



Contextual Teaching and Learning Integrated with Character Education to Improve Student's Motivation and Character in Concentration of Solutions Topic at Pharmacy Vocational School

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Abstract

The learning outcomes of pharmacy students in Cirebon were still lacking, as well as student's motivation and character. The teaching strategies used by teachers were still conventional and character education has not been optimal. The purpose of this study was to determine whether there were differences in student's motivation and character between students who were taught by integrated contextual learning with character education (experimental class) and students who were taught by conventional method (control class). The research method used was the experiment. The data analysis technique was independent sample t-test. The results of this study were (1) the tcount value for the character honesty; discipline; and responsibilities were 4.118; 3.709; and 7.950 respectively, > the ttable 2.003, it means that there was differences in the characters between the control and the experimental class; (2) the tcount value for student's motivation was 3.506 > the ttable 2.003, it means that there was difference in student's learning motivation between the control and the experimental class. The student's responses toward learning in the experimental class amounted to 82.59% in the very good category. The result of this study are expected to contribute the information for education practitioners especially in vocational schools.

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INTRODUCTION

Chemistry in pharmaceutical vocational schools is studied so that students have basic knowledge of chemistry to support productive subjects and be able to adapt to changes in the environment. Chemistry especially in pharmaceutical program, is certainly very related to pharmaceutical expertise programs. Based on this, chemistry in pharmaceutical vocational high schools must be well studied to support students' abilities as potential pharmacists.

The results of preliminary studies in four different pharmacy vocational high schools in Cirebon showed that in addition to student chemistry learning outcomes that were still not optimal, the motivation of most students for chemistry lessons was moderate to low. The factors that cause students to be less motivated to learn chemistry include a tedious learning atmosphere, a tense atmosphere during learning, and many calculation in chemistry.

Iskandar (2009) stated that motivation in learning is the driving force from within an individual to carry out learning activities to increase knowledge, skills, and experience. Sardiman (2014) stated that motivation to learn is the overall power of movement within students that gives rise to learning activities, which ensures continuity of learning activities so that the objectives desired by the subject of learning are achieved. Learning outcomes will be optimal if there is the right learning motivation.

Motivation is an important factor in the process of building knowledge in students. Teachers are expected to continue to provide positive motivation to students so that they can build knowledge well. Thus, motivation in learning is something that needs to be instilled in students. With the encouragement to learn, students will certainly find it easier to achieve learning outcomes as expected.

Success in learning in the classroom that can motivate students to learn can be influenced by the selection of interesting and innovative learning strategies. The teacher's ability to manage classroom learning is included in one of the teacher's professional abilities. Mas (2012) in

his research stated that there is a relationship between the teacher's professional abilities and students' learning motivation. Teachers with good abilities will be able to motivate their students. Rohmah & Marimin (2015) in the results of his research revealed that the teacher's ability to make and implement learning strategies can also influence student learning achievement.

Based on the results of interviews with three chemistry teachers from different pharmacy vocational high schools in Cirebon, the teacher still uses conventional learning such as lectures, question and answer, and problem training. Rudhumbu (2014) in his research in one developing country found the fact that the strategies used by teachers were still teaching-centered rather than student-centered.

One of the learning models that can be used by teachers in improving student learning motivation is contextual learning. The research conducted by Fathir & Sabrun (2015) revealed that there was an increase in motivation and learning outcomes of students in the social sciences through a contextual learning model assisted by a hands-on activity in statistical material.

Chemistry is very close to human life. Some events that occur in the universe are chemical changes or chemical reactions. Material that exists in nature is also a chemical substance. Students have a lot of daily knowledge and experience that is very relevant to science learning at school. The results of the student questionnaire in the preliminary study were still found by students who felt that chemistry was not related to life, whereas in reality chemistry was closely related to life, some even considered that chemistry was less related to pharmaceutical expertise programs. Therefore, in delivering chemical material the teacher should try to link chemical material to the daily lives of students and it would be better to be associated also with vocational skills programs that students travel.

One learning model in chemistry that can link the theory with the real-world applications is contextual learning. Johnson (2007) mentioned contextual learning based on the philosophy that students can receive knowledge well if new

information taught by students is associated with experiences that have been previously owned. Rahardiana et al. (2015) stated that another advantage, this learning model makes students more active in class in solving problems related to life. In this learning students are encouraged to be active in class, work together with their friends, think critically and creatively. Through this learning, knowledge is not only transferred but built by students themselves.

One of the results of research conducted by Clarke et al. (2017) which states that in giving assignments, teachers should be more careful in choosing the context that will be presented, namely the context that is really known by students in life. Teachers should also know what sources of knowledge will be considered relevant and familiar to students' lives.

