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EXAMINING THE STUDENTS' COGNITIVE, AFFECTIVE AND PSYCHOMOTOR ABILITIES IN THE BAKERY INDUSTRY

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ABSTRACT

Bakery industry has risen with the increasing demand of its products. This study aims to examine the students' abilities in terms of cognitive, affective and psychomotor in supporting the competency needs in the bakery industry. This research tested the abilities required by the students during industrial training at the bakery stores. This research was conducted at four different bakeries in the area of Yogyakarta within May to July 2019. A total of 90 students participated in the survey. The findings show that a psychomotor ability is the highest skill needed in the bakery industry with 84%, followed by affective (81%) and cognitive (75.3%). This implies that psychomotor ability is the prominent domain in the bakery industry where it involves physical movement, coordination, and the use of motor-skills. This study helps the educational provider to give the correct knowledge to the students with the precise abilities for their future undertakings.

INTRODUCTION

Knowledge is growing faster than ever before. Educationists and employers spend a significant amount of time on continuing education programs for the students and employees (Sahin, 2012). The nature of learning is a human process to achieve various competencies, skills and attitudes (Baharudin & Wahyuni, 2007). According to Hamalik (2011), learning is

defined as a modification or reinforces behavior through experience. It shows that learning is closely related to activity or process occurs in the industrial world. The demand in the career field suggests a wide variety of competencies that can be used while working. The ratio of cognitive, affective and psychomotor needs in the industrial world is inversely proportional to those provided in the learning system particularly in vocational schools (Alseddiqi, 2012). The learning process in vocational schools not only leads to cognitive abilities but also has applied affective abilities and psychomotor abilities or skills. Teacher's preparation, knowledge of subject matter, and the organization itself play an essential role in student success (Bain, 2004). They focus on engaging students to build their communication and social skills, learn how to work interdependently, and enhance their self-efficacy.

Vocational High School (SMK)

Vocational school is a school that trains students for a specific line of work, often in healthcare or other hands-on fields (Midwest Technical Institute, 2019). In addition, it can be defined as a school in which people learn how to do a job that requires special skills (Merriam-Webster, 2019). The observations show that the majority of SMK graduates in Yogyakarta have not been able to adjust to the development of science and technology, but also have not been able to adjust to the work environment.

The qualifications needed by the industrial world aside from scientific and skill requirements but also a set of non-technical abilities are referred to as affective abilities. During this time students get more knowledge, so opportunities for vocational schools to fill positions in the world of work in general are a personal matter of work attitude. Vocational secondary schools specifically designed to prepare students at the secondary level to enter the workforce. The aim of SMK is to prepare middle-level workforce to fill the needs of the workforce at present and in the future. For this reason, learning is not enough to only be done in schools, but also done outside of the school such as in the industry. The implementation of learning in the career field is called Dual System Education in which student carry out work practices directly in the industry, which is an integration of the vocational education and training process.

Cognitive, Affective, and Psychomotor Abilities

Cognitive abilities describe how a student's mind able to develop and function in order he/ she can think (Mansur, 2015). The brain activities and reasoning skills were divided into six levels in the taxonomy, from the lowest to the highest level and symbolized by 'C' that stands for cognitive (Bloom, 1956):
- C1 (Remember): This level underscores on the capacity to review the concentrated material, for example, information on terms, uncommon certainties, shows, patterns and groupings, arrangements and classifications, criteria and approaches.
- C2 (Understand): This level characterizes cognizance as the capacity to comprehend certain material educated.
- C3 (Apply): This level translates application as the capacity to apply data to genuine circumstances, where understudies can apply their comprehension by in a genuine manner.
- C4 (Analyze): This level characterizes investigation as the capacity to unravel a material into more clear parts.
- C5 (Evaluate): This level characterizes assessment as the capacity to survey the

advantages of a thing for a specific reason dependent on clear criteria.
- C6 (Create): This level characterizes amalgamation as the capacity to deliver and join components to shape a one of a kind structure.

