

# DEVELOPING CRITICAL THINKING ACHIEVEMENT

*by* Rika Riwayatiningasih

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## DEVELOPING CRITICAL THINKING ACHIEVEMENT IN MACROECONOMICS COURSE THROUGH ADI LEARNING BASED

M. Anas<sup>1</sup>  
Zulistiani<sup>2</sup>  
Ita Kurnia<sup>3</sup>  
Erna Daniati<sup>4</sup>  
Basthoumi Muslih<sup>5</sup>  
Rika Riwayatningsih<sup>6</sup>  
Nurin Eva Yanti<sup>7</sup>

### ABSTRACT

**Purpose:** Macroeconomics is one of the most difficult subjects in semester 2. For this reason, ADI learning combined with critical thinking skills is required. This research aims to develop ADI learning so that students can study Macroeconomics courses more easily.

**Method:** The research method used is research and development (R&D) which lasts for one year with the research subjects being Masters of Economics Education, University of Nusantara PGRI Kediri. This design was chosen because it aims to produce new products or improve existing products, namely the ADI learning model in macroeconomics learning. The Argument-Driven Inquiry (ADI) model can increase students' mastery of concepts, the Argument-Driven Inquiry (ADI) learning model is seen as being able to facilitate students to understand macroeconomic concepts well, because learning activities the Argument-Driven Inquiry (ADI) model emphasizes construction and validation of knowledge through research activities.

**Results and conclusions:** Students experience a different learning experience where they have to reinforce references and be ready to accept input from other students. This study found that students with good critical thinking skills could produce good arguments and play an active role in tentative argument sessions and argumentation sessions.

**Research implications:** Through critical thinking, students are expected to be able to decide which one to use in their argument. Students are instructed to review the available information and then make a list of strengths and weaknesses of each decision.

**Originality/value:** The ADI learning process combined with the use of critical thinking can produce a good teaching and learning process.

**Keywords:** ADI Learning Process, Critical Thinking Skill, Macroeconomics, Research and Development, Course.

<sup>1</sup> Universitas Nusantara PGRI Kediri, Kota Kediri, Jawa Timur, Indonesia. E-mail: [anas@unpkediri.ac.id](mailto:anas@unpkediri.ac.id)  
Orcid: <https://orcid.org/0000-0001-5877-7961>

<sup>2</sup> Department of Management, Universitas Nusantara PGRI Kediri, Kota Kediri, Jawa Timur, Indonesia.  
E-mail: [zulistiani@unpkediri.ac.id](mailto:zulistiani@unpkediri.ac.id) Orcid: <https://orcid.org/0000-0001-7077-8924>

<sup>3</sup> Elementary School Teacher Education Department, Universitas Nusantara PGRI Kediri, Kota Kediri, Jawa Timur, Indonesia. E-mail: [itakurnia@unpkediri.ac.id](mailto:itakurnia@unpkediri.ac.id) Orcid: <https://orcid.org/0000-0001-9216-8852>

<sup>4</sup> Department of Information Systems, Universitas Nusantara PGRI Kediri, Kota Kediri, Jawa Timur, Indonesia.  
E-mail: [ernadaniati@unpkediri.ac.id](mailto:ernadaniati@unpkediri.ac.id) Orcid: <https://orcid.org/0009-0008-9471-4421>

<sup>5</sup> Department of Management, Universitas Nusantara PGRI Kediri, Kota Kediri, Jawa Timur, Indonesia.  
E-mail: [basthoumi@unpkediri.ac.id](mailto:basthoumi@unpkediri.ac.id) Orcid: <https://orcid.org/0000-0001-9136-1749>

<sup>6</sup> Department English Language Education, Universitas Nusantara PGRI Kediri, Kota Kediri, Jawa Timur, Indonesia. E-mail: [rieka@unpkediri.ac.id](mailto:rieka@unpkediri.ac.id) Orcid: <https://orcid.org/0000-0003-3353-233X>

<sup>7</sup> Universitas Nusantara PGRI Kediri, Kota Kediri, Jawa Timur, Indonesia. E-mail: [nurineva5@gmail.com](mailto:nurineva5@gmail.com)  
Orcid: <https://orcid.org/0009-0002-3720-6048>



## DESENVOLVIMENTO DO PENSAMENTO CRÍTICO REALIZAÇÃO EM MACROECONOMIA CURSO COM BASE NO APRENDIZADO ADI

### RESUMO

**Objetivo:** Macroeconomia é uma das disciplinas mais difíceis do segundo semestre. Por esse motivo, é necessário o aprendizado de ADI combinado com habilidades de pensamento crítico. Esta pesquisa tem como objetivo desenvolver o aprendizado do ADI para que os alunos possam estudar os cursos de Macroeconomia com mais facilidade.

