



Developing an e-Module to Train Year 10 High School Students' Argumentation Skills in the Material of Spermatophyte Plants Using the Argument-Driven Inquiry Learning Model

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Abstract

Argumentation skills are very important in the 21st century communication skills that students need to master. Technological advances in the 21st century need to be utilized to make teaching materials more effective. Based on the results of interviews with biology teachers at SMA N 12 Semarang, learning biology only uses LKS books with assistance power point and YouTube. The scores of some students in Spermatophyte plant material at basic competency 3.8 and 4.8 have not fulfilled the KKM (Minimum Completeness Criteria) because learning is still centered on the teacher and causes students' argumentation skills to be undeveloped. Therefore, teaching materials in the form of e-Modules were developed to train year 10 students' argumentation skills in Spermatophyte material using a learning model Argument-Driven Inquiry (ADI). e-Module is a teaching material that is arranged systematically that encourages students to learn independently. The ADI Learning Model can train students' argumentation skills. This study aims to analyze the validity, practicality, and effectiveness e-Module to train students' argumentation skills. This type of research is research and development (RnD) with the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) development model. Validity data of e-Module obtained from the media and material validation questionnaire. Practical data of e-Module obtained from student readability, student and teacher response questionnaires. Effectiveness data of e-Module obtained from student activity sheets and questions pretest-posttest determined by the test results Mann-Whitney, Wilcoxon, and N-Gain. Results of validity analysis e-Module from the validation of media experts and the material is stated to be very valid. The results of practicality research e-Module from the results of the readability test analysis it was stated that it was practical, the results of the analysis from the student responses were 76% (practical) and the teacher's response was 81.3% (very practical). Effectiveness e-Module of results N-Gain In the experimental class it is known that only 8% of students are in the high category and 14% of students are in the low category which shows that learning uses e-Module ineffective. The student's argumentation skill level reaches level 2. Test Mann-Whitney showed that there was a significant difference in learning outcomes between the control and experimental classes. Wilcoxon test shows a significance value in the experimental class of $0.486 > 0.05$, which means learning to use e-Module not effective for improving student learning outcomes. The conclusions of this study are the validity and practicality of e-Module very valid and practical for learning, but not effective for increasing the value of learning outcomes.

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INTRODUCTION

Education is an important indicator of national development and an endurance in improving the quality of improving the quality of human capital that sustains it. The quality of education depends on the quality of learning. School is a formal pathway in the education system that has a major role in contributing to the achievement of national education goals (Haerullah & Elihami, 2020). The presence of education can be used as a means by humans to learn to know, study, and understand all the realities that exist in life so education is very important for everyone (Jayanti *et al.*, 2021).

Technology-based learning has increased rapidly in 21st-century learning. According to Rosnaeni (2021) learning in the 21st century has its own characteristics and features that must be the focus of educational institutions. Learning is designed around skills or expertise such as 1) critical thinking skills, 2) creative and innovative thinking skills, 3) communication skills, and 4) collaboration skills.

There are 7 skills or expertise in the 21st century that are focused on students, which include 1) Critical thinking skills and problem-solving, 2) Adaptability and agility skills, 3) Leadership skills, 4) Having ideas/thoughts and spirit entrepreneur, 5) Skilled in communicating both orally and in writing, 6) Skilled in tracing and analyzing information properly and precisely, 7) Having high imagination and curiosity (Fakhriyah *et al.*, 2021).

Communication skills are one of the skills that every student in the 21st century should have. For things that support these communication skills, students must have good scientific argumentation skills. Scientific argumentation skills are needed in the 21st century such as critical thinking, reflection, and evaluation of reasons (Riwayani *et al.*, 2019).

Scientific argumentation ability is closely related to "21st-century skills" which have become an important theme recently. The ability of the 21st century is interpreted as a form of competency and ability that students should have to survive, have skills and good behavior in facing the world of work and future social life (Fakhriyah *et al.*, 2021).

