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**PERKUMPULAN AHLI PENDIDIKAN
TEKNOLOGI DAN KEJURUAN INDONESIA**



**Strengthening Technology and
Vocational Competence on
Pandemic Era Through
Digital Ecosystems**



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Strengthening Technology and Vocational Competence Era Through Digital Ecosystems

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KATA PENGANTAR

Puji syukur kami panjatkan kehadiran Tuhan Yang Maha Esa yang telah menganugerahkan banyak nikmat sehingga kami dapat menyusun buku “ Strengthening of Technolgy and Vocational Competenty on Pandemic Era Trough Ecosystem Digital”.

Menjawab tantangan industri 4.0, pendidikan kejuruan (Vocational Education) sebagai pendidikan yang berbeda dari jenis pendidikan lainnya harus memiliki karakteristik sebagai berikut; berorientasi pada kinerja individu dalam dunia kerja; justifikasi khusus pada kebutuhan nyata di lapangan; fokus kurikulum pada aspek-aspek psikomotorik, afektif, dan kognitif; tolok ukur keberhasilan tidak hanya terbatas di sekolah; kepekaan terhadap perkembangan dunia kerja; memerlukan sarana dan prasarana yang memadai; dan adanya dukungan masyarakat.

Namun saat ini revolusi industry berkembang menjadi Society 5.0. Yang dimaksud dengan Society 5.0 atau Masyarakat 5.0 adalah konsep teknologi masyarakat yang berpusat pada manusia dan berkolaborasi dengan teknologi (AI dan IoT) untuk menyelesaikan masalah sosial yang terintegrasi pada ruang dunia maya dan nyata.

Buku ini adalah hasil pemikiran dan presentasi peserta dan digunakan untuk kepentingan ilmu pengetahuan dan diedarkan untuk masyarakat umum untuk diperjual belikan maupun dibagikan secara gratis. Semoga buku ini bermanfaat.



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ABSTRACT PARALLEL SESSION



VOCATIONAL EDUCATION ORIENTED IN EMPLOYABILITY AND ENTREPRENEUR SKILLS TO FACE CHALLENGES AND COMPETITIVENESS OF GRADUATES

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Each country is always trying to improve human resources through various innovations to keep up with the competition in science, technology, economy, and global business, including a competition to enter the working world. The low quality of workforce with vocational education graduates who have not responded to the development needs of labor market is one of the reasons why Indonesia's productivity and competitiveness are still lagging. The biggest challenge for vocational education institutions is to produce graduates who have academic skills, technical skills, and employability skills are balanced. Mastery of employability skills is one of the main characteristics needed by Indonesian human resources in the revolution industry 4.0. The constantly changing working world creates new challenges for employers and workforces. Employers expect the new workforce to have a wider range of competencies and abilities, strong job-specific skills, and employability skills. Employability skills can be interpreted as the ability to adjust a person's workforce to a job so that it is possible to survive and be aware of opportunities for success at work. In addition, they are expected to have entrepreneurial skills. These skills are defined as the entrepreneur's ability to be creative, innovative, and run a business.

Keywords: Employability Skills, Entrepreneurship Skills, and Vocational Education

ANALYSIS OF PROBLEM SOLVING BASED ON STUDENTS' CRITICAL THINKING SKILLS THROUGH THE APPLICATION OF PROBLEM BASED LEARNING MODELS WITH THE EDPUZZLE MEDIA PLATFORM

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This study aims to describe the results of problem solving analysis based on students' critical thinking skills in the application of the edpuzzle-assisted problem-based learning model. The subjects of this study were 66 students. The data collected is in the form of an essay test which consists of 6 questions. The test results were analyzed according to the indicators of critical thinking skills used, including interpretation, analysis, evaluation, conclusions, explanations, and self-regulation. The results of data analysis showed that overall students' critical thinking skills were classified as good. This is evidenced in the results of data analysis which shows that the overall results are in the good category. Most of the students were able to solve the questions based on the indicators of critical thinking skills used.