Affective abilities teach the qualities and convictions we place on the data we connect with. It alludes to our attitude and readiness to partake in new things, and capacity to decide about how we work and carry on in an assortment of conditions (Pierre & Oughton, 2007). There are five categories under this domain:

- Receiving/Attending: This classification is the most minimal emotional level to incorporate acknowledgment of issues, circumstances, manifestations, qualities and convictions inactively.
- Responding: This category worry to answers and joy of reacting or acknowledging something in understanding with values embraced by network.
- Valuing: This category worries with offering some benefit, thankfulness and trusts in a specific side effect or boost. Understudies can acknowledge the qualities educated and furthermore can pass judgment on the marvel climate fortunate or unfortunate.
- Organization: This category incorporates the conceptualization of qualities into a worth framework, just as reinforcing and organizing the qualities possessed. This can be exemplified by capacity to gauge the positive what's more, negative results of a logical development on human life.
- Characterization: This classification manages incorporation of all the worth frameworks an individual to influence his character and standards of conduct. The procedure of inner qualities is the most elevated in esteem chain of command.

Psychomotor abilities acquire skills involving tools, procedures, and techniques (Johnson & Ferguson, 1998). Psychomotor is a capacity to organize on physical aptitudes comprising of observation, availability, guided development, acclimated developments, complex developments, modification of development examples, and imagination (Rosa, 2015):
- Mimicking: This classification is the capacity to accomplish something dependent on watched model despite the fact that the which means or quintessence of ability isn't yet comprehended.
- Manipulation: This classification is the capacity to complete an activity and pick what is required from the educated.
- Experience: This category is an appearance of activity where things educated and made as models have become a propensity and developments appeared in all the more persuading.
- Articulation: This category is where one can play out a progressively mind boggling expertise, particularly to bargains with interpretive developments.

Bakery Industry

Tremendous attention has been paid to the bakery industry in recent years (Sudha, Vetrimani, Leelavathi, 2007). Numbers of bakery products has also received higher in demand. Considering the demand by the industry, the learning institutions are complying the plea by producing well-equipped students with multiple capabilities including cognitive, affective and psychomotor in order for them to work productively and become a high quality workers. Therefore, the purpose of this study is to examine the students' abilities in terms of cognitive, affective and psychomotor in supporting the competency needs in the bakery industry.

RESEARCH METHODS

This research is descriptive in nature using a quantitative approach. This research will clearly illustrate the profound facts in describing cognitive, affective and psychomotor abilities. Based on the purpose of this study, it seeks to describe the attributes of the three abilities students must have, namely cognitive, affective and psychomotor abilities needed in the industrial field, especially bakery for vocational schools. The steps and procedures in analyzing data are as follows: data collection, editing, coding, tabulating data, testing data quality and describing data. A total of 90 students who carried out industrial training in the culinary expertise program at SMK A, B and C were selected as samples of the study.

To satisfy the objective of the study in describing cognitive, affective and psychomotor abilities in the industrial field, a sample of four bakeries in the Yogyakarta area was chosen. The research instrument was used as a data collection tool. Research instruments must be arranged properly, so as to produce objective data in accordance with research objectives. In this research, data collection on cognitive, affective and psychomotor abilities needed by the bakery industry is taught in the Vocational School through data on students who carry out the industry using instruments in the form of questionnaires. In addition, data collection was also carried out with in- depth interviews both formally and informally with bakery industry users. The interviews were conducted covering all three aspects of students' abilities, namely cognitive, affective and psychomotor that are carrying out industrial training. The cognitive abilities grid that will be focused in the questionnaire and interview can be seen in Table 1.

Table 1.

Cognitive indicators

No	Cognitive indicators
1	Development yeast dough
2	Development pastry
3	Development quick bread
4	Development Danish pastry

The affective capability grid that will be focused on the questionnaire and interview can be seen in Table 2.

Table 2.

Affective indicators.

No	Affective indicators.
1	Have a sense of responsibility
2	Communication skills
3	Time discipline
4	Creative and many ideas
5	Independent
6	Able to collaborate
7	Honest in words and deeds
8	Enthusiasm for work

The psychomotor ability grid that will be focused on questionnaires and interviews as presented in Table 3.

