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VALIDITY OF GUIDED INQUIRY-BASED LEARNING INSTRUMENT WITH GEOGEBRA APPLETS FOR TEACHING CIRCLES

Stri Pertiwi[1], Mailizar Mailizar[2], Elizar Elizar[3]

[1]Universitas Syiah Kuala, Jl. Teuku Nyak Arief No. 441, Banda Aceh, Indonesia.
stripertiwii@gmail.com
[2]Universitas Syiah Kuala, Jl. Teuku Nyak Arief No. 441, Banda Aceh, Indonesia.
mailizar@usk.ac.id
[3]Universitas Syiah Kuala, Jl. Teuku Nyak Arief No. 441, Banda Aceh, Indonesia.
elizar@usk.ac.id

ABSTRACT

The guided inquiry learning model is a student activity that emphasizes maximally training critical thinking skills. The learning instruments developed must be adapted to the syntax/stages of the guided inquiry learning model. Several learning instruments have been developed to assist teachers in making teaching materials. However, many teachers have not mastered technology, especially learning media using applications. Therefore, teachers need learning applications in schools, such as the GeoGebra applet. This study aims to develop valid guided inquiry-based learning instruments using GeoGebra applets for circles. This research is development research employing Plomp's model and involving preliminary research and prototyping stages. The data was collected by compiling the comments and input from the validator through validation sheets related to learning instruments (lesson plans, worksheets, and GeoGebra applets). The results of the data analysis showed that the learning instruments were declared valid with an average lesson plan score of 4.75, an average student worksheet validation score of 4.60, and an average value of the total validation of GeoGebra applets of 4.94. Further research should assess the practicality and effectiveness of the instruments.

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Corresponding Author

Elizar Elizar
Universitas Syiah Kuala
Jl. Teuku Nyak Arief No. 441, Banda Aceh, Indonesia
Email: elizar@usk.ac.id

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INTRODUCTION

Learning is an interaction between students, educators, and learning resources in a learning environment. Mathematics learning has the following objectives: 1) understanding mathematical concepts accurately, efficiently, and precisely, 2) applying reasoning on patterns and characteristics and explaining mathematical ideas and statements, 3) solving problems, 4) communicating ideas with symbols, diagram tables, or other media to clarify situations or problems, and 5) appreciating the use of mathematics in life (Depdiknas, 2006). Learning will be more successful if it is done through sound information processing (Trianto, 2010).

Learning in schools is facilitated by learning models that encourage students to seek, understand, and find information for themselves. Inquiry-based learning is a component of information processing learning. Inquiry involves active participation or involvement in asking questions, obtaining information, and conducting investigations (Nuraisyah et al., 2015). In other words, inquiry is a process of asking and answering scientific questions. This is the goal of the inquiry-based approach, which is to help students build intellectual talent (thinking skills) connected to reflective thinking processes. Likewise, it is hoped that teachers who rarely use the inquiry learning model can improve and make it more effective to improve learning outcomes (Jauhar, 2011).

This study used guided inquiry. Guided inquiry ensures that students' ideas or concepts last. This is because students are actively involved in collaborating with teachers and other students during the learning process, from planning to finalization, and are even directly connected to students' lives (Kuhlthau, 2001). In guided inquiry learning, the teacher helps students by providing extensive advice and assistance to overcome a problem (Fathurrohman, 2015). Guided inquiry learning consists of the following steps: orientation, formulating problems, formulating hypotheses, collecting data, testing hypotheses, and formulating conclusions (Abidin, 2016). The guided inquiry method is a learning paradigm that emphasizes student participation (Suhartini et al., 2017).

Learning media are tools or equipment to help teachers and students to conduct learning activities (Prasetyo, 2011). Technology and the internet must be employed as learning media to enable learning in a flexible time and place (Samala et al., 2020). Various computer programs can help students learn mathematics, including GeoGebra. Geogebra is an interactive software offering algebraic possibilities, particularly for geometry, with some features for other topics (Hohenwarter & Fuchs, 2005). Geogebra can increase student interest in mathematics (Arbain & Shukor, 2015).

In this study, researchers used GeoGebra as an applet as a special program for learning media on circle material. Some software has been developed to assist teachers in making teaching materials. Therefore, teachers and students need to get training in using learning applications at school, such as using GeoGebra, especially in the form of applets.

Applets provide dynamic and interactive graphic representations of mathematical concepts (Morphett et al., 2015). The geogebra applet is a unique program built and runs using geogebra. Geogebra applet development can be initiated in a basic or complex way, depending on the purpose and intended application of the geogebra applet. In addition, the use of interactive GeoGebra applets inspires students to become more enthusiastic, improve their learning outcomes, and actively participate in the acquisition of knowledge (Radović, Radojičić, Veljković, & Marić, 2020). Teachers who want their students to experiment in class and at home can use this geogebra applet program. Therefore, this learning media is very suitable for implementing guided inquiry learning. In developing learning media, learning instruments are needed first. Learning instruments are the components used to manage the learning process to achieve competencies optimally (Trianto, 2011). As stated in Permendikbud Number 65 concerning Elementary and Secondary Education Processes, making a learning instrument is one of the components of lesson planning. Learning instruments include lesson plans, student worksheets, teaching materials, and learning media.

