# Enhancing students' learning outcomes using guided inquiry learning model

# Melhorar os resultados de aprendizagem dos alunos usando o modelo de aprendizagem de investigação guiada

# Mejorar los resultados de aprendizaje de los estudiantes mediante el modelo de aprendizaje de indagación guiada

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**Abstract**

This study aims to find out the enhancement of students' performance and motivation using guided inquiry model in High School 2 Bandar, Simalungun. The methodology used is classroom action research with quantitative and qualitative approach. This study also used pretest and posttest as data collection which done in two cycle. The result showed that guided inquiry model could increase students' performance and learning outcomes. The enhancement can be seen from (a) their average psychomotor score in the end of first cycle for 63 to be 71 in the second cycle; (b) their affective score that increased from zero to 19% in second cycle; (c) their high response toward guided inquiry model which showed that half of the students had very positive response and the other half had positive response. The analysis of students' cognitive study obtained through pretest and posttest had average score in first cycle for 73 and increase to 76 in second cycle. Therefore, the guided inquiry learning model can increase students' performance and learning outcomes.

**Keywords**: Student performance; Economics; Learning outcome; Guided inquiry model.

**Resumo**

Este estudo tem como objetivo descobrir a melhoria do desempenho e da motivação dos alunos usando o modelo de investigação guiada no High School 2 Bandar, Simalungun. A metodologia utilizada é a pesquisa-ação em sala de aula com abordagem quantitativa e qualitativa. Este estudo também utilizou pré-teste e pós-teste como coleta de dados realizada

em dois ciclos. O resultado mostrou que o modelo de investigação guiada pode aumentar o desempenho dos alunos e os resultados de aprendizagem. O aprimoramento pode ser visto em (a) sua pontuação psicomotora média no final do primeiro ciclo de 63 para 71 no segundo ciclo; (b) o escore afetivo que aumentou de zero a 19% no segundo ciclo; (c) sua alta resposta ao modelo de investigação guiada, que mostrou que metade dos alunos teve uma resposta muito positiva e a outra metade teve uma resposta positiva. A análise do estudo cognitivo dos alunos obtido por meio do pré e pós-teste teve pontuação média no primeiro ciclo para 73 e aumentou para 76 nos segundos ciclos. Portanto, o modelo de aprendizagem por investigação guiada pode aumentar o desempenho dos alunos e os resultados de aprendizagem.

**Palavras-chave:** Desempenho do aluno; Economia; Resultado de aprendizagem; Modelo de investigação guiada.

**Resumen**

Este estudio tiene como objetivo descubrir la mejora del rendimiento y la motivación de los estudiantes mediante el modelo de investigación guiada en High School 2 Bandar, Simalungun. La metodología utilizada es la investigación-acción en el aula con enfoque cuantitativo y cualitativo. Este estudio también utilizó la prueba previa y posterior como recopilación de datos que se realizó en dos ciclos. El resultado mostró que el modelo de indagación guiada podría aumentar el rendimiento de los estudiantes y los resultados del aprendizaje. La mejora se puede ver en (a) su puntuación psicomotora promedio al final del primer ciclo para que 63 sea 71 en el segundo ciclo; (b) su puntuación afectiva que aumentó de cero a 19% en el segundo ciclo; (c) su alta respuesta hacia el modelo de indagación guiada que mostró que la mitad de los estudiantes tuvo una respuesta muy positiva y la otra mitad tuvo una respuesta positiva. El análisis del estudio cognitivo de los estudiantes obtenido a través de la prueba previa y posterior tuvo una puntuación promedio en el primer ciclo de 73 y aumentó a 76 en el segundo ciclo. Por lo tanto, el modelo de aprendizaje de indagación guiada puede aumentar el rendimiento y los resultados del aprendizaje de los estudiantes.

**Palabras-clave:** Desempeño del estudiante; Ciencias económicas; Resultado de aprendizaje; Modelo de consulta guiada.

## 1. Introduction

The implementation of 2013 curriculum required students to have good competence in every school subjects. Competency here refers to the ability to think, act and behave

consistently in a form of knowledge, creativity and score. It is an asset for students to respond to:

(a) local, national, global, social, economic, environment and ethic issue;
(b) evaluate critically on the development of economy along with its effects;
(c) give contribution on the continuity of economic and technology development and,
(d)  choose for good career (Depdiknas, 2003).

Students should be involved directly during the learning process due to get experiences.

