VISUAL MATH OF SECONDARY MATHEMATICS EDUCATION IN THE AREA OF GEOMETRY USING GEOGEBRA

J.Sengamalaselvi
Assistant Professor, Department of Mathematics,
Sri ChandraSekharendra Saraswathi Viswa Mahavidyalaya, Kanchipuram, Tamilnadu
V.Nalini
Research Scholar, Department of Mathematics,
Sri ChandraSekharendra Saraswathi Viswa Mahavidyalaya, Kanchipuram, Tamilnadu
T.Venugopal
Professor of Mathematics, Research, and Director of Publications, Dean (Arts & Humanities)
Sri ChandraSekharendra Saraswathi Viswa Mahavidyalaya, Kanchipuram, Tamilnadu.

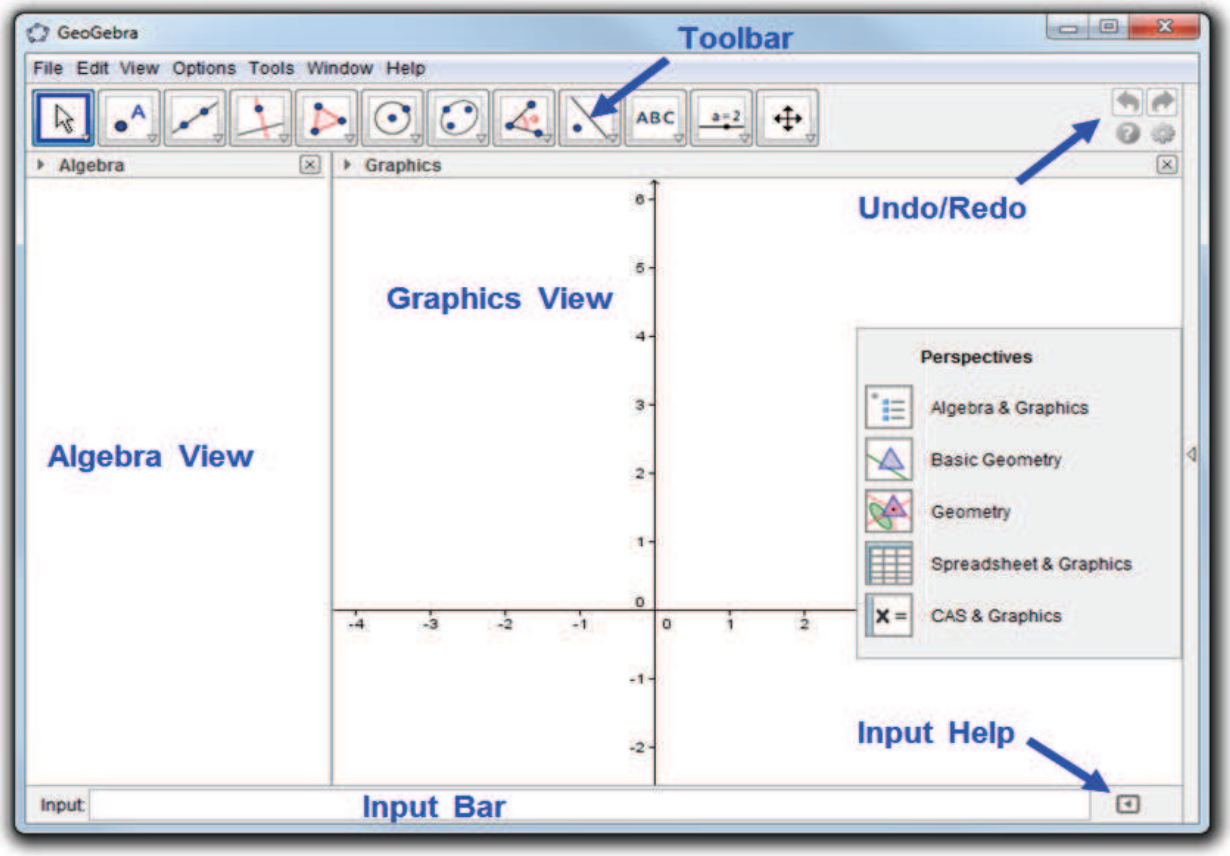
Abstract: Information and Communication Technology (ICT) is an important instrument, which can transfer the present isolated, teacher-centered, book-centered learning environment into a rich student-centered environment. It is a new teaching-learning process, aims at transferring the old traditional paradigm of learning to the new paradigm of learning and of course teaching. In this sense, UNESCO is giving a high priority to the use of ICT for more equitable and pluralistic development in education, this research work pivoted aiming to expand the knowledge base about the issues pertaining in the implementation of ICT tool Geogebra in education which mainly centered on interactive learning environment. Based on the literature gap , the paper highlights in the area of Mathematics, particularly in the field of Geometries for Secondary Mathematics Education. The issues related to graphical representation diagrams are addressed with the help of Geogebra (i.e. open source software), which can be downloaded by students without any cost.

