings, emotions, and land use and aid programs.

Several studies on eco-literacy have been carried out to show that eco-literacy awareness influences students' understanding of green behaviour[22]. The description of education-oriented eco-literacy learning practices for sustainable development in elementary schools with teachers as research samples shows quite good category results[43], while the same research conducted on lecturers as research samples has a medium category level[40]. Meanwhile, the results of evaluation research on agricultural faculty students show that the majority of students still have basic ecological literacy[21]. The research results also show that increasing students' eco-literacy can be done by implementing the eco-literacy module [20] and the field trip method[20]. Best practice eco-literacy based on socio-culture[23] contains four items, namely: Learning objective eco-literacy, media and resources of learning, learning methods, and implementing of eco-literacy learning. The components of eco-literacy are consisting of effect, ecological knowledge, socio-political knowledge, knowledge of environmental issues, cognitive skills, and Environmentally Responsible Behaviors (ERB). Eco-literacy is divided into three parts, namely knowledge, behaviour and attitudes towards the environment[42]. The measurement of eco-literacy level consists of four sets of instruments, namely eco-literacy of knowledge aspect, eco-literacy of attitude aspect, eco-literacy of skill aspect, and eco-literacy of participation aspect instrument[40].

2.5 Research Hypothesis

There is a large body of literature on predictors of g-readiness such as Attitudes, Policies, Practices, Technology, and Governance.

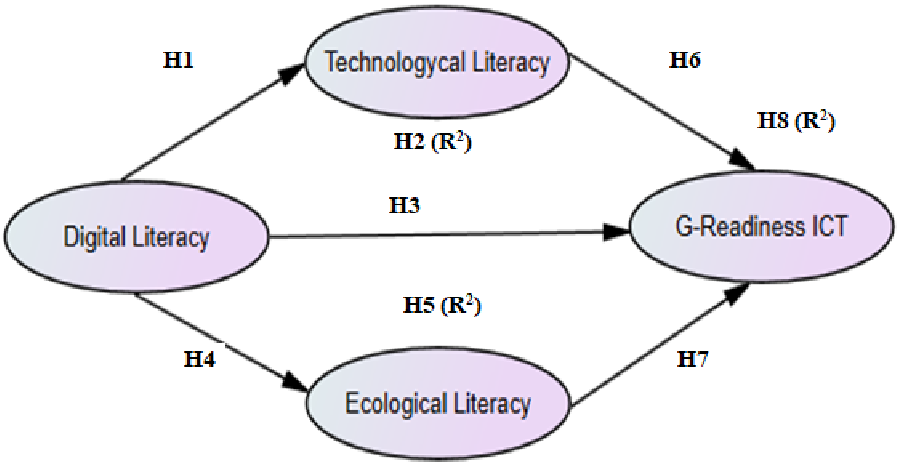

Fig. 2 Path diagram related to study hypotesis

This research aims to examine the relationship between the variables digital literacy (DL), technological literacy (TL), ecological literacy (EL) and attitudes towards ICT G-Readiness (GR), their influence on each other, and, their explanation ratio. To achieve this goal, eight research hypotheses were developed which were supported both theoretically and by related research results, namely:

H1. DL has a positive and significant effect on TL
H2. DL significantly explains TL
H3. DL has a positive and significant effect on GR
H4. DL influences EL positively and significantly
H5. DL significantly explains EL
H6. TL has a positive and significant effect on GR
H7. EL has a positive and significant effect on p GR
H8. DL, TL, and EL together explain attitudes towards GR

The hypotheses and path diagram to test the hypotheses in Fig. 2 were developed by the authors of this study. One of the most important features of SEM is to develop hypotheses suitable for the general purpose of the research by taking the theoretical basis into account, and to test these hypotheses through a model.

