



Application of The Argument Driven Inquiry (ADI) Model Using Interactive E-LKPD to Improve Students' Argumentation Skills

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Article Information	ABSTRAK
Submitted: 12 – 05 – 2024 Received: 30 – 08 – 2024 Published: 30 – 09 – 2024	<p>Sebagian besar siswa belum terampil dalam menulis argumentasi sains, belum mengemukakan pendapat yang disertai dengan data yang relevan, pembelajaran menggunakan metode diskusi yang berpusat pada guru (<i>teacher centered</i>) namun masih belum optimal, guru belum pernah menerapkan pembelajaran untuk meningkatkan keterampilan argumentasi siswa. Maka alternatif untuk meningkatkan keterampilan argumentasi siswa yaitu dengan menggunakan model <i>Argument Driven Inquiry</i> (ADI) yang merupakan rekomendasi model pembelajaran inkuiri keterampilan abad 21 yang dapat meningkatkan keterampilan argumentasi siswa. Tujuan penelitian ini yaitu untuk menganalisis aktivitas siswa pada penerapan model <i>Argument Driven Inquiry</i> (ADI) menggunakan E-LKPD Interaktif, untuk menganalisis peningkatan kemampuan argumentasi pada siswa yang menerapkan model ADI menggunakan E-LKPD Interaktif dan siswa yang tidak menerapkan model ADI menggunakan E-LKPD Interaktif, dan untuk menganalisis bagaimana respon siswa setelah melakukan pembelajaran dengan menerapkan model ADI berbantuan E-LKPD Interaktif. Penelitian ini dilaksanakan di SMA Islam Al-Azhar 5 Cirebon. Dengan populasi kelas X, sampelnya kelas X.3 dan X.1. Hasil penelitian aktivitas siswa selama 3 kali pertemuan menunjukkan bahwa kelas eksperimen memperoleh nilai rata-rata tertinggi pada sintak <i>peer review double blind</i>. Aktivitas terendah siswa selama proses pembelajaran yaitu pada sintak revisi laporan hasil <i>peer review</i>. Terdapat perbedaan peningkatan keterampilan argumentasi siswa yang signifikan menjadi lebih baik setelah penerapan model pembelajaran ADI dengan siswa yang tidak diterapkan model pembelajaran ADI. Respon siswa yang diterapkan model ADI berbantuan E-LKPD Interaktif menunjukkan respon yang positif.</p> <p>Kata kunci: <i>Argument Driven Inquiry</i> (ADI), E-LKPD Interaktif, Keterampilan Argumetasi.</p>
Publisher	ABSTRACT
Departement of Biology Education, Faculty Science and Technology, UIN Walisongo Semarang	<p><i>Most students are not skilled in writing scientific arguments, have not expressed opinions accompanied by relevant data, learning uses teacher-centered discussion methods but is still not optimal, teachers have never applied learning to improve students' argumentation skills. So an alternative for improving students' argumentation skills is to use the Argument Driven Inquiry (ADI) model, which is a recommendation for a 21st century skills inquiry learning model that can improve students' argumentation</i></p>

skills. The aim of this research is to analyze student activities in implementing the Argument Driven Inquiry (ADI) model using Interactive E-LKPD, to analyze the increase in argumentation skills in students who apply the ADI model using Interactive E-LKPD and students who do not apply the ADI model using E-LKPD Interactive, and to analyze how students respond after learning by implementing the ADI model assisted by Interactive E-LKPD. This research was carried out at Al-Azhar 5 Cirebon Islamic High School. With a class X population, the samples are classes X.3 and X.1. The results of research on student activities during 3 meetings showed that the experimental class obtained the highest average score in the double blind peer review syntax. The students' lowest activity during the learning process was the syntax for revising peer review reports. There is a significant difference in the increase in students' argumentation skills for the better after implementing the ADI learning model compared to students who did not apply the ADI learning model. The response of students who applied the ADI model assisted by Interactive E-LKPD showed a positive response

Keywords: *Argument Driven Inquiry (ADI), Interactive E-LKPD, Argumentation Skills.*

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INTRODUCTION

Argumentation skills play an important role in building an explanation, model and theory of a concept being studied, by practicing argumentation skills means training cognitive and affective abilities that can be used to help understand concepts in biology (Zohar & Nemet, 2002; Rizkia, 2022). Most students are not yet skilled in writing scientific arguments, have not expressed opinions accompanied by relevant data and on average some students have argumentation skills only reaching level 2, where students argue from a claim against another claim with supporting data but do not contain rebuttals (Juliанти, 2019; Sondang & Muslim, 2012). The less than optimal argumentation skills possessed by students will affect students' ability to receive material in the learning process. The lack of training in students' argumentation skills can be caused by the lack of teacher knowledge about learning models that can train argumentation skills (Sondang & Muslim, 2012).