**Método:** O método de pesquisa utilizado é a pesquisa e desenvolvimento (P&D) que dura um ano com os sujeitos da pesquisa sendo Mestrado em Educação em Economia, Universidade de Nisantara PGRI Kediri. Este design foi escolhido porque visa produzir novos produtos ou melhorar os produtos existentes, nomeadamente o modelo de aprendizagem ADI na aprendizagem da Macroeconomia. O modelo Argument-Driven Inquiry (ADI) pode aumentar o domínio dos conceitos pelos alunos, o modelo de aprendizagem Argument-Driven Inquiry (ADI) é visto como sendo capaz de facilitar os alunos a entenderem bem os conceitos macroeconômicos, porque as atividades de aprendizagem da Argument-Driven Inquiry (ADI) enfatiza a construção e validação do conhecimento por meio de atividades de pesquisa.

**Resultados e conclusões:** Os alunos vivenciam uma experiência de aprendizado diferente, na qual precisam reforçar as referências e estar prontos para aceitar sugestões de outros alunos. Este estudo descobriu que os alunos com boas habilidades de pensamento crítico poderiam produzir bons argumentos e desempenhar um papel ativo em sessões de argumentação provisória e sessões de argumentação.

**Implicações da pesquisa:** Através do pensamento crítico, espera-se que os alunos sejam capazes de decidir qual usar em seu argumento. Os alunos são instruídos a revisar as informações disponíveis e, em seguida, fazer uma lista de pontos fortes e fracos de cada decisão.

**Originalidade/valor:** O processo de aprendizagem ADI combinado com o uso do pensamento crítico pode produzir um bom processo de ensino e aprendizagem.

**Palavras-chave:** Processo de Aprendizagem ADI, Habilidade de Pensamento Crítico, Macroeconomia, Pesquisa e Desenvolvimento, Curso.

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## 1 INTRODUCTION

This study is motivated by the urgency of developing models of macroeconomic learning to improve critical thinking. The learning model that will be developed is cause-driven search (ADI). The ADI model was chosen because it is relevant to the learning achievement of a macroeconomics course, as well as because this model is based on constructive learning theory and uses a student-centered learning approach. The ADI model is a learning model that integrates opportunities for students to engage in scientific reasoning through the combination of all classroom activities: in the form of exploration, reasoning, writing, and peer review, which are useful for students in exploring important concepts. The ADI learning model is based on the theory of constructive learning and is the implementation of a student-centered learning approach. That is, a learning model that integrates opportunities for students to engage in scientific reasoning through the combination of all classroom activities. With the help of the ADI model, it is expected to be able to simulate students' engagement with the sequence of activities: inquiry, reasoning, writing, and peer review, which are useful for students to



understand important concepts as well as to understand the interrelationship between one concept and another in macroeconomics.

The development of education is happening so fast today, but there is always room for the development of learning methods according to the need of the hour, such as higher work skills or speed of decision-making in the workplace. However, the current implementation of macroeconomics learning does not seem to have achieved the expected results (Sumerno 2019). Although the learning method used by the lecturer is in the form of a discussion method, the quality of the arguments given by students in data processing is not sufficient to relate one concept to another in its implementation (Walker et al., 2010). Students are limited in describing the data they receive without various supporting arguments to reinforce the information they provide. Therefore, in learning macroeconomics, it is considered necessary to develop a learning model that can improve students' ability to develop good reasoning so that they can improve superior and collaborative thinking skills.

