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Digital Mapping of Resilience and Academic Skills in the Perspective of Society 5.0 for Higher Education

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Abstract; The Covid-19 pandemic has changed the policy of higher education in Indonesia from conventional learning to online. This policy change encourages students to have psychological resilience and adaptability through digital resilience and academic skills. The research method is divided into two stages: qualitatively formulating a measurement construct using an open-ended questionnaire with a total of 137 respondents. Based on the qualitative data, a digital measuring instrument for resilience and academic skills was developed as a 5-choice Likert Scale. The second stage is carried out quantitatively, looking at the reliability and item-total correlation test to select items not aligned with the measuring function using the Statistical Program for Social Science.. The results showed that 64.9% of respondents had high resilience, 33.8% had moderate stability, and 1.2% had low strength. While analyzing the items measuring digital resilience and academic skills research, it was found that Cronbach's Alpha reliability value was 0.917. So the measuring instrument for digital resilience and academic skills is reliable and appropriate to be used to explain the condition of students during Covid-19.

Keywords: covid- 19, digital, Society 5.0

INTRODUCTION

The Covid-19 pandemic has forced Indonesia's education system and all its aspects to make significant changes. These changes bring negative and positive impacts by accelerating the transition of the Industrial Revolution 4.0 to the era of Society 5.0, such as the use of Artificial Intelligence and its implementation in many people's lives. [1]. The presence of the period of Society 5.0 is a great opportunity and a challenge for the world of education, including the learning system that must change from conventional learning to online learning. So it is necessary to increase the capacity and ability of universities, lecturers, facilities, and infrastructure. Students must change towards information technology [2].

The learning scheme must change to face the new normal after the Covid-19 Pandemic. Need to innovate learning systems that are starting to change from conventional learning to digital learning [3]. The learning process in higher education must shift from the traditional to the online learning process. Hence, universities need to increase the capacity of the online learning system [4]. Digital learning models that are implemented require a long process that requires valid and reliable evidence-based. Not to mention the problem of describing the condition of digital soft skills and digital literacy. So learning in the era of Society 5.0 requires students and institutions to have strong abilities to adapt to massive technological developments [5]. This capability is known as digital resilience [6].

Digital resilience in the perspective of Society 5.0 can refer to the resilience of individuals or institutions against various forms of risk that threatens Society 5.0 in the communication space or digital interaction space [7]. The conditions of digital resilience include the stages of anticipating, recognizing, and defending against threats present in the digital world [8]. Resiliency is not an immutable trait because it is a dynamic process and involves positive adaptation in the face of challenges and difficulties in life [3]. Masten, Best, & Garmezy describe three characteristics of resilience. First is an individual's ability to face problems and adapt to unpleasant conditions; second is the ability to adapt to stressful life experiences. And Third, the ability to deal with situations that have caused trauma, such as natural disasters, the death of close people, or others' experience having an accident [9]. Hanewald describes three forms of resilience, namely: (1) overcoming the odds, which describes the individual's strength in facing difficulties, (2) coping, the ability to face various forms of adverse risk; and (3) recovery from trauma is the ability to bounce back from adversity or adversity. [10].

[11] describe that students with academic resilience prefer to work hard, rarely leave class, and rarely experience problems. [12] added that other academic resilience characteristics are insight, independence, creativity, a sense of humor, and initiative. In short, academic resilience is influenced by several supporting factors, which will be the key to the success of students passing through the academic stages in higher education.

Figure 1. Supporting Factors of Resiliency in Students

Figure 1 shows several supporting factors for resilience that individual students can have. The first supporting factor is a factor from within the individual. [13] said that every individual has innate genetic resilience, which can be revealed naturally by the presence of several attributes in the environment in which they are located. Several personal supporting factors are problem-solving skills, independence, self-efficacy, social skills, and internal locus of control with a high level of involvement, all of which are considered characteristics of individuals with academic resilience. Problem-solving skills include making plans, processing

several alternative solutions in difficult situations, and thinking critically, creatively, and reflectively.

The following supporting factor comes from the family, where the family can have a positive or negative influence on students' academic success. [14] said that successful students depend on the family's support and the parents' role as caregivers and motivators. Students benefit from parental involvement through good attendance, reasonable homework completion rates, good graduation rates, participation in extracurricular activities, and a positive attitude toward parents.

