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Development of Guided Inquiry-Based Module to Improve Students Understanding in Complex Analysis: A Case of STKIP Muhammadiyah Sungai Penuh

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Abstract: This development research aims to develop a Complex Analysis module with a guide inquiry approach that is valid, practical, and effective in terms of contents and constructs. The focus of this study is the use of modules that can lead to interest in learning and creative thinking because they are easy to understand and like to use. The subject of this study was the seventh semester students of mathematics education at STKIP Muhammadiyah Sungai Penuh. Data collected using The development model is 4D from Thiagarajan, but only 3D is used, for the deployment phase it is not done because research is not aimed at generalizing. The results showed that the module with an inquiry guide approach in the Complex Analysis lecture was practical, based on the results of the description and data analysis, the level of student activity during the lecture process was active students, and learning outcomes were obtained more than 70% of students got scores over 65.

Keywords: module, guided inquiry approach, mathematics learning.

▪ INTRODUCTION

In STKIP Muhammadiyah Sungai Penuh, it was revealed that students had difficulty utilizing existing media/ books because learning materials were scattered in several different books. In addition, the language in textbooks is difficult for them to understand because the delivery of material in textbooks is not interesting and seems stiff so students are not interested in learning it. The level of difficulty of the questions also varied greatly for their understanding, this was due to differences in the backgrounds of the students' secondary schools. In general, they only depend on recording the questions and discussions given by the lecturer during the lecture and tend to wait for the photocopied material from the lecturer, which is basically a photocopy of a math book with limited resources and material. This certainly results in the limited material they have. In the lecture process that took place in the 2017/2018 odd semester STKIP Muhammadiyah Sungai Penuh students, revealed that the teaching materials that had been used so far were not sufficient to support the learning process.

The availability of existing teaching materials has limitations in facilitating students to construct their knowledge. They hope there is an effort to make teaching materials that can bridge the diversity of their abilities, teaching materials that are complete and easy to understand / use, interesting and effective for students. In the lecture process students are often given a theorem, formulas and formulas in form without being given a reason why the argument sounds like that. Submission of theorems, propositions or textbooks does not require students to be able to construct their initial abilities.

Therefore the solution that the researchers did was to use the lecture material to be developed was a module. With this module, it is expected to make students motivated to learn. In addition, by using this module students are expected to be able to develop their own knowledge or concepts actively based on existing knowledge and experience.

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The Inquiry Guide (guided inquiry) is inquiry that is heavily interfered with by the instructor, here the instructor directs and gives instructions both through complete procedures and directional questions during the inquiry process. Because all this time in the lecture process or the delivery of material in textbooks, information was only given. All material is given directly so that it does not maximally help students to construct their knowledge.

The following is presented in the presentation of complex analysis material in one complex analysis book for 7th semester mathematics education students:



DASAR-DASAR AKSIOMATIK SISTEM BILANGAN KOMPLEKS

Dari sudut pandang logika dimungkinkan untuk mendefinisikan suatu bilangan kompleks sebagai suatu pasangan terurut (a, b) dari bilangan riil a dan b terhadap definisi operasi tertentu, yang kemudian ternyata sesuai dengan yang di atas. Definisi ini adalah sebagai berikut, di mana semua huruf menyatakan bilangan riil.

A. **Kesamaan** $(a, b) = (c, d)$ jika dan hanya jika $a = c$, $b = d$
B. **Jumlah** $(a, b) + (c, d) = (a + c, b + d)$
C. **Hasilkali** $(a, b) \cdot (c, d) = (ac - bd, ad + bc)$
$m(a, b) = (ma, mb)$

Dari sini kita dapat menunjukkan [Soal 1] bahwa $(a, b) = a(1, 0) + b(0, 1)$ dan kita menyatakan ini dengan $a + bi$ di mana i adalah lambang untuk $(0, 1)$ yang bersifat $i^2 = (0, 1)(0, 1) = (-1, 0)$ [yang dapat dipandang sesuai dengan bilangan riil -1] dan $(1, 0)$ dapat dipandang sesuai dengan bilangan riil 1. Pasangan berurut $(0, 0)$ berkaitan dengan bilangan riil 0.

