Production-Based Education Model for Improving Technical and Vocational Teachers Ability

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Abstract. The vocational high schools (SMK) in Surakarta have applied the Production-Based Education (PBE) in order to improve the student skills. On the other hand, the implementation of PBE model is needed the professional teachers who have the skill qualifications in the production and learning. This study focuses on strengthening of teacher’s behavior related to the implementation of PBE model at vocational high schools in Surakarta, especially on teacher’s Organizational Citizenship Behavior. This research conducted based on the observational research method that employed 134 teachers of SMK Warga Surakarta as respondents. The data of teachers OCB were analyzed by using the descriptive analysis. The result showed that the PBE model had strengthened the teachers OCB at SMK Warga Surakarta. The measurements of OCB level of SMK teachers had shown the high (H) level and some of the teachers' OCB characters show very high (VH) levels such as altruism and civic virtue. OCB or "good soldier syndrome" could be manifested by the teacher’s interaction at school such as loyalty, volunteering and helping others. Therefore, teacher’s OCB behavior became important due to the organizational effectiveness at vocational high school (SMK).

1. Introduction
The teacher's reform in Indonesia was started after the enactment of the Law No 14/2005 on Teachers and Lecturers. This law stated that teacher and lecturer in Indonesia should hold an academic qualification and teaching certificate. The teacher reform was facilitated by the government through the teacher professional education or Pendidikan Profesi Guru (PPG) in Indonesian. Through this program, the professional teacher gets the teaching certificate. Therefore, the teacher becomes the key point of improving the education quality in Indonesia. In case of Vocational High School (VHS) or Sekolah Menengah Kejuruan (SMK), the professional teacher was required capable in vocational skill and teaching skill [1]. These teacher specifications are related to the main objective of VHS in Indonesia. The SMK is an education for work-oriented at the secondary level of the national education system. The SMK prepared the student’s skill for ready to work in the industry.

Production-Based Education (PBE) is one of the teaching models that can be applied at SMK due to the student’s skill improvement. PBE model have similarity to the teaching factory model [2]. The teaching factory concept is based on the triangle notion of knowledge i.e. education, research and innovation [3] as shown in Figure 1 on the other hand the PBE concept is integrated education and manufacturing based on industrial demands [2] as shown in Fig. 2. PBE is a new paradigm in manufacturing engineering technology and education. SMK Warga Surakarta is one of the vocational high schools in Surakarta that had applied the Production-Based Education (PBE). As evidenced by the
implementation of PBE model at SMK Warga Surakarta, the students' skills improved and the graduates acceptable in the job market or industry. This case is interesting and needs to be observed, especially the success story in the implementation of PBE model at SMK.

Figure 1. Concepts of Teaching Factory [3].

Figure 2. Concepts of PBE [2].
The implementation of PBE model was needed the professional teachers who have the skill qualifications in the production and teaching. Therefore, this study focused on the teacher’s behavior related to the implementation of PBE model at SMK Warga Surakarta. This study concentrates on the strengthening the teacher’s Organizational Citizenship Behavior (OCB) in the vocational high school through the PBE model. The teacher’s OCB behavior became important to study because OCB is a good way to the vocational high school to reach the organizational effectiveness.

Since the Organizational Citizenship Behavior was introduced by the Bateman and Organ, the implementation of OCD Widely used in all discipline, such as social, psychology education, etc. [4]. Smit and Organ was identified the OCB as “good soldier syndrome” [5,6].

Organizational Citizenship Behavior has five categories of character [6] i.e. 1) Altruism is the willingness to provide assistance to co-workers. 2) Conscientiousness means that organizational members have in-role behavior levels above the required minimum standards. 3) Civic virtue is the active participation of members of the organization in thinking of organizational progress, e.g. always looking for the latest info that supports the progress of the organization. 4) Sportsmanship is more emphasis on the positive aspects of the organization than the negative aspects, e.g. disrespectful behavior protests, not complain, and not exaggerate small / trivial problems. 5) Courtesy is doing good and respectful to other members of the organization.

Organizational Citizenship Behavior at school could be manifested by the teachers in school interaction such as loyalty, volunteering and helping others [6]. Many researchers have study the teacher’s OCB at school [7], [8,9], and [10]. Investigated the display levels of teacher’s OCB at the secondary school in Turkey [7]. Oguz, conducted the study on the relationship between leadership styles and the OCB of teachers in Samsun city, Turkey [8]. Zeinabadi, studied on job satisfaction and organizational commitment as antecedents of teacher’s OCB in Tehran, Iran [9]. Runhaar had examined the influence of teachers work context on the relationship between their work engagement and OCB at the secondary school in the Netherlands [10].