In the subject of Biology in high school according to the 2013 Curriculum, Spermatophyte is one of the plants studied in class X. There are 2 Basic Competencies (KD) that must be achieved by students, namely 1) KD 3.8 can classify plants into divisions based on general characteristics, as well as linking their role in life, and 2) KD 4.8 presents a report on the results of observations of plant phenetic and phylogenetic analysis and their role in life. These basic competencies can be achieved using argumentation skills. In learning science, argumentation activities are needed so that students can provide arguments by connecting science concepts and principles to explain phenomena or problems in life (Siregar & Pakpahan, 2020).

Scientific argumentation skills in science learning are very important to train students so that they have logical reasoning, clear or clear observations, and a logical description of something they have learned (Hasnunidah & Wiono, 2019). In order to achieve the goals of science education, students need to master argumentation skills to increase students' scientific literacy. The application of the inquiry approach is one of the methods to increase students' literacy capacity. Students can be directed to use inquiry learning in the delivery of scientific arguments so that they can be actively involved in it (Safira *et al.*, 2018).

Argument-Driven Inquiry (ADI) is a learning model that was created to allow students the opportunity to develop their own data collection methods and carry out investigations, write, think reflectively, and use data to answer investigative questions (Marhamah *et al.*, 2017).

Argumentation is an act of understanding cognitive responses to form scientific knowledge. These actions are in the form of 1) claim namely the core of the argument; 2) reasons or supporting evidence claim (evidence/ground); 3) warrant means the combination of evidence and the core of the argument that determines the pattern chain of reasoning; 4) backing that is, the type of reasoning that appears in reasoning; 5) rebuttal contains a disclaimer of disclaimer or identification of an exception to claim or also called counter-argument; 6) qualifier means a clear or obvious limitation or condition that includes part of the claim (Viyanti *et al.*, 2016).

The development of arguments in science learning can be explored in five potential dimensions, namely: 1) cognitive and metacognitive systems; 2) communication skills and critical thinking; 3) achieving the language of science; 4) application of scientific practice; and 5) increased thinking power (Fatah *et al.*, 2020).

An important component that can really help achieve learning objectives is learning media. Ahmed and Ahmed (2005) examined students' views of the benefits and use of learning media in social studies in Oman and concluded that if the quality of learning in a school is to improve, then learning media is very important for teachers to use (Hutahaean *et al.*, 2019). The implementation of various learning media is able to overcome the passive nature of students because learning media can raise student enthusiasm for learning (Sadiman, 2011). The use of innovative information technology-based learning media can improve the

quality of learning because it is an efficient and effective way of conveying information (Imansari & Sunaryantiningsih, 2017). The guideline for developing teaching materials by the Ministry of National Education (2008) explains that a module is a book that is intended so that students can learn independently without or with teacher guidance. The electronic version of the module which is connected to electronic devices such as smartphone, computers, tablets, and also laptops are referred to as module (Oktavia *et al.*, 2018).

Based on output Interviews with biology teachers at SMA N 12 Semarang showed that the usual biology lessons still apply the lecture method and do not use electronic modules ore-Module. Biology learning is carried out using LKS books and textbooks with the assistance PowerPoint compiled by the teacher from various sources, as well as using a YouTube link connected to the learning material video. The biology teacher also said that some of the student learning outcomes did not meet the KKM. Class X biology teacher at SMA N 12 Semarang has never implemented learning that triggers students to make arguments. Argumentation skills have an important role in improving students' critical thinking patterns which can increase in-depth understanding of an idea or notion (Rahayu *et al.*, 2020). Learning is done in the form of teacher-centered learning. The biology teacher also mentioned his concern that if students were freed to look for objects independently, it would cause confusion so their existing e-Module is expected to provide direction to students who study independently. Independent learning has benefits, namely, students can study according to their interests, motivations, and expectations, can properly explore important ideas that will improve their learning process, students can also plan and assess their own learning outcomes, students become more active when learning which can make learning deeper (Oishi, 2020).

