

Analyses Based on Theory of Capital Based Approach on Indonesian Graduate Employability

Anak Agung Ayu Redi Pudyanti¹, A.A. Ngurah Agung Redioka², Viola Tashya Devana³
STMIK Primakara^{1,2}, University of Raharja³
Denpasar, Bali^{1,2}, Cikokol, Tangerang/(021) 55295863³
Indonesia^{1,2,3}

e-mail: redi@primakara.ac.id¹, redioka@primakara.ac.id², violatashya@raharja.info³



Author Notification
07 March 2022
Final Revised
05 April 2022
Published
07 April 2022



To cite this document:

Redi Pudyanti, A. A. A., Redioka, A. N. A. ., & Devana, V. T. Analyses Based on Theory of Capital Based Approach on Indonesian Graduate Employability. *ADI Journal on Recent Innovation*, 4(1), 25–33.

DOI : <https://doi.org/10.34306/ajri.v4i1.726>

Abstract

The employability of graduates is of global concern. This is one of the most important difficulties in ensuring a smooth transition of graduates from education to industry. Therefore, there are ongoing discussions in many countries about how to improve graduate employment. So the term "employability" was coined to characterize someone who is able to work. This study looks into differences in graduate employment perspectives. This paper uses a literature study method. Information in this study came from secondary sources. Information is collected from several published papers, internet sources, and newspapers. Therefore, the purpose of this study is to examine the perspectives of the government, higher education institutions, industry, and graduates on the employability of graduates in Indonesia. It is hoped that this will help Indonesian graduates find work in the future. Therefore, the gap can be a useful solution for the future of graduate work in Indonesia.

Keywords: Graduate, Employability, Indonesia, University



1. Introduction

Graduate employability is a worldwide topic. The smooth transfer of university graduates into the industry is one of the most essential challenges. As a result, there are continuing conversations in many nations about how to improve the employability of graduates. Beveridge defines used the term "employability" to describe a person who could work [1]. Over time, the definition of employability has changed. When reading the literature on employability, one will come across a variety of definitions. Employability is defined as a set of skills, knowledge, and personal attributes that enable graduates to find work and flourish in their chosen fields, benefiting themselves, the workforce, the community, and the economy. Initially, employability was simply defined as the capacity to work [2]. According to some academics, employability is more than just possessing a list of talents that employers need, but rather an integration of various assets or resources. The capability of acquiring work, functioning effectively within work, shifting between jobs/roles, and having the skills, knowledge, and traits that make this possible after reviewing a large body of literature. Following that, finding work and excelling in your current or previous job responsibilities are signs of employability [3].

Employability as a concept is more of a contested nature. Throughout the literature, employability has been studied and understood in various ways. Employability is defined as a set of skills, knowledge, and personal attributes that enable graduates to find work and flourish in their chosen fields, benefiting themselves, the workforce, the community, and the economy. Initially, employability was simply defined as the capacity to work [4]. In general, scholars have claimed that a person's employability is influenced by human capital and others believed that human capital only will not be sufficient, therefore there are various capitals needed as graduate attributes [5].

Human capital theory believed that a person with more education and training is able to provide more productive work than someone with less education and training [6]. In order to improve organizational performance, the value of a human capital theory is widely accepted, thus a company relies on employees' skill, knowledge, and ability as a crucial notion of value creation [7].

However, this approach has been criticized in a huge body of research since the concepts of graduate qualities are perplexing. Human capital alone cannot fully support graduates' smooth transition to an employability setting. The skills program's proponents argue that providing students with employable skills outside of their formal academic learning prepares graduates to face the demands of graduate-level work in the future [8]. Consequently, a capital-based approach is discovered. It tries to outlook the concept of employability beyond the human capital's point of view, it realizes there are many factors out of human capital that might help graduates ready for employability [9]. The concept of capital is believed to play an important role in determining one's success.

There are many different perspectives on employability. The same perspectives among graduates, higher education institutions, government, and industry need on how the graduate employability are prepared, will help the current situation on employability issue [10]. Therefore, the aim of the research is to analyze the perspectives of government, higher education institutions, industry, and graduates on Indonesian graduate employability. It is hoped to contribute to Indonesian graduate employability in the future [11].

2. Objectives of the Study

This study aims to analyze perspectives on Indonesian graduate employability and find the gap among the perspectives, investigated using the theory of capital-based approach.

