# The Effectivenes of Technopreneurship with Cooperative Learning for Technopreneur in SMK (CLTSMK)

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**Abstract:** This research aims to reveal: 1) effectiveness of technopreneurshipin SMK for the survival skills of students, 2) aspects of motivation to learn, 3) aspects of thinking creativy, and 4) aspects of the student's managerial of class XI students majoring in Mechanical Light Vehicle on the competence of the electrical system at SMKN 2 Depok and SMK Muhammadiyah 1 Playen. This research is a quasi experimental. The study design refers to the model developed by Donald Ary et.al. This study consisted of classroom control using conventional teaching methods and classroom experiments using model CLTSMK. The results of the research are as follows: (1) Application of CLTSMK effective learning model for the development of survival skills students (2) Aspects of motivation to learn of the control A the qualification "Less" while the experimental class the qualification "Very Good". motivation to learn the control class B the qualification "Enough" while the experimental class the qualification "Very Good". (3) Aspects of thinking creativity of the control class A the qualification "Enough" while the experimental class the qualification "Very Good". Thinking creativity of the control class B the qualification "Enough" while the experimental class the qualification "Very Good". (4) Aspects of student's managerial in the control class Athe qualification "Enough" while the experimental class the qualification "Very Good". Student's managerial in the control class B the qualification "Enough" while the experimental class the qualification "Very Good".

**Keywords:** Thinking Creativity, Student's managerial, Motivation to learn, Technopreneurship.

## 1. Introduction

The times demand humans to continue to innovate to adapt to their daily needs. One of them is in the field of education. The existence of innovation in the field of education is expected to make the learning process run more effectively, efficiently and pleasantly. Indonesian education must be able to face the era of globalization and the times. The learning process must be able to improve students' understanding of learning, especially in the Vocational High School (SMK) student learning system.

National Education System Law No. 20 of 2003, the explanation of article 15 states that "Vocational education is secondary education that prepares students to work in certain fields". The implementation of the above Law is that it is necessary to develop a form of vocational education that is able to provide knowledge, attitudes and skills to students to prepare them as middle-level workers who are skilled, professional and have broad insight, and are able to develop themselves according to the times, science and technology. Lucas, Ellen, and Claxton (2012, p.47), say that graduates of vocational education in the 21st century must have six main competencies, namely: knowledge, professional skills, functional skills (communication, literacy, numeracy and ICT), expertise (sensitivity vocational skills, aspiration to do a good job, pride in doing a good job), business attitude (entrepreneurship), broad skills for growth (life-long work and learning). So that from the competency standards above, the most ideal vocational education graduates can be achieved.

Vocational education has different characteristics from general education or high school. The most significant difference is in the objectives of education implementation. The purpose of education in vocational education is to prepare graduates to enter the world of work. Trilling and Fadel (2009, p.45) convey the skills that must be possessed in the 21st century are: Learning and innovation skills, digital literacy / technology literacy skills, career and life skills.

Sudira (2012, p.13) argues that vocational education is secondary education that prepares students to have skills in accordance with the industrial sector, so that they are ready to become the workers needed. Slamet (2005, p.4) vocational education is a means of developing talent, interest in basic skills formation, and attitudes that lead to the world of work which is seen as a process of self-development. Self-development is the main asset to face the world of work.

The specific objectives of vocational education include: preparing students to become productive human beings, able to work independently, to fill job vacancies in the business world and industry as middle-level workers according to the competencies and expertise program chosen; prepare students to be able to choose careers, be resilient and persistent in competence, adapt to the work environment, and develop a professional attitude in their area of expertise; equip students with science, technology, and art, in order to be able to develop themselves in the future either independently or through higher education levels; equip students with competencies in accordance with the chosen expertise program (Republic of Indonesia in Law on National Education System, 2003).

UNESCO (2013, p.3) states that "TVET is important as a set of approaches to learning, both as preparation for the world of work, and for well-being later in adult life.". Vocational education is very important in learning, because it aims to prepare to enter the world of work and fulfill future welfare. Vocational education greatly contributes to the formation of skills, as well as in the development of human resources as well as in strategies to meet the needs of the workforce at the local, regional, national and global levels. Yimei (2012, p.51)… training

the technical and management cadres for all industries, and also was necessary to provide supports in the rapid development… ". Education aims to train technical and management, so that cooperation between individuals develops.

