Application of Inventory Information Systems as a Work Practice Management Strategy in Improving Technology Learning in Education Management

Siti Nurhabibah Hutagalung
Universitas Budi Darma

Article Info	ABSTRACT
	The application of technology in education management often faces challenges in efficient inventory management and technology integration in learning. This research aims to evaluate the effectiveness of inventory information systems as a work practice management strategy in enhancing technology learning in educational management. The research method involved a case study in an educational institution where an inventory information system was implemented. Data were collected through interviews with management staff, observation of work processes, and analysis of the effectiveness of the system through improved operational efficiency and quality of technology learning. The main results showed that the implementation of the inventory information system improved the efficiency of resource management and strengthened technological learning in educational management. In conclusion, the implementation of an inventory information system is recommended as an effective solution to improve the quality of management and learning in education.
	Corresponding Author: Siti Nurhabibah Hutagalung Universitas Budi Darma E-mail :

INTRODUCTION

Currently, educational orientation tends to treat students as objects, while educators function as the holders of the highest scientific authority. Such an educational orientation causes our educational practice to isolate itself from the real life that exists outside, to be less relevant between what is taught and the needs of work, too concentrated on intellectual development that is not in line with the development of the individual as a whole and personality. This is one of the factors that results in low student learning outcomes, including negative behaviors in learning that allow students not to be enthusiastic about learning. Learning activities usually only emphasize the transformation of factual information, educators tend to write definitions or theorems along with their evidence on the whiteboard followed by examples of the application of the theorem in problem solving, while students record what is explained and examples of problem solving written. In addition, educators write questions on the board and students are asked to do it, and ask students to write the results of their work on the board (Dewi and Azmi 2018). Many factors cause students to have difficulties in understanding the subject. The low mathematical ability of students is caused by various factors such as student factors and learning factors. The student factor is the low interest of students in learning mathematics so that students' attitudes towards mathematics subjects are negative. This has an impact on low problem-solving skills in working on problems. The learning factor is the lack

of use of technology or ICT (Information Communication and Technology)-based learning in the learning process (Dewi and Azmi 2018). Autograph is a software developed by Douglas Butter. In its history, the first Autograph Version 3 was published in March 2004, then Autograph version 3.10 was published in April 2005, and the current Autograph version 3.20 international (Unicode) edition was published in May 2007 (Listiana, -, and Wirevenska 2020).

Some mathematical simulation media *Geogebra*, *Mathematica8, ModellusX* and *Autograph5* assisting in the translation of theories and the formulation of visualization graph forms. With *Autograph*, can conduct exploration, investigation, and search for information. Students can test more examples in a short time than just using their hands, so that from the experiment they can create, construct and formulate mathematical principles, as well as the conclusion understand how to draw and read graphs of quadratic functions, determine the set area of SPtLDV (2 Variable Linear Inequality System), integral, Drawing the Area and Volume of the Rotating Object correctly (Parinduri, Hutagalung, and Panjaitan 2021).

Related research on the use of *software Autograph* be Implementing a problem-based learning model that utilizes autographs can improve students' conceptual comprehension, reasoning, critical thinking skills, and mathematical communication (Hasibuan 2016). Learning using autographs is learning by utilizing computers as one of the effective and efficient tools in supporting the quality of learning (Telaumbanua and Zendrato 2019).

METHODS

Place and Time of Research

The implementation of the research was carried out in the process of learning mathematics of square equation material and the volume of rotating objects at SMA Negeri 14 Medan, the research implementation time lasted for 6 months.

Research Methods and Design

The math learning process focuses on using Autograph software to display the results of quadratic equations and the volume of rotating objects. The process begins with general math learning activities. This is followed by the formulation of quadratic equations and the calculation of the volume of rotating objects. The next step is the installation of the Autograph software, which is then followed by data input and the application of logic in the software. Finally, the results of the quadratic equation and rotating object volume display are obtained and displayed as the final output of this process. The process ends once all the steps are completed.

Activity Implementation Method

The implementation method of this research activity consists of: Formulation of a literature review of mathematical materials consisting of square equations and rotational volumes Installation of *Autograph5 software* on students' Laptops Input of square equation data and rotating object volume against *Autograph5 software* The output of the material simulation of the square equation and the volume of the rotating object.

Preparation and Planning

In the implementation of this research, it is necessary to pay attention to the preparation and planning which consists of:
Formulating the concept of the equation of square and volume of a rotating body, Autograph5 software *installation*. The concept of square equation and volume of rotating objects in *Autograph5 software*. Analysis of the simulation display of mathematics material

RESULTS AND DISCUSSION

So far, the teaching process at SMA NEGERI 14 MEDAN in mathematics subjects is still carrying out the teaching and learning process using books and LKS (Student Worksheets) both in explaining formulas and image displays, both graphs and results, where there is ineffectiveness in teaching or it is said that teaching is only one-way.