Table 3.

Psychomotor indicator

No	Psychomotor indicator
1	Skilled at making yeast dough
2	Skilled at making pastry
3	Skilled at making quick bread
4	Skilled at making danish pastry

RESULTS AND DISCUSSION

Cognitive abilities or knowledge, including the ability to remember about things that have been learned are stored in memory (Thobroni & Mustofa, 2013). Comprehension or understanding includes the ability to grasp meaning and the meaning of what is learned. Application includes the ability to apply methods. The study assessed the cognitive abilities in terms of making yeast, pastry, quick bread and Danish pastry to test the students' abilities.
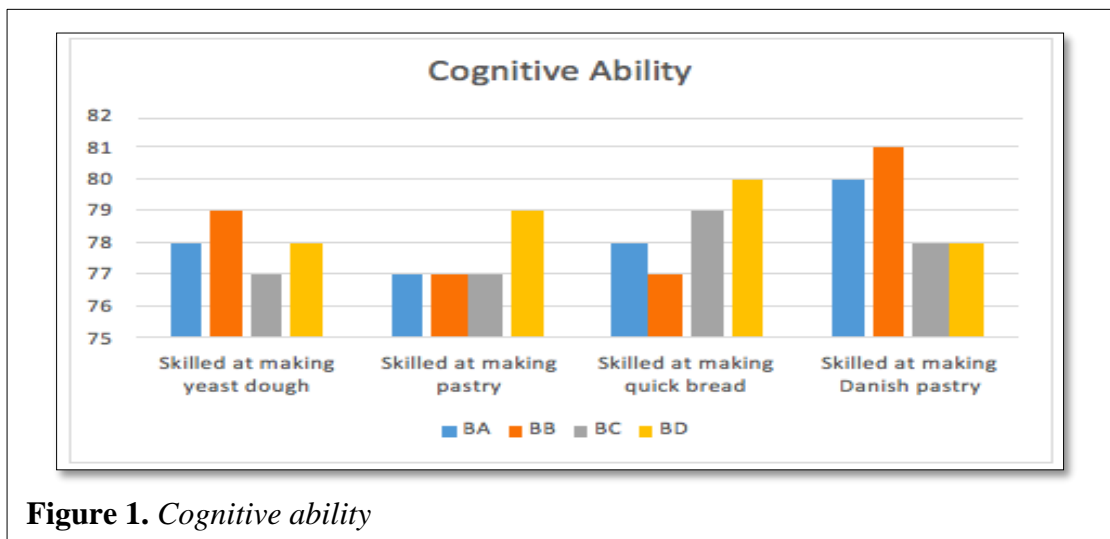

Figure 1. *Cognitive ability*

Based on the Figure 1, the results of students' cognitive abilities in carrying out industrial training in four different bakeries in Yogyakarta is the average cognitive ability in bakery A (75%), bakery B (75%), bakery C (76%) and in bakery D (77%). Seventy-four percent of the students were able to make yeast dough and pastry respectively, while 77% students were able to make quick bread and Danish pastry respectively.
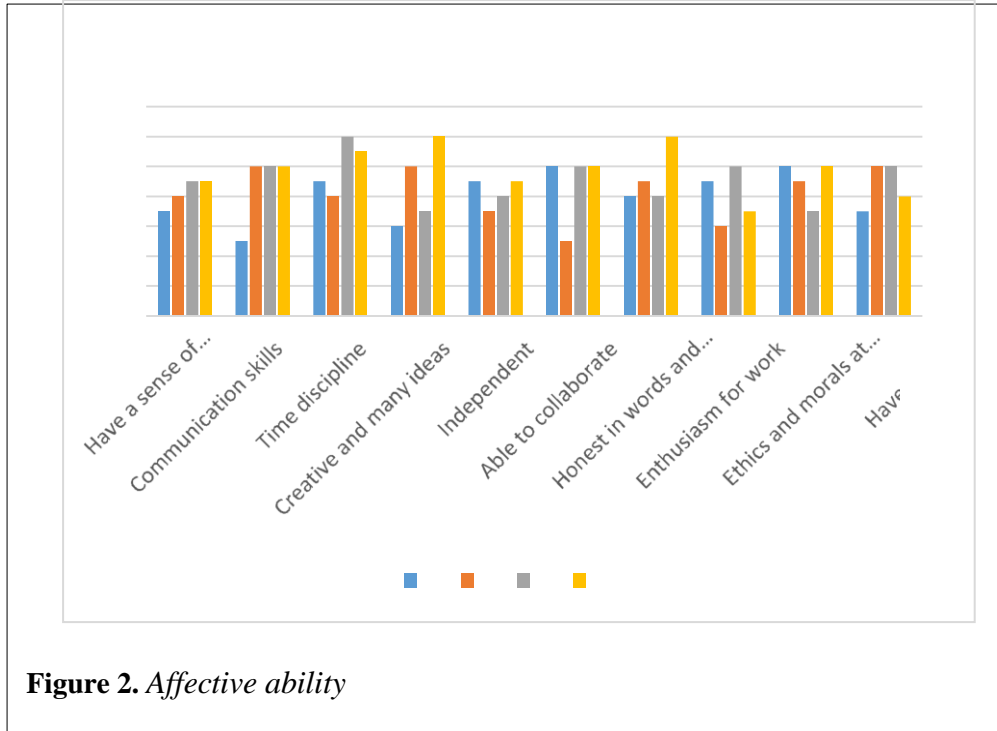