Keywords: Geogebra, Geometry, Secondary Mathematics Education, Visual Math.

Introduction: Geo Gebra is an interactive Mathematics software package incorporating geometry, algebra, and calculus, each of which can be used separately. In the context of a developing country like India, open source (Public domain) software like Geogebra is most important since it can be downloaded without costs by anyone with internet access.

Geo Gebra is the best example of Mathematical software were geometric figures can be manipulated and algebraic operations can be conducted not only by teachers, but at times by students working independently of the teacher.

Geogebra is not computer supported rather computer created mathematics. The problem identification, definitions, thesis and proofs are created with the help of computer. The Main aim is to present how experimental mathematics can be adapted to teaching mathematics.



1. Construction of Quadrilaterals:

1.1. Construct a quadrilateral ABCD with AB=4cm, BC=6cm, CD=5.6cm, DA=5cm, and AC=8cm.Find also its area.

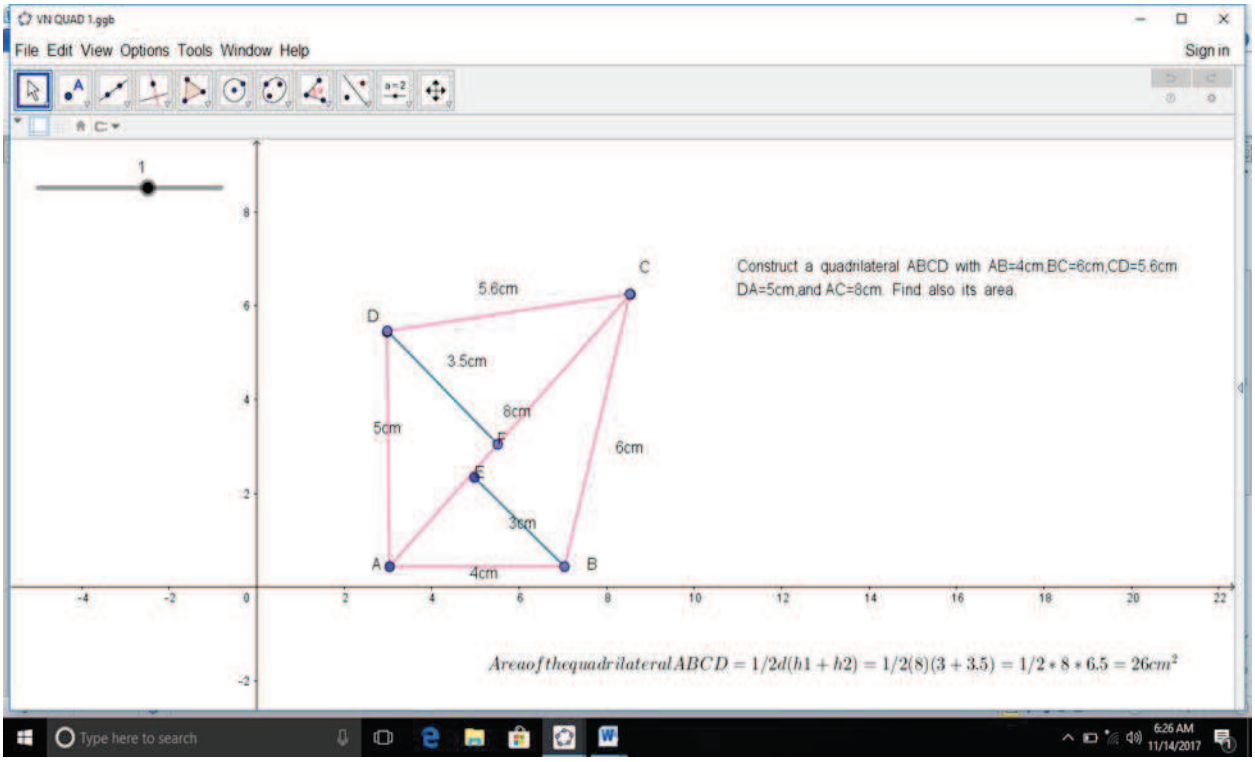


Figure 1.1: Construction of a Quadrilateral with 4 Sides & 1 Diagonal.