3. Methodology

The study discussed the gap among perspectives on graduate employability. The paper is based on secondary sources of information. The data has been collected from different published papers, internet sources, and newspapers.

4. Conceptual Framework

a. Human Capital Approach

There are many types of research focused on human capital theory in which to enhance employability, it is necessary to improve the human capital which is often referred to as knowledge acquisition and professional skills. In most of Higher Education Institutions (HEIs) context frequently embedded with soft skills, graduate competencies, work-ready skills, generic skills, transferable skills [12].

Many countries have backed the skills agenda over the last two decades. Following the Bologna Process, the main goal of European higher education reforms. Not only European, Australia, New Zealand, and Canada have also all expressed their support by establishing institutional and government-based skills frameworks. Higher education in the United Kingdom is primarily focused on acquiring discipline-specific information and professional skills [13]. Higher Education Institutions (HEIs) have been aggressively incorporating graduate qualities such as 'soft skills,' 'graduate competencies,' 'work-ready skills,' 'generic skills,' and 'transferable skills' to improve graduate employability. This agenda is primarily inspired by the human capital approach, which believes that gaining skills and specialized knowledge in higher education will help graduates find better jobs [14].

Graduates convey degrees, knowledge, skill, and abilities, as well as their hopes, to the industry. It is believed that a person with more education and training is able to provide more productive work than someone with less education and training. In order to improve organizational performance, the value of a human capital theory is widely accepted, thus a company relies on employees' skill, knowledge, and ability as a crucial notion of value creation [15]. However, this approach has been criticized in a huge body of research since the concepts of graduate qualities are perplexing. Human capital alone cannot fully support graduates' smooth transition to an employability setting. The skills program's proponents argue that providing students with employable skills outside of their formal academic learning prepares graduates to face the demands of graduate-level work in the future [16]. Therefore, analysts of the labor market and policymakers are viewing it as a holistic understanding of employability in order to provide a true account of the aspects that affect people's job searches.

b. Theory of Capital Based Approach

• Bordieu's Theory of Capital Based Approach

The capital-based approach tries to look at the concept of employability outside of a human capital point of view, recognizing that there are many factors outside of human capital that can help graduates become employable. Based on the concept of capital, it is said that economic, social, and cultural capital all play a role in determining one's success [17].

Capital can take three forms: economic capital, which is immediately and directly convertible into money and may be institutionalized in the form of property rights which is interrelated and often the roots of other types of capital; cultural capital, which is convertible into economic capital under certain conditions and may be institutionalized in the form of educational qualifications; and social capital, which is made up of social obligations or connections and is exchangeable into economic capital under certain conditions and may be institutionalized in the form of educational qualifications [18]. Further explained that cultural capital can take three forms: long-lasting natures of the mind and body in the personified stage; cultural properties (pictures, books, dictionaries, instruments, machinery, and so on) in the actualized stage; and educational qualities in the institutionalized stage. Depending on the time period, society, and social class, cultural capital can be accumulated to varying degrees [19]. The other type, which is social capital is the source of actual or potential resources linked to the possession of a long-term network of mutual social contact and acknowledgment which provides a recommendation that offers recognition in various

senses. The relationship may only exist in a practical sense, in the form of material and/or symbolic exchanges that support the preservation [20]. The last one is economic capital which can be considered the root of other capitals. Many types of capital can be obtained from economic capital, but only at the expense of a more or less significant transformation effort.

- **Development of Capital Based Approach**

The graduate capital model and its relationship to graduate employability are defined. This theory of capital advances the previous theory of capital, which includes five working capitals: human, social, cultural, identity, and psychological [21]. Human capital refers to the knowledge and skills graduates acquire as a basis for their labor market outcomes. Human resources are obtained through formal education, training, and others to empower students in work.