Several studies have examined GeoGebra using the guided inquiry model (Siswanto & Kusuma, 2017; Rahadyan et al., 2018; Safitri, 2019) but have not included questions in GeoGebra applets. Therefore, this study aims to develop valid guided inquiry-based learning instruments using GeoGebra applets for circles.

METHOD

The learning instruments developed in this study were lesson plans, worksheets, and learning media (geogebra applets). This study applied the development model of Plomp (2013), as it is one of the development models in the field of education and can be adapted to the learning model. This model consists of three stages: preliminary research, prototyping stage, and assessment phase but only two stages were conducted in this study, namely the preliminary research and the prototyping stages. Thus, the instrument developed in this study only reached valid criteria. Each stage of the Plomp model carried out by researchers is explained as follows.

Preliminary Research

This stage is the initial stage in development research. The preliminary research stage was carried out to determine the basic problems needed in developing learning instruments. At this stage, the researchers conducted curriculum analysis, material analysis, and evaluation of the content produced as part of this research.

Prototyping Stage

At this stage, the researchers designed the learning instruments: lesson plans, worksheets, and GeoGebra applets on circle material that is in accordance with the guided inquiry approach. The results of the device designed by the researcher are called prototype 1. The resulting prototype 1 was validated by the validators. An explanation of the stages or phases of developing learning instruments that are carried out according to the development of Plomp's model is explained in Figure 1.

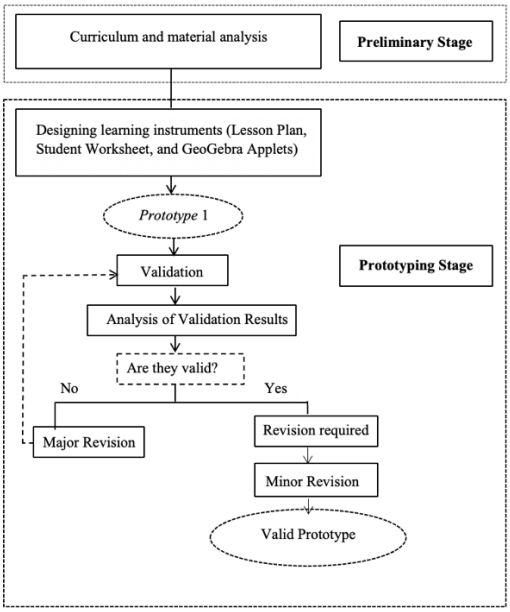


Figure 1. Stages of the Plomp's Model by Researchers

The subjects of this study consisted of four validators: two content expert validators and media experts from the Faculty of Mathematics and Science Faculty of Mathematics at Universitas Syiah Kuala, Indonesia, and two mathematics teachers at the junior high school level. The preliminary stage involved curriculum and material analysis. At the prototyping stage, the researchers designed learning instruments. The instruments in this study were validation sheets of lesson plans, worksheets, and learning media. The validation sheet examined the feasibility of using the learning instrument and learning media developed. Validity data analysis was carried out by finding the average of the categories and the

average aspects of the validation sheet. Furthermore, the average validator assessment results were obtained for each learning instrument by scoring for each component.

Using a Likert scale, the alternative answers are as follows: 5 =Excellent, 4 = Good, 3 = Moderate, 2 =Fair, and 1 =Poor. After the data collection, the average score was calculated using the following formula.

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

The average rating is based on the table of learning device validity criteria (Widoyoko, 2016).

Table 1. The Validity Criteria of the Learning Instruments

Achievement Rate Interval	Criteria
$\bar{x}$ > 4,20	Highly Valid
3,40 < $\bar{x} \leq$ 4,20	Valid
2,60 < $\bar{x} \leq$ 3,40	Fairly valid
1,80 < $\bar{x} \leq$ 2,60	Poorly valid
$\bar{x} \leq$ 1,80	Invalid

RESULTS AND DISCUSSION

The results revealed that learning materials for circle material using the guided inquiry model consisting of lesson plans, worksheets, and GeoGebra applet-assisted learning media met the valid criteria. In the preliminary stage, the curriculum and material analysis was done to identify the basic problems needed in developing learning instruments. Table 2 presents an analysis of the curriculum used as a reference for designing the learning instruments.