Dari hal di atas kita dapat membuktikan bahwa jika z_1, z_2, z_3 termasuk pada himpunan bilangan kompleks S, maka

1. $z_1 + z_2$ and $z_1 z_2$ termasuk di S. — Hukum ketertutupan
2. $z_1 + z_2 = z_2 + z_1$ — Hukum komutatif untuk penjumlahan
3. $z_1 + (z_2 + z_3) = (z_1 + z_2) + z_3$ — Hukum asosiatif untuk penjumlahan
4. $z_1 z_2 = z_2 z_1$ — Hukum komutatif untuk perkalian
5. $z_1(z_2 z_3) = (z_1 z_2) z_3$ — Hukum asosiatif untuk perkalian
6. $z_1(z_2 + z_3) = z_1 z_2 + z_1 z_3$ — Hukum distributif
7. $z_1 + 0 = 0 + z_1 = z_1$, $1 \cdot z_1 = z_1 \cdot 1 = z_1$, 0 dinamakan *unsur kesatuan terhadap penjumlahan*, 1 dinamakan *unsur kesatuan terhadap perkalian*
8. Untuk suatu bilangan kompleks z_1 terdapat suatu bilangan tunggal z dalam S sehingga $z + z_1 = 0$; z dinamakan *invers dari* z_1 *terhadap penjumlahan* dan dinyatakan dengan $-z_1$.
9. Untuk suatu $z_1 \neq 0$ terdapat suatu bilangan tunggal z dalam S sehingga $z z_1 = z_1 z = 1$; z dinamakan *invers dari* z_1 *terhadap perkalian* dan dinyatakan dengan z_1^{-1} atau $1/z_1$.

Figur 1. Examples of discussion of material in complex analysis books

Complex Analysis courses are compulsory subjects given to seventh semester students with a load of 3 credits. Complex analysis courses are courses that study and discuss complex numbers. Complex numbers are one of the important breakthroughs in the world of Mathematics. For those who have taken classes in Linear Algebra, the set of integers has been known as a simple set that has a group structure, and further. This course emphasizes student competence in cognitive, intelligence and psychomotor skills.

The reference book for the Complex Analysis lecture that has been so far is more pressing on the delivery of information rather than prioritizing the process of obtaining that information. This results in students being more inclined to memorize formulas or concepts so that they easily forget the concept of Complex Analysis. In order for this to not happen again, we need a teaching material that is able to build or construct their knowledge to find out the characteristics and concepts of Complex Analysis that they have learned so that understanding will be found.

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According to Rosyid (2010), modules are printed teaching materials designed to be studied independently by learning participants. Whereas according to Suprawoto (2009: 2) there are several notions of modules including:

Modules are learning tools or facilities that contain material, methods, boundaries of learning materials, instructions for learning activities, exercises and how to evaluate those designed systematically and attractively to achieve the expected competencies and can be used independently.

Modules are learning tools that are arranged in accordance with learning needs in certain subjects for the purposes of certain learning processes, a competency or sub-competency packaged in a single module (self contained), able to teach themselves or can be used to learn independently (self-instructional), its use is not independent of other media (self alone), provides the opportunity for students to practice and provide summaries, gives the opportunity to carry out their own tests (self test) and accommodate student difficulties by providing follow-up and feedback.

Based on some understanding of the module above we can conclude that learning facilities in written / printed form are arranged systematically, contain learning material, methods, learning objectives based on basic competencies or indicators of achievement of competencies, instructions for self-instructional learning, and provide opportunities to students to test themselves through the exercises presented in the module (means of independent learning). By paying attention to the above objectives, the module as teaching material will be as effective as face-to-face learning. a good module is written as if teaching a student about a topic through writing. Everything that is to be conveyed during learning is presented in the module developed. Use of the module can be said as a written tutorial activity.