Social capital refers to social relationships and networks articulated by family, peers, higher education, and social organization that can facilitate graduate access to the labor market. A social network that has been evidence to support the negotiation of graduates' employability includes connections with employers, alumni mentorship, and relationship with supervisors and academics [22]. Additionally revealed that developing connections with people in co- or similar ethnic communities could leverage job opportunities for graduate migrants. Besides social capital, it is also important to understand the culture of the job environment, which often refers to cultural capital [23]. This type of capital refers to cultural knowledge, insight, information, regulations, and work-related practices that are valued in the employment which graduates need to embody in order to signal their attractiveness to employers. It is often illustrated as a personality package including accent, body language, and humor. The other type of capital is Identity capital, it is the level of personal investment a graduate makes toward their future career and employability. Curriculum Vitae (CV) is used as a tool allowing graduates to compile narratives of the graduates' identities to impress employers [24]. Developing professional identity during university years is a critical dimension of students' employability, yet has attracted relatively less attention than the dominating skills agenda. Identifying capital enables students to understand their personal values and goals, how they fit with different careers of interest, forms and articulate their professional self to relevant others, including recruiters and employers, and facilitates university to work transition [25]. Finally, psychological capital is a capacity that enables graduates to adapt and respond proactively to inevitable career challenges. This capital is increasingly important because of the competitiveness and uncertainty of employment in today's labor market. Stronger resilience enables graduates to adapt to challenging labor market situations, including periods of unemployment and under-employment or disappointment due to job rejection.

Most recently, agentic capital is developed which complements Tomlinson's capital-based approach. Agentic capital is described as the integration, combination, and recombination of resources so that graduates have to be used efficiently and strategically deploy their employment. Agentic allows graduates to work across cultures and manage the diversity of many identities.

5. Finding and Discussion

a. Graduate Employability in Indonesia

In the relation to Indonesian context, there has been a relatively high unemployment rate phenomenon that cannot be solved over time. In February 2021, there are 8.75 million unemployed in Indonesia. The government and Higher education sectors believed that unemployment in Indonesia is mainly due to skill mismatch and talent shortage. Certain research also indicates a shift in qualifications and skills required in the industrial era 4.0 [26]. Align with this, most of the government support and program on employability are focused on human capital development. Likewise, the government programs are followed by the research and program done in the Higher Education Institutions (HEIs), which emphasize human capital

as the focus of their effort on improving graduates' attributes on employability. It is expected that having a defined strategy for developing students' competencies and skills will have a direct impact on graduates' employability.

b. Government Perspective

Like many former research types, most of the Indonesian research on employability is focused mostly on the human capital side. It is including skills and competency analysis of the graduates. Align with this, most of the government support and program on employability are focused on human capital development the government program begins with vocational senior high school (SMK) and continues through higher education institutions like as colleges and universities, with the main goal of 'connecting and matching' schools and industry [27]. Furthermore, teenagers in Indonesia have access to both formal and non-formal education and skill development opportunities. The government has taken steps to increase the quality and relevance of training in public vocational education and training centers known as the Balai Latihan Kerja in order to provide young people with vocational skills (BLK). Every Indonesian receives free vocational training at these institutes. In addition, the Indonesian government established the Pendidikan Kesetaraan (Equivalency Education), which allows people to enroll in non-formal education depending on their most recent level of formal schooling. These institutions adhere to national standards in terms of curriculum, learning, and evaluation [28]. Those who successfully finish their study at these schools receive a certificate that is comparable to a school completion certificate in the formal education system, as defined by the National Education System Law of 2003. In addition to non-formal education, the government has also launched the Kartu Prakerja Program (Pra-occupational card), a program that can help people enhance their skills and prepare for the workforce. Indonesia's national government has prioritized skill development in recent years and will continue to do so in the future. The Ministry of National Planning/Bappenas has also emphasized the importance of boosting workforce competitiveness by implementing four primary strategies: competency certification, collaboration programs, training programs, and economic productivity in certain industry sectors. Collaboration with vocational high schools and further education institutions to guarantee that young people may successfully transition from education to employment. Additionally, on the higher education side, since 2017 Ministry of Education and Culture has developed National Qualification Framework, referred to as KKNi in order to standardize the human resource quality in Indonesia. This national qualification framework has several implications for the higher education system and standardization. In order to fit the Indonesian Qualification Framework to Indonesian Higher Education System, government compose a national standardization for the higher education system, referred to as SN-Dikti. The standardization includes several aspects, namely: education, research, and community services. Additionally, to support KKNi and SN-Dikti, in 2020, the Ministry of Education and Culture launched a program called Merdeka Belajar Kampus Merdeka (MBKM), which is a framework for upgrading the link and match between the graduates' quality of higher education with the need of industries as well as the future demands. This program gives rights to students getting integrative study experiences and competencies through a linear or interdisciplinary program. There are eight main activities highlighted in the program, namely: students' mobility, internships, teaching assistance at schools, research, social work, entrepreneurship, independent study project, and thematic community services program in remote areas. The programs are expected to enhance students' employability capital and are ready for the industry. Overall, most government programs focus on skill-based development and training. It emphasized human capital development to support the graduates' employability.