Nussbaum et al., (2012) defines an argument as a series of propositions/arguments. While argumentation is a social process in which two or more people build and criticize arguments (Roviati, 2019). Argumentation skills play an important role in building an explanation, model and theory of a concept being learned, by practicing argumentation skills means training cognitive and affective abilities that can be used to help understand concepts in biology (Marhamah et al., 2017; Rizkia, 2022).

One of the appropriate learning models to train students' argumentation skills is the Argument Driven Inquiry (ADI) learning model, which is a learning model that focuses on a scientific explanation, generalizing scientific facts, using data to answer scientific questions and ultimately reflecting on the results of the work that has been done (Dianti, 2023). The ADI model has an effect on students' argumentation skills (Farida, 2018). Based on the results of data analysis, there was an increase in students' argumentation levels from level 1 to level 3. Therefore, the Argument

Driven Inquiry (ADI) learning model as explained earlier, needs to be applied and developed in learning activities (Marhamah et al., 2017).

The ADI learning model is a learning model that can foster students' argumentation skills and this model is designed to provide more space for argumentation and the role of argumentation in building social relations of scientific knowledge when conducting investigations (Erika & Prahani, 2017). In addition, activities carried out in groups will affect the psycho-sociological abilities between students (Sondang & Muslim, 2012). This is where the role of teachers as educators becomes very important where teachers are the figures who interact the most with students both in the learning process and outside the learning process (Rahmat, 2017). However, the implementation of the learning process using the ADI model will be difficult to do without the help of additional learning media because the ADI model has a fairly long syntax when compared to other learning models and must limit time so that learning runs optimally, especially the allocation of time in the argumentation session (Sampson & Gleim, 2009). Therefore, one of the media that can be used is Interactive E-LKPD using Liveworksheets Media.

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The purpose of this study is first to analyze student activities in the application of the Argument Driven Inquiry (ADI) model using Interactive E-LKPD. Second to analyze the improvement of argumentation skills in students who apply the Argument Driven Inquiry (ADI) model using Interactive E-LKPD and students who do not apply the Argument Driven Inquiry (ADI) model using Interactive E-LKPD. Third to analyze how students respond after learning by applying the Argument Driven Inquiry (ADI) model assisted by Interactive E-LKPD.

METHODS

This study uses a quasi-experimental method conducted in July 2021. The research design used is the Control Group Pretest-Posttest Design. Below is a table of the Control Group Pretest-Posttest Design research.

Class	Pretest	Experiment	Posttest
Experimen	Y _a	X _a	Y _b
Control	Y _a	X _b	Y _b

Tabel 1. Seign Research Control Group Pretest-Posttest Design

(Source ; Arikunto, 2010).

Where X_a is the treatment in the experimental class, namely the application of the Argument-Driven Inquiry (ADI) learning model; X_b is the control class without being given the treatment of the application of the Argument-Driven Inquiry (ADI) learning model; Y_a is the Pretest in the experimental class group and the control class group which is given where before the learning action is carried out; Y_b is the Posttest in the experimental class group and the control class group which is given where after the learning action is carried out.

Population and Sample

The population in this study were all students of class X of SMA Islam Al-Azhar 5 Cirebon in the 2023/2024 Academic Year. And the sample in this study consisted of two classes, namely class X.3 as the experimental class and class X.1 as the control class with 26 and 25 students respectively.

Table 2. Data on the Number of Samples in the Research

Student Class X.3 (Eksperimen)	Siswa Kelas X.1 (Kontrol)
26 students	25 students

Data collection technique

The data collection technique in this study for learning activities is in the form of observation sheets by three observers who are prospective biology teachers who are prospective teachers and also understand the learning process and researchers who are filled in once during 3 meetings and at the end of learning. Then to find out the increase in students' argumentation skills, it is seen with a pretest-posttest. Data obtained using student activity observation sheets. In the learning activity process, it can be analyzed using the following formula.

$$P = \frac{\text{Frequencies}}{\text{Total Student}} \times 100$$

(Source : Sudijono, 2008).