Resiliency studies were found to be associated with other psychological variables. Research by [15] shows that religious belief positively relates to resilience, and strong religious belief is a predictor of the formation of the resilience variable. [16] says that gratitude is related to resilience, but [17] research shows the opposite result, where gratitude is not related to resilience. Several characters are also considered supporting factors for resilience. Such as courage, creativity, curiosity, justice, forgiveness and forgiveness, hope, humor, integrity, kindness, leadership, love to learn, open-mindedness to input, self-resilience, perspective, wisdom, self-regulation, social intelligence, spirituality, and vitality. However, only some studies still discuss the relationship between academic resilience and gratitude. In addition, the results of studies that look at the relationship between resilience and gratitude seem inconsistent.

Based on the explanation above, the challenge in the era of Society 5.0 is the improvement of digital soft skills, especially digital resilience and academic skills. Research on mapping digital resilience from the perspective of Society 5.0 has been carried out in several countries but specifically has yet to be found in Indonesia. Research on digital resilience has previously been conducted in various countries. Therefore, research is needed to map digital resilience and academic skills from the perspective of Society 5.0 in Indonesia. The research questions that will be found in this study are as follows: a) What is the description of the digital resilience and academic skills of the Society 5.0 perspective? b) What factors affect the digital resilience and academic skills of the Society 5.0 perspective, and c) How are the digital resilience and academic skills framework of the Society 5.0 perspective?

Research purposes

Based on problems and contexts faced in the world of education, the objectives of this research are: (1) to develop a digital framework for resilience and academic skills from the Society 5.0 perspective for students at the tertiary level, (2) to map the digital conditions of resilience and academic skills of students from the Society 5.0 perspective in Indonesia, and (3) describe the factors that influence the digital resilience and academic skills of students from the Society 5.0 perspective.

LITERATURE REVIEW

Society 5.0

Society 5.0, or what can be interpreted as society 5.0, is a concept that the Japanese Government initiated. The Society 5.0 concept is not only limited to manufacturing factors but also solves social problems with the help of the integration of physical and virtual spaces [18]. Society 5.0 has the concept of big data technology collected by the Internet of Things (IoT) [19] changed by Artificial Intelligence (AI) [1] be something that can help the community so that life becomes better [20]. Society 5.0 will impact all aspects of life, from health, urban planning, transportation, agriculture, industry, and education (Law of the Republic of Indonesia on the National Education System).

Currently, education in Indonesia is entering the 4.0 era. The current trend in Indonesian education is online learning [21] which uses the Internet as a liaison between teachers and students. Technology development is an educational business opportunity to establish online-based tutoring [22]. In addition, technological developments have also changed the education order in Indonesia; for example, 1) since 2013, the national examination system has changed from paper-based to online-based tests. [5], 2) the admission system for new student admissions from elementary school to university level in Indonesia has been carried out online, from registration to announcement of admissions. [23].

The stages of development from Society 1.0 to Society 5.0 can be seen in Figure 4. The principal capital to go to Society 5.0 is the accumulation of organized data in Big Data and reliability in the product manufacturing process through the possession of appropriate advanced technology. Nevertheless, fundamental obstacles still need to be overcome to enter the Society 5.0 era, including health, mobility, infrastructure, and financial technology (financial technology or fintech). (Society, nd).