Economics emphasizes on giving experience to develop the competence to make students able to understand the effect of learning economic in globalization era. Economics also directed to "find out" and "act" in order to help students to understand deeply on economic nowadays. Carl Sagan in Koes (2003) stated that economy is more than a way of thinking but a collection of knowledge. Economy as one of the school subject which develop the ability to think inductively and deductivelyhad role to solve problems related to the nation's or company's economy. It also gives direct experience to expand the competence and make teacher able to develop teaching strategy which can enhance students' motivation. Thus, students' activeness can be improved.

Lecture method is a conventional method that still dominated in learning economics. This model only prioritizes the result without thinking about the process. Whereas in fact, learning economics need both process and result since those have the same part within and cannot be separated. Therefore, the use of good and varied learning method and approach is expected to enhance students' performance and learning outcomes.

Teacher can improve their students' performance through learning which based on global economy introduction. One of the learning method that matched is inquiry. Inquiry is economic learning model that refers to the way to ask, to find knowledge, to find information, or to learn phenomenon (Koes, 2003). If students have no experience yet in learning with inquiry activities, then they need to be guided or known as guided inquiry model.

In High School 2 Bandar, Simalungun, many teachers use conventional learning or lecture method in their learning process, while the students only listen and note the material. The reason why conventional learning is still used, according to the information from some teacher there, because; (a) there is time crash for face to face in the class, (b) it is hard to arrange the learning material with interesting approach, and (c) there is no facility that support the teaching. Thus, teachers prefer to choose lecture method than the other method.

Based on the evaluation done in High School 2 Bandar, the data showed that the economics score is often low and far from the curriculum standard for 65. Also, the students' activeness cannot be seen during the learning process. Therefore, the researcher wanted to analyze the students' performance and learning outcome in studying economics using guided inquiry model.

## 2. Methodology

This research included as Qualitative-Quantitative study. Qualitative research is composed of a variety of genres, elements, and styles, and this introductory chapter reinforces that there is not one but many possible approaches to naturalistic inquiry. Quantitative research Quantitative research will concern itself with statistics such as frequencies and thus will include such phrase as "how much," "how often," "how constant," and soon, to describe its inquiry and consequent findings (Sugiyono, 2016).

This study was held on the second week of September until the third week of November 2019. It was done around those months because the material taught demanded for test performance score in group or individual. The subject of this study was students of High School 2 Bandar in 11th grade of social department with total of 32 students. The data source was the students and teachers that appointed to be the collaborator within the study.

Data Collection Technique

For the data collection technique, the study used classroom action research in two cycle, in which each cycle completed in four phases, including planning, action, observation and reflection. The detail of each phases can be seen as below:

Planning consist of: problem identification; syllabus making; lesson plan making; students' working sheet; observation sheet; evaluation test for pretest and posttest and, tools used for experiment trials and questionnaire for students to know their response on the application of guided inquiry model.

Action consists of:

In this phase, the activities that have been planned before is implemented. The details of the activities can be seen as below;

### a. Introduction

The early activities consist of giving pretest to students before the lesson start, delivering the purpose of the lesson, and relating the lesson with students' knowledge.

**b. Main Activity**

The main activities compose of students who discuss the steps of investigation together and teacher who directs students to find a concept on the discussed material.

**c. Closing**

In closing activities teacher leads students to draw conclusion and give evaluation in the form of posttest. Students also gave questionnaire to see their response toward guided inquiry learning model.

Observation

Observation is an activity to monitor the learning process within the class to know how far the learning model gives effect to students.

Reflection

Reflection is used to evaluate the learning process. The data obtained through this phase is used as the standard to plan for the next cycle.

The detail of study procedure, are: Preparation which means Preparing the learning media (syllabus, lesson plan, students' working sheet, and tools used for lesson, Arranging the observation sheet for students and teacher, Observation sheet is used to observe students' and teacher's activity during the lesson. The observation sheet for students consist of psychomotor and affective sheet. While for teacher, the observation sheetconsists of teacher's activity within the class.

Psychomotor observation sheet

The assessment on students' psychomotor covers the aspect of assembling, measuring, counting, data analysis and describing the shadow formation. The scale which used to measure the students' psychomotor is 4 until 1, with maximal score 4x5=20 and minimum score for 1x5=5. The psychomotor score can be counted using formulation as below;

$$score = \frac{\sum students\ score}{maximum\ score} \times 100\%$$

Affective observation sheet

The assessment on students' affective sheet consists of class attendance, question, and students' participation in laboratory activity and time accuracy in submitting tasks.

