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The Learning Strategy Based on Scientific Approach to Strengthen the Employability Skill of Teacher Candidates

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The preparation of Vocational School teacher candidates who have technical skills and employability skills begins with the learning process. This paper aims to formulate learning strategies based on scientific approach to strengthen employability skills for vocational school teacher candidates. This study employed a quantitative approach with a non-experimental survey design. The samples in the study consisted of 120 vocational teacher candidates in the Automotive Engineering Education Program, Faculty of Engineering, Semarang State University who took car body's electrical system practice course. Research data were collected with test questions, observation sheets and questionnaires. The research data were analysed using descriptive analysis, regression analysis. The results showed that the implementation of learning strategies with scientific approach significantly strengthen employability skills of vocational teacher candidates with a contribution of 22.0%, while the remaining 78% was influenced by other factors. The reinforcement of employability skills vocational teacher candidates resulted in the reinforcement of the competitiveness of prospective graduates. When they have become vocational teachers, they are able to produce competitive vocational school graduates in 4.0 industry era.

Keywords: learning strategies, scientific approach, employability skills, vocational school, teacher candidates

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INTRODUCTION

Vocational Education and Technology Institutions (VETIs) are educational institutions with the same level of university which are responsible for educating teacher candidates. Automotive Engineering Education Program at the Faculty of Engineering, Semarang State University is a VETI that produces vocational school teacher candidates in the expertise of Automotive Engineering. Professors, lecturers, and education staffs are expected to conduct a learning process that is responsive to social roles and changes in job skills in the workplace so learners can succeed in the workplace (Hounsell, 2011; Helyer, 2011; Nghi & London, 2010).

The challenge of VETIs graduates is that the workplace demands graduates with high competition (Fliers, 2018), VETI is challenged to create outstanding graduates who are best suited for work, innovative, creative (Motallebzadeh et al., 2018). The industrial era 4.0 has induced changes in occupational skills at the workplace (Hamill, 2018). The impact of changes at the workplace in the industrial era 4.0 led to several changes in VETI so that the graduates remain relevant according to market needs and are ready to work. There are 10 top skills required in 2020 (Gray, 2016). Furthermore, Wagner emphasized that in the 21st century, seven survival skills are required: *(*1) critical thinking and problem solving; (2) collaboration across networks and leading by influence;(3) agility and adaptability; (4) initiatives and entrepreneurship; (5) effective oral and written communication; (6) accessing and analysing information; and (7) curiosity and imagination (Wagner, 2010). Performance of professors, lecturers, and education staffs are influential in producing competencies and the formation of character, mentality and mindset of students (Lapsley & Ryan, 2016). The learning process is expected to develop exceptional human resources, skilled and have high skill (Orlich et al., 2012).

In Indonesia, the Ministry of Research, Technology and Higher Education (Ristekdikti) pays serious attention to VETIs to be able to produce competent teachers with good character and have high employability skills. Intentionally or not, teachers shape the character of their students, and the best school teachers exemplify a set of virtues which they demonstrate through personal example (Arthur et al., 2015). However, the weak employability skills from VETI graduates who work as teachers both in public schools and in vocational schools and working in the industry are less competent. The graduates of secondary vocational schools, diplomas and higher education are still less competent in terms of: (1) oral and written communication, (2) critical thinking and problem solving, (3) work ethics and professionalism, (4) working in teams and collaborating, (5) working in different groups, (6) using technology, and (7) project management and leadership (Trilling & Fadel, 2009). Those seven components are based on this study. They are basic skills that every teacher candidates are required to adapt to the workplace.

The employability gap is observed by studies in various parts of the world, including Australia (Evans-Greenwood et al., 2015); India (Smith & Edwards, 2012); Malaysia (Singh & Singh, 2008); Uzbekistan (Ajwad et al., 2014) and Pakistan (Mirza et al., 2014) found that a major problem in India is the employability skills of labor. In

Australia, 22.4% of health entrepreneurs face difficulties in recruiting graduates with the appropriate skills (Messum et al., 2015). A total of 64% engineering entrepreneurs in India stated that they are only 'somewhat satisfied' with the recruitment of new workers (Messum et al., 2015). In Uzbekistan, entrepreneurs reported problems in recruiting employees with the appropriate number of skills reaching only 73% (Ajwad et al., 2014).