Figure 2. *Affective ability*

Affective ability or attitude ability includes receiving and pay attention (Thobroni & Mustofa, 2013). The results of the affective ability research that has been carried out in the bakery industry are presented in Figure 2. The average component students have a sense of responsibility as workers in four bakeries has a yield of 78%, with a sense of responsibility it is expected that workers have the same sense of ownership of the industry so that all work can be done in accordance with the responsibilities the responsibility of each employee. The average time discipline has a contribution of 81%, with the high level of discipline it is expected that all job desk jobs in the bakery industry will run in accordance with the specified time. Inaccuracy will cause all the work that has been planned does not run smoothly this will result in the industry experiencing both losses in terms of money and trust from customers. Creative and many ideas contribute 81%. The ability to find many ideas and be creative in the bakery industry is very much needed. In this case the creative ideas are very closely related to the results of bakery products, with the existence of creative ideas, the resulting product will be more varied and will also have an impact on the appearance of a bakery product. Independent and not dependent on others contributed to 80%.

Attitude Reflects Independence in Work

Communication skills have a high contribution in supporting students' work readiness by 81%. In the world of work communication skills are needed in order to minimize the occurrence of conflict in a job with good communication it will be able to help a worker expedite the work and be able to present the results of the product in front of customers. The results obtained in this study are the ability to work together to have a considerable impact in

supporting student work readiness. This is caused by several factors including the demands of the industry that requires each employee to have the ability to cooperate with other employees, in order to produce goals and harmony within the scope of work. Honest in words and actions contributes to 82% of this attitude is very important because it is a benchmark of a worker's personality. Excitement at work contributed 81% with enthusiasm. Ethics and morals at work contributed 83%. Having a high commitment contributed 82%. High commitment is work attitude. Based on Figure 3, it can be concluded that the affective abilities of students based on four bakeries in Yogyakarta obtain an average of 81%. Interview results from Bakery A show that students' affective abilities are said to be sufficient because their abilities are quite varied. At the beginning of the implementation of industry training is still an adaptation stage so that the ability of students' attitudes cannot be explored to the maximum.

The results of interviews with Bakery B regarding students' affective abilities that students are still lacking to bring out their creative ideas because they are still reluctant to ask their work partners. But their enthusiasm for work and work ethics are also quite good. The results of interviews with Bakery C regarding students' affective abilities in terms of student communication are good enough and easy to interact with coworkers, students are also able to work well and have a high curiosity about bakery products that are sold, so they are not shy to ask colleagues in bakery C. Results of interviews with bakery D about the affective ability of students that the discipline works well marked by the absence of students who are late, students are also able to work well together in a production team, communication with customers is also quite good and the spirit of work is also quite good.