Table 3. Learning Activity Criteria

Aktivitas (%)	Kriteria
76-100	Very Good
51-100	Good
26-50	Enough
< 25	Low

(Nurpratiwi, 2015 in Jurnal Geoedukasi)

Gain score data analysis tests the improvement of argumentation skills, if the initial abilities of the experimental group and the control group are significantly different. The n-gain formula is as follows:

$$N\text{ Gain} = \frac{\text{Skor Posttest} - \text{Skor Pretest}}{\text{Skor Ideal} - \text{Skor Pretest}}$$

(Source : Sudijono, 2008).

Table 4. Indeks Gain

Interval	Category
$g > 0,70$	High
$0,70 \leq g \leq 0,30$	Middle
$g < 0,30$	Low

This study data was analyzed by hypothesis testing, namely to see the difference in the increase in students' argumentation skills, argumentation skills after the application of the ADI model with the help of Interactive E-LKPD in the experimental class and the control class. The final stage analysis is an analysis to test the research hypothesis using the two-average equality test after the two samples were given different treatments. The results of this final test will obtain data used as a basis for testing the research hypothesis. Hypothesis analysis uses test scores based on argumentation skill indicators with learning using the ADI and regular models using SPSS 21.

The questionnaire data was used to determine students' responses after learning by implementing the Argument Driven Inquiry (ADI) model assisted by Interactive E-LKPD and the results were analyzed to calculate the average overall score that had been made. The criteria for the questionnaire percentage in table 5. :

Table 5. Criteria of persentage Quitionare

No.	Percent	Criteria
1.	0-20%	Very Low
2.	21%-40%	Low
3.	41%-60%	Enough
4.	61%-80%	Good
5.	81%-100%	Very Good

RESULT AND DISCUSSION

Learning Activity

This study was conducted in three meetings which only observed learning activities in the experimental class, namely class X.3, using the Argument Driven Inquiry (ADI) learning model. Learning activities used observation sheets that were viewed during the learning process. The average value of student learning activities can be seen in Figure 1. :

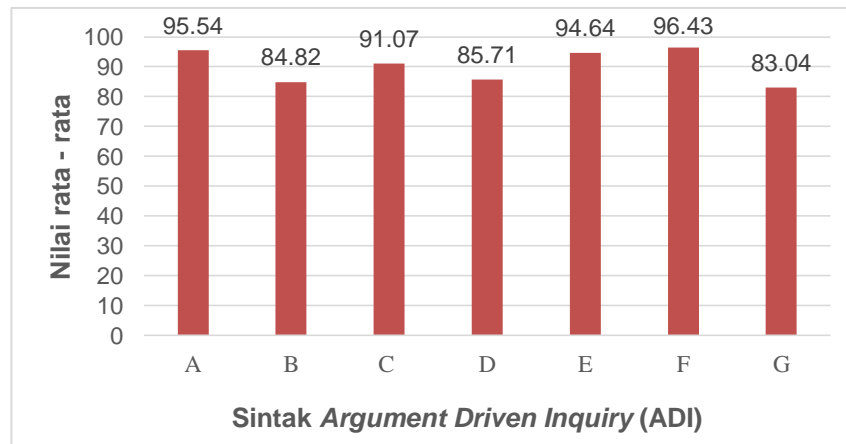


Figure 1. Average Results of Student Activities in Three Meetings

Description :

- A : Task identification
- B : Data collection
- C : Tentative argument production
- D : Argumentation session
- E : Investigation report preparation
- F : Double blind peer review
- G : Revision of peer review report

Based on Figure 1, it shows that the average overall student activity in each syntax observed by observers in the experimental class varies. Based on the research that has been done, the highest average student activity is in the double blind peer review syntax with an average value of 96.43. The syntax was carried out at the 3rd meeting and in this section students conducted an assessment (peer review) of the practicum report made by their friends. Each student reviewed 3 reports belonging to their friends according to the format provided in Google Classroom. This is in accordance with research conducted by (Demircioglu & Ucar, 2015) which stated that the peer review stage provides an opportunity for students to be able to see and correct deficiencies in writing reports. In addition, students are given the opportunity to provide evaluations of other people's writing which will later improve their argumentation and writing skills, as well as understand how to reconstruct sentences.