**Classroom action research**

**a. First cycle**

*Planning:*

Identifying the problems in learning economics, including the students' performance and cognitive learning outcomes in general through interview with economics teacher, Using guided inquiry model as the solution for the problems, Making the learning scenario which covers the making of syllabus, lesson plan, pretest and posttest evaluation, students' working sheet, students' and teacher observation sheet, preparing the learning material, and questionnaire for students' respond.

*Action:*

Teacher gives pretest to know the students' early ability, Teacher divides students into 5 groups which filled with 6-7 students for each groups, Teacher explains on the planning activities that will be done during the lesson, Students do trials based on the direction within the working sheet, while teacher helps them with the trials, After that, each groups present their trial result to be discussed and drawn conclusion, Teacher gives task for the next meeting and exercise on the concept application, Teacher gives posttest in the end of the lesson.

*Observation:*

The researcher observes the learning process and assesses students' ability in doing their group task, Correcting and giving score to students' working sheet along with the pretest and posttest evaluation.

*Reflection:*

After the first cycle is finished, the data is analyzed due to know whether the guided inquiry model given during the lesson can enhance students' performance and learning outcomes.

**b. Second cycle**

*Planning:*

Teachers re-arrange the learning activity which is the refinement from the first cycle, Teachers make the lesson framework which encompass the making of syllabus, lesson plan,

pretest and posttest evaluation, students' working sheet, students' and teacher's observation sheet, prepare for learning material and tools, and questionnaire for students' respond.

*Action:*

Teacher gives pretest to know students' ability after the first cycle, Teacher divides students in 5 groups with 6-7 students within the groups, Teacher explains on the lesson plan, Students do trials based on the direction within the working sheet, while teacher helps them with the trials, After that, each groups present their trial result to be discussed and drawn conclusion, Teacher gives task for the next meeting and exercise on the concept application, Teacher gives posttest in the end of the lesson.

*Observation:*

The researcher observes the learning process and assesses students' ability in doing their group task, Correcting and giving score to students' working sheet along with the pretest and posttest evaluation.

*Reflection:*

In this cycle, the enhancement on students' performance and learning outcomes is already seen. Thus the cycle can be ended.

*Data Analysis*

In analyzing the data, the class average score, the completeness of individual study andthe completeness of classical study werebecoming the indicator. The analyzed data then managed in formulation below:

The class average score:

To count the class average score, the formulation is;

$$x = \frac{\sum x}{N}$$

Source: (Sudjana, 1989).

Notes:

X = class average

$\sum x$ = total of the score

N = the amount of subject

The completeness of individual study

$$individual\ completeness = \frac{the\ total\ of\ right\ answer}{the\ total\ of\ the\ questions} \times 100\%$$

Source: (Usman, 1993)

The completeness of classical study

$$classical\ completeness = \frac{the\ total\ of\ students\ with\ score \geq 65}{the\ total\ of\ the\ students} \times 100\%$$

Source: (Mulyasa, 2003)

While the success indicator of this classroom action research are: Students considered to complete the psychomotor and affective learning if the whole of or at least 75% of the students involved in active behavior, whether for physic, mental or social during the learning process (Mulyasa, 2003), Students reached the cognitive study completeness if they able to solve and master the competition or the learning objective with minimum of 65% from the whole amount of it. While the class success percentage can be seen through the number of students who complete or reach the minimal 65% or at least 85% from the total students who follow the test (Mulyasa, 2003).

## 3. Result

### a. The result on psychomotor analysis

The description on students' psychomotor learning outcomes including the aspect of assembling, measuring, counting, and analyzing data can be seen in Table 1 below:

**Table 1**. Students' psychomotor assessment.

| No. | Category | Score | |
|-----|----------|-------|---|
| | | **First cycle** | **Second cycle** |
| 1 | Highest Score | 81 | 81 |
| 2 | Lowest Score | 56 | 63 |
| 3 | Average Score | 63 | 71 |
| 4 | Completeness (%) | 56% | 78% |

Source: own study.