c. Higher Education Perspective

Likewise the government programs, and implementation in Higher Education Institutions (HEIs) are in line with the government's program, which highlights human capital as the focus of their effort on improving graduates' attributes on employability. Higher education institutions are implementing several strategies in order to enhance their graduates' capital such as studying subjects focusing on knowledge and skills, training, internship, research, seminar, and conferences that mainly focus on human capital which can be defined as knowledge, skill, and degree [29]. It was discovered that having a defined strategy for developing students' competence will have a direct impact on graduates' employability. Indonesian higher education has also started to implement the Merdeka Belajar Kampus Merdeka Program to upgrade

students' readiness for the labor market. There are eight main activities highlighted in the program, namely: students' mobility, internships, teaching assistance at schools, research, social work, entrepreneurship, independent study project, and thematic community services program in remote areas [30]. The programs are expected to enhance students' employability capital and are ready for the industry. Even though the implementation needs improvement due to the newly launched program. As founded, most of the programs implemented in Higher Education institutions, are supporting the government program which is considered more human capital development.

d. Industry Perspective

On the contrary, from the industry side, many studies suggest that users (companies/industries) want personnel who can adjust to changing conditions and master beyond technical skills. The ability to adapt requires not only cognitive excellence but also some general skills. UNESCO and the International Labour Organization (ILO) provide an overview of general skills, which include: adaptation; organizing; solving problems, independence; lifelong learning; reading, writing, and counting; listening; communicating; interacting; creative thinking; working in groups; mastering basic technology; leading; and following directions. Conducted a study to examine the employer's needs for engineering employability skills in Indonesia. The results showed that companies required skills beyond the work-specific skills, including foreign language (especially English) and communications. Further on the competencies needed by accounting fresh graduates based on perceptions of accounting practitioners, namely: work ethics, interpersonal skills, good leadership, responsibility, analytical ability, skills, ability to adapt, and working experience. Moreover, identify employability skills needed for machine operators, namely: 1. communication and listening skills; 2. self-quality: attendance, collaboration, responsibility, honesty, flexibility, empathy; 3. thinking skills: creativity, problem-solving; 4. management: self-management, planning; 5. System and Technology: production flow system and job field mastery concept. In relation to the capital-based approach, these findings show that industry not only needs the employee to have human capital, but also the ability to adjust themselves to the professional world, such as communication and socialization skills, considered cultural capital; adaptation skills to the environment, which is considered psychological capital; self-management, planning, and goals, which is considered as identity capital and the ability to use all combination of capitals interchangeably which is called as agentic capital.

e. Graduates' Perspectives

In line with the industry point of view, several kinds of research conducted from Indonesian graduates' sides found that graduates shifting to the industry needs beyond human capital. Research on the challenges of Indonesian graduates after graduation, the samples are 50 graduates of females and males, from 10 private universities in Jakarta. From the male group, it was found that 40,50% of male graduates are struggling in finding a job, 22,65% are working in the family business, and 36,86% are working on their desired job. From the females' group, it was found that 85,77% of the students do not seek form employment because they are hired before or directly after graduation, and 14,23% are planning to get a job. It is stated that female graduates typically begin their professional careers through colleagues and acquaintances who work for a particular company. It is further stated that students frequently begin looking for jobs based on their interests or planned careers before they graduate from college. Graduates who have hobbies or are involved in anything will cognitively understand the benefits and drawbacks of their careers before getting involved. They will determine whether to accept or reject the career; in this case, it is each new Indonesian graduate student's decision-making process. This clearly demonstrates that their professional choices will have an impact on their talent and expertise as well as their chosen hobbies during college. Graduates who are interested in skill-based employment will make better decisions. This conclusion backs up previous studies that show a desire to influence employment choices based on goals and self-confidence. These data suggest that graduates' preferred fields or interests have an impact on where they choose to work in the labor market.