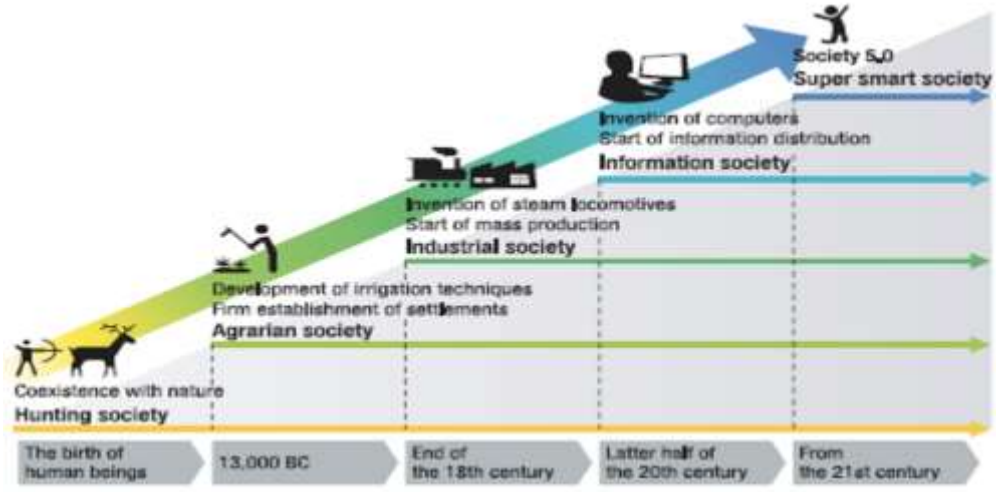

Figure 4. Developmental Stages from Society 1.0 to Society 5.0 Source:(Fukuyama, 2018)

Society 5.0 is based on IT systems featuring an iterative cycle in which data is collected, analyzed, and then transformed into meaningful information, which is then applied in the real world; moreover, this cycle operates at the level of society at large. Society 5.0 identifies three elements that drive social innovation: data, information, and knowledge [24]. Public awareness, data, news, and knowledge spur future social innovation for social systems [21].

Society 5.0 encourages changes in technology applications back to their original purpose, namely serving humans and making human life easier and more comfortable through fulfilling all human interests appropriately, effectively, and efficiently. [25]. Claims, in this case, include interests in individual and social contexts, which cannot be fulfilled in the era of the industrial revolution 4.0, which creates a significant gap in social interaction. Such as the sinking of individuals in their busyness with technological devices to ignoring the surrounding environment or the low level of human awareness to help. Address the humanitarian problems that occur in other parts of the world.

There are many challenges and changes to be made in this era of Society 5.0. Including those that the education unit must prepare as the main gate to preparing excellent human resources. It is considering the critical role of the world of education in improving the quality of human resources in the era of Society 5.0. In this world of education, educators minimize their role as learning material providers; educators become an inspiration for the growth of

students' creativity. Educators act as facilitators, tutors, motivations, and true learners who motivate students to Learn Independently. [26].

Digital Resilience

Resilience implies a process of creating positive development for the long-term learning process. The term digital resilience continues with discussions related to 'lifelong learning. Digital resilience is closely related to education, which refers explicitly to using equipment or technological completeness as a digital resource to carry out a long-term educational process in the digital era. [27].

Digital resilience is defined as a resource that is important to sustain human life in the digital era. Digital resilience refers to technology such as the Internet in the digital age and society 5.0. Digital resilience plays a role in recognizing and processing knowledge gained from technological developments through digital platforms so that 5.0 people can socialize and work online [28]. Efforts to build digital resilience are essential in realizing a good life in this era of technological advancement. The purpose of building digital resilience includes several factors, such as individual fragility factors, personal factors, social factors, and digital factors. Some places can be a source for building digital resilience, such as homes and schools [29].

Digital resilience can also be understood as a step to create resilience against various forms of enemies that threaten society 5.0 in the communication space or digital interaction space. The conditions of digital resilience can include anticipating, recognizing, and defending against threats that are present in the digital world [8]. This study's efforts to build digital resilience refer to the steps taken through education to achieve community digital resilience 5.0. Digital resilience or digital resilience cannot be separated from the context of policy-making, community culture, and social situations. Any three contexts show an understanding that society 5.0 has various aspects related to public awareness, changes in community behavior, and adaptation. [3]. Creating digital resilience from a social perspective is essential to maintaining human life as individuals and communities.

Efforts to build digital resilience are essential in achieving a digital society's success in the era of Society 5.0. It is marked by the advancement of digital technology that enters various aspects of human life. The change or transformation of society 4.0 towards Society 5.0 shows that digital resilience is needed to create a better life in a digital society, especially in improving the quality of life alongside technological advances. Digital resilience in the perspective of Society 5.0 contains an understanding of human intelligence in the Society 5.0 era in optimally socializing through digital platforms [21]. Thus, the intelligent society era is in the Society 5 phase.