Table 1 above showed that, in first cycle, the average score for psychomotor was 63 with 56% of completeness. However, since the number of completeness was under 75%, then it cannot be claimed as complete. In detail, students with ability to assemble the trial tool had average score for 71, students with ability to measure had average score for 67, and 42 for ability to count (in this phase, many students were not be able to count), and the ability for analyzing data had average score for 73. In second cycle, the average score of psychomotorwas 71 with 78% of completeness, with detail as; (a) the students' ability to assemble had average score for 73, (b) the ability to measure for 71, (c) the ability to count for 65 and (d) the ability to analyze the data was 74. Therefore the result on psychomotor learning in second cycle can be claimed as complete.

**b. The result on affective analysis**

The affective assessment is done through direct observation when students were following and doing the lesson. The data can be seen in Table 2 below:

**Table 2.** Students' affective assessment.

| No. | Category | Total Students | | |
|---|---|---|---|---|
| | | First cycle | Second cycle | |
| | | 1 | 2 | 3 |
| 1 | Very interested | 0% | 7% | 19% |
| 2 | Interested | 82% | 93% | 81% |
| 3 | Less interested | 16% | 0% | 0% |
| 4 | Not interested | 2% | 0% | 0% |

Source: own study.

Table 2 indicated the percentage of students with interested category for 82%, less interested category for 16% and 2% for not interested category. While, the second cycle in the second meeting had 7% of total students in very interested category and 93% in interested category. The third week of second cycle, the percentage of students with very interested category enhance for 19%, and decrease for 81% for interested category and the percentage of students with less interested category were 0%. Thus, the result on affective assessment on both first and second cycle can be claimed as complete.

**c. The result on students' response analysis**

The questionnaire used to find out students' response toward the guided inquiry learning model. From the questionnaire sheet, it can be seen that from 32 students, 16 students showed very positive response or similar to 50% of the total students. The rest of the 16 students or another 50% had positive response on the learning model.

**d. Students' cognitive learning outcome**

Based on the pretest and posttest analysis in two cycles, the score obtained can be seen in the following table below:

**Table 3.** Students' cognitive learning outcomes in first cycle.

| No. | Category | Pretest | Posttest |
|---|---|---|---|
| 1 | Highest score | 65 | 93 |
| 2 | Lowest score | 0 | 0 |
| 3 | Average score | 42 | 73 |
| 4 | Completeness (%) | 9% | 89% |

Source: own study.

**Table 4.** Students' cognitive learning outcomes in second cycle.

| No. | Category | Pretest | Posttest |
|---|---|---|---|
| 1 | Highest score | 73 | 93 |
| 2 | Lowest score | 33 | 50 |
| 3 | Average score | 56 | 76 |
| 4 | Completeness (%) | 56% | 91% |

Source: own study.

The result from the two table above showed that in the first cycle the average score (pretest)was 42 with 9% of completeness. After applying the guided inquiry model, the average score (posttest)was 73 with 89% completeness. In the second cycle, the pretest average score was 56 with 56% of completeness, and the posttest average score was 76 with 91% of score completeness.

## 4. Discussion

**First cycle**

Before implementing the first cycle of guided inquiry learning model, the students average score was not yet fulfill the standard and not as expected for 6.25 with 56% of completeness. Hence, a new learning model (guided inquiry model) was done due to optimize students' performance and learning outcome. In the early phase, teacher gives pretest before giving and explaining on the subject material due to know the students' ability. After the pretest is given, teacher gives appreciation and motivation along with the learning objective related to the subject that will be taught. This was done due to make students prepared to face the lesson and encourage their curiosity. In the main activity, teacher divides students in 5 groups contained with 6-7 students. Teacher shares some tools along with the working sheet to the groups. These groups then tried to assemble the tools, measure, count, and analyze based on the working sheet and teacher's direction. Then, each groups is asked to discuss their observation result and fill the working sheet.

The lesson is end with drawing conclusion. In this phase, students are given chance to ask on unclear material during the lesson, while the teacher had job to merge students' framework of thinking by explaining the important things. Posttest is also given in the end of the lesson to know how far students understand the material taught.

Besides, students can have strong basic knowledge through linking the material with their real life condition. This can be done during the discussion phase, in which creates the question and answer atmosphere. Teacher can gather information from students, check for their understanding and uplifting their response.

Moreover, students can complete their discussion result by sharing with one and another. Sharing also has function to generalize the concept between students and between students and teacher. During this time, teacher need to put attention to students' involvement and activeness while they give opinion or answering question.