Several points in the Faculty of Mathematics and Natural Sciences on the Semarang State University campus have various kinds of Spermatophyte plants that can be used as innovations for studying Spermatophyte plants so that they can be included in learning media. This innovation is also used to broaden students' insights about various kinds of Spermatophyte plants that can be included in the development e-Module.

Based on the problems described above, it is necessary to conduct a research "Developing an E-Module to Train Class 10 High School Students' Argumentation Skills in the Material of Spermatophyte Plants Using the Argument-Driven Inquiry Learning Model".

RESEARCH METHODS

This research is Research and Development with the ADDIE development model (Analyze, Design, Development, Implementation, and Evaluation). Implementation of e-Module using an experimental method, with Model Pretest-Posttest Control Group Design. Readability research sample e-Module small scale test in class XI and effectiveness test on a large scale in class X-12 (as an experimental class) and X-11 (as a control class) SMA N 12 Semarang. Sampling using a purposive sampling technique.

This research data collection method uses the type of data in the form of needs analysis with an interview sheet instrument addressed to the teacher. The data type for the validity e-Module using instruments in the form of media and material feasibility validation sheets addressed to media and material experts. Data types for the practicality e-Module were obtained from the readability sheet instrument e-Module addressed to students and response questionnaire sheets addressed to students and teachers. Types of data for effectiveness e-Module obtained from questions pretest-posttest and Student Activity Sheets addressed to students. The test performed is N-Gain test, Mann Whitney test, and Wilcoxon test.

RESULT AND DISCUSSION

The final product result is an e-Module to train the argumentation skills of 10th-grade high school students in the material of Spermatophyte plants using a learning model Argument-Driven Inquiry (<https://online.fliphtml5.com/lprsl/task/>).

e-Module made using the Canva app and earn e-Module in PDF format. e-Module in PDF format is converted into web flipHTML5. Fliphtml5 web can create views e-Module can be flipped through like a printed book. On the web, there are also features for quick access to move pages, zoom buttons, bookmarks, and search buttons to search for the word or sentence you want to search for. Acces-e-Module use web can save more memory storage on smartphones. On the design side, the usage of an e-Module in the form of a flip PDF displays an attractive appearance like a real printed book which allows students to better understand the material provided so that e-Module more effectively and efficiently used for independent learning (Rindaryati, 2021).

e-Module with the spermatophyte material arranged according to basic competence. The material description contains the characteristics of seed plants, the body structure of seed plants, reproduction and life cycle of seed plants, classification of seed plants, gymnosperms (open seed plants) containing general characteristics, and four classes of gymnosperms accompanied by examples of plants (loading pictures, classification, description, distribution, and role), angiosperms (closed seed plants) along with the general characteristics of the classification of monocotyledonous and dicotyledonous along with examples of plants containing pictures, classification, description, distribution, and roles.

Pictures of the species of spermatophyte plants that are in the e-Module were obtained from the results of the exploration of the UNNES FMIPA area and several plants from the internet to clarify the spermatophyte material. The plants obtained at FMIPA UNNES are *Araucaria cunninghamii*, *Adonidia merrilli*, *Aechmea lingulata*, *Aloe vera*, *Kaempferia rotunda*, etc. There were 29 species of plants taken. The plant species in FMIPA UNNES are very diverse, but not all of them are included e-Module due to the state of the species there being endangered and less representative morphology making it difficult to identify.

The results of the analysis of the validity of the media against e-Module to train the argumentation skills of 10th-grade high school students in the material of spermatophyte plants using a learning model of argument-driven inquiry are known to be very valid. The Result of media validity analysis on e-Modules can be seen in the following table.