Based on these reviews, the efforts to reinforce the employability skills for students as teacher candidates start from the reinforcement of vocational institutions graduates. Especially if it is associated with VETIs as institutions which produce vocational school teachers, the position of employability skills is increasingly strategic to be reinforced in the learning process in VETIs. In contrast to previous research, in this study as an effort to strengthen employability skills for teachers candidates through the learning strategy based on scientific approach

This paper aims to formulate a learning strategy with a scientific approach to strengthen employability skills of the vocational teacher candidates. The vocational teacher candidates find it difficult to develop employability skills unless they are explicitly taught. Employability skills must be developed integrated with learning and not with individual learning (Hadromi, 2018)

Employability skills

Employability skills are main skills, soft skills, generic skills, main competencies, transferable skills or personal attributes. Employability skills as skills which are required not only to get a job, but also for the progress of the company and the workforce can contribute well for the company (Messum et al., 2015). Employability skills are general and non-technical competencies required to do all types of work.

According to the results of a study by the American Institutes for Research (2016), employability skills that can be taught through education and workforce development systems, are divided into three broad categories; (1) Effective Relationship, the interpersonal skills and personal qualities that enable individuals to interact effectively with clients, co-workers, and supervisors; (2). Workplace Skills, the analytical and organizational skills and understanding required by employees to successfully perform work tasks; (3). Applied Knowledge, the integration of academic knowledge and wise technical skills, put to practical use in the workplace, (table 1).

Employability skills have three main parameters, namely: 1) basic skills: communication skills, information management skills, problem solving skills; 2) self-management skills: skills in demonstrating positive attitudes and behaviours, responsible skills, adaptive skills, continuous learning skills, safe work skills; and 3) teamwork skills: skills in working with others in the team, skills in participating in a project or task. (Sitthisomjin, 2014; Stephens, 2013; Promís, 2008)

Table 1
Components of employability skills

Skill	Code	Criteria	Including
Effective Relation-ships (K1)	K1-1	Interpersonal skills	Understand teamwork and work with others; respond to customers' needs; leadership training; negotiations to resolve conflicts; respecting individual differences.
	K1-2	Personal quality	Demonstrating responsibility and self-discipline; adapt and show flexibility; work independently; demonstrating a desire to learn; demonstrating integrity; demonstrate professionalism; take the initiative; display a positive attitude and sense of self-worth; assume responsibility for professional growth.
Workplace Skills (K2)	K2-1	Resource management	Time management: manage money; managing ingredients; arrange personnel.
	K2-2	The use of information	Placing information: organize information; use information; analyze information; communicating information.
	K2-3	Communicatio n skills	Communicate verbally: active listening; understand written material; convey information in writing; observe closely.
	K2-4	Systems thinking	Understand and use the system; monitor the System; improve the system
	K2-5	Use of technology	Skills in using various technologies
Applied Knowledge (K3)	K3-1	Applied academic skills	Using reading skills; use writing skills; use mathematical strategies and procedures; using scientific principles and procedures.
	K3-2	Critical thinking skills	Critical thinking; creative thinking; make good decisions; solve the problem; reason; plan and organize.

(Adopted from: American Institutes for Research. 2016)

The top 10 skills that are expected to be essential in 2020 include skills like problem-solving, critical thinking, creativity, people management, and coordination. (Gray, 2016). The twenty-first century has reshaped the world in unimaginable ways. Computers and IT have revolutionized the skills needed by a twenty-first century worker (Burrus, Jackson, Xi, & Steinberg, 2013; Levy & Murnane, 2005; Neubert, Mainert, Kretzschmar, & Greiff, 2015). The Assessment & Teaching of twenty-first Century Skills (ATC21S) (Binkley et al., 2012) identified limited but essential skills such as, problem-solving, critical thinking, decision-making, collaboration, and innovation (Javed et al., 2019)

