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21st Century Skills of Life Career Skills in Productive Learning of Vocational High School of Technical Expertise Engineering in Yogyakarta City

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Abstract This study aims to find out how 21st Century Life Career Skills Overview in Productive Learning of State Vocational Engineering Machining Program in Yogyakarta City. The object of this research is the 21st Century Life Skills Career in Productive Learning of SMK N 2 and SMK N 3 Machining Engineering Skills Program, while the research subjects are productive teachers and 12th grade students. Researchers use simple random sampling techniques to take samples of students, while techniques sampling is saturated in taking samples on productive teachers. This research was a quantitative descriptive study. Data collection techniques used in this study were packaged in the form of questionnaire guidelines, observation and documentation. Data analysis technique used by researchers is quantitative and qualitative descriptive analysis techniques with a range of percentages. The results of this study indicated that 21st Century LCS at the State Vocational School in the engineering engineering program in the city of Yogyakarta in general illustrate the already good application of productive PBM subject teaching theory and practice. The percentage results through the source of student responses obtained by 66.87 percent while the source of teacher responses gained by 61.57 percent, which explains the results of the 21st Century Life Career Skills in the productive learning process of SMK N machining engineering expertise program in the city of Yogyakarta is good (in terms of teachers and students).

Keywords: *21st Century LCS, Productive Learning Process, P21*

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1. Introduction

The most striking feature of the 21st century is the increasingly intertwined world of technology and science, science and technology that are interrelated to bring up new and modern internet, robotics, biotechnology and other technologies. [1]. In the context of scientific and technological development, we are challenged to create an education system that can contribute to the production of human resources capable of helping to build a knowledge-conscious social and economic order in accordance with human needs of the 21st century [1]. This is the basis of researchers' view that conscious education should contribute to producing human resources who have relevant skills exploring the 21st century world. In line with Wijaya's research, Sudjimat and Nyoto who explained that one of the real challenges of the impact of the globalization era is education should be able to produce human resources that have complete competence, known as 21st century competencies [2].

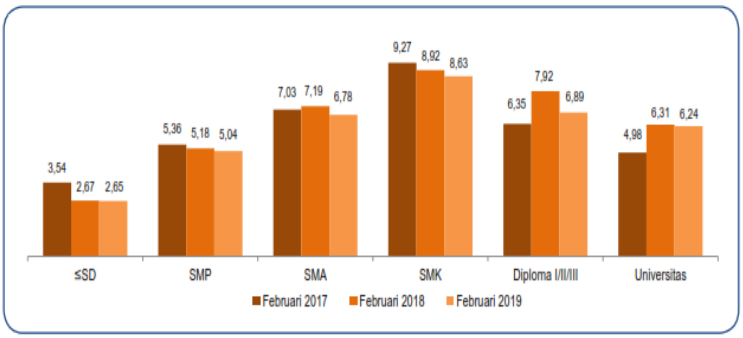

Figure 1. TPT according to the Highest Level of Education completed, February 2017-2019 (https://www.bps.go.id/)

Law No. 20 of 2003 concerning the National Education System mandates Vocational High Schools (SMK) to produce graduates so they have the skills to handle a particular job [3]. However, the Central Statistics Agency (BPS) stated that the Open Unemployment Rate (TPT) of SMKs in February 2019 was still the highest among other education levels of 8.63 percent. The following picture below shows a list of TPT from various National Education Levels that were completed in the February 2017-February 2019 period [4].

Open unemployment rate (TPT) is an indicator that can be used to measure the level of labor supply as a human resource (HR) that is not used or not absorbed by the labor market, if the TPT Vocational High School is very high, it means the HR graduates of education are unable to occupy the qualifications of the workforce Industrial Business World (DU-DI) or not relevant to HR criteria required by DU-DI [4]. Whereas in terms of residence, TPT in urban areas was recorded higher than in rural areas. In February 2019, TPT in urban areas was 6.30 percent, while TPT in rural areas was only 3.45 percent [4]. BPS explained that the TPT factor in the City area was higher than in the rural area due to the urban area starting to show a shift in the more modern sector especially the industrial sector [4]. Related to the above, it can be used as a reference for early identification that some manufacturing industries in urban areas are starting to leave the traditional sector and are starting to shift to more modern sectors, whereas Vocational Education still does not equip graduates so that the quality of human resources is relevant to the needs of the 21st century modern era.