Table 2. Curriculum Analysis

Basic competencies		Indicators of Competence Achievement	
3.7	Explain the central angle, inscribed angle, arc length, and area of the arc of a circle and their relationship.	3.7.1	Identify the elements of the circle.
		3.7.2	Determine the relationship between the central angle and the circumference angle.
		3.7.3	Determine the relationship between the central angle, arc length, and sector area.
4.7	Solving problems related to central angles, inscribed angles, arc lengths, and areas of circles and their relationships.	4.7.1	Solve problems related to the relationship between the central angle, arc length, and sector area.

Table 3 is a material analysis that systematically identifies the concepts and skills students must acquire in learning circles. The material presented in the learning instrument developed is identifying the elements of a circle, determining the relationship between the central angle and the inscribed angle, and solving problems related to the relationship between the central angle, arc length, and area of the sector.

Table 3. Material Analysis

Learning materials	KD	Learning Activities
Circle elements The relationship between the central angle and the circumference angle of the circle The relationship between the central angle and the arc length, and the area of the circular arc	3.7 Explain the central angle, inscribed angle, arc length, and area of the arc of a circle and their relationship. 4.7 Solving problems related to central angles, inscribed angles, arc lengths, and areas of circles and their relationships.	Identify the elements of a circle using the GeoGebra applet. Conduct experiments on the relationship between the central and inscribed angles using the GeoGebra applet. Conduct experiments and conclude about the relationship between the central angle and the length of a circular arc using the GeoGebra applet. Conducting experiments and concluding the relationship between the central angle and the area of the sector of a circle using the GeoGebra applet.

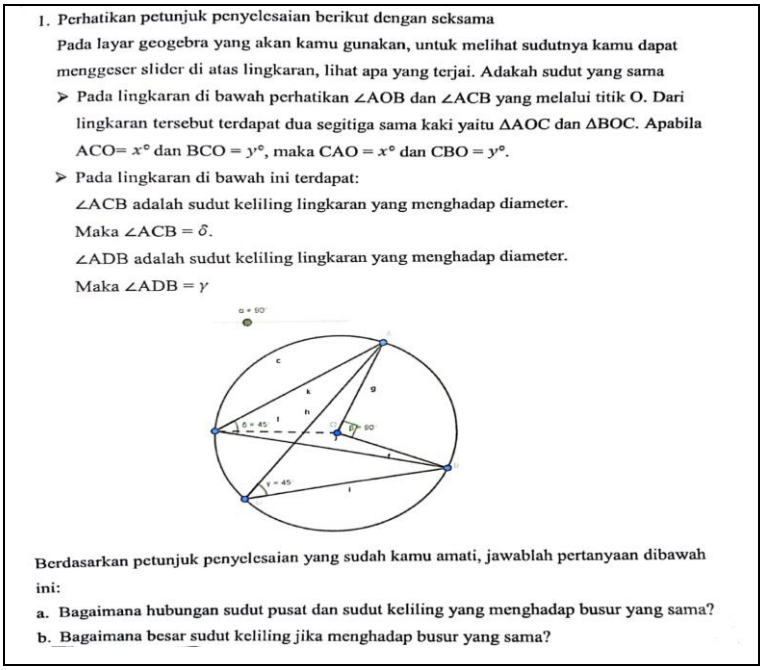
Furthermore, at the prototyping stage, the activities of making, compiling, and designing learning instruments were carried out. The lesson plans were designed to follow the latest one-page format. The student worksheets were designed by considering the objectives to be achieved in learning. The GeoGebra applet is designed as a learning medium that is used in accordance with the lesson plan and student worksheet. The lesson plan developed for three meetings was designed according to the components of the lesson plan and adapted to the guided inquiry model. Table 4 shows the formulation of learning objectives that refer to indicators of competency achievement.

Table 4. Formulation of Learning Objectives

Meeting	Learning objectives
First	Through group discussions with the guided inquiry model assisted by the GeoGebra applet, students are expected to be able to identify the elements of a circle.
Second	Through group discussions with the guided inquiry model assisted by the GeoGebra applet, students are expected to be able to determine the relationship between the central angle and the inscribed angle.
Third	Through group discussions with the guided inquiry model assisted by the GeoGebra applet, students are expected to be able to determine the relationship between the central angle and the arc length and area of the arc of a circle.

