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## Analysis of Students' Learning Skills and Innovation Skills at SMK Negeri 2 Padang Panjang

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### ABSTRACT

In the 21st century, there are several special skills that students must master, one of which is 21st century learning and innovation skills. This research aims to determine the level of learning and innovation skills of students at SMK Negeri 2 Padang Panjang. The variables used are 21st century skills, namely Learning and Innovation Skills, which consist of four components, namely critical thinking skills, creative thinking skills, collaboration skills and communication skills. So the sample totaled 63 people. The data collection technique uses a questionnaire. The data analysis used is descriptive analysis. The results of the research show that the skill level of students at SMK Negeri 2 Padang Panjang Abad 21 has an average percentage of 82.53% which is classified as very good. The average percentage value of each component is 80.51% for critical thinking skills, 79.56% for creative thinking skills, 89.58% for collaboration skills and 85.32% for communication skills. Based on the research results, it can be concluded that the overall level of learning and innovation skills of Vocational High School students at SMK Negeri 2 Padang Panjang is very good.

## 1. Introduction

The development of the 21st century is different from the previous century, especially in the field of increasingly sophisticated technology. This sophistication allows anyone and anywhere to access information quickly. In the 21st century, skills are needed to keep pace with advances in science and technology. Andrian (2019) In the 21st century, the competencies needed by students in the globalization period or what are more often known as 21st century skills and the concept of education are better known as 21st century learning. According to Trilling (2009) said that the skills that a person must have in the 21st century are: (1) Life and career skills, including flexibility and adaptability, initiative and self-management, cultural and social interaction, productivity and responsibility,

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leadership and accountability. (2) Learning and Innovation Skills include communication, collaboration, critical thinking and creativity skills, and (3) Media and information technology skills (media literacy and information technology) include information literacy, media literacy and IT literacy.

21st century skills Learning and innovation skills are divided into creative and innovative thinking skills, critical thinking and problem solving, communication, and collaboration, that is what is called 21st century 4c skills as reported by Junedi (2020). Learning and innovation skills which are called 21st century 4c skills are as follows: a) Creative thinking skills are competency skills that use new approaches to problem solving, innovation and invention. This ability is a truly new and original activity, both personally/individually and culturally Zubaidah, (2018). Research conducted by Wulandari (2019) creative thinking is a stage of thinking by adapting a good and correct answer to help students have the ability to see a problem from various points of view and be able to generate many ideas. b) Critical thinking skills enable students to process information logically and prepare students to learn independently.

Students who have critical thinking skills can determine information that is important, relevant and useful. Critical thinking can play a decisive role in academic success because students can detect goals and points of view, assess certain reasons and make decisions based on analytical reasoning. Critical thinking and problem solving skills can be learned through a variety of learning activities that provide opportunities for investigation and problem solving. These skills are developed most effectively through project-based learning driven by student involvement in solving questions and problems. The more complex the project given, the more honed critical thinking and problem solving skills will be as reported by Mashudi (2021). c) Communication skills are one aspect focused on 21st century learning. Communication plays an important role in teaching and learning activities, which aim to transfer knowledge and exchange ideas (Aliftika, 2019) d) Collaboration skills are 21st century skills that are important for students' academic and career success. Collaboration can be defined as a partnership between two or more students, who share responsibility, accountability, and roles to achieve a common understanding of a problem and its solution (Junedi 2020).

According to Marline, (2021) 21st century skills are procedural knowledge that humans must have in the 21st century. In 21st century learning, students are encouraged to always think creatively in solving problems according to themselves. Teachers, students, and even parents must understand technology and communication media, be able to carry out effective communication, think critically, solve problems and collaborate as reported by Rahayu, (2022). 21st century learning is learning which in the learning process uses a student-centered learning approach. These skills should be applied in learning by students in the 21st century because the 21st century will require innovative and creative people to be able to adapt quickly as reported by Junedi, (2020). These four indicators are important because the ability to think fluently is a person's ability to express different thoughts about things that do not provide many alternative ideas or thoughts for solving problems. Skills must not only be possessed by teachers, but

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students must also understand the skills that students must have in 21st century learning as reported by Himmah, (2021).

