Industrial working culture in learning practice at vocational high school

T Sukardi*, A Fitrah, K Syauqi, and Paryanto

Department of Mechanical Engineering Education, Universitas Negeri Yogyakarta, Indonesia

*thomas_sukardi@uny.ac.id

Abstract. The purpose of this study was to study the application of working culture to the learning practice of machining in vocational high school (VHS) Muhammadiyah 1 Salam. The industrial working culture adds value to integrity, professional, productive, innovative, and competitive. This research is a quantitative and qualitative descriptive study. The subjects in this study were machining subject teachers of class XI and XI grade students in mechanical engineering majors at VHS Muhammadiyah 1 Salam. The obtained data were analyzed through descriptive analysis. The results show the value of integrity that has been implemented by 88% of students by behaving honestly and responsibly. Professional values have been applied to 54.8% of students with standardized procedures and applying K3 while working. Productive value has been applied 69% of students according to the time and quality determined. 27% of students have applied innovative value. Innovative value is applied by finding new alternatives at work. Competitive value has been applied by 53% of students by looking for information related to the field of work and confidence in showing competence.

1. Introduction

Vocational high school is an educational level aimed at producing skilled workers who will pursue careers in the industrial and business world. Clarke & Winch define “Vocational education is confined to preparing young people and adults for working life, a process often regarded as of rather technical and practical nature” [1]. This understanding shows that the types of knowledge and skills taught in vocational secondary education are appropriate to certain types of work. The type of work intended is the type of work that is in the field of employment.

One of the supporting factors for an industry to develop and have a global quality is the work culture that every worker has. The work culture in question is the attitudes and behavior of individuals or groups that are carried out repeatedly so that it becomes the nature and habits that base on values believed to be true [2]. The Industrial Research and Development Center (called BPPI) has launched five work culture values in an industry. These values include integrity, professional value, productive value, innovative value, and competitive value. Integrity is thinking, saying, behaving, and acting correctly and adequately upholding the code of ethics and moral principles”. The above opinion explains that someone with integrity will always uphold the code of ethics and moral principles in his life. BPPI further explained that workers with integrity would show consistent action based on professional norms and codes of ethics, and work responsibly and honestly [3].

Professional is defined as behavior, manner, and quality that characterizes a profession. A person is said to be professional if his work has the technical standard characteristics of a profession [4]. In line with what was revealed by Imawan namely, professionalism shows work that is by the technical
standards of a profession. Technical standards are a set of requirements that must be met by materials, products, or services [5]. Professionals are also shown by applying Occupational Safety and Health when working. According to regulations no. 1 of 1970, the government requires all business sectors to implement Occupational Safety and Health in the workplace as a form of professionalism [6]. The regulations explain the importance of meeting work safety requirements to prevent, reduce and control accidents, detonation hazards, temperature, humidity, radiation, sound, vibration, electrical hazards, extinguishing fires, assistance in accidents, and providing personal protective equipment (PPE) to the workers.

Productive is working within the planned time and quality. According to Simamora, the time and quality in question is the level of an activity completed with the output and maximize the time available for other activities [7]. Timeliness is measured by employee perceptions of an activity provided at the beginning of time until it becomes output, while quality is a standard of results relating to the quality of a product produced by employees.

Innovative can be ideas, ways, or objects that are perceived by someone as something new. The statement is in line with De Jong & Den Hartog, which states that innovative behavior can be defined as all individual actions directed at the generation, introduction, and application of new benefits at each level of the organization [8]. Innovative values for workers are explained by BPPI, which is an effort to make various improvements that have added value to implement ideas as alternative solutions to facilitate a better, faster, and more precise work process [3].

Competitiveness is explained in the Minister of National Education Regulation No. 41 of 2007 concerning standard processes, namely the ability to show better, faster, or more meaningful results [7]. BPPI explains that the competitive value or competitiveness of workers is shown by behaving to be the best, as well as prioritizing their superiority or uniqueness in the face of competition [3].

In general, workers who have just entered the industrial world need adjustment time to get accustomed to the work culture in the industry. The adaptation makes productivity in an industry not run optimally. Seeing this, it would be more efficient if the industrial work culture were applied when the learning process at the Vocational School.