This study adopted the teacher’s work context that applied production-based education [10]. PBE is a form of learning program by empowering the skills of teachers in Vocational High School. On the other hand, this learning model causes problems or friction between teachers in Vocational High School. It was caused by several factors such as the unequal workload, pressure from industry partners, the pressure of school leaders and teachers' welfare level. This was evident of vocational high schools that became the pioneer of teaching factory program cannot exist until today. Unlike the case of SMK Warga Surakarta that is still consistent and successfully developed production-based learning. This study observed the positive behavior of teachers of SMK Warga Surakarta (OCB's level of teachers). The observation was focused in the strengthening of the teacher’s organizational citizenship behavior (OCB) through the PBE.

This study contributes to theories about the impact of organizational and individual factors on organizational citizenship behavior in general and within Vocational High School (VHS) in particular. The practical value of our study is reflected in the guidelines "How to strengthen the teacher’s organizational citizenship behavior (OCB) through the PBE."

2. Methods

This research conducted based on the observational research method and employed all teachers in SMK Warga Surakarta (134 teachers) as respondents. The data was collected by the questionnaires. The OCB questionnaires were created based on the 5 categories of OCB character i.e. 1) Altruism, 2) Conscientiousness 3) Sportsmanship 4) Courtesy and 5) Civic Virtue [6]. The indicators were derived from the 5 categories of OCB’s character as shown in Table 1. The questionnaire consists of 22 items using 5 Likert-Type Scale (1=very low to 5=very high), 5 item related to altruism, 4 item related to conscientiousness, 4 item related to sportsmanship, 4 item related to courtesy, and 5 item related to civic virtue. The interpretation of arithmetic averages is as follow: quite low (1.00-1.79), low (1.80-2.59), medium (2.60-3.39), high (3.40-4-19) and very high (4.20-5).
Table 1. The 5 categories of OCB’s character and indicators.

| No | Categories of character | Indicators                                                                 |
|----|-------------------------|-----------------------------------------------------------------------------|
| 1  | Altruism                | 1. Teamwork  
|    |                         | 2. Responsive to the school leader’s programs                               |
| 2  | Conscientiousness       | 1. Work discipline  
|    |                         | 2. Effectively work and job responsible                                     |
| 3  | Sportsmanship           | 1. An organization member who does not complain at work                      |
|    |                         | 2. The ability of teachers to solve work problems                           |
| 4  | Courtesy                | 1. Keeping the school's image  
|    |                         | 2. Teacher’s contributions to the school                                   |
| 5  | Civic Virtue            | 1. Looking for the latest info that supports the progress of the PBE        |
|    |                         | 2. Teacher’s concern to the PBE                                            |

3. Results and Discussions

Descriptive statistics of the data analysis such as frequency, percentage, mean and standard deviation was shown in the Fig. 3. The teachers OCB of SMK Warga Surakarta has highest mean (M=3.98, SD=0.39). It means that the PBE has the positively related to the teachers OCB of SMK Warga Surakarta.

Table 2 presents the results of data analysis of OCB character and OCB level of SMK Warga Surakarta teachers. The character of altruism and civic virtue of SMK Warga teachers occupies the very high level (VH), while conscientiousness, sportsmanship, and courtesy were high level (H). Thus, the average of OCB level of SMK Warga Surakarta teachers was high level (H). This shows that the existence of PBE learning model at SMK Warga gave the positive impact into the character of teacher’s OCB. The following will be discussed each character of teacher’s OCB at SMK Warga Surakarta:

Table 2. OCB level of SMK Warga Surakarta teachers.

| Categories of character | Average and Level | Level          |
|-------------------------|-------------------|----------------|
|                         | \(\bar{X}\)       |                |
| Altruism                | 4.4               | Very High (VH) |
| Conscientiousness       | 3.7               | High (H)       |
| Sportsmanship           | 3.5               | High (H)       |
| Courtesy                | 4.1               | High (H)       |
| Civic Virtue            | 4.2               | Very High (VH) |
| OCB                     | 3.98              | High (H)       |
3.1. Altruism character of teachers of SMK Warga Surakarta

Altruism character of teachers of SMK Warga Surakarta had shown the very high level (X=4.4). The altruism character of SMK-Warga teachers was shown in the behavior of mutual help among teachers such as in the activities of PBE lesson plans, interpreting the desire of industrial partners and supervising the quality of the student's production. By implementing PBE learning model, the teamwork between teachers at SMK Warga Surakarta becomes solid. The solid teamwork was triggered by the teacher's responsibility for the successful implementation of the PBE learning model. In particular how to maintain the quality of student work was acceptable to partner industry or customer. Evidence from strong teamwork SMK Warga was trusted as CNC machine assembly by PT. Gisma Indonesia. In addition, SMK Warga was trusted by the industries around the Surakarta city to produces the spare parts.