Academic Skills

Society 5.0 is a progress and a challenge for academics, and the readiness of educational institutions to face this is a necessity that cannot be avoided. Because educational institutions as a forum to improve the quality of human resources plays an essential role in preparing a generation ready to survive in the face of various future challenges. The impact of Society 5.0 on various aspects of life is the efficiency process by maximizing the performance of digital devices and degrading most human roles [30]. Essential academic skills to be developed in the era of Society 5.0 are problem-solving, critical, and creative thinking skills. According to Predy, five skills are considered necessary in developing human resources in education: professionalism, competitive power, functional competence, participatory excellence, and cooperation. [31]. In addition, Society 5.0 has an effect on student learning patterns as follows: 1) learning without time and place limits (blended/online

learning), 2) individual learning, 3) project-based learning, and 4) learning to solve problems [31].

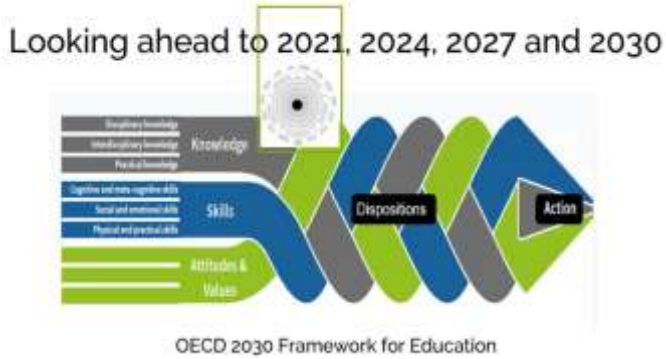

Figure 5. OECD 2030 Learning Framework

Referring to the Figure 5 above, the Organization for Economic Co-operation and Development (OECD) said that there are three aspects of academic skills, namely: 1) knowledge, 3) skills, and 3) attitude. Furthermore, it is described in detail that academic skills in the knowledge aspect are divided into four abilities: 1) single discipline, 2) multi-discipline, 3) epistemology, and) procedural. In the part of skills, there are three abilities: 1) cognitive and metacognitive, 2) social and emotional, and 3) physical and practical. For aspects of attitudes and values, there are four abilities, namely: 1) personal, 2) local, 3) social, and 4) global [32].

RESEARCH METHODOLOGY

This study was designed using a combination of qualitative and quantitative methods. A qualitative approach is carried out in describing the condition of digital resilience and student academic skills from the perspective of Society 5.0 in Indonesia. A quantitative approach is used to determine the factors that influence digital resilience and academic skills in higher education from the perspective of Society 5.0.

The research is divided into two stages. The first stage is to formulate the measurement construct with an open-ended questionnaire qualitatively. The second stage, namely constructing the Digital Resiliency and Academic Resiliency scale in the form of a Likert Scale of 5 answer choices (Highly Incompatible/STS, Not Appropriate/TS, Neutral/N, Appropriate/S, and Very Appropriate/SS) based on qualitative data obtained in the first stage. As previously explained, the construction of measuring instruments in this study was adopted from the theory of the Organization for Economic Co-operation and Development for Digital Resiliency and the theory of [33] for Academic Resiliency.

Respondents who participated currently attending lectures. Online. Twenty-one students participated in the first stage, while 116 were in the second. The administration of the open-ended questionnaire and the scale to the respondents is done online by providing a Google Form link.

Resiliency Digital Instruments

The instrument used in this study is a psychological resilience scale adapted from The Connor-Davidson Resilience Scale (CD-RISC). CD-RISC was developed by [34] to measure

psychological resilience through 5 dimensions, namely: 1) Personal competence, high standards, and tenacity, 2) Trust in one's instinct, tolerance of negative affect, 3) Positive acceptance of change and secure relationship, 4) Control, 5) Spiritual influence. In this scale, there are 25 statement items with answer choices from a scale of 1 (very inappropriate) to a scale of 5 (very appropriate) (See Table 1). The adaptation scale was first tested for validity and reliability in this study. Based on the reliability test results, Cronbach's Alpha coefficient was 0.93, and all items were declared valid (with an inter-item correlation of 0.3).