Area of the Quadrilateral ABCD=1/2d(h1+h2)=1/2(8)(3+3.5)=1/2*8*6.5=26cm2.

1.2. Construct a quadrilateral ABCD with AB=6.5cm , AD=5cm, CD=5cm,∠BAC=40◦ and ∠A BC=50◦ And also find its area.

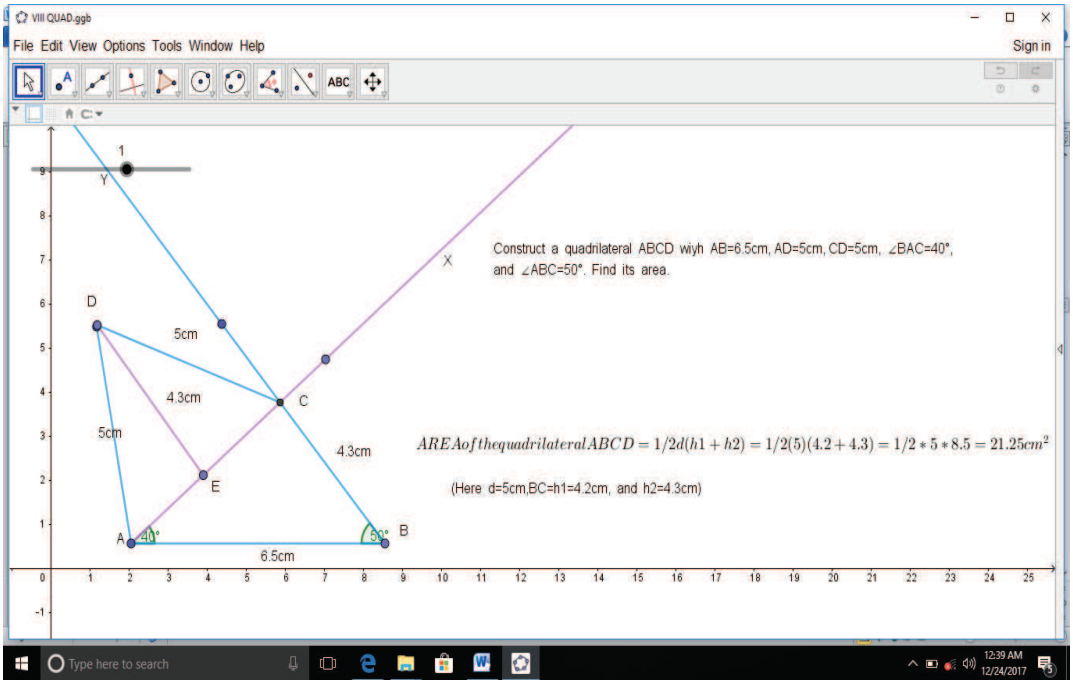


Figure 2.1: Construction of an Isosceles Trapezium.

Area of the trapezium ABCD=1/2h(a=b)=1/2(5.6)(11+7)=1/2*5.6*18=50.4cm2

3. Construction of Parallelograms:

3.1. Construct a parallelogram ABCD with AC=9cm, BD=7cm, and ∠AOB=120◦ where AC and BD intersect at 'O' and find its area.