The Mechanical Engineering Department of VHS Muhammadiyah 1 Salam has the role of supplying skilled workers in an industry, so it is necessary to apply an industrial work culture to the learning of machining practices. In machining practice activities, students are not only taught the ability of technical skills, but students are also taught work attitudes. When learning practical students do activities that represent industrial activities, namely producing a product that requires the application of industrial work culture during the learning process.

The results of observations at VHS Muhammadiyah 1 Salam found that the implementation of the teaching and learning process of machining practices has not fully implemented the industrial work culture. One of the problems was shown by students who did not permit teachers when leaving the workshop during the lesson. Leaving the workshop without permission is not by the value of integrity in the work culture of the industry. BPPI mentions that the value of integrity will reflect on working with full responsibility and honesty. At the time of observation, it was only a small proportion of students used work preparation sheets while working. That when students to work not to use standard procedures. Work without using standard procedures not under professional values. BPPI states that working according to established standard procedures show professionalism [3].

The machining workshop of VHS Muhammadiyah 1 Salam has inadequate facilities. There is only one milling machine that operates in the machining workshop. The inadequate number of machines caused some students not be able to carry out the practice. As a result, students cannot complete work within the allotted time. That is not following the production value. Productive workers will work by the specified time and quality [10].

The environmental conditions of the Muhammadiyah 1 Vocational High School machining workshop Salam are not clean and neat. During practice, students work with scattered equipment. Students also work not to use personal protective equipment (PPE). It is not under the concept of Seiton and Seiketsu in the 5S work culture. The Seiton concept is applied by arranging equipment neatly in the work area, while one of the Seitsuke concepts can be applied with the habit of using PPE when working [11].
Based on the description above, this research is critical to do. This research can help Direktorat Pendidikan Menengah Kejuruan in preparing students to fill jobs in the business and industrial world, equipping students to be resilient and persistent incompetence; and able to develop professional attitudes in the areas of expertise that are of interest.

2. Methods
This research uses descriptive quantitative and qualitative research methods. Descriptive research aims to describe the characteristics of a particular population. The reason for choosing this method is to describe the teaching of industrial work culture by the teacher and student's application. The subjects of this study were two teachers and 55 students.

Data collection techniques in this study included interviews, questionnaires, and observations. Interviews were conducted to find out how the teacher taught industrial work culture in learning machining practices, while the questionnaire was used to find out the application of industrial work culture by students when learning machining practices. Observations were made to confirm the data obtained from interviews and questionnaires.

3. Results and Discussion
The application of industrial work culture in learning machining practices includes teaching the values of industrial work culture and its application by students. The application of industrial work culture values is described as follows:

3.1 Integrity Value
The teacher teaches the value of integrity by emphasizing students to behave honestly and responsibly. The teacher teaches responsibility behavior by requiring students to improve the tool. The teacher teaches honest behavior to students by always giving the warning to do their work and not trying to collect the work of others. Responsible behavior is shown by students not skipping machining practices, ask for teacher permission when leaving the workshop, and report to the teacher when damaging equipment or machinery. The results of this study indicate that more than 85% have behaved responsibly, while less than 15% of students have not implemented these behaviors during practical learning.

The application of responsible behavior can work well because students realize the importance of following practice. The data shows that students never play truant or leave the workshop without permission for fear of their work not being completed. That resulted in students having to add hours of practice to complete their work. Besides, the data shows that students always report when damaging a device because the teacher never scolds students who report. The teacher only asks students to repair damaged tools. The majority of students who have not implemented the behavior of responsibility very often play truant in theory and practice lessons.

The students show honest behavior by doing their assignments given by the teacher and never manipulating them. That more than 72% of students have adopted honest behavior, while less than 22% have not adopted honest behavior. Students who are hesitant apply honest behavior by 6%.

Teaching and application of the value of integrity can work well because teaching the integrity value of the teacher does not only provide knowledge or advice so that students behave responsibly and honestly. However, the teacher also gives consequences to students who do not behave responsibly and honestly. The consequences are sanctions or repeating work outside of class hours. It makes students not only accept advice from the teacher, but students also try not to violate so as not to be penalized.