3.2. Conscientiousness character of teachers of SMK Warga Surakarta

Conscientiousness character of teachers of SMK Warga Surakarta had shown the high level (X=3.7). The character of conscientiousness of SMK Warga Surakarta teachers was demonstrated by discipline and also put forward effective working pattern in PBL model. Teachers recognize that PBE-based learning demands fairness and work effectively because the partner industry or customer demands that orders be completed within the scheduled time. This character is supported and evolved with the learning of the PBE model. Thus, the learning model of PBE is able to improve and strengthen the conscientiousness of SMK Surakarta teachers such as discipline and effective work.

3.3. Sportsmanship character of teachers of SMK Warga Surakarta

Sportsmanship character of teachers of SMK Warga Surakarta had shown the high level (X=3.5). The research findings could be seen that school managers (principals and leaders) were able to provide justice for teachers and students in the learning process of the PBE model. This can be seen from the absence of conflict or protests arising from teachers or students related to the implementation of the PBE. The condition of the school becomes conducive and more comfortable for students to learn and for teachers to be optimal in work. Indicators of research that discuss the emergence of conflict between teachers, teachers versus school leaders, and teachers versus students almost pseudo respondents said very rarely. It is evident that the sportsmanship character of teachers of SMK Warga Surakarta increases with the complexity of the work due to the application of the PBE model.

3.4. Courtesy character of teachers of SMK Warga Surakarta

Courtesy character of teachers of SMK Warga Surakarta had shown the high level (X=4.1). This average value was close to the very high level. The results of questionnaire analysis revealed that SMK Warga teachers were very eager to apply the learning model of PBE. This is due to the motivation for self-actualization of their skills and motivation for school image in the community and the workplace. They realize that private schools like SMK Surakarta Warga will be able to survive in the competition if the school has a specificity and positive image in the community and the workplace. This positive image has made SMK Warga easily get good prospective students (input), and the graduates (output) easily got a job. Thus, the PBE learning model had become a positive trigger for increasing courtesy character of teachers in SMK Warga in constructing school positive image.

3.5. Civic virtue character of teachers of SMK Warga Surakarta

Altruism character of teachers of SMK Warga Surakarta had shown the very high level (X=4.2). The result of questionnaire analysis related to the civic virtue character shows that the implementation of PBE learning model affected to the increasing the active participation of teachers at SMK Warga Surakarta. This is due to the innovations that have been conducted by the teachers related to the product development of PBE. Consumer orders are increasingly diverse, such as machining parts, CNC machines to CNC training and heavy equipment from PT. United Tractor and PT. Bisma Indonesia. Therefore the PBE model can improve the civic virtue character of SMK Warga teachers reflected in
the willingness to make innovations for the successful implementation of learning and satisfaction of industry partner or customer.

4. Conclusion
The results showed that the learning model of PBE that was developed by SMK Warga Surakarta suitable with the wishes of the teachers. The PBE learning model has been able to encourage teachers to work hard, even though the teacher's workload becomes more or increases. Overall, the OCB level measurements of Surakarta SMK teachers was high (H) level and some of the teachers' OCB characters show very high levels such as altruism and civic virtue. The real impact of teacher OCB strengthening can be seen in 5 categories of OCB characters as follows:

a. The altruism character of SMK-Warga teachers was shown in the behavior of mutual aid during conducted learning model of PBE.
b. The learning model of PBE can improve and strengthen the conscientiousness of SMK Surakarta teachers such as discipline and effective work.
c. The sportsmanship character of teachers of SMK Warga Surakarta increases with the complexity of the work due to the application of the PBE model.
d. The PBE learning model had become a positive trigger for increasing courtesy character of teachers in SMK Warga in constructing school positive image.
e. The PBE model can improve the civic virtue character of SMK Warga teachers reflected in the willingness to make innovations for the successful implementation of learning and satisfaction of industry partner or customer.

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