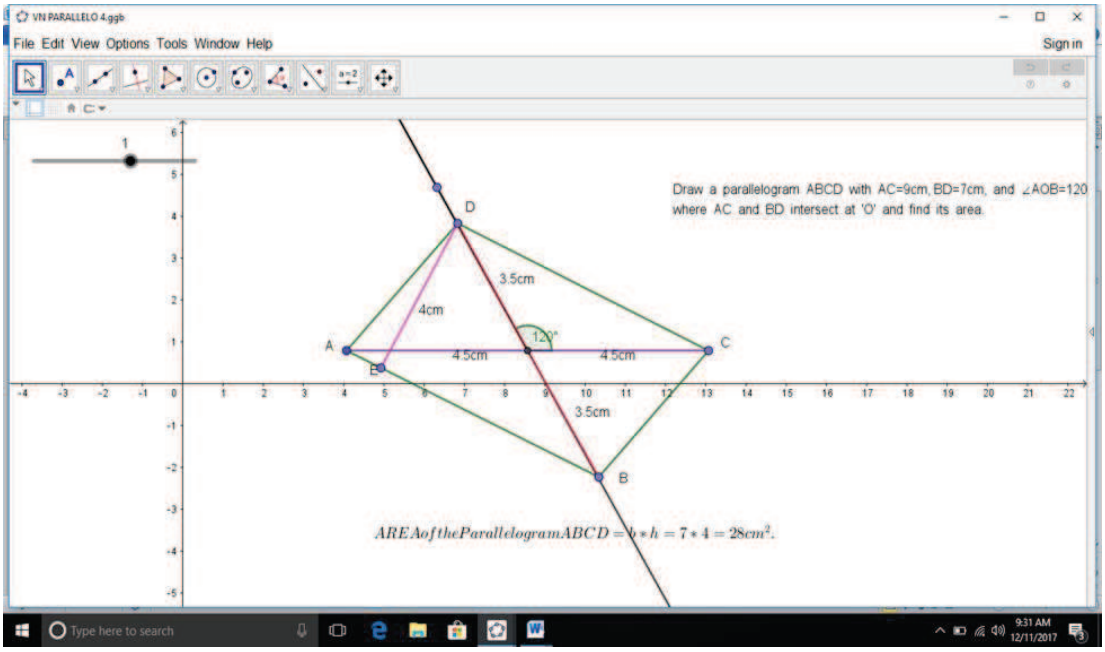


Figure 3.1: construction of a parallelogram ABCD with 2 diagonals & 1 included angle

Area of the parallelogram ABCD=b*h=7*4=28cm2.