However, the current implementation of learning in macroeconomics courses does not seem to have achieved the expected results at Nusantara PGRI University in Kediri, many students who still need to study macroeconomics. Although the learning method used by the lecturer is in the form of a discussion method, the quality of the arguments given by students in data processing is not sufficient to relate one concept to another in its implementation. Students are limited to describing the data obtained without various supporting arguments to reinforce the information provided. Therefore, it is considered necessary to develop a learning model in learning macroeconomics that can improve students' ability to make better reasoning to enhance their superior and collaborative thinking skills.

The ADI learning model is based on the theory of constructive learning and is the implementation of a student-centered learning approach. That is, a learning model that integrates opportunities for students to engage in scientific reasoning through the combination of all classroom activities. With the help of the ADI model, it is expected to be able to simulate students: engaging in a sequence of activities in the form of inquiry, reasoning, writing, and peer review, which are useful for students to understand important concepts and practices and science. The existence of a learning model that supports scientific reasoning activity in the learning process is expected to provide students with the opportunity to improve scientific reasoning skills.

Several studies have been conducted on the implementation of ADI learning models to improve critical thinking, including Kanyavati and Suhandi in 2014, Safira in 2018, Hasibuan et al. in 2018, and Nufas et al. in 2018. Similarly, according to Parmata et al. and Umuroh and Agoestanto in 2019, research linking implementation to students' learning outcomes/achievements. The type of development research related to the ADI learning model has been conducted by Afandi et al. in 2021, Dini et al. in 2022, and Davey and Purvanthi in 2019. The results of the study show that the application of the ADI learning model can improve students' critical thinking. The results of the study also stated that the ADI learning model was found to be able to improve students' learning achievement.

## 2 METHODOLOGY

The research methods used are research and development (R&D) that lasts for one year, and the research subjects are Masters of Economics Education, Nusantara PGRI Kediri University. This design was chosen because it aims to produce new products or improve existing products, such as the ADI learning model in macroeconomics learning. This study uses the R&D ADE development model (analysis, design, development, implementation, evaluation) with the following stages:



1. The analysis phase includes: a) literature study and theoretical review, b) preliminary survey (observation), c) preparation of research tools, and d) problem identification..
2. Design stage. Designing reason-driven inquiry (ADI) models in macroeconomics learning. This initial design is in the form of a draft learning model that will be finalized in FGD1.
3. Stage of development (development). There are several learning device development activities at this stage that support the ADI learning model. Some advanced learning tools include: (a) outline elements such as a short lesson plan, which include: required questions, learning ideas, content quality, lesson objectives, and time required. (b) ADI learning model, and (c) evaluation. Subsequent activities in the development phase include: (a) design verification by experts, (b) changes to learning tools, (c) small-scale trials, (d) model changes. The ADI learning model that has been tested is
4. Implementation Phase. In the form of field trials of the ADI model in macroeconomics learning, which include: (a) testing, (b) the final revision of the model, (c) the ADI model in macroeconomics learning has been completed to improve the efficiency of the 21st century.
5. Evaluation stage. The evaluation of ADI development in macroeconomics learning is conducted using CIPP (content, input, process, and product).

## 2.1 Population and Sample

The study was conducted on second semester students taking macroeconomics courses at PGRI Kediri at Nusantara University. The study began in February 2022 for the 2021/2022 academic year. The population in this study was students in the second semester of the Economics Education Study Program. The study sample was a class of the same skilled population that consisted of 30 students.

## 2.2 Measuring the Level of Critical Thinking

According to the importance of measuring critical thinking skills (Travis, 2015), critical thinking is an essential ability that can be used as an indicator of learning success in achieving skill standards. Barriers to predicting students' critical thinking skills in the form of essay tests and multiple choices require other solutions in the form of experiments with new models. MCR (Multiple Choice with Reasoning) is a form of testing by selecting answers and selecting closed reasons (Zampier et al., 2022). This form of testing has been developed previously (Estiano, 2014) which is assumed to be capable of inferring and describing critical thinking skills because it involves thought processes and existing knowledge to solve complex problems. To obtain parameters in critical thinking arguments provided by students, researchers use the following metrics:

**Table 1.** The level of Arguments

Level	Argument Criteria
1	Arguments contain arguments with one simple claim against one claim against another contradictory claim
2	The argument contains arguments from a claim against another claim with supporting data but does not contain a refutation.
3	The argument contains a series of claims or claims against the supporting data and a few refutations
4.	Arguments show arguments with a clear rebuttal and have several claims and counter claims or arguments containing a series of claims with data, guarantors, or supporters with a clear argument.