The core of the learning approach based on scientific approach

The scientific approach is a series of processes for answering questions (Prayogi & Yuanita, 2018). Through the thought process, the hypothesis is proposed to be a temporary answer to the question, which has been posed (Putra et al., 2020). The scientific approach as a scientific process consists of six steps: (1) posing the problem, (2) formulating hypotheses, (3) designing an experiment, (4) making observation, (5) collecting data from the experiment, and (6) drawing conclusions (Prayogi & Yuanita, 2018). scientific approach is a method to generate and answer scientific questions through observation and or experimentation.

Professors, lecturers, and educational staff of vocational subjects must be able to design learning process that can develop cognitive skills, technical skills, and soft skills in the form of employability skills simultaneously. Preparation of vocational school students who have academic skills, technical skills and employability skills stems from the education process of vocational school teacher candidates (Hadromi, 2018), A study conducted by (Prayogi & Yuanita, 2018), showed that the learning process carried out by vocational teacher education institutions emphasizes on the increasingly strong employability skills of vocational teacher candidates.

The core of learning scientific approach aims to gain scientific knowledge systematically. The scientific approach is rooted in the scientific approach, a concept that emphasizes the process of gaining scientific knowledge. Scientific approach are procedures or processes that prioritize more active and participatory methods (Simonneaux, 2014). This kind of learning strategy can support students to develop hands-on and mind-on and develop students' basic abilities such as communication, interpersonal relationships, critical thinking, and problem solving skills (Lazanyi, 2012). This was confirmed by Prain (2012) who argued that to compete in the 21st century, the young generation must at least have the following abilities; communication skills, interpersonal relationships, critical and rational thinking, problem solving, risk taking, cooperative skills, innovative skills, leadership, and technology.

Scientific approach learning strategies

The application of a scientific approach to learning is basically guided by the characteristics of the scientific approach that is transformed in the steps of learning process. Steps in applying the scientific approach according to Ryan and O'Callaghan (2018) include five steps as follows. Step 1: Make an observation - gather and assimilate information about an event, phenomenon, process, or exception to a previous observation, etc. Step 2: Define the problem - ask questions about the observation that are relevant and testable. Define the null hypothesis to provide unbiased results. Step 3: Form the hypothesis - create an explanation, or educated guess, for the observation that is testable and falsifiable. Step 4: Conduct the experiment - devise and perform an experiment to test the hypothesis. Step 5: Derive a theory - create a statement based on the outcome of the experiment that explains the observation (s) and predicts the likelihood of future observations.

In line with Ryan and O'Callaghan (2018), the Minister of Education and Culture Regulation Number 22 Year 2016 states that learning steps with a scientific approach include observing, asking, experimenting, reasoning (associating), concluding, and communicating (forming networks). These five steps are known as 5M. The scientific approach is included in the student centred approach, because in the process, it prioritizes active students in the learning process and the teacher acts as a facilitator.

In the learning process based on a scientific approach, the domain of attitude observes the transformation of learning substance or teaching material so that students "know why." The realm of skill is observing the transformation of learning substance or teaching material so that students "know how". The realm of knowledge observes the

transformation of learning substance or teaching material so that students "know what." The result is an increase and balance between the ability to be good human beings (soft skills) and people who have the skills and knowledge to live properly (hard skills) from students who includes aspects of competence, attitudes, skills, and knowledge.

METHOD

Research design

This study employed a quantitative approach with a non-experimental survey because the study investigated sample data obtained from the population and used a questionnaire as a data collection instrument (Radhakrishnan, 2013). The study aims to determine (1) the characteristics of the scientific approach implementation and employability skills variables, (2) confirm whether the indicators of the scientific approach implementation influence the reinforcement of employability skills, and (3) determine the contribution of the scientific approach implementation to reinforcing employability skills. The implementation of the scientific approach as an independent variable, and employability skills as a dependent variable.

Population and samples.