Table 1. Results of the Analysis of the Validity Assessment of the E-module According to Media Experts

Aspect	The Score of Obtained	Max score	%	Criteria
Physical/Appearance	39	45	86%	Very valid
Introduction	28	30	93%	Very valid
Utilization	33	35	94%	Very valid
Assignment/Evaluation	35	40	87%	Very valid
Summary	25	25	100%	Very valid
The total aspect score obtained	160			
Maximum total score	175			
Percentage value	91%			
Criteria	Very valid			

The media expert's assessment of the physical/appearance aspect in terms of the cover layout is very proportional and the image appearance is known to be very good. In choosing the type and size of the font, it was stated that it was very suitable and the cover design was attractive. The graphic, visual, and verbal illustrations are in sync, and the color balance is quite appropriate.

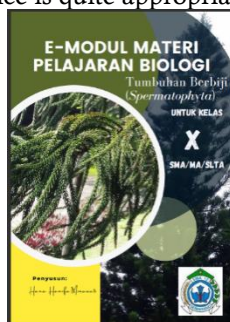


Figure 1. e-Module Cover Design

The media expert's assessment of the preliminary aspect in terms of study instructions, and the formulation of objectives/competencies are known to be very clear, and preparation for learning is very easy. Assessment in terms of the application of learning strategies and linkages with other modules is appropriate, and the preliminary components are stated to be very complete. In terms of utilization in terms of page usage and search e-Module is known to be very easy and interactive. The language used is very communicative. material that is up to date/context which is accompanied by examples and illustrations known to be very clear. In the aspect of assignment/evaluation in terms of instructions for working on practice questions/tests, it is known to be very clear; the sequence of questions, the level of difficulty of the questions, and the answer

keys presented are very good. The proportion of practice questions/tests with material content is balanced and given feedback the user's answer is correct; evaluation in providing problem-solving is known to be quite good. In summary aspect, the essential material and enrichment material is known to be very clear, precise, and useful. The existence of a glossary and bibliography is very well known.

According to the media expert lecturer, there are a number of things that need to be corrected, namely the words in "Foreword" should be replaced with "Foreword" because the preface is written by someone else who delivered his own work. According to Manser, the preface is an introduction to a book or its author, which is often written by someone who is not the author of the book himself and that person is an expert on the contents of the book (Trim, 2017).

Furthermore, the media expert's validator suggested that a module contain a formative test placed at the end of the subtopic as a form of assessment before finally taking the competency test. Self-assessment has a strategic role to recognize achievement and development of independent learning (Cahyanto & Afifulloh, 2021). This is according to the characteristics e-Module that is self-introduction which means students are able to teach themselves, and not depend on other parties (Muhammad, 2017).

The media expert validator also added that the description of the source of the image is in the e-Module listed with a link if the picture is taken from the internet and if the photo is taken from the author's personal documentation, the author's name is included. There are also suggestions for improving the number of competency test questions in order to achieve learning objectives. Media expert validation is used to assess the designs used by researchers in designing learning media and to receive input and suggestions so that learning media develops for the better (Elvina & Dewi, 2020).

The results of the analysis of the validity of the material against e-Module to train the argumentation skills of 10th-grade high school students in the material of spermatophyte plants using a learning model of argument driven inquiry known to be very valid. The result of analysis of the validity of the material on the e-Module can be seen in the following table.

Table 2. Results of the E-module Validity Assessment Analysis According to Material Experts

Aspect	Score Obtained	Max Score	%	Criteria
Introduction	23	25	92%	Very valid
Learning	44	50	88%	Very valid
Content/Description	32	35	91%	Very valid
Assignments/Evaluation	29	35	82%	Very valid
Summary	22	25	88%	Very valid
Total Aspect Score Obtained	150			
Total Maximum Score	170			
Percentage of Score	88%			
Criteria	Very valid			

The material expert's assessment of the introductory aspect in terms of study instructions is known to be very clear. In terms of the steps in preparation for learning, it is clear, and the application of deep learning strategies e-Module that's right. In terms of connection with e-Module, the other is very good and the advanced component is known to be very complete.