Use of the module can be said as a written tutorial activity. In general the preparation of modules follows the format as follows:

• Title page
• Content page
• Subject

a. Introduction
b. Competency standards
c. Basic competencies
d. Learning objectives
e. Learning activities 1

Description and Example

a) Sub-topics
b) Subjects
c) And so on ...

Exercise

Feedback and follow-up

a. Learning activities 2 idem
b. Learning activities 3 idem
c. Answer key i.
d. Bibliography

Purwanto (2007: 15) states that there are 4 stages in module development. The stages of module development are described as follows.

Planning Phase. In the planning stage, it is done to define the outline of the contents of the module (GBIM). The module produced must pay attention to the needs of students, have material truths and be presented well and systematically.

Writing Phase The step taken after the planning stage is the writing stage. At the writing stage, the steps taken are preparation of outline / design and writing. Outline preparation includes creating a module framework and framework description. Phase Review and Revision Review. Finalization and printing stages.

▪ METHOD

The procedure for developing this module uses the 4-D model proposed by Thiagarajan et al in Trianto (2011: 189). This model consists of 4 stages, namely 1) defining, 2) designing, 3) developing, and 4) dissemination. In this study only three stages were carried out, namely the defining phase, the design phase, and the development stage, because the fourth stage, the deployment stage, took a long time and the number of universities was a lot of samples.

Data analysis techniques from each instrument are described as follows:

Validation Analysis

The results of validation from the validator on all aspects assessed, presented in the form of a table. Next, find the percentage score using the formula:

$$P = \frac{Jumlah\ skor\ pada\ butir}{Jumlah\ skor\ max}\ x\ 100\%$$

With P: Percentage

Practicality Analysis

Observations are separated according to the data group. To describe the data of the observations analyzed quantitatively and qualitatively.

To determine the criteria for the percentage of items using the formula:

$$P = \frac{\sum skor\ per\ item}{skor\ \max\ validator\ per\ item} x\ 100\%$$

Effectiveness Analysis

a. Student Activity Observation Sheet

Observation data is obtained by calculating the number of students who carry out activities as contained in the observation sheet. The data is analyzed by the percentage technique stated by Sudijono (2005: 43) as follows:

$$P = \frac{f}{N} \times 100\%$$

Information:
P = percentage of activity
f = frequency of activity
N = number of students

Student activities are observed at each meeting, so that it can be seen the development of student activities in lectures using modules.

Learning Outcomes Test

Data obtained from learning outcomes tests were analyzed using the calculation of the percentage of students. To see whether or not an effective module has been developed, tests need to be conducted, if more than 70% of students get a value of ≥ 65, the module development can be said to be effective.

▪ RESULT AND DISCUSSION

Module Validity

To get a valid module a defining stage, a development phase and a development phase are carried out.

Defining Stage Analyzing Syllabus for Complex Analysis Courses

The initial step of the define phase is analyzing the syllabus of Complex Analysis courses which aims to determine whether the material being taught is in accordance with the expected competencies. The expected competency after taking the Complex Analysis course is that students can understand Complex Numbers, Complex Number Functions, Derivatives and Cauchy Reiman Equations, and Interfacing Complex Functions.

Analyzing and Reviewing the Reference Book for Complex Analysis Courses. After analyzing the syllabus, the next step is to analyze and review the reference book that aims to see the contents of the book, how to present it, practice questions and tasks, with the aim of whether it is in accordance with the applicable syllabus. The reference book used for lecturing Complex Analysis is a book written by Murray R. Spiegel and Koko Martono. But the book was no longer published so students were difficult to get and only photocopied the existing books. The material in the book covers most of the expected competencies. But the presentation of material in the book has not been able to make students understand and discover concepts themselves.



NILAI MUTLAK

Nilai mutlak atau modulus suatu bilangan kompleks $a + bi$ didefinisikan sebagai $|a + bi| = \sqrt{a^2 + b^2}$.