The research population consisted of 450 students of Automotive Engineering Education Program, Mechanical Engineering Department, Faculty of Engineering, Semarang State University. Furthermore, the sample of this study was determined using a purposive sampling technique. The purposive sampling technique is a type of non-probability sampling that is most effective when one needs to study a certain cultural domain with knowledgeable experts within, Three categories: Studies of specific skills, knowledge, or practices; Comparisons between practices; and Case studies (Tongco, 2007; Karmel & Jain, 1987). Sampling was based on on consideration by involving the third semester students and the students who joined program car electrical system course, and AC systems with a total of 120 students.

Research instrument

The research instrument consisted of (1) scientific approaching learning instruments, (2). The instrument for the employability skills reinforcement of vocational school teacher candidates, (table 2).

Table 2
Indicator of employability skills research instruments

Skill	Criteria	No: Instrument Code: Instrument
Effective Relation-ships	Interpersonal skills	1. : K1.1.1: understand teamwork and work with others
		2. : K1.1.2: negotiations to resolve conflicts
		3. : K1.1.3: respecting individual differences.
		4. : K1.1.4: leadership training
	Personal quality	5. : K1.2.1: demonstrating responsibility and self-discipline
		6. : K1.2.2: adapt and show flexibility
		7. : K1.2.3: assume responsibility for professional growth.
		8. : K1.2.4: work independently
Workplace Skills	Resource management	9. : K2.1.1: time management
		10.: K2.1.2: managing ingredients
		11.: K2.1.3: arrange personnel
	The use of information	12.: K2.2.1: organize information
		13.: K2.2.2: use information
		14.: K2.2.3: analyze information
		15.: K2.2.4: communicating information
	Communication skills	16.: K2.3.1: communicate verbally
		17.: K2.3.2: convey information in writing
		18.: K2.3.3: active listening
	Systems thinking	19.: K2.4.1: understand and use the system
		20.: K2.4.2: monitor the System
		21.: K2.4.3: improve the system
	Use of technology	22.: K2.5.1: skills in using various technologies
Applied Knowledge	Applied academic skills	23.: K3.1.1: using reading skills
		24.: K3.1.2: use writing skills
		25.: K3.1.3: using scientific principles and procedures
	Critical thinking skills	26.: K3.2.1: critical thinking
		27.: K3.2.2: creative thinking
		28.: K3.2.3: make good decisions
		29.: K3.2.4: solve the problem
		30.: K3.2.5: plan and organize.

The instruments used in learning activities have scientific approaches consisting of syllabus, lesson plans, practice sheets . The instrument was validated by two vocational education experts and two education practitioners (the lecturers of Automotive Engineering Education Program). Validation was performed by giving scores for each component on the validation sheet with a score range of 1 - 4. Score 1 indicates "invalid," 2 indicates "somewhat valid," 3 indicates "valid," and 4 indicates "highly valid." Data analysis from the results of validation was conducted by calculating the average score from experts and practitioners. Validation results showed the following scores: 3.62 (valid) for syllabus, 3.68 (valid) for lesson plans, 3.70 (valid) for job sheets. Furthermore, the instrument for the scientific approach implementation and employability skills reinforcement consists of 30 questions each. The instruments were validated by using SPSS version 20.0 for windows. The value of Person Correlation for each instrument was between 0.438 to 0.519, and 0.410 to 0.547 with valid category.

Reliability tests were also conducted on instruments to measure scientific approach implementation, and employability skills reinforcement. Reliability testing involved 54 students who were asked to complete 30 questions that had previously been validated. A score of 54 students was then tested using Cronbach's alpha with the help of Statistical Package for Social Sciences (SPSS) version 20.0 for Windows. Reliability test showed that the Cronbach's alpha value for the scientific approach implementation was 0.747, and 0.791 for the employability skills reinforcement. Both values were greater than 0.6. Therefore, both instruments were considered reliable. Both instruments for scientific approach implementation and employability skills reinforcement were valid and reliable to be used to collect research data

Data analysis

Data in this study were tested for their for homogeneity, normality and linearity before they were analyzed using descriptive analysis, regression analysis. The data analysis of the data was performed with the help of SPSS version 20.0 for Windows. The application of descriptive analysis was conducted to determine the variable characteristics of the scientific approach implementation and employability skills reinforcement. The regression analysis was used to determine the influence and contribution of the scientific approach implementation to employability skills reinforcement.