Furthermore, the development of student worksheets refers to the learning objectives that have been formulated. Student worksheet designed to implement group learning using the guided inquiry model. The developed student worksheets contain problems concerning concluding the elements of the circle and determining the relationships in the circle. The activities in the student worksheet are in accordance with the activities contained in the GeoGebra applet. The GeoGebra applet that was developed contains practice questions about circle material and clear instructions for use. The

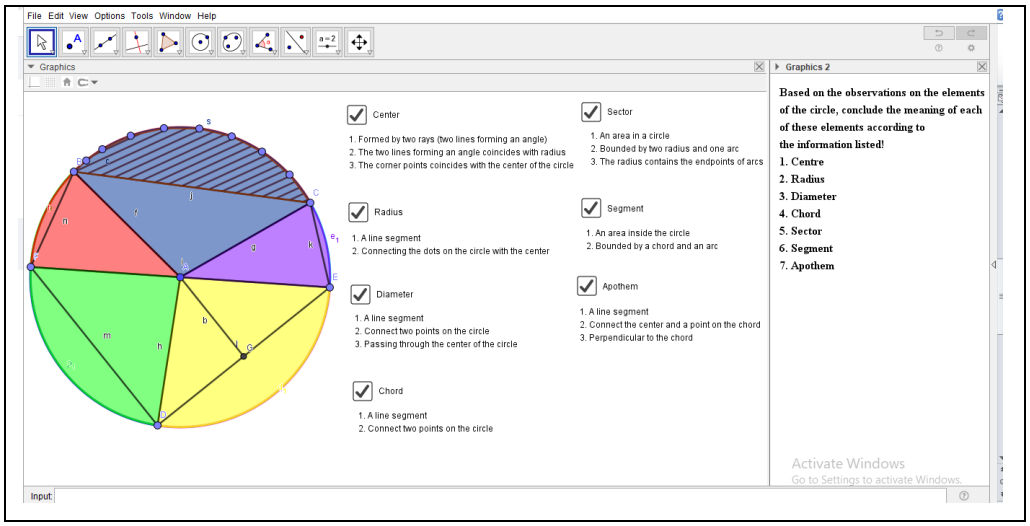
questions used in this study were adopted from Year 8 math textbooks, so there was no validation for the questions needed. Figure 2 shows one of the problems in this study regarding the relationship between the central and inscribed angles.

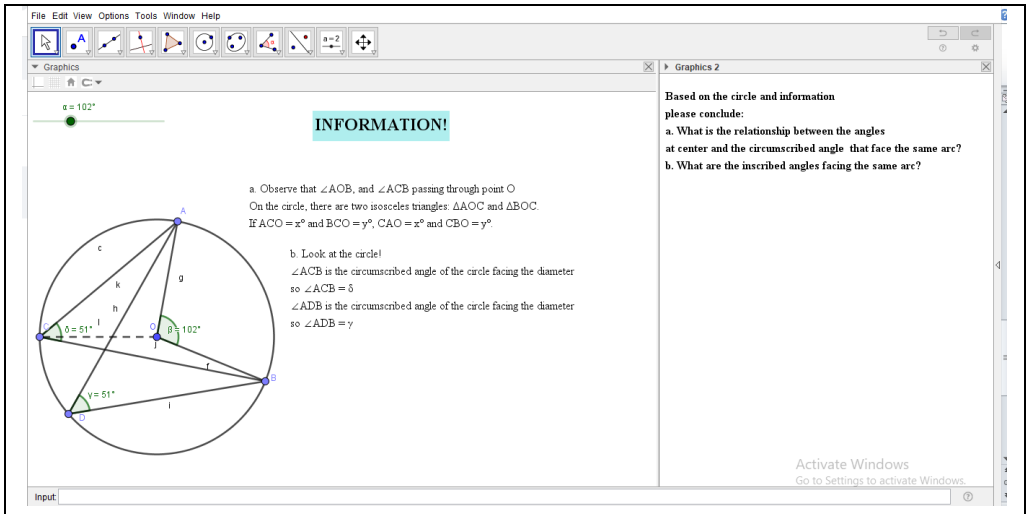

1. Perhatikan petunjuk penyelesaian berikut dengan seksama
Pada layar geogebra yang akan kamu gunakan, untuk melihat sudutnya kamu dapat menggeser slider di atas lingkaran, lihat apa yang terjai. Adakah sudut yang sama
- Pada lingkaran di bawah perhatikan ∠AOB dan ∠ACB yang melalui titik O. Dari lingkaran tersebut terdapat dua segitiga sama kaki yaitu ΔAOC dan ΔBOC. Apabila ACO= $x°$ dan BCO = $y°$, maka CAO = $x°$ dan CBO = $y°$.
- Pada lingkaran di bawah ini terdapat:
  ∠ACB adalah sudut keliling lingkaran yang menghadap diameter.
  Maka ∠ACB = δ.
  ∠ADB adalah sudut keliling lingkaran yang menghadap diameter.
  Maka ∠ADB = γ

