Independence of students in learning science: A study in San Isidro national high school, Lupao City

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ABSTRAK

Purpose of the study: This research aims to explore the independence of students in learning science.

Methodology: This research is a mixed research, which combines quantitative and qualitative approaches. The quantitative approach is shown by descriptive statistical data, while the qualitative approach is shown by the results of the interview. The sample of this study was 9th grade students at San Isidro National High School.

Main Findings: The results in this study indicate that the majority of students have a fairly good independence character in learning science, as indicated by the results of descriptive statistics, which shows as many as 34.9% of students have moderate independence. The remaining 6.6% of students are categorized as very low, 23.6% of students are categorized as low, 25.5% are categorized as high, and 9.4 students are categorized as very high.

Applications of this study: This research is very useful for science teachers in identifying and knowing the picture of students' independent character in learning science, especially in the Philippines.

Novelty/Originality of this study: This research only focuses on looking at the students' independent character in learning Natural Sciences, at San Isidro National High School, especially grade 9.

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1. INTRODUCTION

   Education is closely related to learning activities. Learning in this case can be interpreted as an effort to create conditions that enable students to learn effectively [1]. Effective learning activities can be seen that there are activities to choose, establish and develop methods to achieve the desired results in the learning process carried out by students and teachers. Education is essentially a conscious and planned effort to prepare students through teaching activities, guidance for their role in the future [2]. Teachers need to present interesting and fun learning for students so that a competency and professionalism of the teacher is fulfilled in learning activities.

   Fun learning is expected to occur in the implementation of Natural Science learning, because Natural Science is a natural learning concept and has a very broad relationship related to human life [3]. Natural science is one branch of science that underlies the development of advanced technology and the concept of living in harmony with nature [4]. Natural Sciences is concerned with finding out about natural phenomena systematically, so that science is not only mastering a collection of knowledge in the form of facts, concepts, or principles, but also a process of discovery.

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Science is an inseparable product, process and scientific attitude. Products in the form of a collection of knowledge and principles of science. The process is in the form of steps that must be taken to gain knowledge or seek explanations about natural phenomena [5]. Processes for example, observation, classify, formulate hypotheses, predict, inference, communication, experimentation, and rational analysis [6]. A scientific attitude, for example, is objective and honest when collecting and analyzing data. By using scientific processes and attitudes, scientists obtain discoveries or products in the form of facts, concepts, principles, and theories. So basically, IPA consists of three components, namely the scientific attitude, scientific processes, and scientific products [7]. This means, science does not only consist of a collection of knowledge or various kinds of memorized facts, but science is an active activity or process that uses the mind to study natural phenomena.

Findings regarding the science learning process show that educators who are still struggling with conventional teaching patterns and do not want to learn to create learning conditions that are fun and meaningful [8]. The learning process with conventional teaching patterns is more likely to only lead students to achieve the goals of pursuing curriculum targets such as important concepts, practice questions and tests without involving students actively. Therefore, students are less active in following the lessons so that it has an impact on student independence and learning achievement. Low student independence will be followed by low student achievement.

Independence in learning is defined as learning activities that take place more driven by their own will, their own choices, and the responsibility of the learner [9]. Learning independence is the process when individuals take their own initiative, with or without the help of others, to diagnose learning needs, formulate learning goals, identify learning resources, choose and approach learning strategies, and evaluate the learning outcomes achieved [10]. In line with some of these opinions, it can be concluded that learning independence is known as independent learning. Independent learning is active learning activities, which are driven by the intention or motive to master a competency to overcome a problem, and are built with the knowledge or competencies that have been possessed [11]. Determination of competence as a learning goal and how to achieve it is done by the learner himself. The determination includes the determination of study time, place of learning, rhythm of learning, tempo of learning, ways of learning, learning resources, and evaluation of learning outcomes.

Learning can be done anywhere, anytime, and with anyone [12]. Learning is a relatively permanent change because of experience [13]. That experience can be obtained from interactions with the surrounding environment, both from the process of observing, imitating, and modifying through subjects taught in schools, one of which is Natural Sciences (IPA). Science is one of the compulsory subjects in the secondary education curriculum in the Philippines. Natural sciences are categorized as lessons learned to recognize, respond to, and appreciate science and technology, and to inculcate critical, creative and independent scientific habits of thought and behavior. In addition, there are several reasons why science should be taught in junior high schools, namely 1) because science is the basis of technology so that it is useful for a nation; 2) science provides an opportunity for critical thinking if science is taught one of them by following the "find it yourself" method; 3) Natural sciences are not merely memorized subjects if they are taught through experiments conducted by children; and 4) Science has educational values that can shape the child's personality as a whole. Thus, science is very important in shaping the independence of student learning [14]; [15].