3. METHODS

Relational descriptive models are used to determine changes or degrees of change between two or more two variables[44], as well as detect the existence and extent of covariance. Therefore, it is used in this study, and the analysis is carried out using structural equation models. Eight hypotheses were tested, and the influence of students' G-readiness on DL, TL, and EL on each other and their relationship with each other were analyzed in this study.

The research respondents were 368 students studying at the department of a state university in Indonesia in the odd semester of the 2023-2024 academic year. Confirmatory factor analysis (CFA and structural equation modelling (SEM) are used during the data analysis process[44]. Therefore, the analysis method is crucial in determining the number of respondents. According to Schumacker and Lomax, 250-500 participants are used in many studies, and this number is enough to carry out SEM. In this context, it can be said that the number of participants in this study is sufficient.

The data collection instrument used a questionnaire with a Likert scale with a choice of five points, namely: strongly agree (5), agree (4), doubtful (3), disagree (2) and strongly disagree (1).

3.1 Digital Literacy

The DL scale consisting of six factors and twenty-nine items (Table 1) developed by[45] is used to determine student DL. According to Cronbach Alpha internal consistency scale analysis, the ethics and responsibility factor is ÿ=0.842, the general knowledge and functional skills factor is ÿ=0.875, the daily use factor is ÿ=0.782, the professional production factor is ÿ=0.719, the confidentiality and security is ÿ=0.820, social factors are ÿ=0.860. Internal consistency analysis for the overall scale is ÿ=0.911.

Table 1. The Digital Literacy Scale

Variable	Factor	Item	Example of statement items
Digital Literacy (DL)	1. Ethics and responsibility	DL1-DL7	I am aware of the ethical and legal responsibilities of cyberbullying (insults, profanity, hate speech, etc.) and harassment in the online environment (DL4)
	2. General knowledge and Functional skills	DL8-DL13	I know what is meant by licensed software, demo software, pirated software, malware and crack (DL8)
	3. Daily use	DL14-DL19	I can use cloud computing technologies (Google Drive, iCloud, Dropbox, etc.) effectively in my daily life (DL15)
	4. Professional production	DL20-DL21	I can develop software/applications based on digital technology (DL20)
	5. Privacy and security	DL22-DL25	I know how to limit app access to my personal information (location, contacts, camera, etc.) (DL22)
	6. Social	DL27-DL29	With the help of digital technology, I can change various images (photos, sound recordings and videos) and produce new content (DL28).

Additionally, a CFA scale was also performed in which the ft index was found to be within acceptable limits. All items in the scale have the same structure and positive meaning.

After data analysis, the KMO value for the scale was determined to be 0.936. The results obtained from the KMO and Bartlett Sphericity tests (ÿ=6979.701, df= 406, p=.000) indicate that the data are suitable for factor analysis. The item loading factors varied between 0.693 and 0.362. The Cronbach Alpha value of the internal consistency coefficient of the scale is as follows: the ethics and responsibility factor is ÿ=0.866, the general knowledge and functional skills factor is ÿ=0.860, the daily use factor is ÿ=0.810, the professional production factor is ÿ=0.760, the confidentiality and security factor is ÿ=0.765, the social factor is ÿ=0.769. Internal consistency analysis for the overall scale is ÿ=0.922.

This six-factor scale explains 61.716% of the moral variance. The structure obtained by EFA results was tested using CFA. To obtain a suitable scale value (ft) in terms of the ft index, the modification index (MI) is calculated. Parallel to the modification and Sara indices, four items were removed from the scale and six error covariates were created (e1-e2, e6e-e7, e8-e9, e14-e17, e23 -e25, and e27-e29). When the modification indices (p, (ft value is acceptable).

3.2 Technological Literacy

The TL scale consisting of five factors and thirty-two items (Table 2) developed by[31] is used to determine student TL. According to Cronbach Alpha internal consistency scale analysis, the technology life-oriented skills factor is ÿ=.78, the nature of technology factor is ÿ=.73, the world of design factor is ÿ=.96, the design factor is ÿ=.63, the technology and society factor is ÿ=.66. The internal consistency analysis for the overall scale was ÿ=.86.