Contoh: $|-4 + 2i| = \sqrt{(-4)^2 + (2)^2} = \sqrt{20} = 2\sqrt{5}$

Jika $z_1, z_2, z_3, \ldots, z_m$ bilangan kompleks, maka sifat berikut ini berlaku.

1. $|z_1 z_2| = |z_1||z_2|$ atau $|z_1 z_2 \cdots z_m| = |z_1||z_2| \cdots |z_m|$
2. $\left|\frac{z_1}{z_2}\right| = \frac{|z_1|}{|z_2|}$ jika $z_2 \neq 0$
3. $|z_1 + z_2| \leq |z_1| + |z_2|$ atau $|z_1 + z_2 + \cdots + z_m| \leq |z_1| + |z_2| + \cdots + |z_m|$
4. $|z_1 - z_2| \geq |z_1| - |z_2|$ atau $|z_1 - z_2| \geq |z_1| - |z_2|$

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Dalam suatu himpunan yang unsur seperti S yang unsurnya memenuhi sifat-sifat di atas dinamakan suatu *lapangan*.

Figure 2. Book analysis of complex complex by r. r. sealegel

Language in textbooks is difficult for them to understand because the delivery of material in textbooks is not interesting and seems stiff so students are not interested in learning it. The level of difficulty of the questions also varies greatly for their understanding. After the reference book is analyzed, then it is reviewed into a module that is in accordance with the syllabus. The following is a sample excerpt from the complex analysis book.

Interview with Peers

Interviews with colleagues (lecturers in Complex Analysis courses) aim to find out what problems / obstacles are faced in the field in connection with the Complex Analysis lectures. The interview was conducted informally which was held on October 26, 2018.

From the interview results, it can be concluded that students do not understand the concepts of Complex Analysis courses and there is no handbook for these courses that helps students to understand the concepts learned because the existing reference books have not been able to invite students to find their own concepts. In addition, students are less motivated to look for references regarding the material provided and are just waiting for an explanation from the lecturer. This shows that students are less active in the lecture process.

Studying the Characteristics of Students as Prospective User Modules.

Characteristics of students need to be the basis for developing modules with the inquri guide approach in the Complex Analysis lecture. The purpose of studying the characteristics of students is to find out the general abilities of students about the subject of Complex Analysis and general mathematical abilities. This was done in addition to determining the trial subjects using modules with the guide inquri approach was also used as a reference in developing test kits / difficulty levels of questions and the use of language in the development of the module.

b. Design Stage

1) Outline / Design Preparation

• Determine the topic to be loaded

• Arrange the order of topics according to the order of learning objectives.

• Prepare the design.

2) Writing

• Cover Module

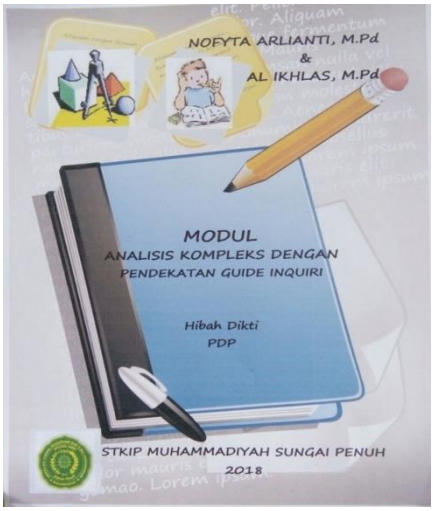


Figure 3. Cover the Module with the Inquri Guide Approach

The cover describes the contents of the module with the designed inquri guide approach. Cover is designed in light blue, orange and gray. Gray is the most neutral color with no specific nature or life. Gray means wise, mature, unselfish, calm, and balanced. So that the gray color is suitable to be used as the color for the module cover. For the title

of the cover using Segoe Print with the letters Segoe Print size 26 and 18. The cover also includes the name of the author and the logo of STKIP Muhammadiyah Sungai Penuh.