Based on the results of observations carried out in February 2023 at SMK Negeri 2 Padang Panjang, 59 students were randomly selected by distributing questionnaires regarding understanding of 21st century learning skills and innovation skills.

Based on the results of this data, 14 people stated that they knew about 21st century skills who completed the questionnaire checklist, while 45 people stated that they did not know what 21st century skills were (did not complete the questionnaire checklist). Based on this description, there are still many students who do not know what 21st century skills are. Based on the results of interviews conducted with several students at SMK Negeri 2 Padang Panjang, it can be seen that teachers in every lesson have provided 21st century skills, especially learning and innovation skills, only However, there are still many students who do not know these 21st century skills in their learning process. Apart from the problems that have been explained, other problems found were (1) Inadequate learning support facilities, this problem can be seen from the lack of computer laboratories which resulted in students having to take turns using computers when carrying out learning. (2) There are still some students who are less creative in their learning.

SMK Negeri 2 Padang Panjang is a vocational school that prioritizes industry based learning. This motto is also proven by several national and provincial level awards related to skills in each area of expertise found in the vocational school. The list of achievements that have been achieved by SMK Negeri 2 Padang Panjang include, winning the FLS2N Olympiad at the West Sumatra provincial level, namely winning 1st place in Short Film in 2022, winning the Electronic Book Creation competition, namely winning 2nd place in the National School Literacy Festival in DKI Jakarta in 2018 , 2nd place in the school literacy festival at the national level in 2019, 2nd place in volleyball at the school level in 2019, and Men's and Women's Indonesian Speech, 1st and 3rd place at the district/city level in 2019. This research aims to determine the level of 21st century skills, because in the 21st century, technicians who excel in the fields of science and technology are not only able to compete in the world of work but also have to balance skills and social characteristics.

The aim of this research is to present information related to the results of the analysis of the level of learning and innovation skills in students at SMK Negeri 2 Padang Panjang. Therefore, the expected results will be taken into consideration by educators so that they can pay more attention to students who still do not have 21st century skills, especially learning skills. and innovation skills (learning and innovation skills). So that the skills possessed by students can become a provision in furthering their dreams.

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## 2. Methodology

This research uses survey research with quantitative methods. Researchers want to know what the level of 21st century skills is like for vocational students at SMK Negeri 2 Padang Panjang. The objects of this research were class XI students majoring in RPL, DKV, TKJ, and PSPT at SMK Negeri 2 Padang Panjang. The population of this research is class from 100 people, it is better to take all of them so that the research is population research, then if the number of subjects is large, 10-15% or 10-25% or more can be taken. Based on the definition above, it can be said that the sum of the samples for this study is  $249 \times 25\% = 62.25\%$ . Based on the calculations carried out above, the total number of research samples was 62.25%, so it was completed to 63 respondents. Number of samples of class XI students majoring in RPL, DKV, TKJ, and PSPT at SMK Negeri 2 Padang Panjang.

The data collection technique used to collect data from respondents is a questionnaire. Instrument. The questionnaire instrument was distributed to class XI students majoring in RPL, MLD, TKJ, and PSPT at SMK Negeri 2 Padang Panjang. Variable measurement uses a Likert scale. The Likert scale is used to measure the attitudes, opinions and perceptions of a person or group towards a social phenomenon Sugiyono, (2018).

Instrument testing is carried out with the aim of finding out whether the instrument used has been tested for its level of success and reliability in collecting data. Instrument trials were carried out internally and externally. Internal trials are carried out by consulting a questionnaire with the supervisor. Meanwhile, external trials were carried out by asking for the willingness of 30 students outside the research sample to fill out a questionnaire.