3.2 Professional Value
The teacher teaches professional values by getting students to work according to stages. The stages consist of pre-work, quality, and post-workmanship. At the pre-employment stage, the teacher explains the outline of the process of working on a product. After that, students make WPS, which contains steps and quality parameters. At the stage of work, students are required to work referring to
WPS. The post-work phase of the students assessing their work to the teacher is followed by cleaning the machines they have used.

Professional value is demonstrated by making agreements where the teacher, technician, or student has the right to give sanctions if meeting students working is not safe. It means that supervision is not only carried out by the teacher but all components of learning.

Work behavior according to the standard procedure shown by students by making work preparation sheets (WPS) before work; work according to the steps on WPS; and entering machining parameters according to WPS. The behavior of making WPS before work shows that more than 89% of students have made WPS before work, while more than 7% of students have not made WPS before work; and less than 4% of students are still hesitant in implementing the behavior. The data shows that the application of behavior makes WPS before work can run well because the teacher always checks the WP of each student before starting the work process. That causes students to have to make WPS before work inevitably.

Working behavior according to the steps in WPS shows that less than 46% of students have implemented work behavior according to the steps in WPS, while more than 54% of students have not implemented the behavior. Students do not implement the application of work behavior according to the steps in WPS because students do not understand the contents of the WPS they make. The data shows that when students made WPS, most of the students copied of WPS. That causes students not to understand the contents of the WPS that they make so that at-work students tend to ask the steps of work to their friends.

The behavior to enter machining parameters referring to WPS shows that almost 62% of students have entered the parameters according to WPS, while more than 36% of students have not applied it, and 2% of students are still hesitant in applying the behavior. Data shows that most students only enter the machining meters at the beginning of the work after that students do not change the parameters until they complete the work. Students only change the machining parameters when doing particular work, such as making grooves and making threads.

Students show the behavior of applying K3 by obeying signs in the workshop and using PPE when working. The data shows that only 45.45% of students behave obeying signs in the workshop, and only 41.81% of students use PPE when working. Students do not implement behavior familiarizing using PPE when working because the number and condition of PPE are inadequate. Data shows that the number of PPE (work goggles) available at the workshop does not match the number of students who practice. Besides that, the condition of the available glasses is not suitable for use (it is very blurry), so students are reluctant to use glasses when working. Students feel that using opaque glasses will add to the difficulty when working.

Professional values have not yet been fully applied to the learning of machining practices. That is because the teacher has taught professional values by accustoming students to work at stages and work safely, but students have not fully applied the behavior.

The students applied behavior is to make WP before work and enter the machining parameters according to the WPS. The behavior can be applied by students because there are rules that make students have to do it. While the not-applied behavior is to work according to the steps in the WPS, obey the signs in the workshop, and use PPE when working. From the behaviors mentioned, the three behaviors have in common, namely the absence of rules or strict sanctions if students do not do so. In the workshop, rules stated that "Students use the work safety equipment or protective equipment specified." The teacher also always reminds students to use PPE when starting practical activities. However, in practice, the teacher does not reprimand or impose sanctions if there are students who work without using PPE. That causes students to understand the use of PPE when working is only a formality.

Based on the explanation above, the application of professional behavior can work well because the teacher provides knowledge to students accompanied by enforcing strict rules. However, some behaviors have not been implemented by students because the teacher only gives knowledge without imposing strict rules, so students only consider it as a formality.
3.3 Productive Value
The application of productive value is to work according to the specified time and quality. The teacher teaches productive values by accustoming students to work behavior according to the specified time and quality. The teacher teaches the behavior by explaining the assessment points on a product. When explaining, the teacher stimulates the assessment with ready-made work-pieces so that students are expected to have targets and figures in order to get satisfactory grades.

Working behavior, according to the specified time, shows that almost 62% of students have worked within the specified time, while 38% of students have not implemented the behavior. The data shows that work behavior, according to the specified time, can be applied by students because students are more concerned with time than product quality. If students do not complete their work, according to the specified time, students are required to practise in extra hours, while there are still some students who have not implemented work behavior according to the specified time due to an inadequate number of tools.