Preface

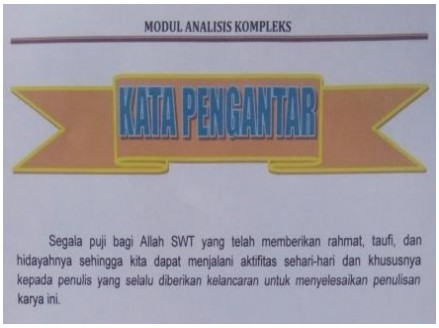


Figure 4. preface the module

The preface contains thanksgiving and the purpose of the author in designing the module with the inquri guide approach. Preface is made with words that are not formal and easily understood by students. The title of the preface uses the calibry (body) font size 11 and the words in the preface Arial (body cs) size 12 in the Complex Analysis module with the inquri guide approach.

Table of Contents

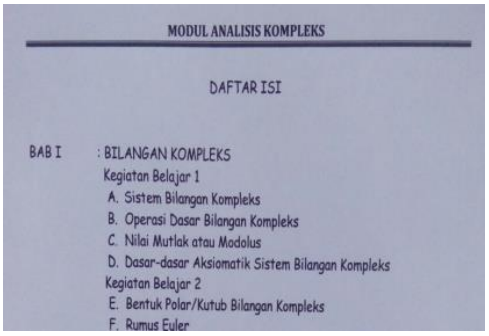
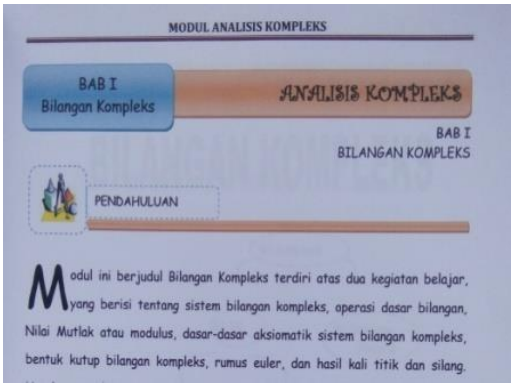


Figure 5. Table of contents the module

The table of contents makes it easy for students to know the desired material pages. The table of contents is clearly made so that students easily find the desired position / page of material. The table of contents uses the letters Comics Sans MS size 12 and the contents of the table of contents use the same letters as size 12. Following is an example of a table of contents in the Complex Analysis module with the approach of inquri guide.

Introduction


MODUL ANALISIS KOMPLEKS

BAB I
Bilangan Kompleks

ANALISIS KOMPLEKS

BAB I
BILANGAN KOMPLEKS

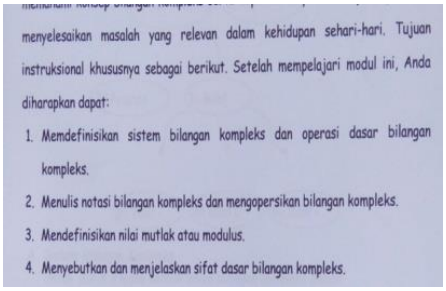
PENDAHULUAN

Modul ini berjudul Bilangan Kompleks terdiri atas dua kegiatan belajar, yang berisi tentang sistem bilangan kompleks, operasi dasar bilangan, Nilai Mutlak atau modulus, dasar-dasar aksiomatik sistem bilangan kompleks, bentuk kutup bilangan kompleks, rumus euler, dan hasil kali titik dan silang.

Figure 6. Introduction the module

Introduction aims to provide a general summary to students about the material to be discussed in the module. In addition, it also explained about the relationship of material to the module with the next material. The preliminary words using the letters Comics Sans MS size 11 and the contents of the introduction using the letters Comics Sans MS with size 12. Next is one of the preliminary examples in the Complex Analysis module with the approach of the guide inquri

Learning Objectives


menyelesaikan masalah yang relevan dalam kehidupan sehari-hari. Tujuan instruksional khususnya sebagai berikut. Setelah mempelajari modul ini, Anda diharapkan dapat:

1. Memdefinisikan sistem bilangan kompleks dan operasi dasar bilangan kompleks.
2. Menulis notasi bilangan kompleks dan mengopersikan bilangan kompleks.
3. Mendefinisikan nilai mutlak atau modulus.
4. Menyebutkan dan menjelaskan sifat dasar bilangan kompleks.

