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Teamwork Skills Improvement Through the Teaching Factory Model

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Abstract: The employability skills needed to anticipate changes in labor market demand as a result of the industrial revolution are teamwork skills. Employers decide on teamwork skills as a condition that must be owned by prospective workers in the recruitment process. This research focuses on improving teamwork skills through teaching factory model. The Agriculture Processing Vocational School that has implemented teaching factory model was chosen as the research target. A total of 60 students were observed to improve teamwork skills using performance assessment. Indicators of teamwork skills used for measurement are member participation, teaching friends, working with different cultures, and leading groups. 12 competency units based on national work competency standards are used as references in performance appraisal. Optimal involvement of students at each stage of learning contributes to improving employability skills in teamwork skills. Differences in the implementation of learning models in vocational schools participate in determining the results of student employability skills. The results of measurements at each vocational school are discussed.

1 INTRODUCTION

In recent years, educational research has been dominated by the development of employability skills (Asonitou, 2015). In line with the increasing complexity of the work environment, the need for employability skills is more prominent than before (Ritter *et al.*, 2018). Understanding competencies expected by employers, helping vocational schools or training institutions to align vocational school programs with industry needs, and improve graduate's employability skills. (Tsitskari *et al.*, 2017). Employability skills are considered to support graduates' transitions and careers because accordance with the requirements in the workplace, so need to be identified and prepared. (Suleman, 2016).

Employability skills can be developed. Foreign language skills, communication skills, computer use skills, and team work skills, are skills that most employers expect for technical school graduates. (Saputra, 2015). Manufacturing industry employers determine communication skills, problem solving skills, teamwork skills, and personal quality as employability skills that must be present in the profile of prospective workers during the recruitment process (Rasul *et al.*, 2013). The skills most sought after by employers are work ethic, oral and written communication, team work, critical thinking, and problem solving (Saadah, 2016). Employability skills needed by employers in the industry are information technology and communication skills, decision making, time management, and teamwork skills (Buntat *et al.*, 2013). Effective team work skills are very important for the success of increasingly team-based workplace workers (Britton *et al.*, 2017). These skills can be developed optimally by determining and implementing the right learning model.

Career-oriented practical training that involves team work is an effort that can be optimized to support increased employability skills (Tanius *et al.*, 2017). Strategies to support the integration of education and workplaces are continuous learning and education, workplace skills training, field experience, and professional guidance (Lai, Shankar and Khalema, 2017). One of the lessons that supports the improvement of employability skills is the teaching factory (Martawijaya, 2012). Teaching factory is the interface of vocational education with industry, because it helps the process of examining and balancing the education process and maintaining

link and match labor market needs (Chryssolouris, Mavrikios and Rentzos, 2016). This research focuses on improving team work skills through teaching factory. The implementation of teaching factory is expected to improve student employability skills, especially team work skills, so that graduates have more readiness to meet the needs of labor and industry.

2 RESEARCH METHOD

The research design used was concurrent triangulation. Quantitative data and qualitative data are collected at one time. Qualitative data was used to determine the implementation of teaching factory model, and quantitative data was used to measure the improvement of student teamwork skills in teaching factory model. The population of this study was students of agricultural products processing vocational schools in West Java who were studying bread production in teaching factory. The research sample was determined by purposive sampling. 60 students from SMKN 1 Cibadak, SMKN 1 Pacet, and SMKN 2 Subang were chosen to be observed to increase their teamwork skills. Observations are carried out three times regularly. The teamwork skills to be measured are outlined in the indicators. The indicators measured in this study are presented in Table 1.

Table 1. Team Work Skills Indicators

Employability Skills	Indicators
Teamwork skills	Participation as a member
	Teaching group friends
	Working with different cultures
	Leading group friends

Indicators of teamwork skills are elaborated and explained in the form of analytical rubrics that are used as a guide to measuring student teamwork skills. The description of the indicators of teamwork skills is presented in Table 2.