Student activity with the lowest average value was in the syntax of peer review report revision with an average value of 83.04 which was carried out at the 3rd meeting, in this section students revised the reports they had made according to the input made by their friends. This is in accordance with Prasetyo & Abduh, (2021) who stated that student activity in the learning process is the main foundation for successful learning..

The Argument Driven Inquiry (ADI) learning model has 7 syntaxes, namely Stage 1: Task Identification, Stage 2: Data Collection, Stage 3: Tentative Argument Production, Stage 4: Argumentation Session Stage, 5: Making an Investigation

Report, Stage 6: Double Blind Peer Review, and Stage 7: Revision of the Peer Review Result Report. Based on the research conducted, the ADI syntax is divided into 3 meetings in the experimental class. The following are the activities carried out by students at the first meeting when implementing the Argument Driven Inquiry (ADI) model in the experimental class.



Figure 2. Student activities at the first meeting

Based on Figure 2. shows the activities carried out by students at the first meeting, namely task identification and data collection. Figure 2. No. (1) task identification syntax students are very enthusiastic and pay attention to the learning mechanisms that will be carried out. Figure 2. No. (2) data collection syntax students go around the school to obtain data that is in accordance with the Interactive E-LKPD. Before students do practicums in the school environment, students are first explained about the learning mechanisms that will be carried out and what data students must obtain during the practicum activities and after students understand, students are then directed to do practicums in the school environment to obtain data according to the instructions in the Interactive E-LKPD.

The following are activities carried out by students at the second meeting when implementing the Argument Driven Inquiry (ADI) model in the experimental class.

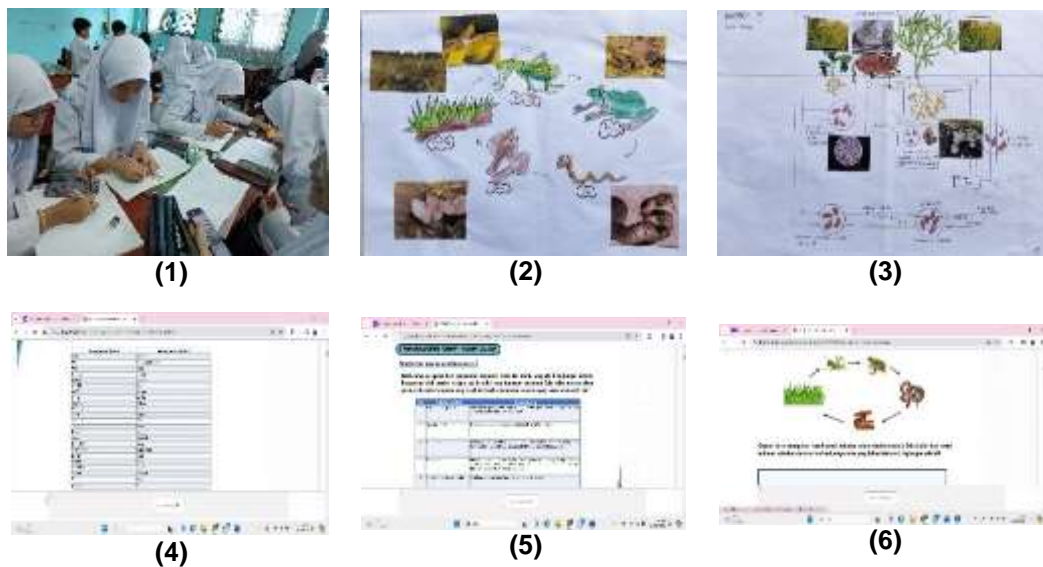




Figure 3. Student activities at the second meeting

Based on Figure 3 No. (1) Tentative argument production syntax, students record data that has been obtained during the practicum in the school environment, then after completion, it is sent via Interactive E-LKPD. Figure 3. No. (2) is an example of a food chain image found at school and the results of the work done by students. Figure 3. No. (3) is an example of a nitrogen cycle image resulting from the work done by students. Figure 3. No. (4) is the result of student observations of the biotic and abiotic components found. Figure 3. No. (5) is the result of observations of the interaction patterns found. Figure 3. No. (6) is an example of sending a food chain creation assignment. Figure 3. No. (7) is a recap of the student's Interactive E-LKPD sending assignment on the Liveworksheets website. Figure 3. No. (8) Argumentation session syntax, students take turns presenting the results that have been obtained and other students listen, then after finishing, provide questions or input to the group that has presented. Figure 3. No. (9) Preparation of investigation reports: students are asked to prepare reports individually using data obtained during practical work in the school environment. Preparation of reports is in accordance with the template that has been sent via Google Classroom.