Table 2. The Technological Literacy Scale

Variable	Factor	Item	Example of statement items
Literacy Technology	1. Abilities for technological world	TL1-TL10	Before using a technology product, I check its positive and negative aspects (TL4)
	2. Nature of technology	TL11-TL18	Technology has a big role in human interaction with society (TL18)
	3. Designed world	TL19-TL24	In solving problems, humans process information with the help of technology (TL19)
	4. Design	TL25-TL29	Technology design must be functional (TL29)
	5. Technology and society	TL30-TL32	Problem identification is an important element of the design process (TL30).

In the data obtained in this study, the first four negative items were changed to positive. After data analysis, the KMO value for the scale was determined to be 0.874. The results obtained from the KMO and Bartlett Sphericity tests (ÿ2=4592.593, df= 496, p=.000) indicate that the data are suitable for factor analysis. Factor loadings varied between 0.707 and 0.378. The Cronbach Alpha value of the internal consistency coefficient of the scale is as follows: the technology life-oriented skills factor is ÿ=.812, the technology nature factor is ÿ=.721, the designed world factor is ÿ=.725, the design factor is ÿ=.705, Technology and society factors are ÿ=.711.

The internal consistency analysis for the overall scale was ÿ=.872. This five-factor scale explains 46.623% of the moral variance. The structure obtained by EFA results was tested using CFA. To obtain a suitable scale value (ft) in terms of the ft index, the modification index (MI) is calculated. Parallel to the modification and suggestion indices, eight items were removed from the scale and three error covariates were created (e1-e9, e12-e17, and e21-e22). When the modification indices (p, (ft value is acceptable).

3.2 Ecological Literacy

The EL scale consists of four factors and sixteen items (Table 3) developed by[40] which is used to determine student EL. According to Cronbach Alpha internal consistency scale analysis, the knowledge factor is ÿ=.91, the attitude factor is ÿ=.82, the skills factor is ÿ=.85, and the participation factor is ÿ=.72.

Table 3. The Ecological Literacy scale

Variable	Factor	Item	Example of statement items
Ecological Literacy	1. Knowledge	EL1-EL5	You know that the use of technology such as computers hurts on the environment (EL1)

2.	Attitude	EL6-EL8	You are aware of the importance of preserving the campus, home and community environment (EL6)
3.	Skills	EL9-12	You have adequate skills in utilizing and managing the environment (EL9)
4.	Participatio n	EL13-16	You participate in activities related to the environment (EL13)

Additionally, a CFA scale was also performed in which the ft index was found to be within acceptable limits. All items in the scale have the same structure and positive meaning.
After data analysis, the KMO value for the scale was determined to be 0.948. The results obtained from the KMO and Bartlett Sphericity tests (ÿ=5175.273, df= 120, p=.000) indicate that the data are suitable for factor analysis. The item loading factor varies between 0.768 and 0.446. The Cronbach Alpha value of the scale's internal consistency coefficient is as follows: knowledge factor is ÿ=0.875, attitude factor is ÿ=0.779, skills factor is ÿ=0.896, participation factor is ÿ=0.838. Internal consistency analysis for the overall scale is ÿ=0.940. This four-factor scale explained 72.053% of the total variance. The structure obtained by EFA results was tested using CFA. To obtain a suitable scale value (ft) in terms of the ft index, the modification index (MI) is calculated. Parallel to the modification and suggestion indices, one item was removed from the scale and four error covariates were created (e1-e3e, e4-e5, e7-e8, and e10-e11). When the modification indices (p, (ft value is acceptable).

3.2 G-Readiness

The G-Readiness measurement (Table 4) was developed from the Attitude component[19]. In this study, one factor was used, namely IT attitude with twenty items. The reliability coefficient was calculated at 0.93.