Based on the results of questionnaires to students in four different pharmacy vocational schools, it was shown that chemistry learning in the classroom, in general, had linked material to everyday life. The real application that is used by the teacher is still general and not much has been associated with the vocational skills program that students take. The results of observations of preliminary studies in the class directly in one of the pharmacy vocational school in Cirebon showed that chemical learning carried out had not been associated with a pharmaceutical expertise program.

Asliyani et al. (2014) conducted a study on the development of chemical contextual teaching materials for Vocational students in class X of Technology and Engineering. The study was conducted in SMK 3 in Jambi City in 2014. The results showed that, through contextual learning student attitudes, interests, participation, and students' sense of responsibility increases. Students find it easier to understand the material because it is associated with an expertise program. Lusyana et al. (2017) also states that contextual learning can increase the interest of vocational students in computer network expertise programs in mathematics subjects at the end of the second learning cycle.

Another thing that happened to students in four different pharmacy vocational high schools

in the Cirebon area was the character of students who were still not good. For example, when daily tests or exams are carried out, there are still many students who lack confidence and eventually cheat or cooperate with their friends. This is reinforced based on the results of student questionnaires from the three pharmacy vocational schools which showed that most students admitted cheating when the test/exam was conducted if they could not answer the question.

Malihah et al. (2014) stated that schools should be able to develop all students' potential comprehensively which includes spiritual, social, intellectual intelligence skills, emotional intelligence including attitudes or character of students as stipulated in Undang-undang No. 20 of 2003. But currently, there are still schools that only focus on intellectual achievement. The potential of other students still lacks attention.

The attitude or character aspect of students in school is still a problem that must be resolved immediately. Dishonesty in academic matters is a forerunner of fraud in all aspects of life, including in the field of work (Lewellyn & Rodriguez, 2015). Ardiwinata et al. (2016) in his research stated that the problems related to the character of students in Indonesia if not addressed immediately would result in a weakening of national dignity and identity. Taufik (2014) stated that the crisis of character in Indonesia can be seen from the surrounding social phenomena such as the fading of the values of togetherness in society, increasing crime, corruption, declining morality of the nation, etc.

Many state officials should be role models for the public, caught in corruption cases (Latifah, 2017). This is an example of a lack of honesty, faith, and responsibility. Another phenomenon is the occurrence of theft, murder, unemployment, the conflict between citizens, and destruction of self-esteem/others and so on.

Sadia et al. (2013) conducted a study of a number of science teachers ranging from elementary school to high school level in Bali in 2012. The study provides the fact that science teachers are still focused on cognitive learning outcomes, while aspects of student character have

not received attention the good one. Around 55.3% of teachers have included character values in the learning device used. The remaining 44.7% does not list but generally implied in the syllabus and lesson plan.

The results of a research conducted by Taufik (2014) in some secondary school teachers are known that teachers already understand the importance of character education, but some teachers do not understand what methods can be used in the implementation of character education in schools. The results of interviews in the preliminary study of this study with three different chemistry teachers at the pharmacy vocational high schools showed that character education had begun to be applied, but had not been listed on the learning devices used.

The topic about calculation of solution's concentration in the 2013 vocational curriculum in health (pharmacy) is given to students of class XI. The topic is in Basic Competence 3.9, which is applying the calculation of solution concentration (% , molarity, and ppm) and Basic Competence 4.9, which is making a solution with a certain concentration according to the procedure. Based on the two Basic Competences, students are expected to theoretically be able to calculate the concentration of the solution and be able to do the practice of making solutions with certain concentrations correctly.

The material for calculating the concentration of the solution is very close to student's life, so it is suitable if delivered using contextual learning. This material is provided with the intent that the vocational school students have a basic knowledge of the various solution concentrations and solution making skills in the laboratory. In the pharmaceutical industry, these basic skills are needed for example in determining the levels of drugs or substances through certain methods such as titration. In a titration, of course, basic knowledge is needed about what solution to use and what the concentration of the solution will be. In making drugs, a pharmacist is required to have knowledge of the maximum amount of active substances that can be added so that they can produce the product correctly.

Based on the characteristics of the topic, it is appropriate if given through contextual learning that is integrated with the growth of student character. Dimiyati (2013) stated that attitudes or characters are closely related to one's motivation. If the character of the student is good, then the motivation for learning is also good. Through this learning, it is expected to be able to improve academic abilities and train student character formation, as well as increase the motivation of pharmacy vocational students to study chemistry.

METHODS

The research method used in this study was the experiment. In the experimental class and control, observation of the student's character were conducted on each meeting and the student's motivation were assessed using motivation questionnaires on the last meeting. The experimental class is a class that given integrated contextual learning with character education, while the control class is a class that given conventional learning.