The following are activities carried out by students at the third meeting when implementing the Argument Driven Inquiry (ADI) model in the experimental class.



Figure 4. Student activities at the third meeting

Based on Figure 4 No. (1) the syntax of double blind peer review, students are asked to assess 3 reports belonging to their friends that are in accordance with the peer review template that has been provided via Google Classroom by adjusting the report code that must be reviewed that has been provided in the comments column in the previous assignment. Figure 4 No. (2) syntax for revising the peer review report results after the peer review session is complete, then students revise the practicum report that has been made according to the input given by their friends during the

peer review session. After students revise their reports, each student then sends back the revised report results via Google Classroom.

The implementation of learning activities carried out using simple practical methods in the school environment also makes students very enthusiastic because previously students have never done practical-based learning so that when explained that they will do practical activities, students are very enthusiastic and arouse students' curiosity to conduct very high scientific investigations and to hone argumentation skills. In line with that stated by Desriyanti, (2016) that practical activities will play a very large role in building conceptual understanding, verifying or proving the truth of concepts, and fostering students' process and affective skills. In addition, practical activities can also support students' creativity and enthusiasm for learning. Students are able to find new things that they have never done before. Students not only know the theory but students also witness it directly which can provide experience.

The following is the average value of peer review assessment activities carried out by peers, presented in Figure 5. :

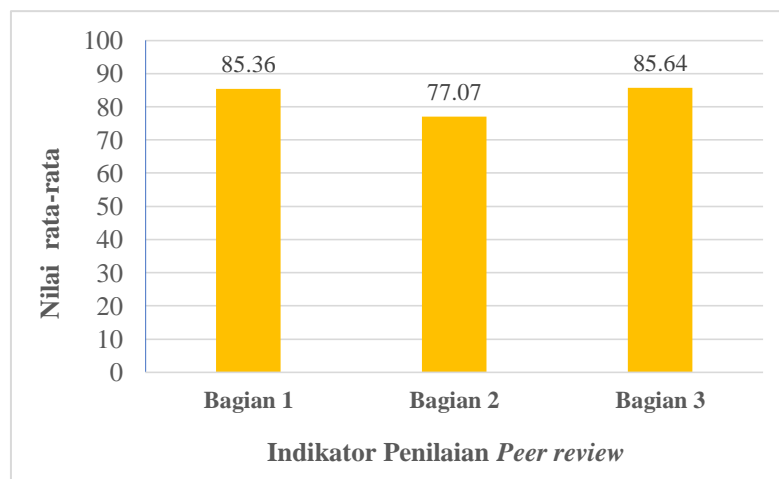


Figure 5. Average Results of Peer Review Reports

Description:

Part 1: Background, Title, Objectives, and Steps of the Practicum

Part 2: Observation Results and Discussion

Part 3: Conclusion

Based on Figure 5, it shows that the highest average value in the peer review assessment is in part 3, namely the conclusion assessment indicator with an average value of 85.64 and the lowest value in part 2, namely the report content assessment indicator with an average value of 77.07. The following is the average value of the peer review assessment activity carried out by researchers on student reports which are divided into 3 parts, namely the introduction, report content and conclusion presented as follows:

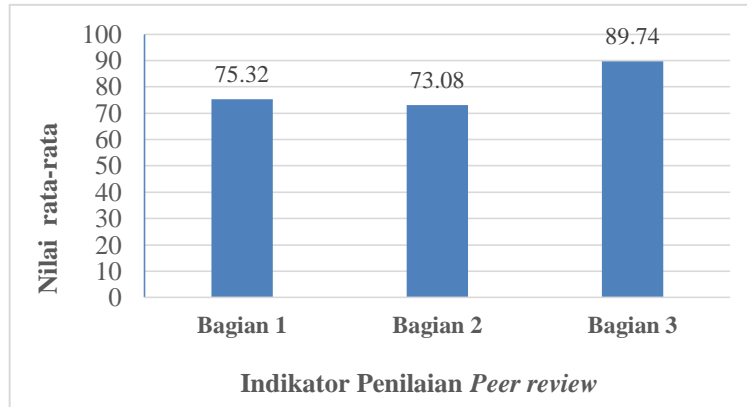


Figure 6 Average Results of Teacher Report Assessment

Description:

Part 1: Background, Title, Objectives, and Steps of the Practicum

Part 2: Observation Results and Discussion

Part 3: Conclusion

Based on Figure 6, it shows that the highest average value in the peer review assessment is in part 3, namely the conclusion assessment indicator with an average value of 89.74 and the lowest value in part 2, namely the report content assessment indicator with an average value of 73.08. The peer review assessment carried out by the researcher in Figure 6 and the assessment carried out by students in Figure 5 show results that are not much different, namely that it can be seen that the highest average value of the peer review assessment is in part 3, namely the report conclusion and the lowest value is in part 2 regarding the contents of the report. So it can be concluded that students have been able to make investigation report results that are in accordance with the examples that have been given.

Argumentation Skills

The learning conducted in the experimental class, namely class X.3, which consists of 26 students, applied the Argument Driven Inquiry (ADI) learning model assisted by Interactive E-LKPD to determine and measure the improvement of students' argumentation skills. While the learning conducted in the control class, namely class X.1, which consists of 25 students, was carried out using the best method that biology teachers usually do at each meeting, using the lecture, discussion and question and answer methods. The researcher gave the same questions in the experimental class and the control class in the form of a pretest and posttest totaling 10 essay questions. These questions were adjusted to the argumentation skill indicators that had been validated by 2 validators, then after validation, the next stage of the question trial was carried out. A comparison of the pretest and posttest results in the experimental and control classes is shown in table 6. :

Table 6. Recapitulation of Pretest and Posttest values in the experimental and control classes

Class	Score	Pretest	Posttest
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Experimen	Maximum	40	70
	Minimum	15	50
	Average	30,96	59,03
	Standar deviasi	6.04	4.60
Control	Maximum	40	55
	Minimum	10	25
	Average	24,22	43,02
	Standar deviasi	7,92	6,91

Based on table 6. it can be seen that the average pretest value of the experimental class obtained an average pretest obtained of 30.96 while the average posttest value in the experimental class was 59.03. While the average pretest value of the control class obtained an average pretest obtained of 24.22 while the average posttest value in the control class was 43.02. The results of the comparison of the average pretest and posttest values in the experimental class increased more than the control class. This shows that the application of the Argument Driven Inquiry (ADI) learning model assisted by Interactive E-LKPD in this study is supported by the results of research (Ginanjar et al., 2015) which states that the use of the Argument Driven Inquiry (ADI) learning model can increase the scientific argumentation skills of high school students, both oral argumentation and written argumentation. This argumentation skill is a type of scientific process skill needed by students who can improve their learning outcomes

After obtaining the final pretest and posttest data in the experimental class and also in the control class, the next stage is to conduct an n-gain test. The n-gain test is carried out with the aim of finding out whether there is an increase between the pretest and posttest data. The n-gain data between the experimental class and the control class are presented as follows.

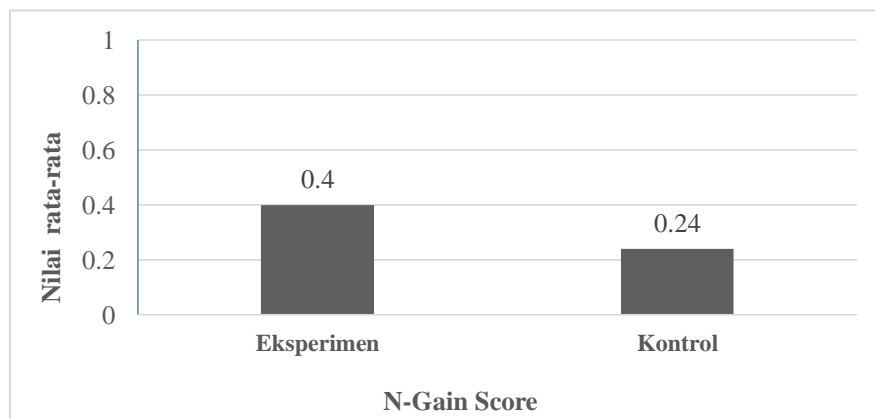


Figure 8 Average Results of N-Gain Argumentation Skills Test of Experimental Class and Control Class

Based on Figure 8, it can be concluded that the average n-gain value in the experimental class is higher when compared to the n-gain value obtained in the control class. In the experimental class, the average n-gain value obtained was 0.40 with a medium category, while the average n-gain value obtained in the control class

was 0.24 with a low category. The average n-gain value was obtained from the results of the pretest and posttest. Based on these results, it can be interpreted that the increase in argumentation skills in the class that applied the Argument Driven Inquiry (ADI) learning model assisted by Interactive E-LKPD on ecosystem material is said to be higher. This study is in line with the results of research (Diyana Prasinta et al., 2015) that the ADI model can improve students' mastery of concepts and argumentation skills in both students with low and high academic abilities.