5	Arguments present extended arguments with more than one rebuttal or arguments contain several arguments with more than one clear refutation.
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Source: Prepared By Author (2023)

#### Information:

- Level 5: Very Good
- Level 4: Fine
- Level 3: Fairly Good
- Level 2: Not good
- Level 1: Bad

### 3 RESULT AND DISCUSSION

#### 3.1 Analysis Phase

At this early stage, the researcher made an observation of the document that aimed to find out what material was provided in semester 2 of the macroeconomics course. The documents observed were semester learning plans and lesson plans. Acquiring skills based on documents enables students to solve macroeconomic problems based on their environmental conditions. This means that students are asked to integrate acquired knowledge with the current situation. It will also be the criteria for ADI learning achievement conducted in this study.

In the analysis, the researcher focused on two issues. The first is the material that students will be taught, a step that is done by browsing documents such as semester lesson plans. The focus is on the learning outcomes that are the goal of the lectures. The second is students' understanding of the material and which ADI approach is appropriate to use to refer to the material. To get an overview of students' skills, the researcher conducted a search of documents such as grades of other subjects, intermediate exam results, and assignment results. These measures are aimed at achieving the capacity of students as a whole. The results of the analysis are as follows:

1. There are three materials from the macroeconomics course which are considered difficult, namely the economic system, economic growth, open economy and fiscal and monetary policies.
2. The average student's ability to understand macroeconomics is good.

Students' level of reasoning was assessed by examining it in the form of an essay measuring ADI and were asked to answer 4 questions related to the material used for learning using their material. The following is the average student reasoning level:

**Table 2.** The Average of Students Argument Level

Level	Number of Students	Percentage
1	0	0
2	0	0
3	13	43%
4	17	57%
5	0	0

Source: Prepared By Author (2023)

From the results of this analysis, the researcher has an idea of what elements will be used in the implementation of learning using ADI and what level of reasoning will be observed on students during the ADI learning process, because the target level of reasoning mentioned is an average of 4.



### 3.2 Design Stage

The ADI learning model was designed to replace traditional learning that allows students to learn in a manner reflected in scientific inquiry so that they can develop efficient reasoning and critical thinking (Kadafasi, Atasoy, & Akkas, 2012);

Macroeconomics is a basic course for studying the foundations of complex economics. The skills of the students expected in this course are (1) able to analyze and discuss parts of macroeconomics and present them; and (2) ability to write practical reports and write accurate scientific papers. This skill is part of scientific reasoning skills. Effort One of the achievements of these skills is through the ADI learning model and material development based on these aspects.

The first step taken in the development of an ADI learning program is to map which materials will be used in learning. The role of the lecturer in this department is to determine what material will be provided using the ADI learning method. Lecturer's reference in determining which elements of the semester learning plan should be used for macroeconomics courses. From the semester plan, the researcher determines four materials that can be used for discussion and forces students to look for references about these materials. The components of the readymade macroeconomic course are economic systems, economic growth, open economy, and fiscal and monetary policy.

To organize ADI learning, the researcher uses a semester lesson plan with references to learning achievement in it. This achievement became the basis of research in the development of the materials used. For more details, the goal of the following macroeconomics course is to achieve learning:

1. Able to apply logical, critical, systematic thinking in the context of the development or application of science.
2. The development of science and technology enables decision-making in the context of problem solving that focuses on human values based on the analytical study of information and data.

### 3.3 Develop Stage

Macroeconomics is a basic course for studying the foundations of complex economics. The skills of the students expected in this course are (1) able to analyze and discuss parts of macroeconomics and present them; and (2) ability to write practical reports and write accurate scientific papers. This skill is part of scientific reasoning skills. Effort One of the achievements of these skills is through the ADI learning model and material development based on these aspects.