Working behavior according to the specified quality shows that 40% of students have worked according to the quality determined, while more than 53% of students have not implemented the behavior, and more than 7% of students are doubtful. The application of work behavior, according to the specified quality, has not been implemented well by students because most students are lazy to eat as taught by the teacher.

The data shows that there are still many students who do not calculate the depth of eating. This condition indicates that the majority of students just guessing in making a product size. Students eat slowly and then measure the work-piece. This is done until the size approaches the specified size or even exceeds the specified size.

Based on the explanation above, the application of productive values has been applied by students in learning machining practices. The teacher teaches productive values by getting students to work according to the specified time and quality. The teacher explains the product evaluation points at the beginning of the lesson and teaches how to calculate the depth of work-piece eating correctly. However, the way the teacher has not made students apply the full product value. The results showed that students had implemented work behavior according to the specified time, but students lacked work behavior according to the quality specified.

Students can work according to the specified time because the teacher agrees if students cannot complete the work according to the specified time, students are required to add practice hours outside of class hours. That causes students to try to finish their work according to the specified time.

Different things happen in the application of work behavior according to the specified quality. The teacher has taught ways or tips so that the work can produce products that meet the specified quality. However, students are reluctant to take these steps. That is because students only accept the consequences of reducing the value of the product if it produces a product that does not meet the specified quality.

In the implementation of practical learning, reducing the value of products that do not meet the specified quality does not make students try to produce products that meet the specified quality. That is because, at the end of the semester, the grades of students who have not fulfilled the Minimum completeness Criteria will only be given written assignments, so that students do not think the value of the work is essential. Based on the explanation above, in teaching work behavior with the specified quality and time, the teacher must provide consequences that are directly felt by students so that students try to work according to the specified time and quality.

3.4 Innovative Value
The application of innovative values is to look for new alternatives in working to be more productive and efficient. The teacher teaches innovative value to students by freeing students in determining the steps to work on a product. Students are free to determine the steps to work on a product when making WPS. The teacher's role in making WPS is to ensure that the steps that students make do not pose a risk of danger.

Behavior looking for new alternatives in work shows that more than 27% of students have looked for new alternatives so that work is more effective and efficient. Nevertheless, almost 70% of students
do not look for new alternatives at work. Behavior looking for new alternatives in working on learning machining practices has not been well implemented. Observation results show that students are lazy to look for new ways of working. Students taking pictures or copying WPS showed this. However the teacher did not rebuke the behavior. The teacher considers students to equate the steps of work with their friends because students do look at this method.

Based on the explanation above, the way teachers teach innovative values has not been able to make students look for ways so that the work done is more effective and efficient. The teacher only frees students in determining the steps of the work without giving clear rules to students. Students understand that they are free to do anything so that most students are free to copy the work of their ready friends. The results of observation also showed that the teacher did not reprimand students who plagiarized so that it made students lazy to think about the steps in making WPS.

Based on the explanation above it may conclude that the teaching of innovative values has not gone well because the teacher frees students in making WPS but does not provide precise rules. Students understand that the teacher frees students in making WPS not to foster students’ innovative values, but rather the opportunity to copy each other’s WPS between students. This causes the innovative value of students to be applied less.

3.5 Competitive Value

Application of competitive value, namely behaving independently in increasing knowledge in the machining field, independently increase knowledge related to employment; and confident in showing their competence. The teacher teaches competitive value to students by giving assignments outside of class hours so that students are independent in finding information in the machining field. The teacher also provides career guidance on the sidelines of the lesson. The activity is to increase student confidence and foster student independence in finding information related to employment.

The behavior of founding in increasing knowledge in the machining field shows that more than 65% of students have not applied independent behavior in increasing knowledge in the machining field. In contrast, only 31% of students have implemented such behavior, and less than 4% of students are still doubtful.

The results of the data note that students do not understand what the teacher meant. The teacher gives assignments to students with the intention that students independently seek knowledge related to the machining field from books or the internet. Also, some students are lazy to find information from books and the internet. In doing the assignment, students tend to cheat their finished friends. The students who have implemented independent behavior to increase knowledge in the machining field are students who are known to be diligent in their class.