Figure 3. *Psychomotor ability*
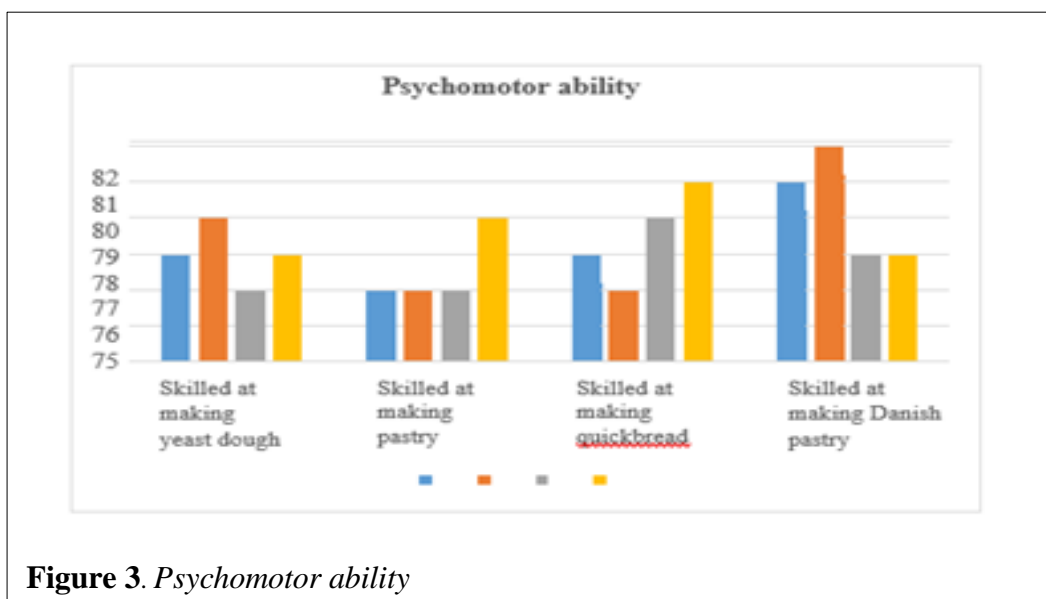
Based on Figure 3, the average score of the acquisition of four bakeries in Yogyakarta in terms of skilled making yeast dough is 83%. The average in skilled components makes 84% of the pastry. The average in the skilled component in making quick bread is 84% and the average in the skilled component makes Danish pastry by 84%. The results of research on students' psychomotor abilities are equal to 84%. The results of interviews about the psychomotor abilities of students in Bakery A are students who are quite skilled in making various leavened breads, and are able to duplicate the products made. For birthday cake decorations, it has not been left to students because the level of difficulty is high enough so

that students are only given the opportunity to see the cake decoration techniques. The results of interviews about the psychomotor abilities of students in Bakery B, namely students are quite skilled in making some components, especially good enough to duplicate various Danish pastries as exemplified. For the components of making pastries and quick breads, students are quite good in terms of preparing materials and supporting components for making products. The results of interviews about the psychomotor abilities of students in Bakery C, namely students are still quite skilled in making some components of bakery products. The results of interviews about the psychomotor abilities of students in D bakery namely students in the category are quite good in making bakery products, there are some students who are quite skilled in making quick bread. But for Danish and pastry products, it is considered sufficient because students are not yet accustomed to making these forms of pastry.

CONCLUSIONS

Based on the above research that has been carried out and the data obtained during the study, researchers can draw conclusions as follows: 1) The average achievement of students' cognitive abilities at four bakery locations is equal to 75.3%. 2) The average achievement of students' affective abilities that is equal to 81%. 3) The average achievement of students' psychomotor abilities is equal to 84%. The cognitive, affective and psychomotor abilities of students in SMK A, SMK B and SMK C are in the good category in supporting the ability needs in the bakery industry. Suggestions of the results of this study can be a reference of cognitive, affective and psychomotor abilities that are needed when going into the industrial training, especially in the bakery industry. This study helps the educational provider to give the correct knowledge to the students with the precise abilities for their future undertakings.

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