In this study, the data analysis in quantitative research is an activity carried out after respondent data has been collected. The activities carried out in data analysis are grouping data according to variables and types of respondents, according to variables for all respondents, presenting data for each variable studied (Sugiyono, 2018). The following are the data analysis techniques used in this research: 1. Data verification is carried out after the questionnaire/questionnaire is distributed. What is done is an inspection to find out whether all questionnaires have been filled in as expected. 2. Descriptive analysis was carried out by grouping the scores from each instrument weight according to the indicators, and then calculating the number of answers from all respondents to each question. Next, to find out the percentage, you can use the formula:

$$P = \frac{F}{N} \times 100 \%$$

Source:(Sugiyono, 2018)

Information:

P : Answer Percentage

F : Answer Frequency

N : Total score

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The standard deviation and average value (mean) for each statement item will be calculated using the SPSS program. To calculate the percentage you can use:

$$P = \frac{\text{Mean value of all respondents}}{\text{Maximum score}} \times 100 \%$$

Source: (Sugiyono, 2018)

The results of the analysis using a formula can be categorized from each existing percentage according to the category which can be seen in table 1:

Table 1. Clarification Based on Percentage

Value interval	Meaning
>75% - 100%	Very good
>50% - 75%	Good
>25% - 50%	Enough
0% - 25%	Not good

### 3. Results and Discussion

#### *Descriptive Analysis Results*

Data from the student learning skills and innovation skills questionnaire as a whole can be seen in Figure 1:

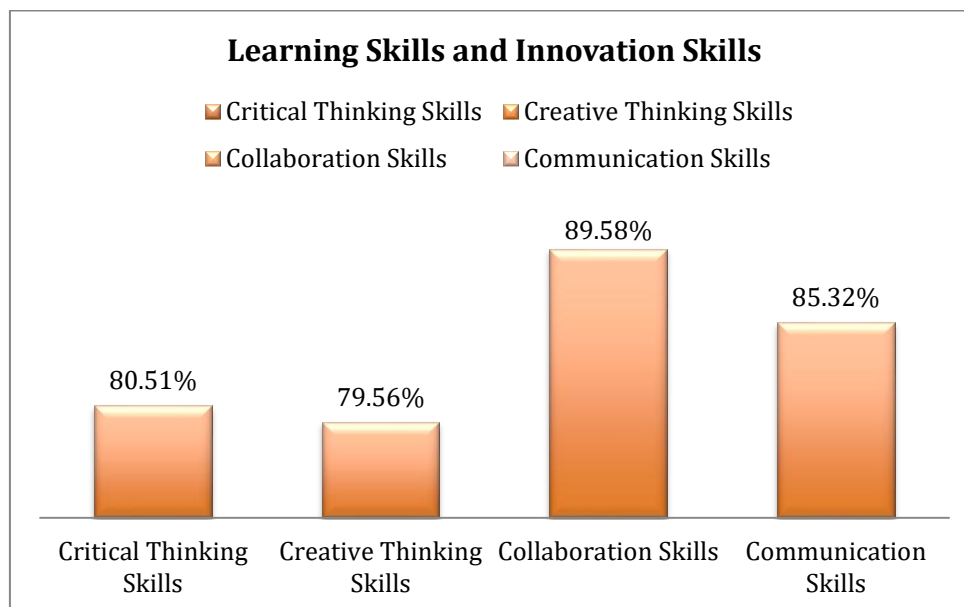


Figure 1. Data from Questionnaire Results for Each Competency  
*Questionnaire Result Data Based on Gender*

Based on table 2, it can be seen that in the aspect of critical thinking skills, male students have a percentage of 81.57%, female students have a percentage of

78.44%, which means that the percentage of critical thinking skills for male students is greater than female students. Furthermore, female students' creative thinking skills and communication skills have a greater percentage than male students, then male students' collaboration skills have a percentage of 85.33%, female students have a percentage of 85.00%, which means that the percentage of male students' collaboration skills is higher. higher than female students' collaboration skills. It can be concluded that the average percentage of men is 82.5% and the average percentage of women is 82.36%, which means that between male and female students it is found that the difference in percentage is not very significant, namely 0.14%. shows that male students' learning and innovation skills are higher than female students.