The material expert's assessment of the learning aspect is very good in terms of basic competence with learning indicators that are known to be appropriate. In terms of basic competence with program material, graduate competency standards with basic competencies are known to be very suitable. In terms of the title of the program and the target, users are very clear. In terms of implementing learning strategies, the explanation of theoretical and practical material is appropriate, and the variations in the delivery of types of information/data are good. The material is interesting and motivates users well. In terms of content, in terms of the scope of the content/description of the material, it is known that it is very good and very coherent. In terms of factuality and actuality of the contents of the material as well as the plant examples included, it is known that they are good and clear. In terms of the relevance of the data, the language used is known to be very clear. In the aspect of assignment/evaluation/assessment in terms of instructions for working on practice questions/tests, it is known to be clear, the sequence of questions presented is comprehensive, and the level of difficulty of the questions is good. In terms of training/tests with basic competencies, it is very appropriate. In terms of the proportion of test questions/exercises with the content of the material being balanced, giving feedback for the user's answer is correct, and the evaluation in providing a solution to the

problem is clear. In the aspect of the summary, in terms of the content of the summary, it is known that it is clear, a summary e-Module as repetition material is very appropriate, the summary is useful as enrichment material, and the glossary and the bibliography are very good.

In this assessment, the material expert lecturer suggested that the design of determining taxon levels be more consistent, the boundaries between materials, especially those that had not yet reached a completeness score, adding germination sentences as seeds and ovules, as well as additional competency achievement indicators. Validation results can be used as a reference for revising teaching materials (Hariyanto & Mu'arifuddin, 2018). Material expert validation is used to see the feasibility of the material used by researchers, determination, and clarity of the material e-Module (Nila & Mustika, 2022). E-Module Good learning must be practical so that students can study flexibly without being limited by time and place. Next, the practicality e-Module to train the argumentation skills of 10th-grade high school students in the material of spermatophyte plants using a learning model of argument-driven inquiry known from the results of the analysis of student readability, student responses, and teacher responses.

In the readability assessment conducted on a small scale by 10 grade 11 students, it was found that 50% of students stated that e-Module to train the argumentation skills of 10th-grade high school students in the material of spermatophyte plants using a learning model of argument-driven inquiry very practical and 50% of students stated that it was practical. The results of e-Module readability analysis can be seen in the following table.

Table 3. Results of the Readability Assessment of the Practicality of the E-Module

Criteria	The Number of Students
Very Practical	5 (50%)
Practical	5 (50%)
Pretty Practical	0 (0%)
Less Practical	0 (0%)
Impractical	0 (0%)

Some of the suggestions and comments given by 40% of students are related to e-Module namely election font and size e-Module can be improved again, the color compatibility is not compatible, the selection of background colors can be adjusted and the supporting elements of the module can be improved, use template too monotonous Canva, image placement could be better, and the use of colors could be more tailored to the elements. Advice given by 60% of other students stated that the e-Module is good and complete and there are already practice questions to hone students' abilities.

Some of the criticisms and suggestions were given by students are very useful for the improvement e-Module. However, there are several responses that one would like to express from these various criticisms, namely the election font and the size used has adjusted the size of the paper e-Module is A4. The font does look small when viewed from a smartphone, However, this can be overcome with features zoom to enlarge the size of the text or images you want to see carefully. Furthermore, on the criticism that the color compatibility is not compatible, the selection of background colors can be adjusted more and the supporting elements of the module can be improved, the use of templates that are too monotonous in Canva, the placement of images can be even better, the use of colors can be more adapted to the elements. These criticisms it is more related to the design of e-Module, this is because there are facts that show that human tastes for a design are different because some already think it is good and some others think it is not good according to the theory of Consumer Behavior.

The theory of Consumer Behavior is a psychological theory in which consumer behavior is influenced by cultural factors, social factors, personal factors, and psychological factors. Psychological factors are the main factors that affect judgment including motivation, perceptions or views, learning (where experience causes changes in knowledge, attitudes, or behavior), as well as attitudes and beliefs (Oktavera, 2021). Furthermore, the selection of green color is intended to make it more comfortable for the eyes. Green is included in the color additive. Color additives are the colors used for monitor screen display, not for printing needs. Green relates to nature, plants, environment. The effect of the green color in products is to give a 'friendly' color effect to the eyes, calm, and cool (Monica & Luzar, 2011).