As seen from the above cases some of the male graduates get their job in a family business context. Moreover, female graduates generally begin their professional careers by networking with co-workers and friends who work for a certain company. Based on the capital-based

approach, social capital can both help and hinder students' transition experiences. Social capital refers to social interactions and networks with relevant others, such as family, peers, higher education institutions, and social organizations. In this case, it is one of the factors that help graduates successfully get a job. Moreover, it was founded that students who have prior employment background during the college period will have clearer goals and better decisions on career paths. As stated the amount of personal investment a graduate puts in their future profession and employability is referred to as identity capital. Active self-investment and preparation for what one does shape an individual's personality. For example, career identity encompasses attributes such as career motivation, personal meaning, and individual values by addressing 'who I am or want to be.

Another research established research on evaluating the preparation programs of Indonesian youth for the health workforce through a program called Pencerah Nusantara. It was founded that communication issues are common when deployed in multiple cultural situations. Because Indonesia has such a diverse range of cultures and languages, researching cultural distinctions before deploying Pencerah Nusantara is seen as an effort to improve communications with locals. Cross-cultural adaption training was included in PN's intense training program to address the problems. CCT has long been promoted as a method of enabling effective cross-cultural encounters. PN also learn and practices the local language and culture through contact with local health workers when they first arrive on the ground. PN can build trust with communities by speaking to them in their own language, which will help them deal with them more effectively and implement health interventions. Not only the culture, but the findings also imply that a one-year team-based deployment program in a remote area can help early-career health workers in Indonesia improve their skills and personal attributes, such as resilience and proven leadership, which bring a positive impact on their employability. In regards to the capital-based approach, the arts of dealing with local people and understanding their culture is considered cultural capital which refers to culturally valued information, dispositions, and insights that are often appreciated in schools, universities, and businesses. This capital is depicted as a 'personality bundle,' which includes an accent, body language, and a sense of humor. Moreover, this finding proved that a graduate's resilience, which is considered psychological capital also gives an important contribution to the graduates' employability. Based on the findings, it shows that students' experience shows that their success in employment goes beyond their skills, knowledge, and degree. They need more than human capital. Students need to have strong social relations, understand the community culture, have a resilience mentality to be able to thrive in a difficult situation, be prepared and experience more to make a better decision, and sometimes need to use them all interchangeably depending on the situation, which all goes beyond human capital.

f. Gaps Among Perspectives

While the government and higher education program highly emphasizes human capital, and supports that graduates should be prepared knowledgeable, and skillful, the industries declare that the employability required is beyond human capital. The industry needs personnel who can adjust to changing conditions and master beyond technical skills. The ability to adapt requires not only cognitive excellence but also some general skills including adaptation; organizing; problem-solving; independency; lifelong learning; communication and interaction; creative thinking; working in groups; work ethics; interpersonal skills; good leadership; responsibility; responsibility; honesty; flexibility; empathy; creativity; self-management and planning.

In line with the industry point of view, graduates experienced shifting to the industry needs beyond human capital. Found that graduates experience typically begin their professional careers through references from colleagues and acquaintances who work for a particular company. Some graduates get their job in a family business context. It shows that one of the factors that help graduates successfully get a job is their social capital. Moreover, it shows that the more graduates are clear about their identity and have more self-investment, the better decision they can make on their career path.

The findings show that there are gaps between what is prepared for graduate employability through government and higher education programs and what is really expected by the industry as well as experienced by the graduates. While the preparation of graduates' employability weighs more on the human capital, the industry needs and graduates experience goes beyond that.

6. Conclusion and Suggestion

The current state of graduate employability in Indonesia demonstrates that improving graduate employability is a shared duty among numerous stakeholders. It has to be realized that the graduates' employability is beyond human capital. The gap between the employability preparation programs by the government and the higher education sector with the industry needs need to be seriously considered. Finding the silver lining between the gaps can be a helpful solution for future graduates' employability in Indonesia.

Regardless of the importance of the finding, this study is limited to a literature review, therefore, it is necessary to explore further in the field context.