Table 2. Data from Questionnaire Results Based on Gender

Gender	Critical Thinking Skills	Creative Thinking Skills	Collaboration Skills	Communication Skills	Average
Male	87,57%	78,88%	85,33%	83,61%	82,5%
Female	78,44%	81,54%	85,00%	83,93%	82,36%

### ***Questionnaire Result Data Based on Department***

Based on table 3, it shows the results of the questionnaire based on majors which are divided into 4 classes including RPL, DKV, TKJ, and PSPT. In the aspect of critical thinking skills, the RPL major has a higher percentage compared to the DKV, TKJ and PSPT majors. Then, in the aspect of creative thinking skills, the PSPT major has a higher percentage compared to the RPL, DKV and TKJ majors. Furthermore, in the aspect of collaboration skills, the PSPT major has a higher percentage compared to the RPL, DKV and TKJ majors. And in the aspect of communication skills, the RPL major has a higher percentage compared to the DKV, TKJ and PSPT majors. Analysis of the aspect of critical thinking skills, seen from each department in the "Very Good" category with the highest percentage achieved by the RPL department with a percentage of 83.14%.

Then the data obtained is for aspects of creative thinking skills in learning and innovation skills. The analysis of achievements in the aspect of creative thinking skills was completed by looking at the results from each department in the "Very Good" category with the highest percentage achieved by the PSPT department with a percentage of 81.25%. Furthermore, the data obtained on the aspect of collaboration skills in students' learning and innovation skills was seen as the results from each department were in the "Very Good" category with the highest percentage achieved by the PSPT department with an average percentage of 93.12%. Then the data obtained on the aspects of communication skills in students' learning and innovation skills were seen as the results from each department were in the "Very Good" category with the highest percentage achieved by the RPL department with an average percentage of 86.9%.

Based on the results of the descriptive analysis, it can be concluded that the Learning and Innovation Skills level of Vocational High School Students at SMK

Negeri 2 Padang Panjang for the 2023/2024 academic year obtained an average of 83.74% in the "very good" category. This shows that vocational school students have good abilities in mastering 21st century skills, especially Learning and Innovation Skills. According to Manurung, (2019) explains that Learning and Innovation Skills, called 4C skills, must be mastered and possessed by every student in order to face the challenges of the 21st century, which consist of critical thinking skills, creative thinking skills, collaboration skills and communication skills. Supported by research results Oktavia, (2023) in the learning process teachers have implemented learning processes such as: directing students to think critically, using communication to share goals, providing assessments and evaluations of assignments, as well as motivating students, aspects of teacher learning and innovation skills Productivity at SMK Negeri 2 Padang Panjang is in the "High" category with an average percentage of 84.28%. Furthermore, in this research, in the learning process, vocational school students already have good abilities in mastering 21st century skills, especially learning and innovation skills.

Data from student learning and innovation skills questionnaire results based on majors can be seen in table 3.

Table 3. Questionnaire Results by Major

Major	Critical Thinking Skills	Creative Thinking Skills	Collaboration Skills	Communication Skills	Average
RPL	83,14%	79,5%	87,5%	86,90%	84,26%
DKV	81,42%	77,96%	90,23%	84,15%	83,44%
TKJ	78,91%	80,00%	88,92%	86,20%	83,50%
PSPT	78,61%	81,25%	93,12%	82,85%	83,96%

## Discussion

### Critical Thinking Skills

Based on the research results, it shows that the level of critical thinking skills for each department in Vocational High School students at SMK Negeri 2 Padang Panjang was assessed using 9 statements grouped into 4 indicators. The critical thinking skills aspect of students has a percentage above 75.00% in the "Very Good" category. Therefore, it can be concluded that students already have a good understanding and are able to apply critical thinking skills in every lesson in class. Critical thinking skills are a very important role in student development. There are several main indicators that students must apply in applying critical thinking skills at school, namely: Reasoning effectively, Systems Thinking, Making judgments and decisions, and Solving Problems. Supported by research results Amandita (2021) shows that the critical thinking skills component of students' level of achievement is in the "good" category with a percentage in class XI TP 1 of 88.5%, then 92.9% in class, finally 92.6% in class XI TP.

In terms of critical thinking skills between men and women, the ratio difference was found to be not very significant, namely 03.13%. Based on the theory that

there is a difference in percentage because biologically men and women have different brain structures. Thus, in many aspects such as the ability to process and respond to information, emotions, motivation, behavior and long-term information storage, men and women show differences Yanti, (2019). Male students have a tendency to be able to solve problems better than female students. The student research questionnaire stated that the ability to reason effectively, think systems to make considerations and decisions as well as the ability to solve problems of female students is lower than that of male students.