Sudira (2016, p.128) argues that the main purpose of vocational education is to make everyone able to facilitate themselves in work and with dignity (self employable), get a job with sufficient income to support their lives, and contribute to society and the environment. Vocational education focuses on individuals who apply their competences for the benefit of themselves and society in general.

From this statement it can be concluded that the purpose of vocational education includes not only what and how the world of work is, but also to help each individual overcome deficiencies in various social situations from previous educational experiences. Therefore students will get provisions to achieve success in life.

Presidential Instruction Number 9 of 2016 contains the revitalization of Vocational High Schools aimed at improving the quality and competitiveness of Indonesian Human Resources (HR). The presidential instruction is in line with the aim of the SMK to form graduates with superior quality human resources. According to PP. 19 of 2005 Article 26 paragraph 3: The competency standards of graduates in vocational secondary education units aim to increase intelligence, knowledge, personality, noble character, and skills to live independently and find out further education according to their vocations. This is in line with the competency standards of graduates from Lucas, Ellen and Claxton (2012), that the ideal SMK graduates are ready-to-use and productive workforce. The implementation of achieving the goals of vocational education requires support from all elements of the nation, especially good cooperation between schools and the business / industry world.

SMK is one of the embryos to prepare graduates with high quality and competitiveness. In order to achieve the government's goal of preparing quality graduates with middle-level human resources who are productive, creative, innovative, and effective, efforts are needed to strengthen entrepreneurs both for students (technopreneurs), teachers (teacherpreneurs), and schools (schoolpreneurs) (Triyono, 2015). Vocational schools that are able to develop entrepreneurs in the learning process must have a network and cooperation with the business / industry world.

Technopreneurship is a person's ability to develop an entrepreneurial spirit by utilizing technology both in the manufacturing and marketing processes in accordance with the competence of their respective expertise (Triyono, 2015). Technopreneurship comes from the combination of two words, namely technology and entrepreneur. Technology is the use of advances in business development, while entrepreneurship is a person's ability to provide economic added value for the goods and services he sells.

Chua Eung Hwa (Triyono, 2016) argues, "A technopreneur is an extension of an entrepreneur, and makes use of technology to make a new invention an innovation and exploits his achievement in the market to make money". Technopreneurship is self-development of an entrepreneur who uses technology to make new discoveries or innovations so that they can generate economic value.

Jousma (Walker, 2012, p.12) states, "Technopreneurship is described as the interaction between science and industry with the intended output of new economic activity". Technopreneurship is described as the use of technology and industrial science to generate economic value. Eucharia (Triyono: 2016) argues: Entrepreneurship education is therefore a specialized training given to individuals who acquire such knowledge to acquire the skills, ideas and the managerial abilities and capabilities for self-employment rather than being employed by others. Entrepreneurship education is special training given to individuals to acquire independent knowledge, skills, ideas and attitudes.

The guidebook for the Directorate of Higher Education Academic Affairs in the Directorate General of Higher Education (2008, p. 7) states that there are three main components that form the character of technopreneurs, namely: intrapersonal, interpersonal, and extrapersonal. Technopreneurship in general focuses on the use of technology for development in the entrepreneurial field. The type of entrepreneurship in the sense of technopreneurship here is not only limited to information technology entrepreneurship, but all technologies that can support entrepreneurship. The use of technology is carried out to produce economic value, so that it is able to meet their needs.

Some of the definitions above provide an overview of the aspects in forming a technopreneur, namely motivation, creativity and managerial. Based on some of the opinions above, it can be concluded that terchnopreneurship is a person's ability to develop an entrepreneurial spirit by utilizing science and technology in the process of innovation and service provision according to expertise competencies.

SMKN 2 Depok or often referred to as STM Pembangunan Yogyakarta (STEMBAYO) is one of the favorite schools that has collaborated with industry. This vocational school collaborates with Toyota, known as the Toyota-Technical Education Program (T-TEP).