Table 4. The G-Readiness measurement: IT Attitude

Variable	Factor	Item	Example of statement items
G-Readiness	IT Attitude	GR1-GR20	I am aware and care about the impact of IT on environmental sustainability (GR1) I act responsibly as a student who is aware of sustainability (GR11)

In the data obtained in this study, the first ten negative items were changed to positive. After carrying out the analysis, the KMO scale value was determined to be 0.939. The results obtained from the KMO and Bartlett Sphericity tests (ÿ=5191.561, df= 190, p=.000) indicate that the data are suitable for factor analysis. The item loading factors varied between 0.642 and 0.449. The Cronbach Alpha value of the scale's internal consistency coefficient is 0.939. This single-factor scale explained 46.704% of the total variance. The structure obtained by EFA results was tested using CFA. To obtain a suitable scale value (ft) in terms of the ft index, the modification index (MI) is calculated. Parallel to the modification and suggestion indices, four items were removed from the scale and three error covariates were created (e2-e4, e5-e13, and e10-e161). When the modification indices (p, (ft value is acceptable).

4. RESULTS

Based on data analysis, a model is proposed that presents the level of influence of digital literacy, technological literacy, ecological literacy, and G-readiness on each other and the explanation ratio. The ft index is as follows: Chi-squared = 6621.737; df= 2128; p=.000; $x^{2/sd}$ (CMIN/DF=2.117; GFI=.912; CFI=.967; NFI=.902; AGFI=.865; RMSEA=.47 and SRMR=.088. These results illustrate an acceptable and desired level of the model fit index.
There were six latent variables and 25 observed variables in the Digital Literasi scale. Whereas DL1 and DL25 had to lowest effect coefficients, DL4 and DL21 had the highest effect coefficients hierarchically. Besides, the effect coefficients were between 0.89 and 0.46.

There were five latent variables and 25 observed variables in the Technology Literasi scale. Whereas TL6, TL22, and TL26 had to lowest effect coefficient, TL8 and TL30 had the highest effect coefficient hierarchically. Besides, the effect coefficients were between 0.97 and 0.58.
There were four latent variables and 15 observed variables in the Ecology Literasi scale. Whereas EL2 and EL7 had to lowest effect coefficient, EL3 and EL10 had the highest effect coefficient hierarchically. Besides, the effect coefficients were between 0.98 and 0.78.
There were 16 observed variables in the G-readiness scale. While GR6 and GR9 have the lowest effect coefficient, GR18 and GR20 have the highest effect coefficient among the overserves variables. Besides, the effect coefficients were between 0.78 and 0.55.
Based on the hypothesis, the following are obtained: digital literacy influences technology literacy positively at a level of 0.45. This result is confirmed by the accuracy of the hypothesis that appears in H1. Furthermore, digital literacy significantly explains technology literacy at a ratio of 34%. So, it can be said that changes in technology literacy depend on digital literacy by 34%. H2 is confirmed by these results.
H3 confirmed that digital literacy has a positive and significant effect on g-readiness at the 0.21 level. However, digital literacy certainly influences ecological literacy at the highest level and g-readiness at the lowest level. The research results also confirm that digital literacy influences ecological literacy positively and significantly at the 0.89 level. Therefore, the accuracy of the stated hypothesis H4 confirmed these results. Furthermore, it is confirmed that digital literacy explains Ecological literacy with a ratio of 79%. In other words, changes in Ecological literacy increased from digital literacy with a ratio of 79%. H5 confirmed these results.
Next, it is confirmed that technology literacy influences G-readiness positively and significantly at the level of 0.26. The accuracy of the hypothesis emerging in H6 is confirmed by these results. It is confirmed that Ecological literacy has a positive and significant effect on G-readiness at a level of 0.23. The accuracy of the hypothesis is stated in H7.
Based on the last hypothesis (H8), it is confirmed that digital literacy, technology literacy, and ecological literacy together significantly explain g-readiness with a ratio of 39%. Therefore, H8 has confirmed this result. So, the overall research results show that digital literacy, technological literacy, and ecological literacy together have a significant influence and explain students' IT G-Readiness.