Besides the readability e-Module, the practicality e-Module can also be seen from the responses of students and teachers. The practicality of learning media can be identified from learning activities with learning media, teacher responses to learning media, and students' responses to learning media (Milala *et al.*, 2022). The results of the questionnaire analysis of students' responses to the practicality e-Module to train the argumentation skills of 10th-grade high school students in the material of spermatophyte plants

using a learning model of argument driven inquiry It is known that 42% of students responded that it was very practical, 36% of students responded that it was practical, and 22% of students considered it quite practical. The results of analysis of student responses to the practicality of the e-Module can be seen in the following table.

Table 4. Results of Analysis of Student Responses to the Practicality of the E-Module

Criteria	The Number of Students
Very Practical	15 (42%)
Practical	13 (36%)
Pretty Practical	8 (22%)
Less Practical	0 (0%)
Impractical	0 (0%)

Assessment of student responses stated that the learning carried out was interesting, fun, easy to understand, and could provide motivation to learn. Learning is very encouraging to work together and encourage independent learning. Student responses agree that the e-Module is interesting, can help in learning to understand the material, and is easy to understand. According to student responses, they also agreed that assignments in student activity sheets provided challenges in learning, assignments, and evaluations were carried out openly or transparently, assignment topics were in accordance with the material being studied, assignment instruments and instructions were easy to understand, and the questions in the tests were in accordance with competency demands.

The results of the questionnaire analysis of the teacher's response to the practicality e-Module to train the argumentation skills of 10th-grade high school students in the material of spermatophyte plants using a learning model of argument-driven inquiry known to be very good with a value of 81.3%. Assessment of the teacher's response on the practicality aspect e-Module can make it easier to convey spermatophyte material to students who strongly agree. Teachers are more interested in using books because teachers find it difficult to explain spermatophyte material when using theme-Module. The teacher's response strongly agreed that students were more enthusiastic and interested in participating in spermatophyte learning in class, but the teacher could not focus when teaching using e-Module spermatophyte. Teachers strongly agree that teachers become more comfortable when teaching using the e-Module spermatophyte and strongly agree that with the use e-Module can better control the development of students in spermatophyte material. The teacher agrees with the e-Module, the intensity of student learning increases and can overcome the boundaries of the classroom. According to the assessment of the teacher's response e-Module can overcome the limitations of experience that students have can enable direct interaction between students and their environment, can add basic concepts that are correct, real, and appropriate, can set the pace of student learning, and provide a thorough experience from concrete to abstract things. The teacher added that note e-Module this spermatophyte plant is very good, interesting, and quota-friendly because it can be treated directly with a smartphone.

Effectiveness-Module to train the argumentation skills of 10th-grade high school students in the material of spermatophyte plants using a learning model of argument-driven inquiry implemented in class X-12 learning as an experimental class with a control class comparison in class X-11. In the experimental class, there are sessions for video demonstration screen recording from the smartphone on how to access e-Module and use of features in fliphtml5. Furthermore, students carry out learning according to the instructions for use-Module. If students feel confused, they are allowed to ask questions. In the e-Module, there is a formative test consisting of 10 multiple-choice items and 5 essay questions which are located between subtopics. The existence of a formative test allows students to find out the extent to which subject matter is still difficult. From these formative tests, teachers can measure the extent to which the material being taught is conveyed properly to students (Arikunto, 2009).

Formative tests are also used to measure student learning completeness. Students are said to be complete in learning if they get a score of ≥ 70 . It is known that 81% of students completed learning the material with e-Module and 19% of students have not completed it. This is because students find it difficult to master e-Module and some students lack time to study. The incompleteness of student material occurs because lesson plans are not implemented properly, the time used by educators is less, the lack of good material organization from educators, and the personalities of the diversity of students are not the same which is a challenge for educators (Nurwidyawati *et al.*, 2018).