The development stage (development) consists of several learning tools development activities that support the ADI learning model. Some advanced learning tools include: (a) outline elements such as lesson plans (short lesson plans), including: required questions, learning concepts, content quality, lesson objectives, and time required. (b) ADI learning model, and (c) evaluation. Further activities in the development phase include: (a) design verification by experts, (b) changes to learning tools, (c) small-scale trials, (d) model changes. The ADI learning model that has been tried. All aspects of development and how to develop them are fully given to the lecturer. In this study, the aspect that developed the most was the lesson plan document.



### 3.4 Implementation Phase

The ADI learning model was designed to change conventional learning that allows students to learn in a manner reflected in scientific inquiry so that they can develop efficient reasoning and critical thinking (Kadaif, Atasoy, & Akkas, 2012;

#### 3.4.1 Stage 1 task identification

An investigation is initiated to determine an event or problem. Students discuss what they notice and wonder about the event or problem. The work is introduced to students and they share ideas about the event or problem. The phase ends with students identifying what they need to learn more about.

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The results obtained from this process are that students need more accurate references to elements related to microeconomics, especially those that will be used in the ADI learning process such as economic systems, economic growth, open economy, and fiscal and fiscal policy. The references required are books to find theories about the three materials, journal articles about the material, and current news about the material.

#### 3.4.2 Stage 2 data collection

At the data collection stage, the lecturer asks students to use different sources such as news, articles in indexed journals, and books. Students must then be able to find the right sources to be able to compile robust data as the basis for reasoning and learning outcomes. Students must be really proactive in finding the data because whether their arguments are really good depends on the validity of the data they receive. The role of the lecturer at this stage is to ensure the validity of the data used by the students and to ensure that the data processing process goes well.

#### 3.4.3 Stage 3 productions of tentative arguments

During temporary argument-making sessions and reasoning sessions, students need to better understand the content or material they will use as support for the arguments or opinions that students make during argument sessions. So that when the learning process occurs, students are more active in the class discussion process. The role of the lecturer in this process is that the arguments given by the students are always based on the references received at the stage of data collection.

In this session, each student gave their reasoning about the materials studied. The following are examples of students' reasoning and their level of reasoning:

**Table 3.** Students' tentative arguments

No	Arguments	Level
1.	The Pancasila economic system is not really implemented because it has too many philosophies	3
2.	Not all economic actors understand Pancasila economics	3
3.	The principle of kinship complicates economic activities on several sides.	3
4.	During the pandemic, economic growth did not work as it should.	2
5.	Only big businessmen feel the economic growth	2





6.	The government's current monetary policy has succeeded in maintaining economic stability	3
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Source: Prepared By Author (2023)

From the arguments above, most of them come from students' current knowledge of what they know. In fact, there are some that are quite strong, but students don't have clear references because they don't know the source. Overall, the arguments raised by the students are good. Also in this session, students were asked to take the opinions of other students and make these opinions a new perspective. The lecturers asked students to have a new attitude towards differences in opinion and the intention to collaborate. As such (Ross, 1988) creativity and innovation are ways of thinking that are different, productive, creative, heuristic thinking, and lateral thinking. (Nogueira et al., 2021). The ability to collaborate is an implementation of learning in the form of collaboration between individuals and groups that helps and complements each other to perform specific tasks to achieve predetermined goals.

#### 3.4.4 Stage 4 argumentation session

It is important to be trained in macroeconomic elements with very scientific reasoning skills so that students get logical reasoning, clear perspectives, and a reasonable explanation of the things they study. In addition, the power of scientific reasoning can equip students to interpret parts of macroeconomics that occur in everyday life based on theories/concepts (Osborne, 2010). Although reasoning receives special attention in research education (Acker & Patton, 2012), reasoning sessions will encourage students to provide valid evidence, data, and theory to support opinions (claims) against a problem (Roberts Ha & Campbell, 2013). In this session, students were asked to read the source before making their arguments. In this session, the lecturer plays the role of guiding the students in reasoning.

The session begins with students arguing about the economic system. Not all students were given the opportunity to argue, but 10 students and students who did not have the opportunity to argue were asked to respond. The session went well where students argued and got feedback. Here the lecturer acts as the controller in charge of the arguments arising from the discussion. The lecturer controls several times, so that students do not discuss issues outside the corridor.