One of the vocational high schools that has initiated cooperation with the industrial world, PT. Daihatsu Motor Astra is SMK Muhammadiyah 1 Playen. SMK Muhammadiyah 1 Playen which is often called MUSPLA is one of the reference schools in Gunungkidul district. One of the implementation of learning at this vocational school in collaboration with industry, one of which is Daihatsu, which is known as Smart Together with Daihatsu (PBD). Similar to the T-TEP program, this PBD program consists of 4 aspects, namely: (1) curriculum adjustment to the Daihatsu curriculum, (2) training guidance assistance, (3) teaching aids, (4) training for teachers. In the aspect of

adjusting the curriculum to the Daihatsu curriculum, SMK Muhammadiyah 1 Playen in the process of teaching and learning activities uses the 2013 Curriculum (K-13) which is adjusted to the PBD program.

This research is the third year of research on edupreneurship in Indonesia. The first year research by Triyono (2015) states that the improvement of student competence in SMK can be optimized by using CLTSMK which focuses on forming student survival skills. Factors that influence improving the product quality of technopreneurship-based vocational high school students include creativity (sig <0.05); innovation (sig <0.05); and student managerial abilities (sig <0.05).

Research by Endang (2011), entitled "Entrepreneurial Cooperative Learning: Strategies to Cultivate Entrepreneurial Spirit: Strategies to Cultivate the Entrepreneurial Spirit of Vocational School Students". This research has the aim of fostering entrepreneurial behavior and attitudes of vocational high school students. This study also aims to find a cooperative method with entrepreneurship insight. This research uses the R&D method. The development of learning methods is carried out using the Four-D Model. Based on data analysis from the instrument of entrepreneurial attitudes and behavior, it was found that of the 120 respondents who were the research sample, the lowest score achieved was 1.48 and the highest score was 2.89. The mean score of entrepreneurial attitudes and behavior is 2.33. Through the cooperative learning method, students are seen to be more active and motivated in following lessons.

The explanation of the observation result above shows that the highest unemployment data according to the Central Bureau of Statistics are SMK graduates of 9.84%. From the observation data on the implementation of learning in the classroom, it was found that students were still difficult to understand the material being taught, students lacked an entrepreneurial culture, learning motivation, creativity and managerial. In addition, several facilities and media are not well optimized. Various kinds of teaching strategies that are suitable for improving entrepreneurial culture are the Coorperative Learning by Technopreneur for SMK (CLTSMK) learning method.

Based on the above discussion, research is needed on "The effectiveness of learning methods Cooperative Learning by Technopreneur for SMK (CLTSMK) for the development of student survival skills at SMKN 2 Depok and SMK Muhammadiyah 1 Playen". Technopreneurship competence used in this learning method is the ability of students in the teaching and learning process (PBM) to produce a product according to student competencies by utilizing the latest technology and technology in schools. Improving the quality of learning that is reviewed is student learning attitudes which consist of aspects of student motivation, creativity, and managerial.

## 2. Method

Research on "The effectiveness of the Cooperative Learning by Technopreneur for SMK (CLTSMK) learning model for the development of student survival skills at SMKN 2 Depok and SMK Muhammadiyah 1 Playen" is a quasi experimental study. This research took place in the odd semester of November to December of the 2016/2017 school year. The place of research at SMKN 2 Depok, Sleman, DI. Yogyakarta and SMK Muhammadiyah 1 Playen, Gunungkidul, DI. Yogyakarta. The target / subject of this study were students of class XI at SMKN 2 Depok and SMK Muhammadiyah 1 Playen in the odd semester of the 2016/2017 academic year. In one of the basic competencies of class XI student learning in odd semesters. This research requires two research groups, so the sample in this study was taken from the entire population, namely class XI A and XI B. The documentation method is used to determine the list of student names and numbers, the process of implementing the CLTSMK learning model and the results of the Group Disscusion Forum (FGD). The implementation of the CLTSMK learning model includes:

First Phase: Delivering goals and motivating students

Delivering information: The learning objectives of the electrical system, an outline of the learning material, the learning model and the media used, Apperception: Questions and answers regarding the electrical system and making engineering works related to the electrical system, dividing students into 6 groups, each group has duties and obligations that same.