Then after the students finished working on the last formative test, the students divided into groups first then worked on the Student Activity Sheet which had a component of argumentation skills from Toulmin's Argumentation Pattern. Students are divided into 6 groups of class members totaling 36 students. Then students discuss between groups related to the questions that have been given in the LKS. Furthermore, student representatives one by one go to the class department to present arguments for answers that answer the introductory questions received.

The results of the assignment of Student Activity Sheets showed that the highest percentage of argumentation skills was 88% of students at level 2, namely argumentation having arguments from a claim with data, guarantees, and supports, but does not contain disclaimers. 6% of students are at level 1, namely the argumentation only contains one claim as opposed to the claim of others, and 6% are at level 0 which means students do not argue. Students at level 0 are caused by not filling out worksheets. The full results of attainment of student argumentation skill level can be seen in the following figure.

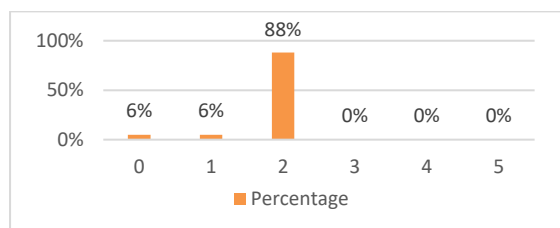


Figure 2. Percentage of Students' Argumentation Skill Levels

The results of training students' argumentation skills have reached level 2 because students are still new to learning models that involve student arguments through indicators such as claim, data, warrant, backing, qualifier, and warrant. Students who still reach level 1 are included in the very weak argumentation level category (Noviyanti *et al.*, 2019). Factors that affect low argumentation skills are that students have various characteristics, students still need stimulation to give their arguments, and there are students' habits of being silent or answering as briefly as possible according to the question (Devi *et al.*, 2018). Factors that influence argumentation are the initial knowledge possessed by students (prior knowledge) which only provides arguments with prior knowledge and learning experience possessed and when there is something related to the problem being discussed (Marsita *et al.*, 2010).

Analysis of the percentage of indicators from each level shows that students who argue with the claim of 94%, with data of 94%, with a warrant by 88%, with backing by 77%, with qualifier by 66%, then 0% rebuttal. The percentage of 0% in rebuttal is because students mutually agree on opinions between other groups so they don't use the rebuttal as a rebuttal. Percentage indicator claim and data show a percentage that is greater than warrant, backing, qualifier, and rebuttal because the data is real and in accordance with the facts so students easily make it to support the claim. However, this argument is still weak because it does not contain any objections (Noviyanti *et al.*, 2019). Rebuttals are not listed because students agree with each other's arguments. The percentage of each use of the argumentation component of each student can be seen in the following figure.

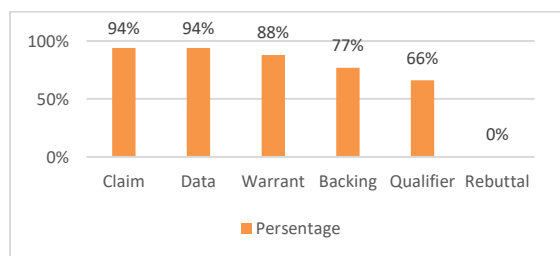


Figure 3. Percentage of Argumentation Ability Indicators for Each Level

The results of the data normality test were analyzed using the testMann-Whitney of the yield value pretest it is known that the value of Asymp. Sig. (2-tailed) of 0.991 is greater than the probability of 0.05. So it can be concluded that the "hypothesis is rejected". Thus it can be said that there is no difference in the average value pretest in the experimental and control classes so the 2 samples come from the same population so that after an experiment it is hoped that there will be a difference in value posttest.