The National Education Standards Agency (BSNP) has conceptualized the 2013 curriculum which is used as the heart of education in Indonesia to be ready to face the 21st century era [1]. Government Regulation No. 32 of 2013 concerning National Education Standards (SNP) establishes the 2013 Curriculum which was developed sourced from eight Standards, namely: content standards, process standards, graduate competency standards, teacher and education personnel standards, facilities and infrastructure standards, management standards, financing standards, and educational assessment standards [5]. In order to achieve the competence of SMK graduates it is necessary to set a standard of learning process which is the minimum criteria regarding learning planning, implementation of learning, assessment of learning and supervising learning in teaching units (teachers) in SMK. The growth and development of the era is not spared from every change, it has an impact on the change in the way we educate where it is a challenge for all education providers including Vocational Education Educators.

Afandi and Sajidan explained that the quality of the quality learning process and assessment must be in line with the demands of 21st century teacher competence [6]. Dharma explained that the learning process in vocational education must also be carried out by prioritizing the mastery of information and communication technology (ICT) aspects. [7]. The role and task of the teacher to provide a learning environment that enables the development of the potential of students in order to obtain knowledge and attributes of higher-level thinking should be the core in classroom learning [6]. Researchers' observations in the field and research findings regarding the standard of the learning process carried out by the Education Unit in Vocational Schools have concluded that the standard implementation of the learning process is still not running optimally, this is due to the fact that there are still many teachers who teach learning material using the lecture method in each learning. Other research findings also state that the implementation of Process Standards at State Vocational Schools (including learning planning, learning implementation, and evaluation of learning) is not in accordance with BSNP demands. The findings in the field prove that the learning activities implemented by the Education Unit in Vocational Schools are not in accordance with the 21st century, in their implementation teachers still use a teacher centered learning approach. In addition to the Learning Process Standards above, Dharma identified a number of skills that vocational teachers should pay attention to in order to survive in the 21st century including digital age literacy, inventive thinking, effective communication and high productivity *[7]*. The OECD also maps the 16 skills needed in the 21st century that are divided into three groups, namely basic literacy, competence, and character quality [8]. Zubaidah also provides a map of 21st century skills to the world of work that requires personal skills (having initiative, tenacity, responsibility, risk taking, and creative), social skills (working in teams, having networks, having empathy and compassion), and learning skills (managing, organizing, metacognitive skills, and not easily discouraged or changing perspectives in the face of failure) [9].

World professionals through the projection of 21st Century skills have long conceptualized, identified, defined, predicted and described the skills that can withstand the demands of globalization in changing times. One of the reference frameworks of 21st century skills that the world's most adapted worlds belong to is the US-based Partnership for 21st Century Learning (P21) which translates into (1) life and career skills, (2) learning and innovatiion skills and (3) information media and technology skills. 21st Century skills are not taught individually but are integrated with various disciplines [10]. Various countries have actualized 21st century skills into their country's education system. One of the secondary education syllabus guides in Singapore, known as the Education and Career Guidance (ECG) Syllabus Secondary, this guide provides an illustration that students with secondary productive age in the country really need to increase awareness of the skills, knowledge and attitudes needed to make a successful transition from school to further study and work [11]. This allows students to examine and identify their skills and talents and students will be encouraged to explore various educational opportunities and career paths (life career skills) [11]. 21st century education is operationalized in the structure of the educational curriculum in Indonesia, which contains compulsory subjects (groups A and B) and specialization subjects (group C) [12]. Furthermore, Murti groups compulsory subject groups (A) to reach 21st century learning achievements and innovation skills and technology and information media skills, while compulsory subject groups (B) and specialization subject groups (C) are aimed at achieving life and competence career skills [12]. Wagiran emphasized that vocational education prepares graduates to get career success

wherever they work [13], for that 21st century skills development that first needs to be seen is life career skills as soft skills that are closely related to student preparation before a career and work. Therefore, to see a picture of life career skills of the 21st century the right size to use is on productive learning.