The population in this study were class 11th of SMK Farmasi Muhammadiyah 2 Cirebon in 2018. The sampling technique in this study was saturated sampling or total sampling. The entire population were sampled, namely, as many as 58 students divided into two classes.

The data collection techniques that used in this study were interviews, questionnaires, and observations. The research instruments used in this study were interview guideline sheets, student questionnaires in preliminary studies, character observation sheets and learning motivation questionnaires.

The indicators on the character observation sheets were made referring to Kemendiknas indicators (2010) for the character of honesty, discipline, and responsibility. The indicator of the learning motivation questionnaire refers to the motivation dimension of learning by Aritonang (2008).

The data analysis techniques that carried out in this study were (1) processing the results of the validation of observation sheets and learning

motivation questionnaires, (2) processing observations and learning motivation questionnaires, and (3) testing the character hypothesis and student motivation using the independent sample t-test.

RESULTS AND DISCUSSION

In this study, efforts to increase student's motivation were carried out by (1) giving verbal appreciation to students who took action both in class and in the laboratory, (2) giving verbal appreciation to students who were able to work on the problems in the discussion well, (3) raising curiosity by apperception at the beginning of learning, (4) showing examples or direct contextual applications that relate to the pharmaceutical world from the chemistry topic, (5) informing the learning objectives at the beginning of the learning, (6) share the tasks that have been collected by students and have been assessed by the teacher, (7) reviving the atmosphere of healthy competition during the discussion activities, (8) giving examples of behaving with good morals to students.

The character values in this study were integrated into classroom learning activities. For example, to practice honesty students must report the results of weighing materials to make a solution according to the numbers printed on the analytical balance. The discipline of students can be trained through practical activities, including discipline using closed suits and shoes while in the laboratory, making solutions according to the correct procedure, in writing the unit of concentration solution must also be appropriate, and so on. The character of responsibility can also be trained through practicum activities, namely when finished practicing the student must clean up the equipment that has been used and returns it to its original place. The students were also responsible for completing practical worksheets after practicum finished.

The average value of learning motivation obtained for the control class was 69.2593, while the experimental class was 78.6204. The value of student motivation in the experimental class was higher than the control class.

The average difference test was used to see the comparison between the average value of the learning motivation of the control class students and the experimental class. The difference in the average value of learning motivation in this study was tested using SPSS 16. The statistical hypothesis for student learning motivation was, H_0 is no difference in learning motivation between control class students and experimental class, and H_a is there are differences in learning motivation between class students control and experimental class. If the significance is < 0.05 then H_a is accepted. If the significance is > 0.05 then H_a is rejected. If the significance value is < 0.05 then H_a is accepted. H_0 is accepted if $-t_{table} \leq t_{count} \leq t_{table}$ or sig value ≥ 0.05 . H_0 is rejected if ($t_{count} < -t_{table}$ or $t_{count} > t_{table}$) or sig < 0.05 .

Based on the results of the independent sample t-test, t_{count} was 5.294, it was bigger than t_{table} 2.003. Based on the results of the independent sample t-test, it was known that the equal variances assumed (because of homogeneous data) was 0,000, less than 0.05, so H_a was accepted, meaning there was differences in the average value of learning motivation between the control class and the experimental class. The student's motivation in the experimental class is better than the control class. This is in line with the research conducted by Rahmadonna & Fitriyani (2011), that contextual learning can improve student's learning motivation in lessons that involve a lot of calculations.

Daud (2012) stated that learning motivation is one of the internal factors of student learning difficulties. Students who have the motivation to learn and good emotional intelligence will get good learning outcomes. Similarly, Yakina et al. (2017) stated that students who have low learning motivation are usually indifferent even though there is material that has not been mastered differently from students with high learning motivation who have the desire to be able to understand a material one of them by asking the teacher or peers. Sanjayanti et al. (2014) in his research on the application of integrated contextual learning character stated

that learning can increase students' learning motivation and students' scientific attitudes. This is also in line with the results of Fathir & Sabrun's research (2015) that contextual learning involving hand activities can improve student's learning motivation and increase student's activity in learning.

The average character values for honesty, disciplined, and the responsibility in the control class were 62.5020; 75.001; and 65.5237 respectively. The average character values for honesty, disciplined, and the responsibility in the experimental class were 69.4768; 81.977; and 81.9768 respectively. Based on these data it can be seen that the character of students in the experimental class was better than the control class.

The statistical hypothesis for student characters was, $H_0 =$ there is no difference in character between the control class and the experimental class and $H_a =$ there is a difference in character between the control class and the experimental class. H_0 is accepted if $-t_{table} \leq t_{count} \leq t_{table}$ or $sig \text{ value} \geq 0.05$. H_0 is rejected if $(t_{count} < -t_{table} \text{ or } t_{count} > t_{table})$ or $sig. < 0.05$.