Prerequisite test

The prerequisite test which was performed before regression analysis consisted of homogeneity test, normality test, and linearity test. The data homogeneity test results with α: 0.5 with numerator df (n-1, where n = 120), and denominator df (n-1, with n equal to 120) showed F stat: 1.146, and F table : 1.35 . Because F count < F table, then the data had the same variance (homogeneous).

The results of normality test data using Kolmogorov-Smirnov showed the Sig. Kolmogorov Smirnov = 0.200>α = 0.05, the conclusion is that the data on scientific approach implementation and employability skills are normally distributed. The linearity test results showed the F value was fit (Deviation from linearity is 1.145 with significance 0.311 above 0.05) so that linearity requirements were met.

Stages of Learning with Scientific Approach

Planning

The planning stage of learning process with employability skills reinforcement for vocational school teacher candidates was conducted in the following steps;

1. The lecturer prepared the learning documents; semester learning plan; teaching materials, learning media.
2. The lecturer chose a car body's electrical system practice course that was used in conducting research.

3. Vocational teachers and prospective teachers understood the curriculum that strengthens the mutually agreed employability skills of vocational teacher candidates.
4. The vocational school teacher candidate understood the competencies that was applied in learning according to the content of the Automotive Engineering Education Study Program's Curriculum.
5. In this context attitude/affective indicators are taken from the formulation of *employability skills* that already exist in the curriculum consisting of *Effective Relationships* (K1) , *Workplace Skills* (K2) , and *Applied Knowledge* (K3)
6. The selection of the value of employability skills to be developed in vocational school teacher candidates is used as a basis for determining learning and assessment activities.
7. Prepared the assessments; test questions, questionnaires, and observation sheets.

Implementation

The learning process which used the scientific approach was carried out in three stages: (1) preliminary activities; (2) core learning activities; and (3) closing activities. Preliminary activities were carried out by giving orientation to vocational school teacher candidates about the learning material to be delivered, it was continued to provide motivation, apperception, giving references.

The core learning activities were carried out according to the steps of the scientific approach including observing, questioning, experimenting, reasoning (associating), concluding, and communicating (5M) (Utanto et al., 2017) . 5M was applied using ICT-based media and applied the learning technique / method based on students' activities that are fully illustrated in table 3.

Closing activities were carried out by (1) making a summary / conclusion of the lesson by involving the teacher candidate; (2) checking the completion of the tasks; (3) providing feedback and direction / motivation; (4) Delivering follow-up on learning and remedial/enrichment services; (5) Informing the material / tasks of the next meeting; (6) closing the lesson with greetings

Table 3
The stages of the implementation of learning process with a scientific approach

Scientific Learning Stages	Learning Activities	Competencies	Assessment	Objective
Observing (M1)	The teacher candidate observed the demonstration of the learning object to understand the object of learning	Knowledge, affective aspect, and skills of the teacher candidates to the components of employability skills; K1-1, K1-2, K2-1, K2-2, K2-3, K2-3, K2-4, K2-5, K3-1, K3-2.	Knowledge: test on their understanding of the learning material Affective aspect: Observation sheet skills: observation sheet	Assessing the completion; knowledge, affective aspect, and skills to the components of employability skills included; K1-1, K1-2, K2-1, K2-2, K2-3, K2-3, K2-4, K2-5, K3-1, K3-2.
Questioning. (M2)	The teacher candidate poses questions about the learning object from the factual question to the hypothetical questions, creates a concept of employability values with the guide of the lecturer			
Gathering information (M3)	The teacher candidate determines the information based on the questions, determines the source of information and gather the information from various sources both online and offline			
Associating. (M4)	The teacher candidate analyses the information by categorizing, determines the relationship of the category information/category and concludes the information based on the analysis			
Communicating. (M5)	The teacher candidates communicate the results of their work by spoken and written media using diagram, chart or other media. They reflect on the employability skills			