Based on the description of the independence of learning and learning science, junior high school students are expected to have the independence of learning in science learning as one aspect of the development of his personality. Learning independence in question is the process of student learning activities that can take their own initiative, without being dependent on other people, to plan, conduct, and evaluate their learning activities in science learning. Based on this, the researcher is interested in seeing or doing research related to the analysis of students' independence in learning science in San Isidro National High School.

2. RESEARCH METHOD

This research is a mixed study. Mixed research is research that involves the use of two methods, namely qualitative and quantitative research methods in a single study or one study [16]. The quantitative approach in this study can be seen from the quantitative results in the form of descriptive statistics. Furthermore, the qualitative approach can be seen from the results of in-depth interviews conducted by researchers of several students.

The sample of this study consisted of students who attended San Isidro National High School. The sampling technique in this study uses random sampling. Random sampling is a sampling procedure for a population in which the selection of sample units is based on each element of the existing population [17]. In

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this study total sampling was done by taking all students in grade 9, San Isidro National High School. Based on this, 3 classes were obtained, with a total of 106 students.

Furthermore, this study uses a questionnaire instrument and an interview guide. Interviews were conducted to strengthen the findings of quantitative data [18], while a questionnaire related to student independence adopted from Sulisworo and Sutadi [19] consisting of 20 statements with a reliability value of 0.74 and validity of 0.83. Each questionnaire uses 5 Likert scales. A positive statement is given on a scale of 5 to strongly agree, 4 to agree, 3 to neutral, 2 to disagree and 1 to strongly disagree. Conversely, negative statements are given on a scale of 1 to strongly agree, 2 to agree, 3 to neutral, 4 to disagree and 5 to strongly disagree.

In this study using SPSS to analyze descriptive statistics. In this study the descriptive statistics used are frequency, mean, min, max and percentage. The categories of students’ independence questionnaire in learning science consisted of very low, low, medium, high and very high, as shown by table 1.

Table 1. Categories of student independence in learning science.

<table>
<thead>
<tr>
<th>Category</th>
<th>Interval</th>
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</thead>
<tbody>
<tr>
<td>Very low</td>
<td>16.0 – 28.8</td>
</tr>
<tr>
<td>Low</td>
<td>28.9 – 41.6</td>
</tr>
<tr>
<td>Fair</td>
<td>41.7 – 54.4</td>
</tr>
<tr>
<td>High</td>
<td>54.5 – 67.2</td>
</tr>
<tr>
<td>Very high</td>
<td>67.3 – 80.0</td>
</tr>
</tbody>
</table>

During data collection, the first activity undertaken is to select students who fit the category in this study. Furthermore, a questionnaire related to the independence of students to students, along with it conducted interviews with several students.

3. RESULTS AND ANALYSIS

This research focuses on looking at the independence of junior high school students in learning science. Some of the research results described in this session, namely the results of quantitative data are indicated by frequency, percentage, average, standard deviation, minimum, and maximum, while the results of qualitative data are indicated by transcripts. The results of students’ independence in learning science are shown in the following table 2.

Table 2. Results of student independence in learning science

<table>
<thead>
<tr>
<th>Independence Level</th>
<th>Interval</th>
<th>f</th>
<th>%</th>
<th>SD</th>
<th>Mean</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very low</td>
<td>16.0 – 28.8</td>
<td>7</td>
<td>6.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>28.9 – 41.6</td>
<td>25</td>
<td>23.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fair</td>
<td>41.7 – 54.4</td>
<td>37</td>
<td>34.9</td>
<td>1.57</td>
<td>49.6</td>
<td>16</td>
<td>80</td>
</tr>
<tr>
<td>High</td>
<td>54.5 – 67.2</td>
<td>27</td>
<td>25.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very high</td>
<td>67.3 – 80.0</td>
<td>10</td>
<td>9.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>106</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Based on table 2, the quantitative results obtained describe the independence of students in learning science. Of the total 106 respondents, it was dominated by the moderate category of 37 students or 34.9%. Table 2 also shows other categories, such as 7 students (6.6%) having a very low category, 23.6% having a low category, 25.5% having a high category, and only 9.4% having a very high category. The overall mean results indicate the number 49.6 (SD = 1.57), which indicates that the results of student independence in learning science are not too good, but not too bad, but rather mediocre, are in the fair category. The result of min shows 16, which if interpreted that one respondent answered strongly disagrees all on each questionnaire statement, on the contrary, the max result shows the number 80, which if interpreted that one respondent answers strongly agrees to all statements of independence questionnaire.