From the guided inquiry learning model in the first cycle, the average score of students' psychomotor was 63 with classical completeness for 56%. This meant that 18 students get the score 65 or more. However, this number was not yet fulfills the score standard. This happened because; (1) there is still student whose not get used to science or laboratory activity, and (2) some students cannot communicate on the experiment data. Meanwhile, the affective students' activities showed zero number on students with very interested category, 82% for students with interested, 16% for less interested and 2% for not

interested. Since the average class which interest on guided inquiry model is huge, then the students' affective result is also quite high.

For the cognitive test result, students had the average score for 42 with completeness of 9% before getting the treatment. This indicated that only three students who get score for 65 or more. From this average score, it can be conclude that students still have minimum knowledge on the economics, especially on its relation with needs, scarcity and economy system. In the end of the lesson, students were given posttest to know how far their knowledge on the material. The result found that, the students' posttest average score was 73 with the completeness of 89%. It meant that 28 students have score for 65 or more. Thus in the first cycle, the cognitive students' result claimed as complete.

However, students in this first cycle were less active. Students also not really master the guided inquiry model, which make students keep quite during their difficulties. Students are less controlled during the discussion because they are not yet understand what was on their working sheet. As John Dewey in Dimyati & Mudjiono(1994) claimed that study concerns on what things should be done and teacher is merely the guide and director within.

Based on the data above, it needed a refinement on the next learning process. Teacher should be able to manage the class better than before. Teacher also need to fix the way to motivate students. He also need to guide students during the discussion and master the guided inquiry model due to make the learning process walk based on its objective.

**Second cycle**

Based on the psychomotor activity in second cycle, students' psychomotor, affective, and cognitive learning outcomes had reached completeness. The average score of psychomotor was 71 with 78% completeness which meant that there were 25 students who get score for 65 or more and 7 students under the score 65 or did not meet the standard. Compared to the first cycle, the psychomotor activity had enhancement for about 22% in second cycle.

While in affective activity, students with very high interest had reach 7% and 93% with high interest. In the third meetings, there is an enhancement on students with very high interest to b 19% and students with interest was down for 81% and 0% for students with less and no interest. Even though there is a little enhancement and decrease but the average score has reached the standard then it can be said as complete.

For the cognitive test result, students had the average score for 56 with completeness of 56% in pretest which meant that there are 18 students who get score for 65 or more. After

the end of the lesson, students' posttest average score was 76 with completeness of 91%. This meant there was enhancement in the total students who get score for 65 or higher for 29 students. Therefore, in the second cycle, the result of students' cognitive claimed as complete.

In learning process, the active students are enhanced which indicated by asking question, answering question and observing in good manner and on time. From the observation, the group discussion also improved. The number of active students increase in a great number. This showed that the students' motivation in learning is also increased.

The achievement of students' learning outcomes has been compatible with what was expected and it is not off of teacher's role in the learning process. Since teacher is one of the component that influence students' learning outcomes. In second cycle, there was change such as students' learning outcome become optimal, motivation increased, students active during the lesson and the atmosphere become more conducive. Therefore, this guided inquiry model involved students actively into the lesson. Gulo(2002) stated that inquiry placed students as an active learning subject. Besides, enhancing the students' activeness, the other factor that pushed the cognitive learning completeness was students' motivation and interest to study thus it became easier to understand the material.

From the questionnaire sheet given in second cycle, it is seen that mostly students show high respond on guided inquire model. It indicated that half students had very positive response and the other half had positive response.

## 5. Conclusion

In conclusion, the application of guided inquiry learning model could increase students' performance and learning outcome. The enhancement of students' performance can be obtained through psychomotor, affective and questionnaire analysis. Also, through teacher's performance who support the learning process. This enhancement can be seen through; (a) the average score of students' psychomotor in the end of first cycle for 63 to be 71 in the end of second cycle, (b) the average score of students' affective in the first cycle which showed zero number to 19% in the end of second cycle, and (c) the result from questionnaire given to students on their response to guided inquiry learning model which showed 50% of the total students had very positive response and the other 50% in positive response. Furthermore, the students' cognitive learning outcomes which obtained from pretest and posttest was also increased from 73 in first cycle to 76 in second cycle.

**Suggestion**

It is suggested for teacher to motivate students to propose early hypothesis by offering a guide question and within the learning process. It is also suggested that teacher uses some example based on the real life condition which link to the subject material. If the further research applied the guided inquiry as the learning model, it is required a good control system during the lesson so that students can use the time wisely and understand the material well.

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