Second Phase: Presenting information, Observing and Asking.

Delivering information about electrical systems, Providing examples of engineering works on electrical systems, Providing opportunities for each group to discuss, Assigning each group to look for examples of electrical system engineering work, Observing the results of discussions between groups, Asking about discussions that have been carried out by each group .

Third Phase: Provides the opportunity to gather information, discuss, perform, and present the results of the discussion.

Guiding students to make observations and dig up information about the identification of the electrical system, Guiding students to make observations and multiplying information about the identification of the electrical system, Guiding students when making reports on discussion results, Guiding students when presenting the results of the discussion

Fourth Phase: Strengthening the Material and concluding the lesson

Giving questions to students about the stages that have been carried out with the aim of knowing student understanding, Guiding students in making conclusions from the material that has been studied, Collecting student assignments in groups, conveying learning information globally, closing lessons.

The questionnaire method is used to obtain information about learning activities during learning and survival skills (motivation, creative thinking and student managerial) while students are learning. The learning motivation questionnaire sheet contains statement items about: not having doubts about decisions taken, being serious, starting from the beginning to the end of learning, being confident when doing assignments, and being a pioneer of work or a leader in a group. The questionnaire sheet for students' thinking creativity contains statement items about: innovative attitude, group / team orientation, openness, and broad insight. The student managerial questionnaire sheet contains statement items about: group ability and management ability.

The collection of observational data to obtain information about activities and survival skills (learning motivation, creative thinking and student managerial) while students participate in learning. Research Instruments

Learning Implementation Plan (RPP)

The Learning Implementation Plan is prepared by referring to the syllabus and in accordance with the applicable curriculum, namely the 2013 curriculum.

Questionnaire sheet

This study obtained secondary data in the form of a response from the object of research. The data is obtained by filling out the observation sheet. The observation sheet given is in the form of learning motivation observation sheet, thinking creativity observation sheet and student managerial observation sheet. The observation sheet given aims to determine the attitude of the research object (students) in participating in teaching and learning activities. Observation sheets are written questions that must be answered by the observer. The assessment uses a Likert scale, where answers are given a value of 4, 3, 2, 1 for four choice statements: Always, Often, Rarely and Never (Sugiyono, 2008).

## 3. Result

The learning motivation data at SMK Muhammadiyah 1 Playen and SMKN 2 Depok can be illustrated by table 1 and histogram diagram 1:

Table 1. Results of Learning Motivation at SMK Muhammadiyah 1 Playen and SMKN 2 Depok

| **Fase** | **SMK Muhammadiyah 1 Playen** | **SMKN 2 Depok** |
|---|---|---|
| Control Class | **6,46** | **7,461** |
| Experiment Class | **14,14** | **13,688** |

From table 1, if it is presented in the form of a histogram to determine the development of data on the learning motivation of class XI students between SMK Muhammadiyah 1 Playen and SMKN 2 Depok are as follows:

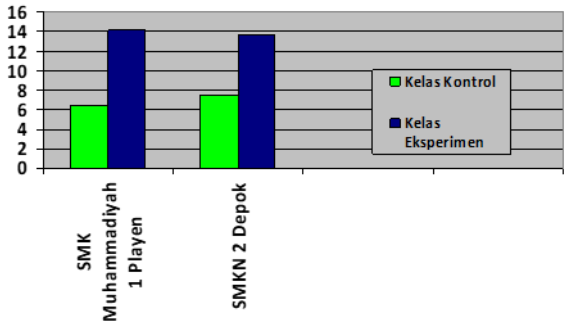



Figure 1. The histogram of student learning motivation data between SMK Muhammadiyah 1 Playen and SMKN 2 Depok

Data on creativity thinking between SMK Muhammadiyah 1 Playen and SMKN 2 Depok can be described in table 2 and histogram diagram 2:

Table 2. Thinking Creativity Results SMK Muhammadiyah 1 Playen and SMKN 2 Depok

| **Fase** | **SMK Muhammadiyah 1 Playen** | **SMKN 2 Depok** |
|---|---|---|
| Control Class | **25,914** | **26,3125** |
| Experiment Class | **53,571** | **54,0625** |

From table 2, if it is presented in the form of a histogram to determine the development of data on the thinking creativity of class XI students between SMK Muhammadiyah 1 Playen and SMKN 2 Depok, are as follows:

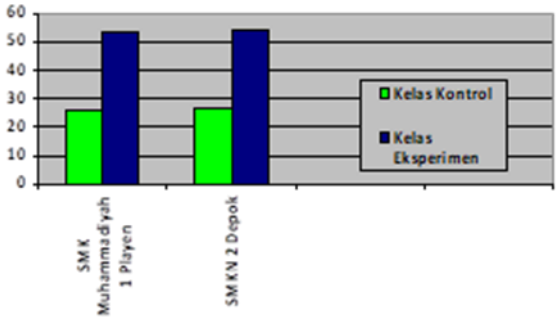



Figure 2. Histogram data of students' thinking creativity between SMK Muhammadiyah 1 Playen and SMKN 2 Depok

The student managerial data between SMK Muhammadiyah 1 Playen and SMKN 2 Depok can be described in table 3 and histogram diagram 3:

Table 3. Managerial Results of Students of SMK Muhammadiyah 1 Playen and SMKN 2 Depok

| **Fase** | **SMK Muhammadiyah 1 Playen** | **SMKN 2 Depok** |
|---|---|---|
| Control Class | **16,51** | **17,75** |
| Experiment Class | **33,66** | **34,375** |

From table 3, if it is presented in the form of a histogram to determine the development of managerial data for class XI students between SMK Muhammadiyah 1 Playen and SMKN 2 Depok are as follows:

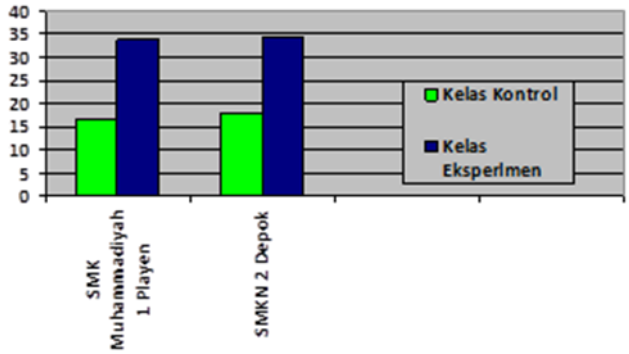



Figure 3. The histogram of student managerial data between SMK Muhammadiyah 1 Playen and SMKN 2 Depok

The results of hypothesis testing with the Manova Wilks' Lambda test obtained Sig. 0.00 <0.05, so that Ho is rejected. These results can be interpreted that there are significant differences in Survival Skills (Learning Motivation, Thinking Creativity, and Student Managerial) in class XI students who are given the CLTSMK Learning method with the Conventional Learning model at SMKN 2 Depok and SMK Muhammadiyah 1 Playen.

The achievement of the effectiveness of the application of CLTSMK learning at SMKN 2 Depok and SMK Muhammadiyah 1 Playen, has the criteria according to table 4:

Table 4. Criteria for assessing the achievement of CLTSMK learning

| **Qualification** | Motivation to learn | Creativity Thinking | Student managerial |
|---|---|---|---|
| **Very well** | 12,0-16,0 | 45,0-60,0 | 33,0-40,0 |
| **Good** | 10,0-12,0 | 35,0-44,9 | 25,0-32,9 |
| **Enough** | 7,0-9,0 | 25,0-34,9 | 17,0-24,9 |
| **Less** | 4,0-6,9 | 15,0-24,9 | 10,0-16,9 |
| **Too little** | 0-3,9 | 0-14,9 | 0-9,9 |

The average score of learning motivation in the control class of SMKN 2 Depok is 7.75 with the qualification "Enough" while the experimental class is 13.69 with the qualification "Very Good". Learning motivation in the control class of SMK Muhammadiyah 1 Playen has an average score of 6.46 with a qualification of "Less" while the experimental class is 14.14 with a qualification of "Very Good".