Based on the results of the normality test and homogeneity test, it was found that both the n-gain data in the control class and the n-gain data in the experimental class both had normal distributions and the variance of the data for both n-gain values was homogeneous. Therefore, the hypothesis test used was the parametric Independent Sample T-Test. The basis for decision making in the Independent Sample T-Test is by comparing the significance value with 0.050. The results of the hypothesis test using the Independent Sample T-Test are explained in table 7. :

Table 7. Independent Sample T-Test

Data		Conclusion
Sig. (2-tailed)	A	
0.00	0.050	Sig. (2-tailed) < 0.050 H_a received H_o rejected

Based on table 7. regarding the results of the hypothesis test using the Independent Sample T-Test in table 7. The results of the significance value are 0.00, which is smaller than 0.050. Thus, there is a significant difference in the average n-gain value between the control class and the experimental class. In other words, there is a difference in the increase in argumentation skills between students in the experimental class, namely those who applied the Argument Driven Inquiry (ADI) learning model assisted by Interactive E-LKPD and students in the control class, namely those who did not apply the Argument Driven Inquiry (ADI) learning model assisted by Interactive E-LKPD. This is in accordance with research conducted by (Afandi et al., 2021) that argumentation skills support the development of communication skills both orally and in writing.

The results of this study are also supported by the results of research (Andriani, 2016) which states that the implementation of the ADI learning model can significantly improve students' concept mastery abilities compared to guided inquiry learning. The cognitive aspect that increases the most is the aspect of understanding in classes using ADI and classes using inquiry-based learning. Concept mastery increases the most in the Convection material in both the experimental and control classes.

The higher the students' argumentation skills, the higher their learning outcomes. Because correct arguments show that the students understand the concepts that have been learned. With the provision of conceptual understanding, students can correctly answer the questions given by the teacher. The results of this

study are in line with research (Wahyunan Widhi et al., 2021) that argumentation learning can improve students' argumentation skills which will have a positive impact on improving student learning outcomes.

Scientific argumentation or reasoning skills are very important to be trained when students are learning so that students can have logical reasoning, clear views and reasonable explanations of what they have learned (Kurniasari et al., 2017). In addition, scientific reasoning skills can equip students to provide explanations of biological phenomena that occur in everyday life based on biological theories/concepts..

STUDENT RESPONSE

Students' responses to the application of the Argument Driven Inquiry (ADI) learning model assisted by Interactive E-LKPD to improve argumentation skills in ecosystem material can be measured using a questionnaire. This response questionnaire is only intended for the experimental class using a Likert scale. This scale is arranged in the form of statements and four responses that indicate the level of response. This instrument can be used to measure students' tendencies towards the learning they have followed, then an analysis is carried out and it can be seen that most students have a good response to the application of the Argument Driven Inquiry (ADI) learning model assisted by Interactive E-LKPD.

Student responses using a questionnaire consisting of 20 questions covering 10 positive questions and 10 negative questions. The purpose of distributing the questionnaire is to measure student satisfaction when following the learning process in the experimental class. The options listed in the questionnaire consist of 4 options, namely strongly agree (SS) which is worth 4, agree (S) worth 3, disagree (TS) worth 2, and strongly disagree (STS) worth 1. In making the options, the researcher deliberately did not add the hesitant option (R) because adding the hesitant option would make the questionnaire results invalid due to uncertain answers. The following are the results of student responses to the application of the Argument Driven Inquiry (ADI) learning model assisted by Interactive E-LKPD.