The US-based Framework for 21st Century Skills Partnership for 21st Century Learning (P21) describes Life and Career skills or 21st Century LCS into several dimensions, including; (a) Flexibility and Adaptability, (b) Initiative and Self-Direction, (c) Social and Cross Cultural Interaction, (d) Productivity and Accountability and (e) Leadership and Responsibility *[14]*. Broadly speaking, Vocational High School (SMK) learning materials are integrated into two parts, namely the theory delivered in the classroom, and the practice carried out in the workshop. If viewed from the relationship above the question arises the question of how far the consistency of vocational education units in actualizing the Learning Process in productive subjects according to the rules of the 21st Century LCS. Therefore, the researcher focuses on examining the 21st Century Life Career Skills Overview on productive learning of State Vocational Engineering engineering expertise programs in Yogyakarta City.

2. Research Methodology

This study aims to find out how the 21st Century Life Career Skills Overview in Productive Learning of State Vocational Engineering Machining Program in Yogyakarta City. The object of this research is the 21st Century Life Career Skills (LCS) on Productive Learning in SMK N 2 and SMK N 3 Machining Engineering Skills Program, while the research subjects are productive teachers and 12th grade students. Researchers use simple random sampling techniques to take samples of students in line with Sugiyono's statement, researchers can use sampling techniques to determine a representative sample (representative) of the population to be used in research [15], while the sampling technique is saturated in taking samples to productive teachers. So that the number of random sampling students taken was 127 people (based on an error rate of 10%), while the number of productive teachers was 27 people. This research is a quantitative descriptive study. Data collection techniques used in this study were packaged in the form of questionnaire guidelines, observation and documentation. The questionnaire was used to find out the efforts or efforts made by the teacher in implementing the learning process in productive subjects to bring PBM closer to the 21st Century LCS. Field observations were carried out to prove the truth of the information obtained through a questionnaire or questionnaire regarding the emergence of 21st Century LCS in productive learning of SMK N Machining Engineering Expertise Program in carrying out the process of vocational learning in the classroom and practice workshop. The documentation collected was aspects related to questionnaire/questionnaire information and observations of the emergence of 21st Century LCS in the vocational learning process in the classroom. Data analysis technique used by researchers is quantitative and qualitative descriptive analysis techniques with a range of percentages.

Table 1. Research Percentage Range Description

Ukuran Nilai (%)	Ukuran Deskripsi	Keterangan Deskripsi
0-25	Sangat rendah/sangat kurang	Sedikit
26-50	Rendah/kurang	Belum banyak
51-75	Tinggi/baik	Sebagian
76-100	Sangat tinggi/sangat baik	Sebagian besar

3. Results and Discussion

There are two State Vocational High Schools (SMK N) in the city of Madya Yogyakarta that have Machining Engineering Skills Programs, namely SMK N 2 and SMK N 3. The research subjects used in this study are Class XII Students and Productive Teachers of State Vocational School Machining Expertise Program in the city of Yogyakarta, with details of the number of research subjects explained in the following table.

Table 2. Subjects of Class 12 Students

School Origin	N	Persen (%)
Student SMK N 2	72	56.69
Student SMK N 3	55	43.30
amount	127	100

Table 3. Productive Teacher Subjects

School Origin	N	Persen (%)
Guru SMK N 2	12	44.44
Guru SMK N 3	15	55.56
amount	27	100

The 2013 curriculum explicitly is a form of 21st century skill orientation, one of which is contained in the Process Standards that must be met by the Educator Unit (Teacher) in implementing the 2013 curriculum explicitly is a 21st century skill orientation form, one of which is contained in the Process Standards that must be met by the Educator Unit (Teacher) in implementing the principles of the learning process. Reviewing the development of 21st century skills in Vocational Schools, the values of implementation of specialization subjects (Productive) according to the 21st century skills objectives adopted by the education curriculum in Vocational Schools are 21st Century LCS in Vocational Schools, the values of implementation of specialization subjects (Productive) according to the 21st century skills objectives adopted by the educational curriculum at SMK is 21st century LCS.