Next, tests were carried out by Mann-Whitney Which was a second posttest value with N-Gain percent to find out the difference between two independent samples from the same population. The test is to find out the difference in students' conditions after being given a different treatment, namely learning to usee-Module or without an e-Module. Test results Mann-Whitney indicates that the significance value or Asymp. Sig. (2-tailed) of 0.00 is less than the probability of 0.05, the hypothesis is accepted. Therefore, the results of the analysis of the data that have been obtained show that the hypothesis is accepted, which means that there is a difference in the average learning outcomes between the experimental class and the control class.

Test results of Wilcoxon in the experimental class of 0.486 which is greater than 0.05. Therefore, learning to usee-Module to train the argumentation skills of 10th-grade high school students in the material of spermatophyte plants using a learning model of argument-driven inquiry does not affect the increase in the value of student learning outcomes. In the control class, it is 0.000 which is less than 0.05. Therefore, learning without using an e-Module affects the increase in the value of student learning outcomes. It can also be seen that 56% of students in the experimental class experienced a decrease in the value of their learning outcome pretest to value posttest. Then, in the control class that uses the lecture method with assistancePower Point influential in increasing the value of learning outcomes. Only 13% of control class students experienced a decrease in grade pretest the posttest.

The result of the value pretest and posttest from the experimental and control classes were analyzed using N-Gain test with the SPSS application program. Analysis resultsN-Gain from the experimental class it is known that the learning outcomes of 8% of students are in the high category, 14% of students are in the medium category, and 78% of students are in the high category. Effectivenesse-Module determined from the medium and high categories where both percentages are <40%.e-Module to train the argumentation skills of 10th-grade high school students in the material of spermatophyte plants using a learning model of argument-driven inquiry ineffective.

Analysis results of N-Gain test from the control class it is known that 36% of students' learning outcomes are in the high category, 25% of students are in the medium category, and 39% are in a low category. The high and medium category values are less than <40% so learning in the control class is not effective. However, the percentage of high and medium categories in the control class is still much higher than in the experimental class. The results of the N-Gain test analysis for each student can be seen in the following table.

Table 5. Results of the N-Gain Test Analysis for the Experimental Class and the Control Class

Category	The Number of Students	
	Experiment Class	Control Class
High	3 (8%)	13 (36%)
Medium	5 (14%)	9 (25%)
Low	28 (78%)	14 (39%)

Ineffectiveness in the experimental class can be seen from the average results post-test decreased from the yield pretest which is in accordance with the Wilcoxon test results. According to the test Wilcoxon results, students in the control class who experienced a decrease in learning outcomes were much less than the experimental class. The decrease was due to the experimental group of students working on post-test at home as a form of homework because the duration of the learning time in class has run out. Students are given up to 4 days to work because students have assignments and activities that come from other subjects. Even though the relief was given, there were still a few students who finished working on it post-test after approaching the deadline, so it needs a re-appeal regarding the work-post test. Students are in a hurry and work-post tests by not focusing which affects the value post-test. Work delay post-test This is included in procrastination activities or delaying work so that it can reduce value post-test. Comparison, when viewed from the learning outcomes of the control class, is better than the experimental class, due to the workmanship post-test done immediately after learning spermatophyte material is complete so that procrastination does not occur. Research conducted by Nelasari *et al.*, (2022) namely students who experience problems regarding procrastination experience a decrease in value from the high category to the medium category.

This procrastination can cause students to forget. The forgetting condition occurs due to conflict disturbances between information items or material in the student's memory, there is pressure on existing items either intentionally or not, there is a change in the environmental situation between learning time and recall time, there are changes in attitudes and interests students towards certain learning processes and situations (Kosim, 2015).

CONCLUSION

Based on the results of research and discussion, it can be concluded that the e-Module to train the argumentation skills of 10th-grade high school students on Spermatophyte plant material using a learning model Argument-Driven Inquiry is very valid according to media experts and material experts. E-Module was declared practical according to student readability and student responses, and very practical according to teacher responses. E-Module declared ineffective. The student's argumentation skills show that the student reaches level 2 in the argumentation skill level.

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