#### 3.4.5 Stage 5 compilations of written investigation reports

At this stage, each student is grouped and questions are available that must be answered based on the references they collect. The goal of this activity is to compile an accurate report on students' macroeconomics. Each member of the group is expected to be able to contribute the most to this session. The role of the lecturer is to guide students in the preparation of research reports by acting as a reminder about what to write and how to write. Students are given more time to write. Lecturers use the assessment model provided by Glass et al. (2005) as follows:

**Table 4.** Writing Assessment Model According to Glass

No	Description	Score
1.	One idea that is clear, focused, and on topic. All concrete and specific details to support the idea. Many interesting and original details to support the idea. All parts are integrated and compliant.	5
2	One idea that is clear, focused, and on topic. There are concrete and specific details. Interesting details to support the idea. All parts are integrated and compliant.	4



3	In general, be on topic and develop a clear theme or message. Some concrete details and some still general. Some supporting details are predictive and some are general. There may be parts that do not fit.	3
4.	Much of the text is repetitive and like a collection of unrelated ideas. Less specific details and lots of general ones. Predictive and sketchy details.	2
5.	Unfocused, completely out of ideas, unidentified, long, and not developed enough. Inconsistent, unclear, or trivial details.	1

Source: Prepared By Author (2023)

Using the above rubric, the students' writing results showed that 21 students received a score of 3 and 9 students received a score of 4. This may lead to the conclusion that some students may still express their arguments correctly but still need guidance.

#### 3.4.6 Stage 6 review the report

This report review phase is conducted in pairs with groups such as groups 1 and 2, groups 3 and 4, and more. Where by reviewing this report, the students correct whether the results of the report prepared by the other group were correctly done. For example, at the first meeting, students are still hesitant to evaluate other group reports because it is still their first experience in assessment, it needs to be conducted by the teacher so that the results corrected by the students are accurate. They can compare reports they have made themselves with their friends. At this stage the lecturer acts as a controller as well as a reviewer if there are parts that not all students can yet address. Lecturers must be very specific so that the information available during this session is always accurate.

#### 3.4.7 Stage 7 revision based on review results

At this stage, students provide feedback in the form of revised research reports based on other group reviews. Any research reports obtained from the review, which still need to be revised, are returned to their respective source groups to be able to revise the reports made. The role of the lecturer at this stage is as a supervisor who ensures that students make corrections according to the results of the review session.

In this session, the lecturer presented the results of the provisional reasoning session. The lecturer discusses the arguments collected. The lecturer first argued from level 3 to level 4. The lecturer provides the necessary input so that students' reasoning is better. Lecturers also accept questions raised by students. Not only the arguments presented, but also the students' writing results are applied where the lecturer first shows low results and then high results. There are a lot of questions, so the class is active.

#### 3.4.8 Stage 8 reflective discussion

At this stage, the role of the lecturer is to guide students to self-reflect on the learning process and the results of the research done. Students can reinterpret the macroeconomic factors they receive. The lecturer in this session serves as a guide to what should be corrected in the arguments produced by the students. Students are allowed to provide input on other students' work. This session went well because students already had enough references to provide input.

### 3.5 Evaluation Stage

Evaluation is a process to see whether the learning system that is being built is successful, Whether or not this was initially expected. In fact, the evaluation phase can occur



in any of the above four stages. The evaluation of ADI development in macroeconomics learning is conducted with CIPP (content, input, process, and product).

Content is the first thing to evaluate in the implementation of an ADI. The evaluated content is the Macroeconomics Lecture Material which consists of three sub-materials, namely Economic Systems, Economic Growth, Open Economy, and Fiscal and Monetary Policy. All three were taken because they were considered quite difficult subjects to study alone. With the application of ADI, all three can be learned in an orderly process. Most students said it was easier to understand the material by applying the ADI learning process.

The input that is evaluated is that of students studying microeconomics. To measure this, the researchers used document monitoring in the form of students' grades in the previous semester. This process shows that the average student GPA was 3.2, which shows that students are good input into this learning process.

When evaluating the process, researchers use observation to determine whether all elements of ADI learning, such as analysis, design, and implementation, have been met. All of these processes have been properly conducted by lecturers based on the observations of researchers and produce products in the form of quality oral and written arguments..