5. DISCUSSION

This research examines the level of influence of digital literacy, technological literacy, ecological literacy, and IT g-readiness on each other as well as their explanation ratio. Therefore, eight hypotheses were developed within the research theoretical framework. In this section, the results of this study and the results of other studies will be discussed.
Based on the first hypothesis, it was found that student digital literacy had a positive and significant effect on technology literacy. In addition, by considering the second hypothesis, it is confirmed that students' digital literacy explains technology literacy significantly[46]. Students need to have digital literacy to use technology effectively and efficiently, as well as functionally[31]. In the literature, it is emphasized that there is a significant relationship between students' perceptions and beliefs about digital literacy and their attitudes towards technology[47]. Likewise, students' digital literacy has been considered an important element in ICT-supported education.
Based on the results of research conducted the perception of the use of Web 2.0 tools is positive and digital literacy has an impact on this situation. The results of H1 and H2 overlap with the results of other studies. Therefore, several studies reveal a positive relationship between digital literacy and technological literacy[31][45]. Next, it is confirmed that student digital literacy has a positive and significant effect on g-readiness (H3). Research by [19] states that self-efficacy in using computers significantly influences the readiness of academics to implement green ICT. Other research also shows a positive relationship between digital literacy and ICT g-readiness[40], [42].

Based on the fourth hypothesis, the results confirm that student digital literacy has a positive and significant effect on the literacy ecology, as well as the fifth hypothesis, it is confirms that student digital literacy explains the literacy ecology significantly. The research results for H4 and H5 are consistent with the research results of[22], [42], [43], [48]. Likewise, the results of other research confirm that there is a relationship between digital literacy and literacy ecology[49]. Meanwhile, the sixth hypothesis confirmed that student technology literacy has a positive and significant effect on ICT g-readiness. In research conducted by[50], it was revealed that technology literacy had a significant effect on ICT g-readiness[22]. Apart from that, there is an overlapping relationship with the results of H6. Likewise, H7, it is confirmed that student literacy ecology has a positive and significant effect on ICT g-readiness [12][35].

Based on the eighth hypothesis, it is confirmed that digital literacy, technological literacy, and ecological literacy together significantly explain ICT g-readiness. Likewise, several studies reveal students' positive attitudes towards ICT g-readiness[50]. Therefore, the results of the eighth hypothesis show that the four variables support, explain and are statistically compatible with each other[31][50].

6. CONCLUSION

Theoretical information in the literature and research results show that the level of digital literacy, technological literacy, and ecological literacy of students and students predict attitudes towards ICT G-Readiness. In other words, theoretical knowledge and research results show that students' levels of digital literacy, technological literacy, and ecological literacy have a significant influence and explain their ICT G-Readiness. It was revealed that digital literacy, technological literacy, and ecological literacy together significantly explained students' ICT g-readiness. In other words, it has been determined that digital literacy, technological literacy, and ecological literacy are important predictors of ICT G-Readiness. In addition, the exogenous variables digital literacy, technological literacy, and ecological literacy were found to significantly influence and explain, namely predicting the endogenous variable G-Readiness ICT.

Based on these results, the level of digital literacy of students should be determined and developed first so that they can have a positive and high attitude towards ICT G-Readiness, as well as technology literacy, and their literacy ecology in a positive and significant way. The research results show that technology literacy contributes to their attitudes towards ICT G-Readiness. Therefore, the high level of student attitudes towards ICT G-Readiness is closely related to an adequate level of Green IT. In addition, literacy ecology has also been determined to be effective in IT students' attitudes towards ICT G-Readiness.

In addition to the contribution of the study, some limitations that should be mentioned. Apart from digital literacy, technological literacy, and ecological literacy, other literacy types also affect attitudes toward applying G-Readiness ICT.

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