The 21st Century Skills Framework (Framework 21st Century Skills) of the US-based Partnership for 21st Century Learning (P21) describes Life and Career skills into five (5) dimensions, including; (a) Flexibility-Adaptability, (b) Initiative-Self-Direction, (c) Social-Cross-Cultural Interaction, (d) Productivity-Accountability (Productivity-Accountability) and (e) Leadership-Responsibility *[14]*. Broadly speaking, specialization (productive) subjects in Vocational machining engineering expertise are integrated

into two PBM conditions, namely the material done in the classroom and the material applied in the practice room. Implementation of the Learning Process Standards as a principle by the Education Unit in State Vocational Schools includes minimum criteria for learning planning, learning implementation, learning assessment and learning supervision. The researcher focuses on how far the consistency of vocational education units is in actualizing the Learning Process Standards so that they are in accordance with the principles of the 21st Century LCS. Therefore, the researcher aims to find out the picture of 21st Century LCS on productive learning of State Vocational School in engineering machining programs in Yogyakarta City.

Table 4. 21st Century LCS Productive Learning SMK N 2

K. Abad-21	Dimension	SMK N 2 Research Subjects		Average Dimensions	Total *L.C.S*
		Students	Teacher		
Life Career Skills (L.C.S)	Flexibility-Adaptation	68.5	68.72	68.61	69.87
	Initiative and Self-Direction	62.59	73.73	68.16	
	Social andCross Cultural Interaction	69.93	78.47	74.2	
	Productivity and Accountability	70.49	70.68	70.58	
	Leadership and Responsibility	63.14	72.5	67.82	

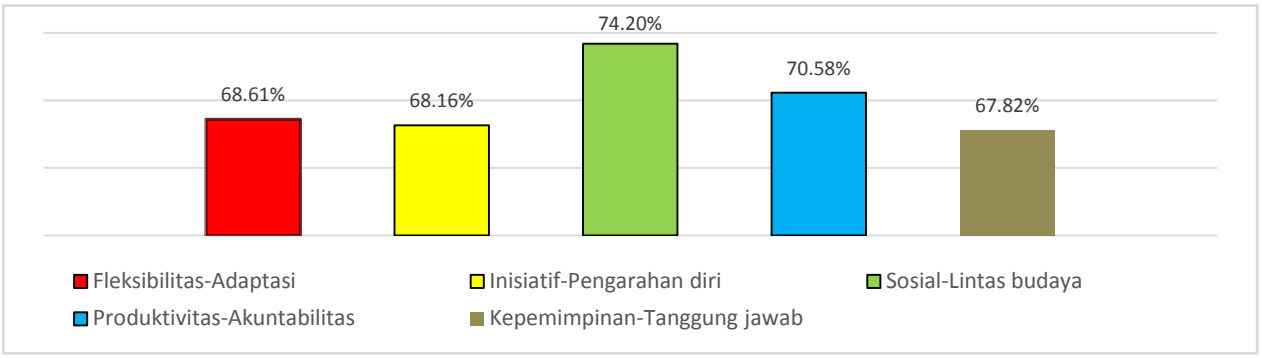

Figure 2. Percentage Diagram of 21st Century LCS Productive Learning SMK N 2

Applied 21st Century LCS in the productive learning process of SMK N 2 is shown through two subjects, namely the subject of 12th grade students and the subject of productive teachers in machining techniques. Research data regarding perceptions, knowledge, experiences experienced by research subjects during the productive learning process, it is known that 21st century LCS at SMK N 2 Yogyakarta obtained a percentage of 69.87%. The data shows or illustrates that a part of 21st Century LCS has been applied to the productive learning process in SMK N 2 Yogyakarta Machining Engineering Expertise Program. The 21st century LCS picture of the productive learning process includes five dimensions, namely Flexibility - Adaptability, Initiative - Self-regulation, Social-Cultural Interaction, Productivity-Accountability and Leadership-Responsibility.