References

- [1] T. T. Tran, "Graduate employability," *Innov. High. Educ. to Enhanc. Grad. Employab. Rethink. possibilities*, vol. 158, 2019.
- [2] I. Römgens, R. Scoupe, and S. Beusaert, "Unraveling the concept of employability, bringing together research on employability in higher education and the workplace," *Stud. High. Educ.*, vol. 45, no. 12, pp. 2588–2603, 2020.
- [3] A. M. Abubakar, H. Rezapouraghdam, E. Behraves, and H. A. Megeirhi, "Burnout or boreout: A meta-analytic review and synthesis of burnout and boreout literature in hospitality and tourism," *J. Hosp. Mark. Manag.*, pp. 1–46, 2021.
- [4] G. Antarnusa and S. Ristantiya, "Ganeshha Antarnusa 1 , Siva Ristantiya 2 1),2) ," pp. 37–50, 2012.
- [5] J. Gleeson, R. Black, A. Keddie, and C. Charles, "Graduate capitals and employability: Insights from an Australian university co-curricular scholarship program," *Pedagog. Cult. Soc.*, pp. 1–19, 2022.
- [6] N. P. Aditama and A. E. Winarto, "Pengabdian Kepada Masyarakat Melalui Revitalisasi BUMDes Sebagai Layanan Sosial Pada Bamuju Bamara Desa Sungai Tabuk," *ADI Pengabd. Kpd. Masy.*, vol. 1, no. 2, pp. 41–53, 2021.
- [7] Q. Aini, M. Budiarto, P. O. Hadi Putra, A. Khoirunisa, N. P. L. Santoso, and U. Rahardja, "Gamified education practice: Designing with e-commerce and ilearning concept," *Int. J. Psychosoc. Rehabil.*, vol. 24, no. 7, 2020, doi: 10.37200/IJPR/V24I7/PR270799.
- [8] Y. Durachman, A. S. Bein, E. P. Harahap, T. Ramadhan, and F. P. Oganda, "Technological and Islamic environments: Selection from Literature Review Resources," *Int. J. Cyber IT Serv. Manag.*, vol. 1, no. 1, pp. 37–47, 2021.
- [9] U. Rahardja, Q. Aini, Y. I. Graha, and M. R. Tangkaw, "Gamification Framework Design of Management Education and Development in Industrial Revolution 4.0," *J. Phys. Conf. Ser.*, vol. 1364, no. 1, pp. 0–13, 2019, doi: 10.1088/1742-6596/1364/1/012035.
- [10] A. Ornellas, K. Falkner, and E. E. Stålbrandt, "Enhancing graduates' employability skills through authentic learning approaches," *High. Educ. Ski. Work. Learn.*, 2018.
- [11] F. Agustin, F. P. Oganda, N. Lutfiani, and E. P. Harahap, "Manajemen Pembelajaran Daring Menggunakan Education Smart Courses," *Technomedia J.*, vol. 5, no. 1, pp. 40–53, 2020, doi: 10.33050/tmj.v5i1.1315.
- [12] E. Peeters, J. Nelissen, N. De Cuyper, A. Forrier, M. Verbruggen, and H. De Witte, "Employability capital: A conceptual framework tested through expert analysis," *J. Career Dev.*, vol. 46, no. 2, pp. 79–93, 2019.
- [13] R. Widayanti, U. Rahardja, F. P. Oganda, M. Hardini, and V. T. Devana, "Students Formative Assessment Framework (Faus) Using the Blockchain," in *2021 3rd International Conference on Cybernetics and Intelligent System (ICORIS)*, 2021, pp. 1–6.
- [14] H. T. Sukmana, "Prototyping ITSDI Journal Center Menggunakan Tools Invision Untuk Mewujudkan Creative Innovation Soft Skill Di Era Industri 4.0," *ADI Bisnis Digit. Interdisiplin J.*, vol. 1, no. 1, pp. 56–69, 2020.
- [15] U. Rahardja, Q. Aini, F. P. Oganda, and V. T. Devana, "Secure Framework Based on Blockchain for E-Learning During COVID-19," in *2021 9th International Conference on Cyber and IT Service Management (CITSM)*, 2021, pp. 1–7.
- [16] M. Prawira, H. T. Sukmana, V. Amrizal, and U. Rahardja, "A Prototype of Android-Based Emergency Management Application," *2019 7th Int. Conf. Cyber IT Serv. Manag. CITSM*