Keyword : Critical Thinking; Problem Based Learning; the edpuzzle Media Platform

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Abstract

Each country is always trying to improve human resources through various innovations to keep up with the competition in science, technology, economy, and global business, including a competition to enter the working world. The low quality of workforce with vocational education graduates who have not responded to the development needs of labor market is one of the reasons why Indonesia's productivity and competitiveness are still lagging. The biggest challenge for vocational education institutions is to produce graduates who have academic skills, technical skills, and employability skills are balanced. Mastery of employability skills is one of the main characteristics needed by Indonesian human resources in the revolution industry 4.0. The constantly changing working world creates new challenges for employers and workforces. Employers expect the new workforce to have a wider range of competencies and abilities, strong job-specific skills, and employability skills. Employability skills can be interpreted as the ability to adjust a person's workforce to a job so that it is possible to survive and be aware of opportunities for success at work. In addition, they are expected to have entrepreneurial skills. These skills are defined as the entrepreneur's ability to be creative, innovative, and run a business.

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INTRODUCTION

ECONOMIC competition as well as the emergence of the influence of new technologies and the effects of globalization will have an impact on changes in the dynamics of work and the structure of employment for the industrial sector in Indonesia. Changes in work dynamics and employment structures need to be accompanied by the emergence of new forms of skills to increase productivity and use technological innovations in the workplace [1]. Graduate employment patterns appear to have changed around the world. The labor market is flooded with graduates with various qualifications competing for jobs.

The results of Seth's research [2] stated that 85% of employers believe that the quality of the workforce can be improved by including job skills in the curriculum. Because of the importance of job skills, educators, employers, and students become partners in the development of a skilled workforce [3]. The Stanford Research Institute and the Carnegie Mellon Foundation at Fortune 500 CEOs found that 75% of long-term job success hinges on soft skills and only 25% on technical skills. According to a survey by Harvard University, 80% of career achievements determine by soft skills and only 20% by hard skills [2] The main challenge for graduates of vocational colleges in entering the workforce is the gap between graduate work skills and the skills needed in the workplace. The workforce in the 21st Century not only requires graduates with high academic qualifications as represented by subjects and degree levels but also equipped with several skills and attributes related to technical work. However, the aspect of employability skills remains a consideration in finding recruitment of new workers. The development of new technology based on vocational education is one of the aspects of successful economic development.

One of the examples of economic progress is the development of technology and industry in Japan. Vocational education and training in Japan are considered a vehicle for skills development for economic

development [4]. Agrawal [5] also stated that Japan's experience as one of the industrial centers in East Asia with a relatively low unemployment rate but can achieve high economic growth rates because the people have vocational technology skills. Various sources reveal that almost two-thirds of the middle-level workforce (intermediate level) in developed countries are the vocational education talent [6]. Furthermore, Norbert & Guggenheim stated that the development of high-quality vocational education is a strategy that is inseparable from the competitiveness of graduates.

Bukit [7] formulates that significant improvement in the quality of vocational education has been carried out by various countries, both in developed countries and in developing countries including Indonesia. Thus, it can be said that the development of quality vocational education will have an impact on increasing the mobility and competitiveness of a country's industrial management.

Several research results state that currently for employers' special academic skills are no longer sufficient for graduates to meet the needs of the national labor market [8]. In addition to basic knowledge and specific skills, current workers are expected to have an additional set of skills. Several skills and attributes are also called job skills, which are needed by students to prepare themselves to meet the needs of various jobs after graduation. Job skills are considered one of the components related to education and training needed by the business world and the industrial world.

Therefore, the labor market has changed and has become competitive and flexible if employability skills are considered in vocational higher education. This change is caused by the expansion of the provision of employability skills in higher education, globalization, and the expansion of the global economy which affects the recruitment needs of employers [9], [10], reveals that the key factor in economic development and competition, and even social stability in many countries, including developed countries, is vocational education. Therefore, the main requirement for development in the modern era is that the community has vocational education and training so that it is easy to meet technological changes [11].