Academic Resiliency Instruments

The measurement construction of the measuring instrument in this study was adopted from [33] theory of Academic Resiliency. According to [33], Academic Resiliency is an individual's ability to increase success in education, even in difficult situations. Cassidy further explained three aspects that make up Academic Resiliency: (1) Perseverance, which describes individuals who work hard (keep trying and do not give up quickly), focus on plans and goals, receive and utilize feedback, and can solve problems, Creatively and imaginatively, and position adversity as an opportunity for growth; (2) Reflecting and adaptive help-seeking (reflecting and adapting in seeking help), namely individuals who can reflect on their strengths and weaknesses and can seek help, support, and encouragement from other individuals as an effort to individual adaptive behavior; (3) Negative affect and emotional response (negative affect and emotional response) is a picture of anxiety, negative emotions, optimism-pessimism, and negative acceptance possessed by individuals during life.

In this case, resilient individuals can avoid things related to negative responses, feel calm (low anxiety and have meaningful feelings where individuals have confidence in their goals in life and the things they live in).

Data analysis

Before collecting data with questionnaires, validity and reliability tests were carried out on the research instruments used, which were carried out in Year 1. The validity test was carried out with evidence based on content which was carried out by conducting content assessments by experts (expert judgment). Moreover, evidence-based constructs, namely through Explanatory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA), to obtain a fit model of the digital resiliency research instrument and academic skills of the Society 5.0 perspective students. The reliability test used Cronbach's Alpha statistical test with Cronbach's Alpha value above 0.6. Furthermore, to test the overall results regarding the mapping of digital resilience and academic skills of Society 5.0 students in Indonesia, Structural Equation Modeling (SEM) analysis will be carried out.

DISCUSSION

This study aims to obtain an overview of resilience in students during the online learning period, which in Indonesia began around mid-March 2020. From the results of research conducted on 137 students from various campuses in the city of Bandung, which were born in the time range from From May to June 2022, it is shown that the ability of these students to overcome various obstacles and difficulties experienced during online learning is generally in the high category. The data shows that more than half of the respondents (64.9%) are in the high category. Meanwhile, 33.8% of the respondents were in the medium category, and only a tiny proportion (1.2%) were in the low category. These data indicate that, even though they are in an online learning situation during the Covid-19 Pandemic, students show their psychological capacity and ability to overcome various complex

problems during the online learning process. Where in this online learning, many situations have the potential to weaken the passion for learning and interfere with learning performance. Such as the lack of infrastructure such as books, laptops, and others when students are in their hometowns; inadequate internet network; a situation in the family or home that is not conducive; and so forth. However, despite these stressful conditions, most students have solid beliefs and positive perceptions about their ability to face various demands and difficulties. As well as, changes that occur during online lectures can manage various stresses experienced, so they are not frustrated, can see the spiritual side of difficult situations that arise, and get up from adversity or uncomfortable situations encountered in this pandemic situation and online learning. [35] describes resilient students as individuals who maintain and maintain their motivation and performance even when faced with stressful situations or situations that have the potential to reduce learning performance.

CONCLUSION

Based on the results and discussion described , the following conclusions can be drawn:

1. Based on the categorization of the results of the resilience score, it is known that there are 64.9% of respondents with high resilience, 33.8% have moderate resilience, and 1.2% have low resilience.
2. In the sub-dimension of personal competence, high standard, and tenacity, 64.9% is classified as high, 33.3% is classified as moderate, and 1.8% is classified as low.
3. In the sub-dimension of trust in one's instinct, tolerance of negative affect, 54.7% is high, 43.6% is moderate, and 1.8% is low.
4. In the positive acceptance of change and secure relationship sub-dimensions, 47.9% is high, 47% is moderate, and 5.1% is low.
5. In the control sub-dimension, 59.9% were classified as high, 38.9% were classified as moderate, and 1.2% were classified as low.
6. In the sub-dimension of spiritual influence, 87.1% is high, 12.1% is moderate, and 0.8% is low.
7. Based on the analysis conducted on the items measuring the academic resilience research instrument, 41 items were obtained for the Academic Resilience Scale with a Cronbach Alpha reliability value of 0.917. So this measuring tool is reliable and appropriate to explain students' academic resilience during Covid-19.

[1] https://www8.cao.go.jp/cstp/english/society5_0

[2] https://www.sphinx-it.eu/from-the-agenda-of-the-world-economic-forum-2019-society-5-0/

[3] https://en.wikipedia.org/wiki/Society#Types

[4] https://image.slidesharecdn.com/20078bersintechhrindiajoshbersin-170802201549/95/the-hr-software-market-reinvents-itself-33-638.jpg?cb=1501705039

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