FINDINGS

The Description of Scientific Approach Implementation Data

The data on the implementation of scientific approach were revealed by questionnaire consisting of 30 items in the four scale (1 - 4). A minimum score for the scientific approach implementation variable was equal to 30, the amount of the maximum score was 120, and the mean criterion $(\bar{X}k)$ was 75. The results of the research data showed that the minimum score was 74, the maximum score was 108, the mean score was 92.26, the median score was 92, the mode was 95, and the standard deviation was 6.15. By using the mean score of the criteria ($\bar{X}k = 75$), The mean score of the research data was 92.56 ($\bar{X} = 92.56$). In general, all students in Automotive Engineering Education Department, Faculty of Engineering, Semarang State University perceived the implementation of scientific approach in electrical and air conditioning systems were categorized as very high. Only 6.67 % of students perceived the implementation of the

scientific approach in the moderate category, 74.17 % in the high category, 19.16 % in the very high category.

Table 4
Data on strengthening of vocational teacher candidtes' employability skills

Component	Effective Relationships (K1)		Workplace Skills (K2)					Applied Knowledge (K3)	
	K1-1	K1-2	K2-1	K2-2	K2-3	K2-4	K2-5	K3-1	K3-2
Sum	412.0	391.0	393.0	402.0	423.0	462.0	386.0	344.0	378.0
Max	5.0	5.0	5.0	5.0	5.0	6.0	5.0	5.0	5.0
Min	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Average	3.4	3.3	3.3	3.4	3.5	3.9	3.2	2.9	3.2
Median	3.0	3.0	3.0	3.0	4.0	4.0	3.0	3.0	3.0
Mode	3.0	3.0	3.0	3.0	4.0	4.0	3.0	3.0	3.0
Stdev	0.6	0.7	0.7	0.7	0.8	0.9	0.8	0.7	0.9
Varians	0.4	0.5	0.5	0.5	0.7	0.7	0.6	0.6	0.8

Note: K1-1: Interpersonal skills, K1-2: Personal quality, K2-1: Resource management, K2-2: The use of information, K2-3: Communication skills, K2-4: Systems thinking, K2-5: Use of technology, K3-1: Applied academic skills, and K3-2: Critical thinking skills.

Description of Employability Skills Reinforcement Data

The variable on employability skills reinforcement of the teacher candidates at vocational school was revealed by the questionnaire. The questionnaire consisted of 30 items in a scale of four (4). The minimum score was 30, the maximum score was 120. Therefore, the mean criteria ($\bar{X}k$) was 75. The results of the research data showed that the minimum score of the employability skills reinforcement was 68, the maximum score was 101, mean score was 90.49 , median score was 92.0, mode was 95, and the standard deviation was 5.71. The percentage of employability skills of students as the vocational teacher candidates in Automotive Engineering Education which were categorized as low was 0.83, the moderate category was 6.67%, higher category was 73.33%, and 19.17% was on the very high category.

If it is classified, the data for strengthening employability skills for prospective vocational teachers in each component, i.e. (1) *Effective Relationships* (K1), (2) *Workplace Skills* (K2), and (3) Applied Knowledge (K3), (table 4).

Hypothesis testing

The SPSS output was a regression model: $Y = 49.438 + 0.445 X + \varepsilon$, at the significance level $\alpha = 5\%$, the null hypothesis was rejected because the sig (0,000) < α (0.05). It can be concluded that the variable X 'learning with a scientific approach' had a significant effect on Y 'the reinforcement of the employability skills of vocational schools teacher candidates'.

F test (model fitness test)

By using SPSS ANOVA, Conclusion on the significance level of 5%, HO was rejected, because the value of sig (0.000) <α (0.05), then the model was fit.