Figure 7. Learning objectives the module

Learning objectives contain general instructional objectives and specific instructional objectives. The learning objectives are placed on the first page in the introduction to the module. This learning objective is referenced from the indicators contained in the course syllabus. Learning objectives are presented in simple language so that it is easily understood by students. Writing the purpose of learning is written using the letters Comics Sans MS size 12. Here is one example of learning objectives in the introduction to the Complex Analysis module with the inquri guide approach.

Title of Learning Activities

The title of learning activities is designed as interesting as possible written using Comics Sans MS size 14. While for writing learning activities are written using Comics Sans MS size 12 letters. Here is one example of the title of learning activities in the Complex Analysis module with the inquri guide approach.

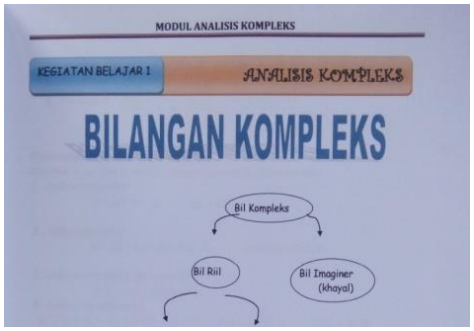


Figure 8. Title of Learning Activities the module

Material

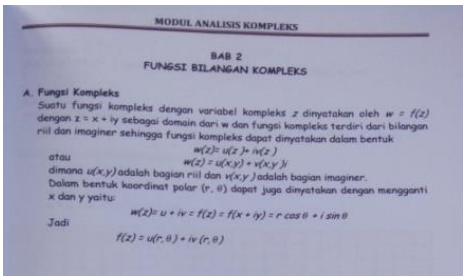


Figure 9. Material the module

The material description contained in each module / learning activity is intended to provide a complete explanation of the material that students will learn. For this reason, the material description is equipped with simple images and language so that it is easy for students to understand. The material description provides an opportunity for students to study a topic (orientation element) that is able to invite students to construct their own knowledge from initial knowledge. The material description is typed using the letters Comics Sans MS size 12. The following is one example of the material contained in the Complex Analysis module with the inquri guide approach.

Guided Exercise

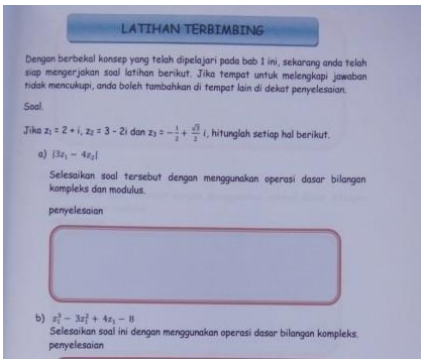


Figure 10. Guided Execise the module

This section contains inquiry guide elements, namely reconstruction of ideas (arranging new ideas by being faced with existing ideas). This section contains questions from low, medium and high levels of ability. Each question is given an incomplete step of completion, it aims to guide students to form their knowledge to find new ideas. By

working on guided exercises students are expected to gain learning experience and can construct their own knowledge to understand the material being studied. Guided exercises are typed in the letters Comics Sans MS size 12

Independent Training

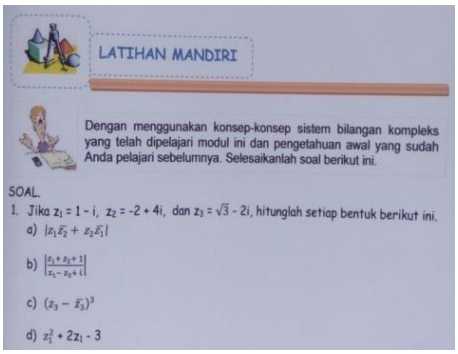


Figure 11. Independent Training the module

Independent training requires students to be independent in solving problems. In this section students can develop their own answers based on the understanding that is formed when studying material descriptions and filling out guided exercises. This will make students more knowledge. This section contains guide inquiri elements. In this section no instructions are given as in the guided exercise. The type of writing used is comics sans ms size 12.