Table 2. Description of Teamwork Skills Indicators

Indicators	Description
Participation as a member	Working with group friends and conveying ideas
Teaching group friends	Helping other friends learn the necessary knowledge and skills; identify training needs and provide
	job information to help friends or groups
Working with different cultures	Cooperate with male or female friends or with various ethnic, social, and educational backgrounds
Leading group friends	convey thoughts, feelings, and ideas to provide support, trust, motivation to individuals or groups, who are responsible for work rules based on the guidelines and authority given

Source: Hanafi (2014)

3 RESULT AND DISCUSSION
3.1 Teamwork Skills Measurement

The measurement of teamwork skills consists of four indicators, are participation as members, teaching friends, working with different cultures, and leading group friends. Four indicators on aspects of teamwork skills include aspects of interpersonal competence in workplace competencies. The following are the results of measuring teamwork skills at SMKN 1 Cibadak, SMKN 1 Pacet, and SMKN 2 Subang:
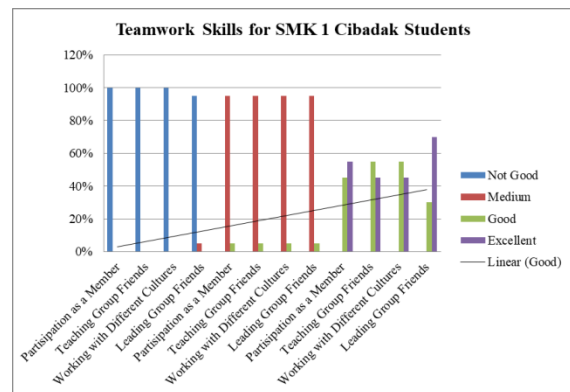
3.1.1 SMKN 1 Cibadak

Figure 1. Teamwork Skills for SMK 1 Cibadak Students

In general, the linear graph of the measurement results of the team work skills of SMKN 1 Cibadak students increased in the category of very good and good step measurements 1-3. Measurement results increase on all indicators, including participation as members, teaching friends, working with different cultures, and leading group friends. A linear graph of the teamwork skills of students in SMKN 1 Cibadak is presented in Figure 1.

3.1.2 SMKN 1 Pacet

In general, linear graphs from the measurement of the work skills of the SMKN 1 Pacet increased from 1-3 measurements in the excellent category. The measurement results increase on all indicators. The results of the measurement of the teamwork skills of SMKN 1 Pacet students are presented in Figure 2.
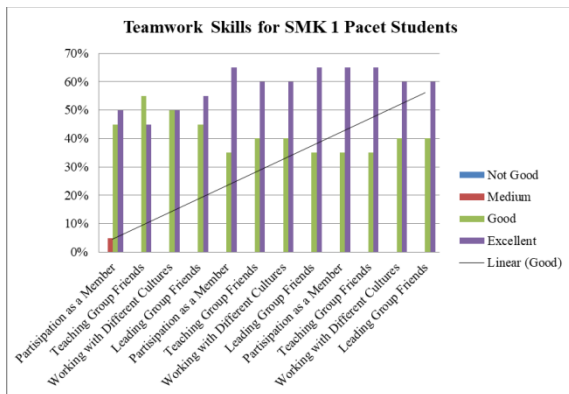

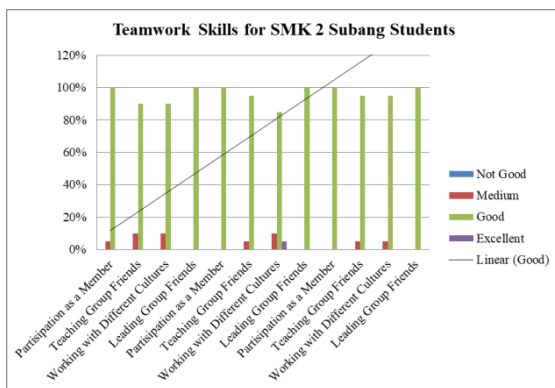Figure 2. Teamwork Skills for SMK 1 Pacet Students

3.1.3 SMKN 2 Subang

Figure 3. Teamwork Skills for SMKN 2 Subang Students

In general, the graph of the measurement results of the teamwork skills of SMKN 2 Subang students increased from the measurement of stages 1-3 in the good category. The measurement results increase on indicators teaching friends. In the indicator of involvement as a member, and leadership, the measurement results are stable from stages 1-3. In indicators working with different cultures, there is an increase in the measurement of stage 2 from the results of the measurement of stage 1, and a decrease in the measurement of stage 3. The results of measuring the team work skills of SMKN 2 Subang students are presented in Figure 3.