Creativity thinking in the control class of SMKN 2 Depok the average score is 25.44 with the qualification "Enough" while the experimental class is 54.06 with the qualification "Very Good". Creativity thinking in the control class of SMK Muhammadiyah 1 Playen the average score is 25.91 with the qualification "Enough" while the experimental class is 53.57 with the qualification "Very Good".

Managerial students in the control class of SMKN 2 Depok have an average score of 17.75 with the qualification "Enough" while the experimental class is 34.33 with the qualification "Very Good". Managerial students in the control class of SMK Muhammadiyah 1 Playen have the average score of 18.83 with the qualification "Enough" while the experimental class is 35.23 with the qualification "Very Good".

The learning motivation of class XI students at SMKN 2 Depok and SMK Muhammadiyah 1 Playen was obtained from the learning motivation questionnaire sheet. The learning motivation questionnaire sheet contains statement items about: not having doubts about decisions taken, being serious, starting from the beginning to the end of learning, being confident when doing assignments, and being a pioneer of work or a leader in a group. From the results of the questionnaire, the following data were obtained:

Table 5. Results of learning motivation data

| Motivation to learn | **Mean** | **Median** | **Modus** | **SD** |
|---|---|---|---|---|
| Pre survey | **6,314** | **7** | **6** | **1,05** |
| After Treatment | **13,415** | **13,5** | **13,5** | **1,127** |

From table 5, if it is presented in the form of a line diagram to find out the development of data on the learning motivation of class XI students, it is as follows:

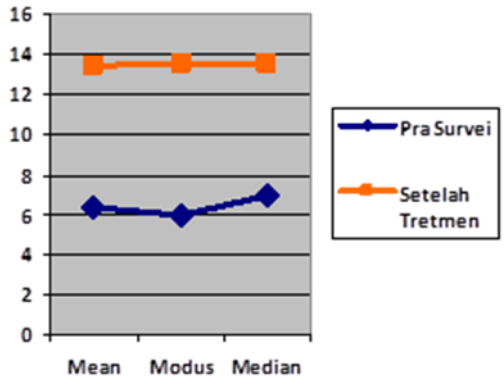



Figure 4. Figure 13. Line graph of the results of the learning motivation questionnaire

The results of student learning motivation data at SMKN 2 Depok and SMK Muhammadiyah 1 Playen showed an increase after the application of the CLTSMK learning model, namely in the aspects: not having doubts about decisions taken, being serious, starting from the beginning to the end of learning, being confident when doing assignments, and be a pioneer of work or a leader in a group. These aspects are in accordance with Azliana's (2013, p.75) statement that learning motivation is mostly influenced by intrinsic motivation. Azliana (2013, p.75) argues that intrinsic motivation consists of being confident in making decisions, being confident, and being serious. Compos (2009, p.2) has a different opinion, that student learning motivation is influenced by intrinsic motivation and extrinsic motivation.

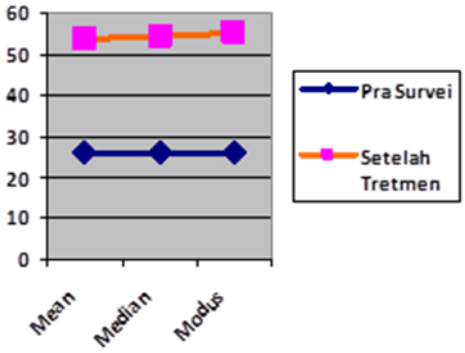
Silva (2008, p.153) argues that intrinsic motivation is more dominant than extrinsic motivation. This is also in accordance with the statement of Alsharif (2011, p.124) which states that students' intrinsic motivation has the most dominant impact on the learning process. Sophia (2016, p.44) argues that learning motivation is influenced by the learning process from beginning to end, this is in line with the aspects that affect student learning motivation. Student learning motivation can be achieved according to the criteria stated by Azliana (2013, p.75) and Sophia (2016, p.4).