Next there are the results of interviews by researchers with several students, as shown by the following transcript:

Q: What do you think is a science lesson? Can natural science produce independent characteristics?
A: “I think natural science studies are natural-related subjects, which relate to existing phenomena if asked about whether science studies produce independent nature, it seems
yes, given that science is science related to certainty, besides that some scientists Science is famous for its personality, one of which is independent in doing something...

Q: “Do you try to apply independent nature in learning science? What is the importance for you to apply these qualities?”

A: “Yes, I try to do it, hmmm, for example when the teacher gives an assignment, I try to do it myself, besides that sometimes I take the initiative to find my own information about science lessons on the internet, for example when there is interesting or confusing material, but if I can’t, and every way I’ve done it, I try to find information from friends or even teachers... For me, independence in learning science is very important to apply because it will train us in the future, especially later when going down to the world of work, and that can make us not lazy to only rely on friends, but we can rely on ourselves...”

From the transcript it is clear that students claim that independent attitude is related to science lessons, and science lessons teach these independent traits. Furthermore, the respondent also explained that IPA is identical with being independent, especially the scientists, where scientists always teach to be independent, not dependent on others [20]. Respondents also explained that being independent is very useful, especially later when in the world of work, or growing up, because it will benefit someone especially not too dependent on others [21].

It is known that science is related to finding out about nature systematically so that science is not only mastering a collection of knowledge in the form of facts, concepts, or principles, but also a process of discovery [22]. Science is a problem-solving activity by humans who are motivated by curiosity about the nature around them and the desire to understand, master, and process it to meet their needs [23]. Science is needed in daily life to meet human needs through solving identifiable problems.

In essence, science can be viewed in terms of products, processes, and in terms of attitude development [24]. science as a product is the result of previous science pioneers and is generally arranged in a complete and systematic way in the form of textbooks. Science as a process is a scientific method. Middle school students are expected to develop the scientific method gradually and continuously so that they can carry out simple research. Science as an attitude in junior high school students is limited understanding of scientific attitudes towards the environment.

Science learning in the classroom is seen as an active process and is strongly influenced by what students really want to learn [25], [26]. Important aspects that need to be considered by the teacher in empowering the potential of students through science learning are 1) The teacher needs to understand that students already have preliminary knowledge so that the teacher should not neglect what is thought too quickly; 2) Children's activities through various real activities with nature become the main thing in learning science; 3) The activity of asking questions becomes an important part and even becomes a major part of learning; and 4) Science learning provides opportunities for children to develop their thinking skills in explaining a problem [27].

Science lessons are closely related to the nature of independence. Because true science lessons teach these independent characteristics to students [28]. The concept of independence is formulated as the ability and willingness of people to take responsibility and mobilize their own behavior in carrying out accepted activities. The concept of independence is formulated as the ability and willingness of people to take responsibility and mobilize their own behavior in carrying out accepted activities.

Independence can be seen from changes in attitude that is more responsible, an increase in performance, can control life. Independence is an attitude and behavior of a person in carrying out activities to meet the needs of his life which is always changing. Independence is not the result of the process of internalizing authority rules but rather a process of self-development in accordance with human nature [29]. The students’ independence also includes being independent in the learning needed during their lives. Independence in learning is defined as learning activities that take place more driven by their own will, their own choices, and their own responsibilities from the learner. Learning independence describes a process when individuals take their own initiative, with or without the help of others, to diagnose learning needs, formulate learning goals, identify learning resources, select and determine learning strategy approaches, and evaluate the learning outcomes achieved.

Independence in learning science is very important. Because the child's independence is very important for the child's mental development because it will cause the child's level of self confidence [30]. The impact of independence is that the child has a passion for his activities and has a desire to try a lot of new things and improve his performance. In the context of learning, independence is needed as a provision of lifelong education. Individuals who do not have the independence of learning can experience unfavorable habits in carrying out lifelong education.
4. CONCLUSION

Independent is an attitude that does not depend on others, trying to complete the task with one's own abilities. Students are expected to have an independent attitude in doing the task and are responsible for completing the task on time. Of course, this attitude is not only carried out in schools, but also familiarized in everyday life. Independent is very important to be applied in learning, as is the case with natural science learning. Based on this, the researchers conducted research related to the analysis of students' independent attitudes in learning science, especially at San Isidro National High School. From the results that have been obtained that most students get an independent attitude that is categorized as fair, which indicates that students' independent attitude in learning science is not too good, but not too bad. Based on this, it is very important to do ways to improve students' independent attitude in learning science, and this can be used as future research.

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REFERENCE