- 2019, 2019, doi: 10.1109/CITSM47753.2019.8965337.
- [17] Sudaryono, U. Rahardja, Q. Aini, Y. Isma Graha, and N. Lutfiani, "Validity of Test Instruments," *J. Phys. Conf. Ser.*, vol. 1364, no. 1, 2019, doi: 10.1088/1742-6596/1364/1/012050.
- [18] V. T. D, "MODEL DALAM E-LEARNING PADA," no. 2016, pp. 21–29, 2020.
- [19] K. Kis, C. Kirana, P. Romadiana, B. Wijaya, and A. M. Raya, "Peningkatan Sumber Daya Manusia Melalui Pembuatan Video Pembelajaran Bagi Guru-Guru," *ADI Pengabd. Kpd. Masy.*, vol. 1, no. 2, pp. 1–7, 2021.
- [20] Q. Aini, P. A. Sunarya, A. S. Bein, and P. Nursaputri, "The Implementation Of Viewboard Of The Head Of Department As A Media For Student Information Is Worth Doing Final Research," *IAIC Trans. Sustain. Digit. Innov.*, vol. 1, no. 1, pp. 18–25, 2019, doi: 10.34306/itsdi.v1i1.1.
- [21] M. Saraswati, N. Lutfiani, and T. Ramadhan, "Kolaborasi Integrasi Inkubator Bersama Perguruan Tinggi Sebagai Bentuk Pengabdian Terhadap Masyarakat Dalam Perkembangan Iptek," *ADI Pengabd. Kpd. Masy.*, vol. 1, no. 2, pp. 23–31, 2021.
- [22] M. Zarlis, E. P. Harahap, and L. N. Husna, "Test Appraisal System Application Based on YII Framework as Media Input Student Value Final Project and Thesis Session at Higher Education," *Aptisi Trans. Technopreneursh.*, vol. 1, no. 1, pp. 73–81, Mar. 2019, doi: 10.34306/att.v1i1.31.
- [23] U. Rahardja, A. N. Hidayanto, T. Hariguna, and Q. Aini, "Design Framework on Tertiary Education System in Indonesia Using Blockchain Technology," *2019 7th Int. Conf. Cyber IT Serv. Manag. CITSM 2019*, pp. 5–8, 2019, doi: 10.1109/CITSM47753.2019.8965380.
- [24] P. A. Sunarya, F. Andriyani, Henderi, and U. Rahardja, "Algorithm automaticPrawira, M., Sukmana, H. T., Amrizal, V., & Rahardja, U. (2019). A Prototype of Android-Based Emergency Management Application. 2019 7th International Conference on Cyber and IT Service Management, CITSM 2019. <https://doi.org/10.1109/CI>," *Int. J. Adv. Trends Comput. Sci. Eng.*, vol. 8, no. 1.5 Special Issue, pp. 387–391, 2019, doi: 10.30534/ijatcse/2019/6281.52019.
- [25] F. A. Rahardja, S.-C. Chen, and U. Rahardja, "Review of Behavioral Psychology in Transition to Solar Photovoltaics for Low-Income Individuals," *Sustainability*, vol. 14, no. 3, p. 1537, 2022.
- [26] A. Adi and P. Kepada, "Inovasi Di Era," *Pendidik. Manufaktur Berbas. Gamifikasi Untuk Meningkatkan. Inov. Di Era Insudtri 4.0*, vol. 1, no. 1, pp. 14–20, 2020.
- [27] N. Lutfiani, U. Rahardja, and I. S. P. Manik, "Peran Inkubator Bisnis dalam Membangun Startup pada Perguruan Tinggi," *J. Penelitian Ekon. dan Bisnis*, vol. 5, no. 1, pp. 77–89, 2020, doi: 10.33633/jpeb.v5i1.2727.
- [28] Henderi, Q. Aini, N. P. L. Santoso, A. Faturahman, and U. Rahardja, "A proposed gamification framework for smart attendance system using rule base," *J. Adv. Res. Dyn. Control Syst.*, vol. 12, no. 2, pp. 1827–1838, 2020, doi: 10.5373/JARDCS/V12I2/S20201226.
- [29] T. Hariguna and T. Wahyuningsih, "Perancangan Ajri Learning Journal Center Menggunakan Tools Invision Untuk Mewujudkan Creative Innovation Soft Skill," *ADI Bisnis Digit. Interdisiplin J.*, vol. 1, no. 1, pp. 1–9, 2020.
- [30] S. Watini, Q. Aini, M. Hardini, and U. Rahardja, "Improving Citizen's Awareness in Conserving Diversity of Malay Traditional Dances in Malaysia through the Art Appreciation Performed by Students of Early Childhood Education Study Program," *Int. J. Psychosoc. Rehabil.*, vol. 24, no. 8, pp. 2730–2737, 2020, doi: 10.37200/IJPR/V24I8/PR280292.