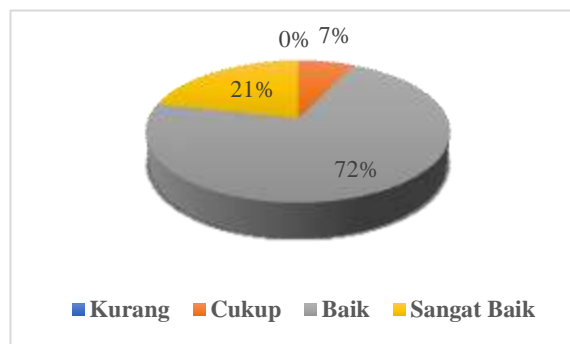


Figure 9. Overall Student Response Results

Based on Figure 9. Shows a percentage diagram of student response questionnaires to the application of the Argument Driven Inquiry (ADI) learning model at SMA Islam Al-Azhar 5 Cirebon. Based on the overall results, the percentage of

student responses with a very good category of 21%, a good category of 72%, a sufficient category of 7% and a less than ideal category of 0%. The overall value is 73.66%. So it can be seen that student responses are included in the good category. The questionnaire items used in this study consisted of 20 items with 3 dimensions. The following is a table of questionnaire analysis per dimension. These results are in line with the research of Marhamah et al., (2017) that the ADI learning model has a significant influence on students' argumentation skills.

Table 8. Student Response Results Per Dimension

No.	Dimension	Average score	Maximal score	Percent average	Category
1.	Student Responses to the Implementation of the Argument Driven Inquiry (ADI) Model	818	1040	78,65%	Strong
2.	Student Responses to Interactive E-LKPD	297	448	66,26%	Strong
3.	Student Responses to Argumentation Skills	511	672	76,04%	Strong

Based on table 8. Shows that the percentage of student questionnaires per dimension on the application of the Argument Driven Inquiry (ADI) model assisted by Interactive E-LKPD on ecosystem material. Based on the table, it shows that in dimension 1, namely student responses to ecosystem material with the application of the Argument Driven Inquiry (ADI) learning model, it has a frequency of 260, an average score of 818, a maximum score of 1040 and an average percentage of 78.65% so that dimension 1 is included in the strong category. This is also shown by student responses when participating in learning using the Argument Driven Inquiry (ADI) model, feeling that it is easier to accept and understand the material, mastering biological concepts in ecosystem material so that students like biology learning and are able to solve problems in learning produced by students during practicums, the process of understanding data, presentations, discussions or question and answer sessions.

Dimension 2, namely student responses to the learning process using Interactive E-LKPD, has a frequency of 104, an average score of 297, a maximum score of 448 and an average percentage of 66.26% so that dimension 2 is categorized as strong. This shows that the use of Interactive E-LKPD has quite an influence on the implementation of the learning process with the Argument Driven Inquiry (ADI) learning model. This is shown through good student responses, easy to use and able to facilitate the learning process, no need to download the application,

students can see the value directly after submitting the assignment, and students can also see and correct wrong answers.

Dimension 3, namely student responses to argumentation skills with the application of the Argument Driven Inquiry (ADI) learning model assisted by Interactive E-LKPD, has a frequency of 156, an average score of 511, a maximum score of 672 and an average percentage of 76.04% so that dimension 3 is categorized as strong. Through these student responses, it means that students have increased argumentation skills after the Argument Driven Inquiry (ADI) model is applied. However, each student has a different level of argumentation skills so that the advantages of each indicator of each student's argumentation skills are also different. After conducting the research, students' argumentation skills were trained to be able to express their opinions, gain knowledge from direct experience, be able to link relevant experiences and theories, be able to solve problems and be scientific.

SUMMARY

Based on the results of the research that has been conducted, it can be concluded that student activity after the learning process using the Argument Driven Inquiry (ADI) model assisted by Interactive E-LKPD shows that the highest average student activity is in the double blind peer review syntax with an average value of 96.43. The lowest student activity during the learning process is in the syntax of the revision of the peer review report with an average value of 83.04. There is a significant difference in the increase in students' argumentation skills in the application of the Argument Driven Inquiry (ADI) model assisted by Interactive E-LKPD on ecosystem material with the non-application of the Argument Driven Inquiry (ADI) model assisted by Interactive E-LKPD on ecosystem material. This can be seen from the average n-gain value in the experimental class of 0.40 with a medium category, while the average n-gain value obtained in the control class was 0.24 with a low category. The students' responses that applied the Argument Driven Inquiry (ADI) model assisted by Interactive E-LKPD on ecosystem material showed a positive response with the percentage of overall student responses being 73.66%. So it can be seen that the students' responses are included in the good category.

As for suggestions for educators in the learning process to be able to use effective and interesting learning techniques. This aims to prevent students from feeling bored and can also increase their enthusiasm for learning.

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