3.2 Teamwork Skills Improvement

The measurement of team work skills in this study is limited to four indicators, including member participation, teaching friends, working with different cultures, and group leading. The competency unit used to measure indicators of member participation is the involvement of students as group members, and involvement in discussions. The competency unit used to measure indicators teaching friends is to help group members, and remind group members to do sanitation and hygiene. The competency unit used to measure indicators working with different cultures is the ability of students to work in different situations, cooperation in cleaning up the practice room, collaboration in cleaning production equipment, and collaboration in compiling work reports. The competency unit to measure group lead indicators is the ability of students to lead group friends, positive responses from group members when expressing opinions, the ability of students to divide the task of tidying up production equipment, and the ability to share work tasks during production.

The measurement results show an increase in four indicators of teamwork skills. This shows that teaching factory which is dominated by team work in its implementation supports the improvement of student teamwork skills. The practical learning intensity in the laboratory hones students' skills to collaborate compared to classical learning. Teaching factory model in each vocational school apply the distribution of student practice groups based on the products produced. Individual practice work carried out by students only in competency tests as a final evaluation of teaching factory.

In this case, the difference in the final achievement of measuring teamwork skills in three vocational schools is caused by several factors, namely differences in active involvement of students at each stage of the bread production teaching factory learning process, the interaction process between counselors and students, and the condition of factories that support the learning process. Active involvement of students at each stage of the learning process in the factory participates in determining the experience gained by students, because during learning there are factors that interact with each other and influence the improvement of student competency (Wu, 2005; Robinson & Millan, 2006; Ogbeide, 2006). The final achievement of the teamwork competency measurement of SMKN 1 Pacet students is higher than SMKN 1 Cibadak and SMKN 2 Subang. The involvement of students in

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the learning process in the incubation program of SMKN 1 Pacet is more than the SMKN 1 Cibadak, and SMKN 2 Subang. Teaching factory model SMKN 1 Pacet is implemented based on procedures and real job standards, starting from habituation in applying occupational health and safety, personal hygiene standards, the use of personal protective equipment, the process of identifying raw material quality, production processes, product testing, marketing to product distribution. Personal hygiene standard checks, inspection of the use of personal protective equipment, and the process of identifying raw material quality, are not seen in the implementation of teaching factory in two other vocational schools. The learning experience gained by students is accompanied by enthusiasm and a sense of responsibility for learning is one of the effective learning process factors (Gurney, 2007). Teamwork skills achievement is presented in Figure 4.
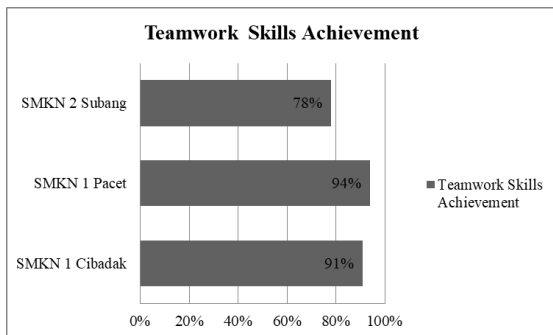

Figure 4. Teamwork skills achievement

4   CONCLUSIONS

Teamwork skills are employability skills that must be prepared by prospective workers. Indicators for measuring student teamwork skills are member participation, teaching friends, working with different cultures, and leading groups. Twelve competency units based on national work standards became a reference for measuring teamwork skills in teaching factory the bread production. Optimal involvement of students at each stage of learning contributes to improving employability skills in teamwork skills. Differences in the implementation of teaching factory model participate in determining the results of student employability skills.

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