Develop Stage

Complex Analysis Module Validation Results with the inquri guide approach

Module validation is carried out by four validators, namely one Complex Analysis expert, two Complex Analysis lecturers and one Indonesian language lecturer Based on the results of the validator's assessment, then the percentage of achievement modules can be calculated for the following material aspects:

Table 1. Results of Material Aspect Validation in Complex Analysis Module Using the inquri guide approach

No.	Aspek Yang Dinilai	Validator				Jumlah
		1	2	3	4	
1.	Materi yang disajikan sesuai dengan kompetensi yang dicapai	5	5	4	4	18
2.	Konsep-konsep yang diuraikan pada materi dipertegas dengan gambar, grafik atau tabel	4	4	4	4	16
3.	Penyajian materi telah memberikan kesempatan bagi mahasiswa dalam menemukan sendiri konsep dan prinsip yang dipelajari	4	4	4	4	16
4.	Materi telah disajikan dengan urutan yang sistematis	4	4	4	4	16
5.	Materi telah dirumuskan berdasarkan ciri-ciri pendekatan guide inquiri	4	4	4	4	16

6.	Materi yang disajikan pada modul telah mengarahkan mahasiswa untuk mengkonstruk pengetahuannya sendiri	4	4	4	4	16
7.	Contoh soal, latihan terbimbing dan latihan mandiri relevan dengan materi yang disajikan	4	5	4	4	17
Aspek secara keseluruhan		29	30	28	28	115

Total score for all items tabel 1 = 115
Maximum score = 140

$$P = \frac{114}{140} \times 100\% = 82,14\%$$

After being converted 82.14% is in a very valid qualification.

Table 2. Validation Results of Presentation Aspects in Complex Analysis Modules With the inquri guide approach

No	**Aspek yang Dinilai**	**Validator**				**Jumlah**
		1	**2**	**3**	**4**	
1.	Kompetensi utama dan khusus serta petunjuk penggunaan modul telah disajikan secara jelas	4	5	4	4	17
2.	Secara visual, penulisan konsep, ide, istilah dan rumus telah disajikan dengan jelas	4	4	4	4	16
3.	Penyajian materi telah membahasakan gagasan yang ingin disampaikan	4	4	4	4	16
4.	Penyajian materi telah memunculkan proses pembentukan dan pemahaman konsep	4	4	4	4	16
5.	Penyajian gambar jelas dan menarik	4	4	4	5	17
6.	Materi yang disajikan memberikan kesempatan untuk mengembangkan motivasi dalam mempelajarinya	4	4	4	4	16
7.	Materi yang disajikan membantu mahasiswa mengungkapkan ide-ide secara jelas dengan tulisan ataupun gambar.	4	4	4	4	16
Jumlah secara keseluruhan		28	29	28	29	114

Total score for all items tabel 2 = 114
Maximum score = 140

$$P = \frac{114}{140} \times 100\% = 81,43\%$$

After being converted 81.43% is in a very valid qualification.

Tabel 3. language validation and readability results in complex analysis modules with the inquri guide approach

No.	**Aspek Yang Dinilai**	**Validator**				**Jumlah**
		1	**2**	**3**	**4**	
1.	Kalimat yang digunakan telah sesuai dengan kaidah bahasa Indonesia	4	4	4	4	16
2.	Kalimat yang digunakan melibatkan kemampuan berpikir logis mahasiswa	4	4	4	4	16