### 3.6 The Critical Thinking Development with ADI

Based on Glazer's (2017) statement, critical thinking is the process of thinking by analyzing information to form an evaluation of something. In other words, critical thinking requires supporting evidence so that an argument can be believed. This statement has a lot to do with learning ADI where students must provide reasoning based on information. Good critical thinking skills will make strong arguments. Arguments that are not only convincing, but can also provide new knowledge to those who listen to them.

Reason-Driven Reasoning (ADI) Model The impact of application against the Student Reason-Driven Inquiry (ADI) model helps students argue through stages of temporal reasoning and session reasoning, enabling students to develop scientific thinking habits. Critical thinking skills can be completed in two ADI sessions. In the sample class, students were ready to pass both sessions.

The results of the study are consistent with the advantages of reason-driven model search (ADI) according to Sampson et al. (2009), which states that reason is driven. Model Search (ADI) helps students develop literacy in knowledge about macroeconomics and helps students develop their critical thinking habits. Students become more confident in giving their opinions because they have strong references.

In the provisional reasoning session, students were given a number of topics related to economic systems, economic growth, open economy, and fiscal and monetary policy. Through critical thinking, students are expected to be able to decide which one to use in their argument. Students are instructed to review the available information and then make a list of strengths and weaknesses of each decision. Students are asked to assess the situation from different perspectives. One-sided evaluation does not simply reflect a critical attitude. From the results of this study, students can decide which is the best decision.

In reasoning sessions, the use of critical thinking is very important because students need to express arguments that are structured to reach a wider space. Also in this session, students will get questions and problems. It is very important that students are able to answer and provide solutions. Critical thinking skills that can be applied are arguments based on logical and methodological factors that support it:

1. Can solve the problem.
2. Can draw conclusions based on facts.
3. Details in examining the different arguments that still have relevance to the problem.



4. Communicative in conveying ideas.
5. Think critically and clearly about the topic of the problem.
6. Able to analyze available data and information.
7. Paying attention to the implications that might be contained in the argument.
8. Know the strengths and weaknesses of each argument.

After this reasoning session, students are asked to give each other a problem related to the material studied. It's a way to improve students' critical thinking skills. When answering the questions received, students were monitored for what the process of answering these questions was. According to Elder, (Elder, 1995), critical thinking skills and problem-solving skills are defined as an individual's skills in a variety of ways, including: 1) using both inductive and deductive appropriately and situationally for different types of thinking/reasoning, 2) understanding the interconnection between one concept and another. Other concepts of a subject, as well as the relationship between a subject and other topics, 3) conducting assessments and effectively making decisions using data processing and reasoning, 4) making connections between test results and information and arguments, 5) processing and interpreting the information obtained through the initial decision and examining it through optimal analysis, 6) creating solutions to various non-routine problems in a general way and in their own way, 7) Use their skills to try to solve the problem, and 8) compile and publish, analyze, and solve a problem in the cell.

In this Q&A session, the lecturer acts as a controller where every time an argument goes off track, the lecturer must try to return it. Based on the observations, there were several questions that were out of line, questions outside the topic in question. Lecturers can instruct students to get back on track by providing a few key words from the theme. Similarly, if you want to raise problems for discussion, the lecturer should always try to keep these problems according to the themes studied. This process itself takes between 30 minutes and 45 minutes, depending on the speed at which students answer questions or provide solutions to problems.

#### 4 CONCLUSION AND SUGGESTION

According to the results of Andriani's (2015) study, the reason-driven inquiry (ADI) model can enhance students' conceptual skills, while the cause-driven inquiry (ADI) learning model is seen as capable of helping students better understand macroeconomic concepts, as learning activities emphasize the construction and validation of knowledge through reason-driven inquiry (ADI) model research activities. This model is designed to create a class that can help students reflect on how to create scientific explanations, how to generalize scientific phenomena, use data to answer scientific questions, and ultimately reflect on the work done. By engaging in reasoning sessions in an argument driven search (ADI) model, students can better master more concepts, because to create better reasoning, students need better skills of knowledge about the content of the material. Learning ADI better matches students' critical thinking skills. This research shows that students with good critical thinking skills can make good reasoning and play an active role in provisional reasoning sessions and reasoning sessions. Combined with the use of critical thinking, the ADI learning process can create a good learning and learning process.

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