Table 5. 21st Century LCS Productive Learning SMK N 3

K. Abad-21	Dimensi	SMK N 3 Research Subjects		Average Dimensions	Total *L.C.S*
		Students	Teacher		
Life Career Skills (L.C.S)	Flexibility-Adaptation	71.62	49.12	60.37	58.77
	Initiative and Self-Direction	66.94	41.14	54.04	
	Social and Cross Cultural Interaction	68.13	54.72	61.42	
	Productivity and Accountability	73.37	56.54	64.95	
	Leadership and Responsibility	55.82	50.34	53.08	

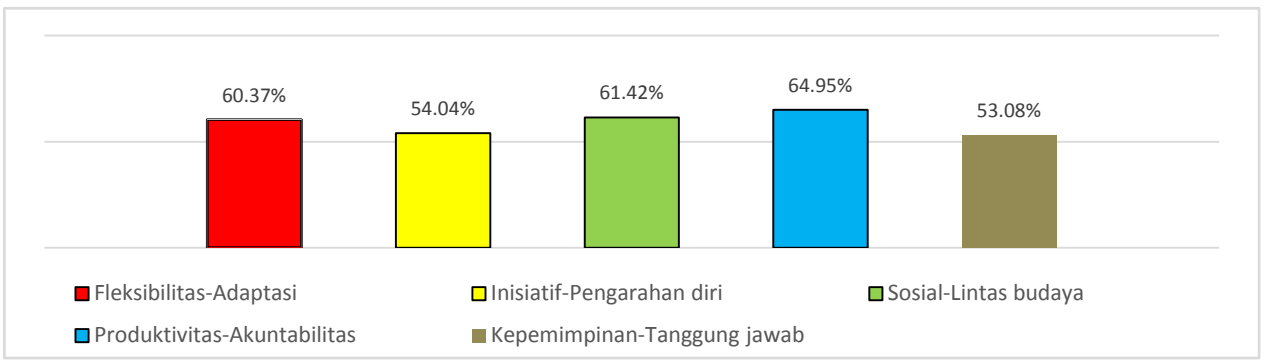

Figure 3. Percentage Diagram of 21st Century LCS Productive Learning SMK N 3

Applied 21st Century LCS in the productive learning process of SMK N 3 is shown through two subjects, namely the subject of 12th grade students and the subject of productive teachers in machining techniques. Research data regarding perceptions, knowledge, experiences experienced by research subjects during the productive learning process, it is known that 21st century LCS at SMK N 3 Yogyakarta obtained a percentage of 58.77%. The data shows or illustrates that a part of the 21st Century LCS has been applied to the productive learning process at SMK N 3 Yogyakarta in the Machining Engineering Expertise Program. The 21st Century LCS picture of the productive learning process includes five dimensions, namely Flexibility-Adaptability, Self-Regulatory Initiative, Socio-Cultural Interaction, Productivity-Accountability and Leadership-Responsibility.

Table 6. 21st Century LCS Productive Learning SMK N in Yogyakarta

K. Abad-21	SMK N Yogyakarta		Total (%)
	12th grade students	Produktive teacher	
LCS Abad-21	66.87 (%)	61.57 %	64.22

In general the 21st Century LCS for State Vocational Schools in the engineering engineering program in the city of Yogyakarta has shown or illustrated good application. Based on the percentage of the accumulation of subject teachers and 21st century LCS students in the productive learning process obtained a percentage of 64.22%, the meaning of this percentage explains some of the 21st Century LCS has been applied to the productive learning process in SMK N Machining Engineering Expertise Program in Yogyakarta City.

4. Conclusion

21st Century Skills Life Career Skills in State Vocational Engineering engineering expertise programs in the city of Yogyakarta In general show or illustrate the already good application of productive PBM subject teaching theory and practice. The results of accumulation through the source of student responses obtained a percentage of 66.87%, while the source of the teacher's response obtained a percentage of 61.57%, which explains the results of the 21st Century Life Career Skills in the productive learning process of SMK N machining engineering expertise program in Yogyakarta it's good (in terms of teachers and students).

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