### ***Creative Thinking Skills***

Based on the research results, it shows that the level of creative thinking skills for each department in Vocational High School students at SMK Negeri 2 Padang Panjang was assessed using 10 statements grouped into 3 indicators. The creative thinking skills aspect of students has a percentage above 75.00% in the "Very Good" category. Therefore, it can be concluded that students already have a good understanding and are able to apply creative thinking skills in every lesson in class. Regarding creative thinking skills between male and female students, it was found that the percentage difference was not very significant, namely 02.66%, this shows that female students' creative thinking skills were higher than male students. It can be seen in attachment 18 of the student research questionnaire that the average percentage of female students' ability to think creatively, work creatively with others, and apply innovation is higher than the percentage of male students.

According to Zubaidah (2018) creative thinking skills A person can generate and apply ideas in a specific context, and can see solving problems in different ways. Students' creative thinking skills have the lowest average percentage compared to other skills, namely having a percentage of 79.56% even though they are still in the "very good" category. This is because students are still not maximally using these skills to increase creativity in each lesson. Teaching methods that tend to be instructive and teacher-centered will prevent students from developing creative thinking skills. Creative thinking skills must be carried out because it will produce students who are more active and creative in the learning process. According to Darwanto (2019) creative thinking skills are mental activities related to sensitivity to problems, considering new information and unusual ideas with an open mind, and being able to make connections in solving these problems.

### ***Collaboration Skills***

Based on the research results that have been obtained, it shows that the level of collaboration skills from each department in Vocational High School students at SMK Negeri 2 Padang Panjang is assessed using 4 statements which are grouped into 1 indicator. the collaboration skills aspect of students has a percentage above 80.00% in the "Very Good" category. This shows that students have awareness of the application of collaboration skills in learning.

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According to Septikasari (2018) students will learn better if they are actively involved in the learning process in small groups. Important collaboration skills are enhanced in learning. The difference in collaboration skills between male and female students in learning is not too big, namely 0.33%. The percentage of male students is greater than that of female students. This shows that male students have applied collaboration skills better than female students. In collaborative thinking skills, students have the highest average percentage compared to other skills, namely having a percentage of 89.58% in the "very good" category. It can be concluded that in the learning process students make a significant contribution to the learning process.

### ***Communication Skills***

Based on the research results that have been obtained, it shows that the level of communication skills for each department of Vocational High School students at SMK Negeri 2 Padang Panjang is assessed using 7 statements which are grouped into 2 indicators. The communication skills aspect of students has a percentage above 80.00% in the "Very Good" category. This shows that based on the questionnaire that has been filled out, students utilize their communication skills well. Academic communication is an activity used to communicate observation results (conclusions) using oral, written or existing media. Good communication skills will put students on a good career path. Apart from being used to carry out da'wah activities, today's communication skills such as writing (journalism) and public speaking are an integral part of the field of work. So that it can encourage students' careers in the media field (Elizza, 2021).

The difference in communication skills between male and female interns is not too big, namely 0.32%. The percentage of female students is higher than male students. This shows that female students use communication skills better than male students. Many theories state that women's communication skills are better than men. Because in general, women remember better while men think better logically (Murtafiah 2016) but in fact, between men and women, each person has their own communication criteria. Boys tend to speak directly and clearly, while girls tend to speak indirectly and less structured. Therefore, it can be concluded that male and female students show differences in the way they carry out learning. Each student has their own language to communicate with their classmates.

## **4. Conclusion**

Based on the results of descriptive analysis of the level of learning skills and innovation skills of students at SMK Negeri 2 Padang Panjang, it can be concluded that overall students have a good understanding of the importance of learning skills and 21st century innovation skills in learning. This can be seen from the average percentage of 21st century skills, especially Learning skills and Innovation Skills in the "Very Good" category. Overall, students at SMK Negeri 2 Padang Panjang have mastered learning skills and 21st century innovation skills well. Based on the research results obtained, the researcher has suggestions for

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teachers at SMK Negeri 2 Padang Panjang, especially regarding creative thinking skills in students. Teachers need to pay more attention to teaching methods that teach students in class, one of which is teaching methods that tend to be instructive and teacher-centered. inhibits students' creative thinking skills in the learning process.

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