4. Construction of Rhombus:

4. Construct a rhombus ABCD with AC=7.5cm, and ∠A=100◦. Find its area.

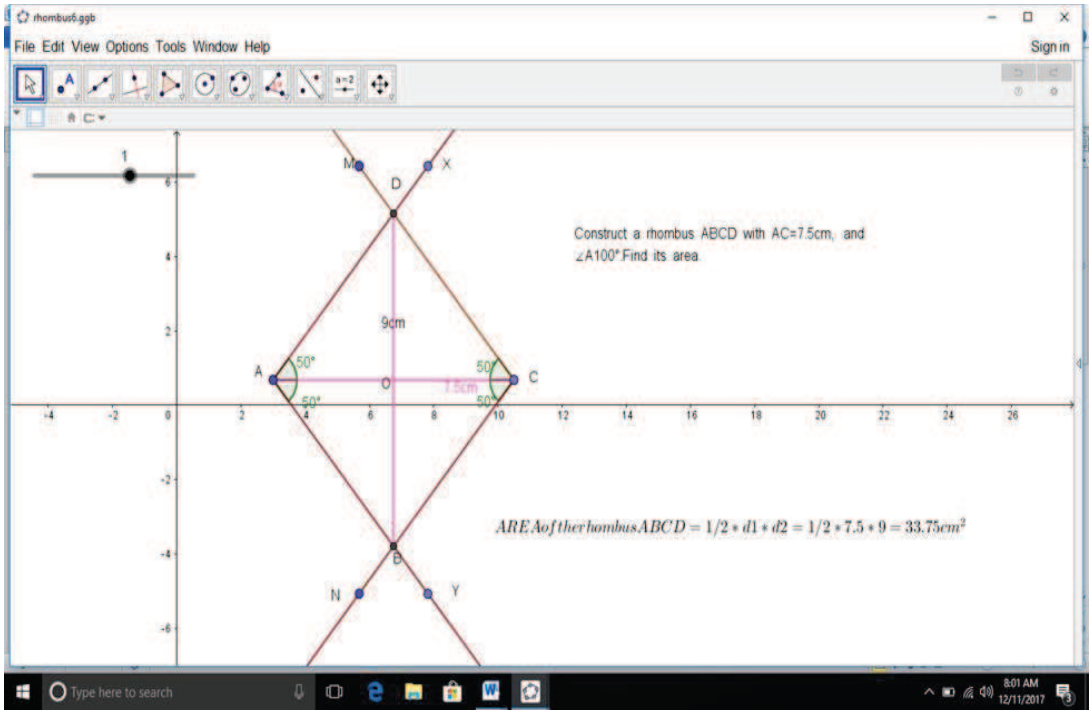
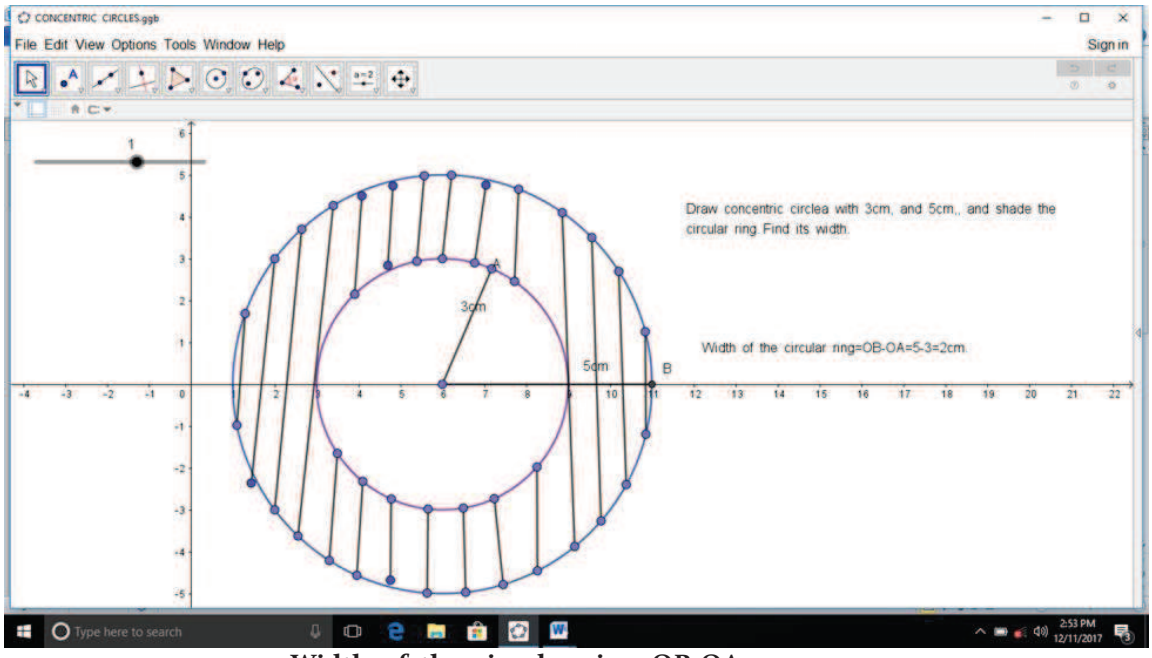


Figure 3.3.4d: Construction of rhombus with 1 diagonal & 1 angle.
Area of the Rhombus ABCD=1/2*d1*d2=1/2*7.5*9=33.75cm2.

4. Construction Of Concentric Circles When The Radii Are Given:

4.1 Draw concentric circles with radii 3cm and 5cm and shade the circular Ring. Find its width.



Width of the circular ring=OB-OA=5-3=2cm.

Conclusion:

- In the conventional method the students are able to only imagine the pictures. There is no scope for seeing the plotting, angle, etc. from a different point of view. So it is difficult for them to have a clear vision of the picture. Whereas in the Geogebra method the students are able to visualize the pictures clearly and understand it better. The graphical representation helps in are easy understanding.
- The society which adopts new technological inventions will grow very fast. At present there is a tremendous change in computer and information technology. So this is a proper time for the switch over to the new methodology in the teaching field. Moreover, the students will easily adopt and have access to this new technology rather than the teaching faculty. This will help the students to keep in pace with the latest technologies as well as the other pupil who live in the other part of this world. The age old traditional teaching cannot be easily dislodged or evaded, but at the same time we should not ignore implementing new methodology in teaching learning process. The author strongly believes that this new technology will rule our classrooms in the near future.

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