Confidence in showing competency shows that almost 73% of students are confident in showing their competence, but more than 25% of students are not confident, and less than 2% of students are still doubtful. The data shows that confident students show their competence because they understand the story that the teacher tells about successful alumni as motivation for them. Most students assume that if alumni can demonstrate their competence so they can successfully work in large industries, then they are also able to follow in the alumni's footsteps. Some students are not confident in showing their competence because they are still afraid of being wrong and not sure of their abilities.

Competitive value has been applied to learning machining practices. The teacher has taught competitive value by giving assignments outside of class hours and providing career guidance between practical lessons. The teacher conducts the treatment so that students behave independently in increasing knowledge in the machining field as well as knowledge related to employment. Students have applied the behavior, but students have not behaved independently to increase machining knowledge.

Independent behavior increases the knowledge in the machining field taught by the teacher by giving the task of finding other informations about the machining process in the outside of school workshop. It is expected that students' knowledge in machining is not limited to learning in-school workshops. However, based on observations, most students only copied the work of their friends, so that students are not yet independent in increasing their knowledge in machining.
Based on the explanation above it may conclude that the assignment of tasks by teachers outside of class time has not been able to foster student independence. This is because the teacher only assigns the without assignments to motivate the students first, so students understand that the work done is only to fulfill the assignments given by the teacher.

Different things are done by the teacher when teaching independent behavior, looking for information related to employment. The teacher provides career guidance to students by telling the types that exist in the industry and tells the alumni who are successful in working in large companies. That causes students to be motivated to look for information related to employment. In teaching independent behavior looking for information related to employment, the teacher also teaches by freeing students when choosing a place for industrial work practices (industrial practice). That causes students to actively search for information about the industries they will choose for Internship. From the explanation above, teaching the competitive value to students can be done by giving assignments and accompanied motivation to students. This is done so that students understand that the assignment is an attempt by the teacher to equip students to compete in the world of work.

4. Conclusion
Based on the study, it shows that the teachers teach integrity values by reminding students to behave honestly and responsibly and through discipline in the workshop. The value of integrity has been applied by 89.8% of students by behaving honestly and responsibly. It is also proved that the professional values taught by teachers by getting students to work according to stages. Professional grades have been applied by 54.8% of students by working according to standard procedures and applying K3 when working. In addition, the teacher teaches productive values by explaining the assessment points on a product so that students have a target value to be achieved. The productive value has been applied by 50.9% of students by working according to the specified time and quality. Innovative values taught by teachers by freeing students in determining the steps of working on a product. The innovative value is only applied by 27.3% of students by finding new alternatives at work. The teacher teaches competitive values through inserted career guidance on the sidelines of the lesson and assignments outside of class hours. Competitive value has been applied by 52.7% of students by looking for information related to employment and confidence, showing competence.

References
[1] Clark L and Winch C 2007 Vocational Education International Approaches, Development and Systems (New York: Routledge)
[2] Hadari N 2003 Manajemen sumber daya manusia untuk bisnis yang kompetitif (Yogyakarta: Gadjah Mada University Press)
[3] BPPI 2016 Nilai-nilai Budaya Kerja Pegawai Industri (Accessed on January 24, 2019, http://bppi.kemenperin.go.id/page-nilai-budaya-kerja/)
[4] Oerip P and Oetomo T 2000 Mengatasi Krisis Manusia di Perusahaan (Jakarta: Grasindo)
[5] Imawan 1997 Proesionalisme Bidang Politik dan Swadaya Masyarakat. Prosiding, Seminar Nasional Ilmu-Ilmu Sosial 1997 (Medan: Universitas Sumatera Utara)
[6] Undang-Undang Tentang Keselamatan Kerja No. 1 Tahun 1970 TLN No. 2918
[7] Simamora H 2000 Manajemen Pemasaran Internasional (Jakarta: Salemba Empat)
[8] Jong D and Hartog D 2003 International Journal of Innovation Management Research Report H200303 p 1
[9] Permendiknas No. 41 Tahun 2007 tentang Standar Proses Untuk Satuan Pendidikan Dasar dan Menengah.
[10] Hasibuan M 2005 Manajemen Sumber Daya Manusia (Jakarta: Bumi Aksara)
[11] Ekoanindido 2013 Jurnal Dinamika Teknik 2 p 1