Creativity thinking class XI students at SMKN 2 Depok and SMK Muhammadiyah 1 Playen were obtained from the thinking creativity questionnaire sheet. The questionnaire sheet for students' thinking creativity contains statement items about: innovative attitude, group / team orientation, openness, and broad insight. From the results of the questionnaire, the following data were obtained:

Table 6. Data results on creativity to think

| Kreativitas Berfikir | Mean | Median | Modus | SD |
|---|---|---|---|---|
| Pra survei | 25,914 | 26 | 26 | 2,331 |
| Setelah Tretmen | 53,817 | 54 | 55 | 2,469 |

From table 6, if it is presented in the form of a line diagram to find out the development of data on the thinking creativity of class XI students, it is as follows:




The results of the data on student learning creativity at SMKN 2 Depok and SMK Muhammadiyah 1 Playen showed an increase after the application of the CLTSMK learning model, namely in the aspects: innovative attitude, group / team orientation, openness, and having broad insights. These aspects are in accordance with Akar's (2013, p.1) statement that creative thinking is divided into several aspects. Aspects in students' creative thinking include: broad and innovative insights. Meanwhile, another opinion was put forward by Saeed (2013, p. 401) that creativity is more about the ability to focus on goals. However, the innovative aspect is reinforced by Mania (2014, p.2) who argues that creative thinking is able to generate new ideas. These new ideas are the most important pont in the innovative aspect.

Another aspect of creative thinking is in accordance with the statement of Jerzyk (2014, p.99) which states that creative thinking is part of increasing student professionalism including: openness and individual orientation among group members. Students' creative thinking can be achieved according to the criteria stated by Akar (2013, p.1) and Jerzyk (2014, p.99).

Managerial grade XI students at SMKN 2 Depok and SMK Muhammadiyah 1 Playen were obtained from student managerial questionnaire sheets. The student managerial questionnaire sheet contains statement items about: group ability and management ability. From the results of the questionnaire, the following data were obtained:

Table 7. Results of learning motivation data

| Motivation to learn | Mean | Median | Modus | SD |
|---|---|---|---|---|
| Pre survey | 16,51 | 17 | 17 | 2,241 |
| After Treatment | 34,016 | 35 | 35 | 2,469 |

From table 7, if it is presented in the form of a line diagram to find out the development of managerial data for class XI students are as follows:

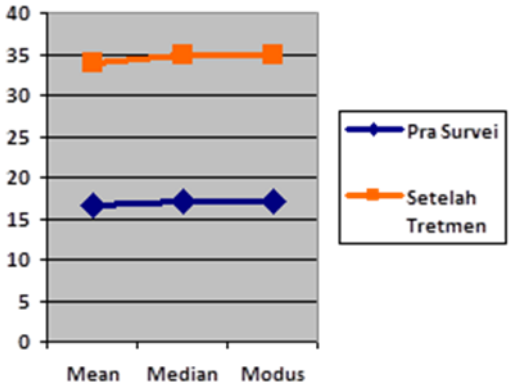



Figure 6. Line graph of the results of the learning motivation questionnaire

The results of student managerial data at SMKN 2 Depok and SMK Muhammadiyah 1 Playen show an increase after the application of the CLTSMK learning model, namely in the aspects: group ability and ability to

manage these aspects in accordance with Ali's statement (2010, p.313) that student managerial is part of from the aspect of developing group skills. Zeyer (2010, p.2) argues that student managerial is more towards the ability to empathize and systematically, not just group ability. However, Gail (2013, p.33) argues that managerial students can be trained repeatedly so that groups of women are formed.

The managerial aspects of other students are in accordance with the statement of Moreno (2014, p.417) which states that managerial students organize students to manage themselves and student managerial time management can be achieved according to the criteria stated by Ali (2010, p.313) and Moreno (2014). , p. 417).

**4. Conclusions**

The application of technopreneurship with the CLTSMK learning model was effective for students at SMKN 2 Depok and SMK Muhammadiyah 1 Playen, with the results of the Manova Wilks' Lambda test, it was obtained Sig. 0.00 <0.05. Effective for developing aspects of learning motivation, thinking creativity and managerial students.

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