The coefficient of determination (R^2)' and correlation coefficient (R)

Correlation coefficient was R = 0.476 means that there is a relationship between the implementation of scientific approach learning process during electrical in car body and air conditioning systems and employability skills reinforcement on vocational school teacher candidates vocational school teacher candidates in automotive engineering program with valid and reliable indicators of 22.7 % (table 5). The coefficient of Determination value (R Square) was 0.22. Therefore, the contribution of the scientific approach implementation in reinforcing the employability skills was 22.0 %, while the remaining percentage of 78 % is influenced by other factors.

Table 5
The coefficient of determination and correlation

Model Summary [b]

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.476[a]	.227	.220	5,053	.227	34,640	1	118	.000

a. Predictors: (Constant), Scientific approach

b. Dependent Variable: employability skills reinforcement

DISCUSSION

Learning Planning

Lecturers developed a semester learning plan with employability skills. The semester learning plan with employability skills was written through the formulation of learning objectives, the selection of learning method, the development of learning scenarios, and the development of learning instruments with employability skills. The formulation of learning objectives was performed by including the employability character indicators and audience, behaviour, condition, degree *(ABCD)* components.

The learning material on car body's electrical system practice was a module which contained the flow diagram on the learning material; electrical lighting systems; central lock; power window; and door lock. The vocational teacher candidates read and understood the flow chart carefully, recognized the characteristics of the car body's electrical system, performed trouble shooting, and repaired the possible damages. In this example, vocational teacher candidates read and understood the images carefully was one formulation of communication skills from employability skills as intended by *BCA / ACCI, 2002*. The learning method with employability skills can be selected from a variety of learning methods that have the main characteristics to make students active in learning process. Therefore, in addition to being effective in achieving hard skills competencies, the vocational school candidate can also strengthen their employability skills.

Learning scenarios for employability skills were developed from pre-selected learning method such as; the group work method, the project method, and the discussion. Learning scenarios in the form of lecturer teaching activities and learning

activities of prospective vocational teacher were organized in the stages of opening activities, core activities, and closing learning activities. The learning assessment was developed in the form of a booklet test to assess cognitive knowledge on the program of Automobile electrical system courses, and air conditioning systems, observation sheets to observe the behaviour (employability skills) of the vocational teacher candidate, and self-evaluation sheet to allow any prospective vocational teachers reported learning activities related to the development of their employability skills.

Learning Implementation

The scientific approach to learning is similar with the scientific method, or the scientific model commonly used in science learning (Longbotham & Longbotha, 2006; and Keyes, 2010). Implementation of scientific approach was carried out by applying these following steps: Observing, Questioning, Gathering information / experimenting, Associating / processing information, Communicating (5M) as shown in table 3.

The implementation of a scientific approach to learning can strengthen the employability skills of vocational teacher candidates in the Automotive Engineering Education study program. The learning process was carried out in these stages; (1) group learning made the vocational teacher candidates felt more confident and comfortable; (2) the stages of observing strengthened them to be more motivated and increase their curiosity; (3) the stage of experimenting / gathering information made vocational teacher candidates more comfortable to gather information that can be performed together, exchanged ideas and experiences; (4) stages of associating, adding breadth and depth to information by processing information by seeking solutions from various sources; (5) communication stage, vocational teacher candidates were trained to convey the results of learning by reporting and presenting to the class. This is in line with the integrated productive practice management model (momantikproter) developed by Hadromi (2015). Hadromi (2015) argued that the application of momantikproter provides opportunities for teaching staff; participants learned to have an integral understanding of practice material, and have implications for increasing motivation to optimize their potential. These steps are steps in strengthening the employability skills of vocational teacher candidates.