3.	Struktur kalimat telah sesuai dengan tingkat pemahaman mahasiswa	4	4	4	4	16
4.	Bentuk dan ukuran huruf pada modul telah sesuai dengan kapasitas keterbacaan mahasiswa	5	4	4	4	17
5.	Kalimat yang digunakan dalam penyajian modul tidak memberikan makna ganda (ambigu)	4	4	4	4	16
Jumlah secara keseluruhan		21	20	20	20	81

Total score for all items Tabel 3 = 81
Maximum score = 100

$$P = \frac{81}{100} \times 100\% = 81\%$$

After being converted 81% is in a very valid qualification

Mathematics Education students. The trial of the module with the inquri guide approach was conducted in 5 meetings (5 learning activities). During the trial, researchers were assisted by two observers. The Observer is in charge of observing the implementation of lectures using modules with an inquri guide approach and observing student activities.

Observer Observation Data on the Implementation of the Lecture Process with Modules with the inquri guide approach. The effectiveness test needs to be done to find out the benefits of using the module. The aspect of effectiveness observed in the lecture process using the module with the inquri guide approach in the pilot class is the activities and student learning outcomes.

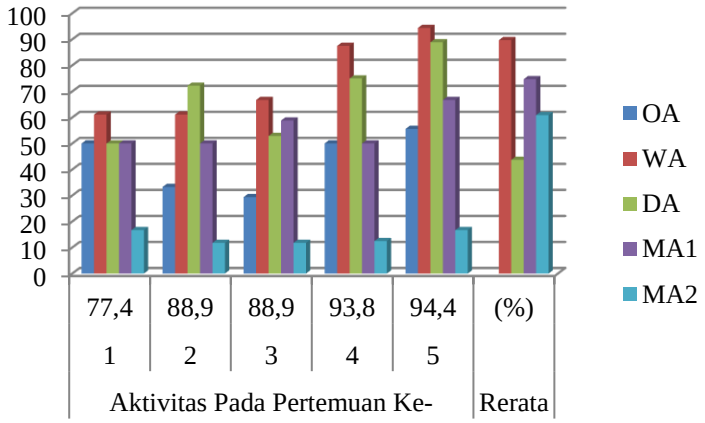


Figure 12. Student activities during meetings

Based on the observations of student activities during lectures, the module with the guide inquri approach can generate positive activities and reduce negative activities (Visual Activities, writing activities, drawing activities and mental activities are positive activities while Oral activities and motor activities include negative activities)

Learning outcomes tests are used to find out how the effectiveness of the module with the guide inquri approach to student learning outcomes. The learning outcomes that will be measured are cognitive abilities possessed by students after carrying out Complex Analysis lectures with the help of a module with an inquri guide approach. The learning

outcome test is held on November 7, 2018. Learning outcomes are obtained from the tests given in the form of essays in 3 items.

▪ CONCLUSION

Module Validity With the Guide Inquiry approach to Complex Analysis Lectures. Based on the results of the study it can be concluded that the results of the validation from the validator show that the module with a inquiry guide approach developed in the Complex Analysis lecture is valid. This means that the module has assessed what should be assessed in accordance with the competencies formulated in the syllabus.

Module Practicality With the Guide Inquiry approach to Complex Analysis Courses The results of the trials conducted on 7th semester students (seven) of the STKIP Muhammadiyah Sungai Penuh Mathematics Education Study Program showed that the module with an inquiry guide approach in the Complex Analysis lecture was practical. Modules with an inquiry guide approach in lectures Complex Analysis that is used can generate interest in learning and creative thinking because it is easy to understand and likes to use it. The time needed to study the module with the inquiry guide approach in the Complex Analysis lecture was insufficient, but this did not become a significant obstacle.

Module Effectiveness With the Guide Inquiry approach to Complex Analysis Lectures. The effectiveness observed in conducting lectures using modules with this inquiry guide approach is the activities and student learning outcomes. Based on the results of the description and data analysis, the level of student activity during the lecture process is active students. From the description of the seventh semester student learning outcomes of the Mathematics Education Study Program, more than 70% of students get scores of more than 65. This means the module can be said to be effective.

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