Vocational universities are expected (by employers, government, and the community) to produce graduates not only with knowledge and skills specific to disciplines, but also well-developed work skills so that they become assets for the organization where they work [12]. One of the skills that can be acquired and developed by students in vocational higher education is employability skills which are not limited to a particular job but are relevant to various jobs and are relevant for all levels of work from senior to junior level.

One of the causes of the lack of employability attributes of vocational higher education graduates is an understanding of low employability skills. Job skills are a very important issue in the national, regional, and international labor markets. Suarta [13] stated that work skills are considered as one of the links between education and training and the world of work. A book entitled "Lesson from The Top" by Neff and Citrin published in 1999 [14] contains sharing and interviews with the 50 most successful people in America, revealing that what determines one's success the most is not technical skills alone, but rather the quality of self which is included in employability skills. This statement implies that to compete in the world of work does not only rely on technical skills but must also be supported by employability skills.

These challenges include the lack of attention paid to the development of graduate job skills attributes, which negatively impacts the readiness of college graduates for high-skill jobs.



Discussion Employability Skill

Definition of Employability Skill

Common terminology used for employability skills is words such as transferable skills, key skills, soft skills, generic attributes, job skills, key competencies, core skills, and support skills. The term employability skills have many similar meanings such as: generic abilities, transferable skills, basic skills, essential skills, job skills, soft skills, core skills, core competencies and key skills [14]. Employability skills are used interchangeably with other terms such as generic skills, transferable skills, non-technical skills, core skills, key skills, essential skills, and 21st century skills [13].

Employability skills can be interpreted as a person's ability to adjust to a job so that it is possible to survive and be aware of opportunities for success at work [10]. This understanding shows that employability skills have implications for skills and knowledge that can improve the ability of the workforce. In addition, employability skills contribute to maintaining a good job, coping with changes and work dynamics, and securing various types of work in the workplace [14]. Thus, it can be said that employability skills are abilities that enable a graduate to easily compete for work and survive in the workplace.

According to Hillage and Pollard [15] employability skills are the ability to get an initial job, keep a job and get a new job if needed. Yorke [16] provides a clearer definition of employability skills as a set of soft skills consisting of skills, understanding, and personal attributes that make a person more likely to secure and succeed in a job chosen for his or her interests. themselves, the workforce, society and the economy”.

Employability skills are an important aspect of competence possessed by all employees to become skilled workers to be able to explore the world of work [17]. Another understanding expressed by Weligamage [18] that employability skills are skills, understandings and personal attributes that make it easier for graduates to get a job and be successful in their chosen job. In most cases, the terms employability skills are used interchangeably to refer to the employability of graduates [19].

This means that one's ability in the form of employability skills can make it easier to get a job and benefit oneself so that it is important for prospective workers to have, especially vocational higher education graduates to survive and improve their performance in the workplace.

Based on this understanding, it can be concluded that one's ability in the form of employability skills can make it easier to get a job and benefit oneself so that it is important for prospective workers to be able to survive and improve their performance in the workplace. In addition, employability skills contribute to maintaining a good job, coping with job changes and dynamics, and securing various types of work in the workplace.

Employability Skill Aspects

Competition in seizing jobs and new management processes applied by the business world/industrial world require graduates, especially graduates of vocational education to have critical thinking, be able to solve problems in addition to being excellent in communication skills. So that respond to technological advances and competition in the world of work, it is necessary to prepare graduates to have the skills and ability to adapt to the work environment [20]. This means that it is important for graduates of vocational higher education to have skills and the ability to adapt to the work environment.