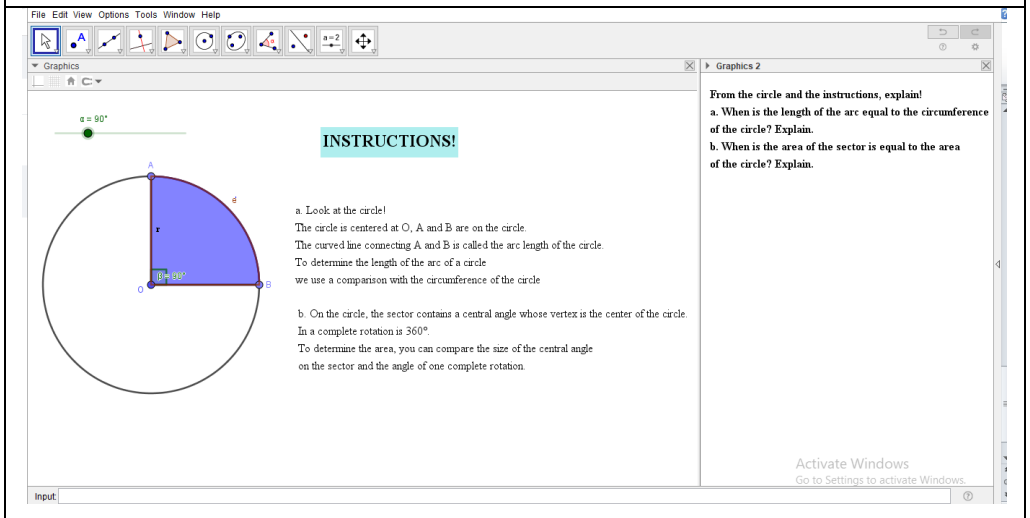
Berdasarkan petunjuk penyelesaian yang sudah kamu amati, jawablah pertanyaan dibawah ini:
a. Bagaimana hubungan sudut pusat dan sudut keliling yang menghadap busur yang sama?
b. Bagaimana besar sudut keliling jika menghadap busur yang sama?

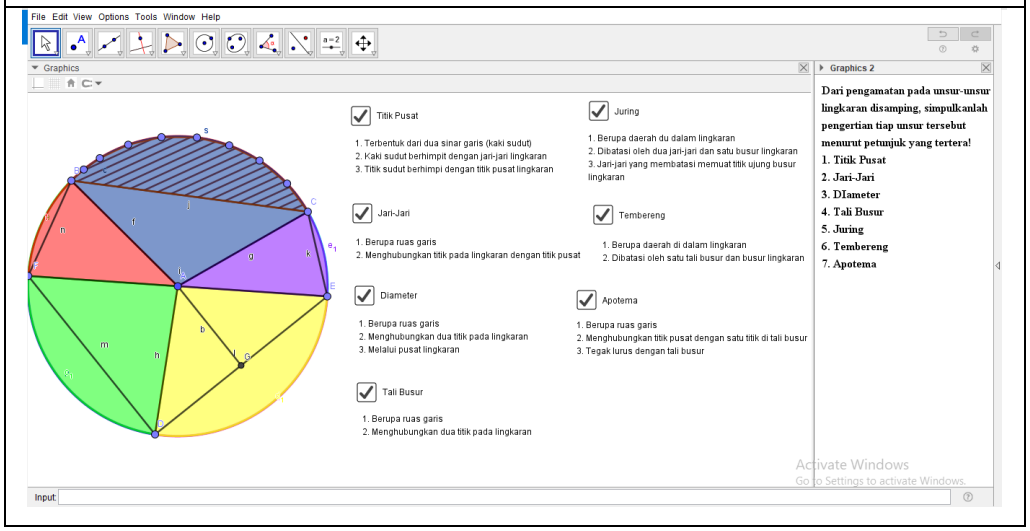
Figure 2. Problem with the relationship between the central angle and the inscribed angle

The GeoGebra applet used in this study is a learning medium that can be operated online via the web without downloading an application and does not require large storage space. Figure 3 presents the learning media in the form of a GeoGebra applet for circles.




File Edit View Options Tools Window Help
Graphics
Graphics 2
α = 102°
INFORMATION!
a. Observe that ∠AOB, and ∠ACB passing through point O
On the circle, there are two isosceles triangles: ΔAOC and ΔBOC.
If ACO = x° and BCO = y°, CAO = x° and CBO = y°.
b. Look at the circle!
∠ACB is the circumscribed angle of the circle facing the diameter
so ∠ACB = δ
∠ADB is the circumscribed angle of the circle facing the diameter
so ∠ADB = γ
δ = 51°
β = 102°
γ = 51°
Based on the circle and information
please conclude:
a. What is the relationship between the angles
at center and the circumscribed angle that face the same arc?
b. What are the inscribed angles facing the same arc?
Activate Windows
Go to Settings to activate Windows.
Input:


File Edit View Options Tools Window Help
Graphics
Graphics 2
α = 90°
INSTRUCTIONS!
a. Look at the circle!
The circle is centered at O, A and B are on the circle.
The curved line connecting A and B is called the arc length of the circle.
To determine the length of the arc of a circle
we use a comparison with the circumference of the circle
b. On the circle, the sector contains a central angle whose vertex is the center of the circle.
In a complete rotation is 360°.
To determine the area, you can compare the size of the central angle
on the sector and the angle of one complete rotation.
From the circle and the instructions, explain!
a. When is the length of the arc equal to the circumference
of the circle? Explain.
b. When is the area of the sector is equal to the area
of the circle? Explain.
Activate Windows
Go to Settings to activate Windows.
Input:


File Edit View Options Tools Window Help
Graphics
Graphics 2
Titik Pusat
1. Terbentuk dari dua sinar garis (kaki sudut)
2. Kaki sudut berhimpit dengan jari-jari lingkaran
3. Titik sudut berhimpi dengan titik pusat lingkaran
Juring
1. Berupa daerah du dalam lingkaran
2. Dibatasi oleh dua jari-jari dan satu busur lingkaran
3. Jari-jari yang membatasi memuat titik ujung busur lingkaran
Jari-Jari
1. Berupa ruas garis
2. Menghubungkan titik pada lingkaran dengan titik pusat
Tembereng
1. Berupa daerah di dalam lingkaran
2. Dibatasi oleh satu tali busur dan busur lingkaran
Diameter
1. Berupa ruas garis
2. Menghubungkan dua titik pada lingkaran
3. Melalui pusat lingkaran
Apotema
1. Berupa ruas garis
2. Menghubungkan titik pusat dengan satu titik di tali busur
3. Tegak lurus dengan tali busur
Tali Busur
1. Berupa ruas garis
2. Menghubungkan dua titik pada lingkaran
Dari pengamatan pada unsur-unsur
lingkaran disamping, simpulkanlah
pengertian tiap unsur tersebut
menurut petunjuk yang tertera!
1. Titik Pusat
2. Jari-Jari
3. DIameter
4. Tali Busur
5. Juring
6. Tembereng
7. Apotema
Activate Windows
Go to Settings to activate Windows.
Input:

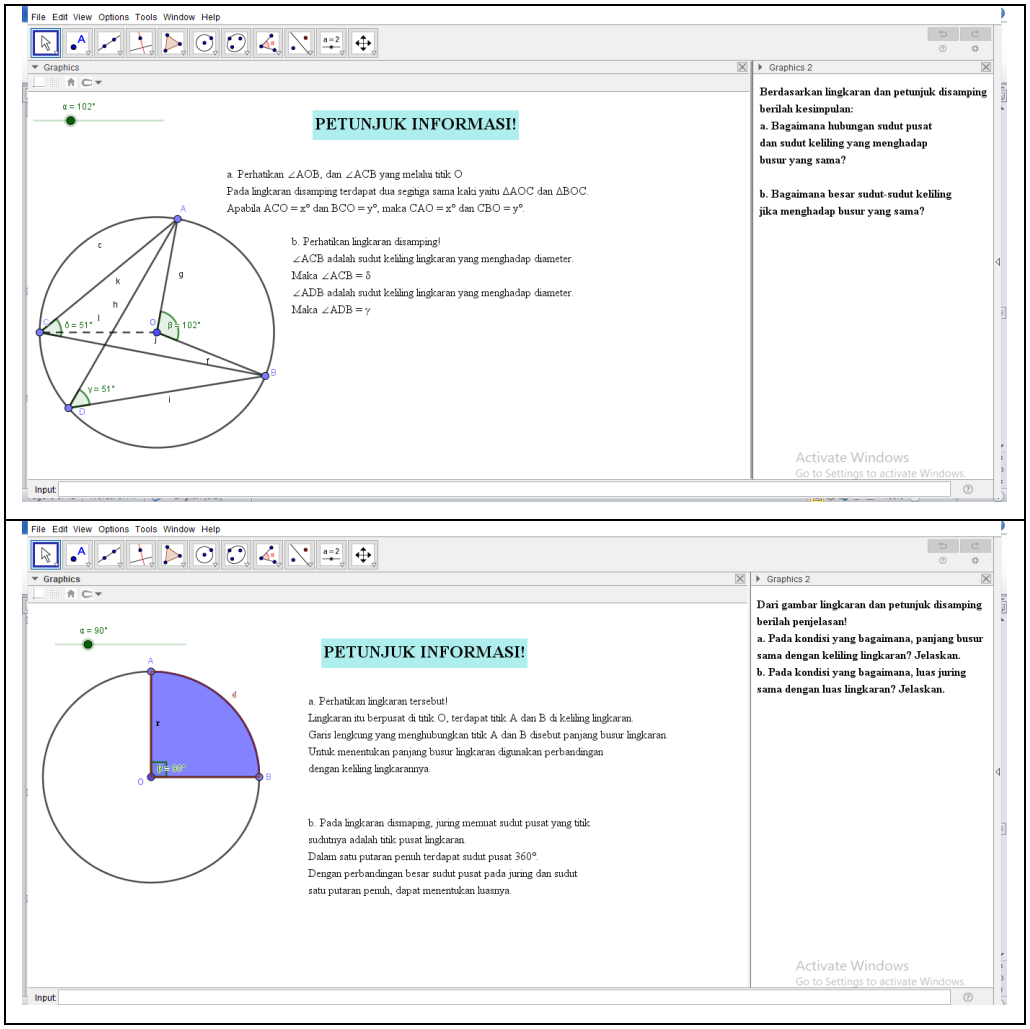


Figure 3. GeoGebra applet for Circles

To access the applet on circle materials, you can go through the following steps: 1) Activity 1 elements of the circle https://www.geogebra.org/calculator/x8hgknxw, 2) Activity 2 the relationship between the central angle and the inscribed angle https://www.geogebra.org/calculator/hbfemb2k, 3) Activity 3 the relationship between the central angle and the length of the circular arc https://www.geogebra.org/calculator/jexekz6p.

The instrument compiled in this study is a learning device validation sheet designed as an instrument to obtain validation results data. Learning instruments are validated by expert validators in their fields. Based on the results of the validation, the lesson plan that was developed met the valid criteria with minor revisions. The lesson plan was validated using several components, such as content feasibility, construction feasibility, and language feasibility. The results of the validator's assessment of the lesson plans show that the average rating score for all components is 4.75. Therefore, based on the instrument validity criteria presented in Table 1, the lesson plans meet the highly valid criteria. In

addition to assessing the learning instrument being developed, the validator provided some suggestions and input so that the developed lesson plan was feasible. Table 5 summarizes suggestions and comments on the lesson plan developed from several validators and revisions made.

Table 5. Revised lesson plan

Before Revision	After Revision
Not including the assessment of Minimum Competence (AKM), indicators, and appropriate learning objectives.	Include competencies, indicators, and learning objectives that are in accordance with AKM.
In the introductory part of the lesson, the appropriate apperception and motivation have not been included.	Apperception and motivation have been included in the introduction.
Examples of assessment and reflection sentences have not been included in the closing part of the lesson.	Sentences for assessment and reflection in the closing part of the lesson have been included accordingly.
The assessment procedure is still unclear.	The assessment procedure has been completed as needed.

Furthermore, the learning instruments validated by the validator were the student worksheets. The student worksheet was validated using several components, such as content feasibility, construction feasibility, language feasibility, and graphic feasibility. The results of the validator's assessment of the student worksheet show that the average score for all components is 4.60. Therefore, the validity criteria of learning instruments (Table 1) shows that student worksheet meets highly valid criteria.

In addition to providing an assessment of the student worksheet being developed, the validator also provides some suggestions and input so that the developed student worksheet is feasible for use. Table 7 summarizes suggestions and comments regarding the student worksheet developed from several validators and revisions.

Table 7. Student Worksheet Revision

Before Revision	After Revision
On the student worksheet, the explanation "use the GeoGebra screen" does not need to be included, and make motivational sentences for each activity.	The student worksheet contains motivational words and does not display the words "use the GeoGebra screen."
The time allocation does not match the details that have been made at each stage of learning.	Allocation of time already with details that have been made at each stage of learning.
Learning objectives are still not in accordance with AKM-based learning.	Learning objectives are in accordance with the required learning.
At meeting 1, the instructions for the activity did not need to be detailed; it was enough to give instructions on how to use it when it was displayed on the GeoGebra screen.	At meeting 1, the activity instructions were brief and showed how to use them on the GeoGebra screen.
Add instructions for the part that students must slide when used using GeoGebra.	Instructions for using the student worksheet on the GeoGebra screen have been explained.

For learning, the media developed by the validator did not provide suggestions and comments. The validator only provides an assessment regarding several components that are validated in the form of material feasibility components, illustration feasibility

components, quality feasibility components and media appearance, and attractiveness eligibility components. The results of the validator's assessment of learning media in the form of GeoGebra applets show that the average rating score for all components was 4.94. Therefore, based on the validity criteria of learning instruments (Table 1), the learning media met very valid criteria and required no revision.

Based on the results of the validation assessment, it was found that the mathematics learning instruments with the guided inquiry model assisted by the GeoGebra applet for circle material met the very valid criteria according to the components used. The results of this study are in line with the research of Sulistyowati, Usman, & Harini (2022), producing a valid GeoGebra applet valid that can be used as a reference for other related research and mathematics classroom.

The learning instruments produced in this study have met the valid criteria but have not been tested for practicality and effectiveness. However, this learning instrument is ready and valid for field testing.

CONCLUSION

To sum up, the learning instruments developed in this study (lesson plans, worksheets, and GeoGebra applets) using the guided inquiry model have met the highly valid criteria. The development of these learning instruments was based on the Plomp model (2013), covering preliminary and prototyping stages. Two mathematics lecturers and two junior high school mathematics teachers were involved in the validation. All instruments developed are valid and thus are feasible to use.