Based on the results of the independent sample t-test, the t_{count} values that obtained for the honesty; discipline; and responsibilities were 4.118; 3.709; and 7.950 respectively, it were bigger than the t_{table} 2.003, meaning that there was differences in the three characters between the control class and the experimental class. The character of the experimental class students was better than the control class students.

In this study, student characters were observed at each meeting using observation sheets. The results of processing the average character values in the control class can be seen in Figure 1. The results of character observations in the experimental class can be seen in Figure 2. Character values in the control class and experimental class generally increased from the first to the fourth meeting. However, the increase was not so drastic.

Widodo et al. (2016) said that there are several factors that influence the character and behavior of students, namely the physical

condition of students, the attention of parents including teachers, the learning methods used by teachers, the language used by teachers, environmental factors, and the complexity of subject matter. Monotonous learning methods can affect the character and behavior of students in the class. Students who were given conventional learning had a lower average character value compared to the experimental class students.

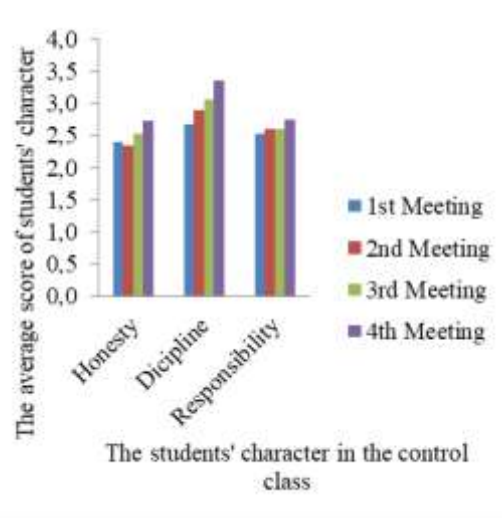


Figure 1. The result of characters' observation in the control class

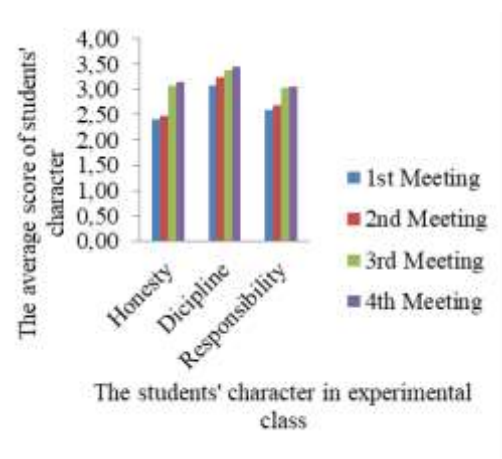


Figure 2. The result of characters' observation in the experimental class

According to Sukidjo et al. (2013) contextual learning can increase student activity in the classroom, and increase student character participation in the learning process. The implementation of character education through

contextual learning becomes more concrete because it can be adapted to the conditions of each school environment. Sari et al. (2014) in their study said the same thing, namely that character values are more easily raised in learning with a contextual approach. Likewise, the opinion of Putri et al (2014) in her research stated that the application of contextual learning to cooperative methods can improve character such as students' curiosity and communicative.

The results of the study by Nurrohmah (2012) showed that the use of Contextual Teaching and Learning (CTL) has a positive impact on increasing students' interest in learning. Nurani (2014) stated that contextual learning has a significant effect on student learning outcomes. In addition, contextual learning can increase student motivation and creativity.

The student responses were used as input for further learning and research. Thirteen students (46%) responded well, and as many as 15 students (53%) responded very well. The results of the calculation of student response sheets for integrated character contextual learning activities have an average of 82.59%. Based on the established criteria the response of students is categorized as positive if the average obtained is more than 70%. It means that student's responses toward the learning process has a positive response. The results of research conducted by Hayati et al. (2013) showed that students basically prefer learning, which encourages students to be active and directly involved in the experience.

CONCLUSION

Based on the results and discussion, this study has the conclusions, (1) there was significant differences in student learning motivation between students that getting integrated contextual learning character with students who obtain conventional learning in the material for calculating solution concentration (tcount 3.506 was bigger than the ttable 2.003), (2) there was differences in student character (including honesty, discipline, and responsibility)

that are significant between students that getting integrated contextual learning character with students who obtain conventional learning in the material calculation of solution concentration (the tcount for honesty was 4.118, tcount for discipline was 3.709, and tcount for responsibility was 7.950, it were bigger than the ttable 2.003, and (3) the student's responses toward integrated contextual learning character in calculating concentration of solution was 82.59%, in the very good/very positive category.

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