According to the American Management Association [21], job skills attributes such as critical thinking and problem solving, creativity and innovation, collaboration, and communication skills are becoming increasingly important in today's global economy. Skills such as communication, problem solving, decision making, analytical and critical thinking, synthesizing information, teamwork, interpersonal, and continuous learning are some of the job skills attributes required by graduates in entering the workforce, as

well as being prerequisites for professional recognition [22]. Employability skills that employers are looking for are good communication and interpersonal skills, proficiency in English, the ability to speak constructively, the ability to identify and state problems and issues, solve problems, present ideas, and analyze problems and issues encountered [23].

In addition, employability skills such as good communication and teamwork skills are recognized as graduate skills that are consistently most desired by employers in developed countries today [24]. Work skills can be instilled in students before they enter the world of work. The modern world is characterized by innovation, where companies compete to bring innovative solutions to existing problems and introduce new skills products to the market based on employability skills. This rapid progress requires aspects of employability skills such as problem solving with creativity and identifying new problems and creating solutions for the workforce [25]. According to Shivoro [26] aspects of employability skills include, among others: self-management, leadership, interpersonal, mastery of information technology.

The group of employability skills according to the results of the identification of [27], [28], [29] are as follows: (1) communication skills contribute to a harmonious relationship between employees and customers; (2) teamwork skills contribute to working relationships; (3) problem solving skills can contribute well to problem solving; (4) initiative skills contribute to innovative work; (5) self-management skills contribute to the satisfaction of other employees; (6) continuous learning skills contribute to sustainable improvement and expansion for the company; and (7) information technology skills contribute to the effective execution of tasks.

Based on the various descriptions of employability skills, it can be said that for the purposes of education in vocational higher education in the context of developing human resources in the future, students should be equipped with employability skills attributes to anticipate the work requirements set by the manager of the industrial world in recruiting workers. The success of a graduate of vocational higher education in the workplace is not only determined solely by knowledge and technical abilities (hard skills), but also by the ability to manage oneself and others or what is often referred to as employability skills.

Entrepreneurial Skill

Definition of Entrepreneurship

Many definitions of entrepreneurship, in this study only coverage a few. Entrepreneurship is a multi-dimensional concept that includes being innovative, acting as a leader, owning a small business, or starting up a new company [30]. Furthermore, Syam [31] defines entrepreneurship is the ability to creative thinking and behave innovative as basic resources, purpose, and process of facing life's challenges.

Entrepreneurial Competencies

The entrepreneurial competencies developed at some level be the main purpose of most entrepreneurial education. These competencies have defined the ability and willingness to perform the new value innovation entrepreneurial job based on impact integration of knowledge, skills, dan attitudes [32], [33].

Knowledge have three competences are mental models, declarative knowledge, and self-insight. 1) mental models are knowledge about how to get things done without resources, risk, and probability models. 2) declarative knowledge is basics of entrepreneurship, value creation, idea generation, and opportunities. 3) self-insight is knowledge to identify characteristic of an entrepreneur [32], [33].

An entrepreneur has many skills such as marketing, resource, opportunity, interpersonal, learning, and strategic skills. Among six skills, we explain three skills 1) marketing skills are capability to communicate a vision, dealing with customer, and assessing the marketplace. 2) opportunity skills are ability to capture

and realize opportunities. 3) interpersonal skills are leadership, motivating others, managing people, listening, resolving conflict, and socializing [32], [33].

Finally, entrepreneur attitudes are entrepreneurial passion, self-efficacy, entrepreneurial identity, proactiveness, uncertainty/ambiguity tolerance, innovativeness, and perseverance [32], [33].

CONCLUSION

The preparation of human resources, especially for workers in vocational field, requires strategies so that they can compete in the working world. Students who have employability and entrepreneurial skills. They have dual skills, not only can be work in industry but also independently running a business or creating jobs. Dual capability requires a strategic step that starts with revision curriculum by involving stakeholders from industry practitioners and entrepreneurs. So that this concept can be realized and can improve the quality of human resources, the nation's competitiveness, and overcome the problem of unemployment.

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