REFERENCE

Arbain, N., & Shukor, N. A. (2015). The Effects of GeoGebra on Students Achievement. *Procedia - Social and Behavioral Sciences*, 208–214.

Depdiknas. (2006). *Permediknas Nomor 22 Tahun 2006 Tentang Standar Isi Sekolah Menengah Atas*. Jakarta: Depdiknas.

Fathurrohman, M. (2015). *Model--model pembelajaran inovatif: Alternatif desain pembelajaran yang menyenangkan*. Yogyakarat: Al-Ruzz Media.

Hohenwarter, M., & Fuchs, K. (2005). Combination of dynamic geometry, algebra, and calculus in the software system GeoGebra. *Computer Algebra Systems and Dynamic Geometry Systems in Mathematics Teaching Conference*, 1–6.

Jauhar, M. (2011). *Implementasi Paikem dari Behaviorisik Sampai Konsruktivitas*. Jakarta: Prestasi Pustaka Publisher.

Kuhlthau, C. (2001). Guided Inquiry: School Libraries in the 21st Century. *School Libraries Worldwide*, 1–12.

Morphett, A., Gunn, S., & Maillardet, R. (2015). Developing interactive applets with GeoGebra : processes, technologies. *Elephant Delta: 10th Southern Hemisphere Conference on the Teaching and Learning of Undergraduate Mathematics and Statistics*, 110–132.

Nuraisyah, Samad, A., & Maruf, U. M. M. (2015). Upaya Meningkatkan Hasil Belajar Fisika Melalui Model Pemecahan Masalah (Problem Solving). *Jurnal Pendidikan Fisika*, *3*(3), 270–278.

Plomp, T., & Nieveen, N. (2013). Educational design research. *Enschede: Netherland Institute for Curriculum Development (SLO).*

Prasetyo, KZ., dkk. (2011). *Pengembangan perangkat pembelajaran sains terpadu untuk meningkatkan kognitif, keterampilan proses, kreativitas serta konsep ilmiah peserta didik SMP*. Yogyakarta: Pascasarjana UNY.

Radović, S., Radojičić, M., Veljković, K., & Marić, M. (2020). Examining the effects of Geogebra applets on mathematics learning using interactive mathematics textbook. *Interactive Learning Environment, 28*(1). 32–49.

Samala, A., Fajri, B., Ranuharja, F., & Darni, R. (2020). Pembelajaran Blended Learning Generasi Z di era 4.0. *Jurnal Teknologi Informasi Dan Pendidikan*, 45–53.

Suhartini, E., Supardi, Z. A. I., & Agustini, R. (2017). Pengembangan Perangkat Pembelajaran Model Inkuiri Terbimbing Berbantuan Teknik Mind Mapping untuk Meningkatkan Penguasaan Konsep dan Kemampuan Berpikir Kreatif Siswa SMP. *JPPS (Jurnal Penelitian Pendidikan Sains)*, *5*(2), 892.

Sulistyowati, F., Usman, A., & Harini, E. (2022). Media Pembelajaran Lingkaran Berbasis GeogebraApplet untuk Penguatan Kemampuan Berpikir Kreatif Melalui

Pembelajaran Open Ended. *Delta: Jurnal Ilmiah Pendidikan Matematika*, *10*(2), 313–328.

Trianto. (2010). *Mendesain model pembelajaran inovatif progresif*. Jakarta: Kencana Prenada Media Group.

Trianto. (2011). *Model pembelajaran terpadu konsep strategi dan implementasinya dalam Kurikulum Tingkat Satuan Pendidikan (KTSP)*. Jakarta: Bumi Aksara

Widoyoko, E. (2016). *Teknik penyusunan instrumen penelitian*. Yogyakarta: Pustaka Pelajar.

Yunus, A. (2016). *Desain sistem pembelajaran dalam konteks kurikulum 2013.* Bandung: PT Refika Aditama.

Siswanto, R. D., & Kusumah, Y. S. (2017). Peningkatan kemampuan geometri spasial siswa smp melalui pembelajaran inkuiri terbimbing berbantuan geogebra. *JPPM (Jurnal Penelitian Dan Pembelajaran Matematika)*, *10*(1).

Rahadyan, A., Hartuti, P. M., & Awaludin, A. A. R. (2018). Penggunaan Aplikasi Geogebra dalam Pembelajaran Matematika di Sekolah Menengah Pertama. *Jurnal PkM Pengabdian Kepada Masyarakat*, *1*(01), 11-19.

Safitri, R. L., Oktaviani, D. N., & Isnani, I. (2019). Validasi Lembar Kegiatan Peserta Didik dengan Pendekatan Inkuiri Berbantuan Geogebra. *JIPMat*, *4*(2).