The results showed that scientific approach learning had a significant effect on the strengthening of employability skills of prospective vocational teachers (table 5). The contribution of scientific approach to strengthen employability skills was 22.0%. This is possible because the scientific approach to learning involves vocational teacher candidates directly to associate learning material in real life contexts (In'am & Hajar, 2017; Stephenson & Sadler-McKnight, 2016). The association of the lessons with real life context in learning makes vocational teacher candidates more creative, innovative, and are able to bring out brilliant ideas in solving problems they face (Bandaranaike, 2018). The creativity of teachers candidate grows because learning is centered on students. Professors to act more as facilitators and allow students to take greater responsibility for their own education and increase the levels of interactive education (Khorbortly & Budnik, 2014). It appears that as the children had more time to engage with the material, participate in cooperative peer discussions, and receive

encouragement from their teachers to provide elaborated feedback to each other (Gillies, 2015), so that it could strengthen the employability skills of vocational teacher candidates (Stephenson & Sadler-McKnight, 2016; Rosenberg et al, 2012).

The sequence of employability skills components from the largest to the smallest is as follows: K2-4, K2-3, K1-1, K2-2, K2-1, K1-2, K2-5, K3-2 and K3-1. This data reveals that strengthening Workplace Skills (K2) and Effective Relationships (K1) are spread evenly at high levels, while the Applied Knowledge (K3) component is spread at lower level. The scientific approach is able to create an atmosphere of active learning, and can make students more creative and innovative in learning the material (Sodik & Wijaya, 2017) supports that the scientific approach in learning process can make the learning atmosphere active and very interesting, because students are confronted with the reality of the material and the facts in their surrounding to increase their motivation to find out more.

Learning Assessment

The implementation of the scientific approach required understanding and creativity of the lecturer in presenting the material with the scientific approach. Scientific approach has advantages and disadvantages (Camuffo et al., 2020). One of the strengths of the scientific approach is that it creates an enjoyable learning situation (Putra et al., 2020; Lyubomirsky, 2008). The lecturer need to pay attention to several factors that influence the success of the learning process. The success of the teaching and learning process is influenced by; the self of vocational teacher candidates as the main actors in the teaching and learning process (Winarso, 2016); the lecturer himself as the manager of the teaching and learning process with all its uniqueness (Kim et al., 2011; Obwogi, 2013); the educational objectives which are the targets of achievement of the teaching and learning process (Singh & Leavline, 2013); learning materials as the main supporting material for the achievement of objectives (Fox, 2000); ease of accessing teaching material resources (Eucheria, 2020); the atmosphere of learning (Said, 2016). From all the descriptions, the lecturer is one of the components that greatly determines the success of vocational teacher candidates in learning and strengthening employability skills . Therefore, lecturers must always try and innovate to find the appropriate strategies, methods, models and approach in learning.

Through learning wit scientific approach, professor, and lecturer become the learning facilitators so that the learning process can take place more effectively to improve the knowledge, skills and attitudes. Darling-Hammond (2015) corroborates that to realize students' cognition requires the teaching of broad skills from the teaching staff. In addition, Orlich et al. (2012) believes that good teaching staff reflects the way in which they will present their lessons and through their education, having various teaching strategies at their disposal (Irmita & Atun, 2018).

CONCLUSIONS

Effective teaching not only involves the use of tools, techniques, and strategies but also the understanding of meaning specifically about how vocational teacher candidates learn, process information, motivate themselves, and pay attention inhibiting

factors in learning. Scientific approach is a learning method that regulates learning in stages that contain instructions for conducting learning to vocational teacher candidates. The application of scientific approach can strengthen the employability skills of vocational teacher candidates. This condition is possible because learning is carried out with the scientific stages. This implementation of the scientific approach in learning could strengthen employability skills with the percentages as follows: the medium category by 6.67%, the high category by 73.33%, and 19.17% in the very high category. The amount of contribution in strengthening employability skills was 22.0%. The application of learning strategies with the scientific approach specifically strengthens employability skills in the components as follows: Workplace Skills (K2) and Effective Relationships (K1) components that spread evenly at high levels of reinforcement, while the Applied Knowledge (K3) component is at a moderate level of reinforcement.

SUGGESTION

The results of this study for educational institutions can enrich the reference of educational institutions in constructing curricula and developing lesson plans to implement the scientific approach to learning. This study revealed that university curricula must be redesigned with more direct industry internships and projects, which could facilitate pre-employment training and improve employment capacity of the graduates

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