The use of *Autograph5* starts from the stage of determining the theoretical formulation by using "Enter Question" on the 2-Dimensional display, for example in the Equation:

$$4x + 6y \leq 24 \text{ ;}$$

Then the input of the equation $4x + 6y \leq 24$ is carried out as follows:
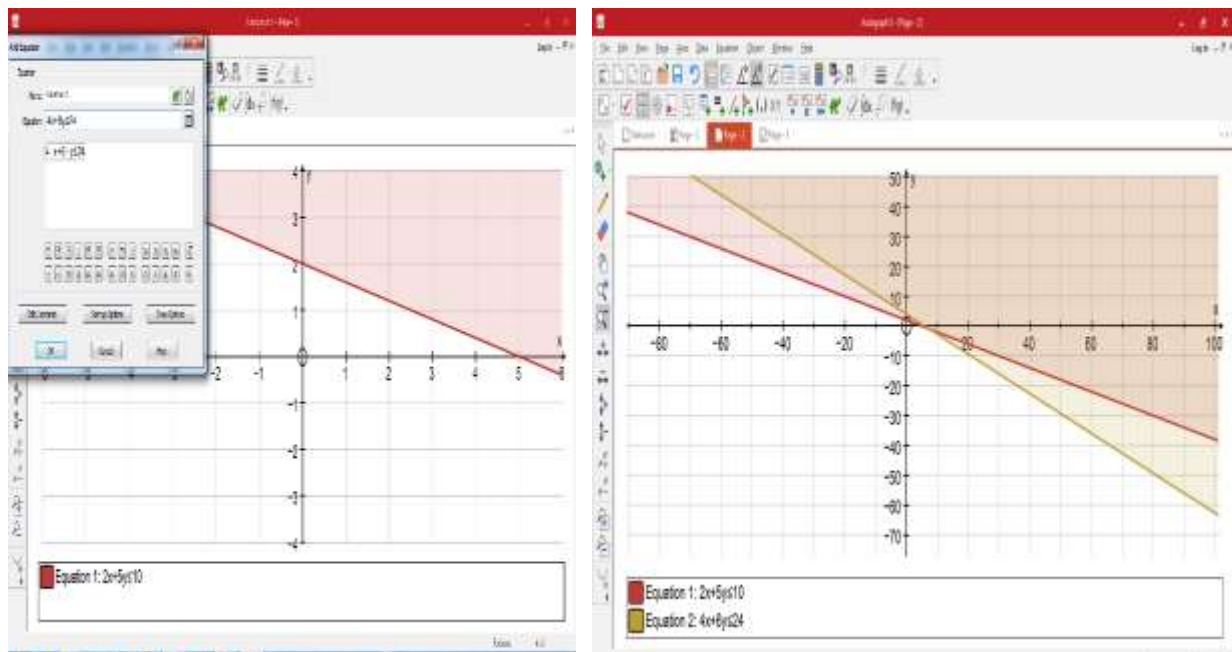
Figure 1: Equation Input, b. Display of Graph Results $4x + 6y \leq 24$

Visualization of Calculating the Volume of a Rotating Object

Open the *Autograph* program and select the "advanced" menu for a more complete view. Next, select the 3D menu on the *Autograph toolbar*, see the image below click on the arrow that shows:
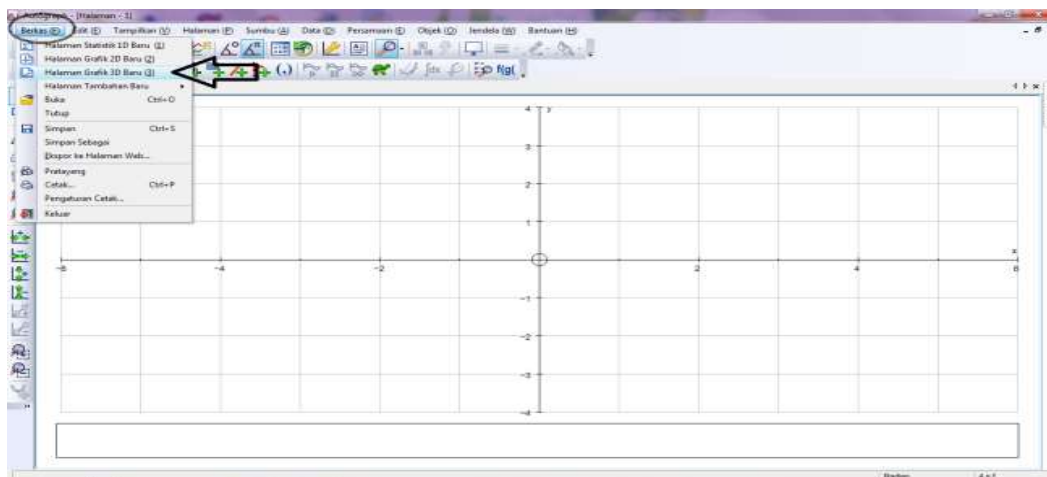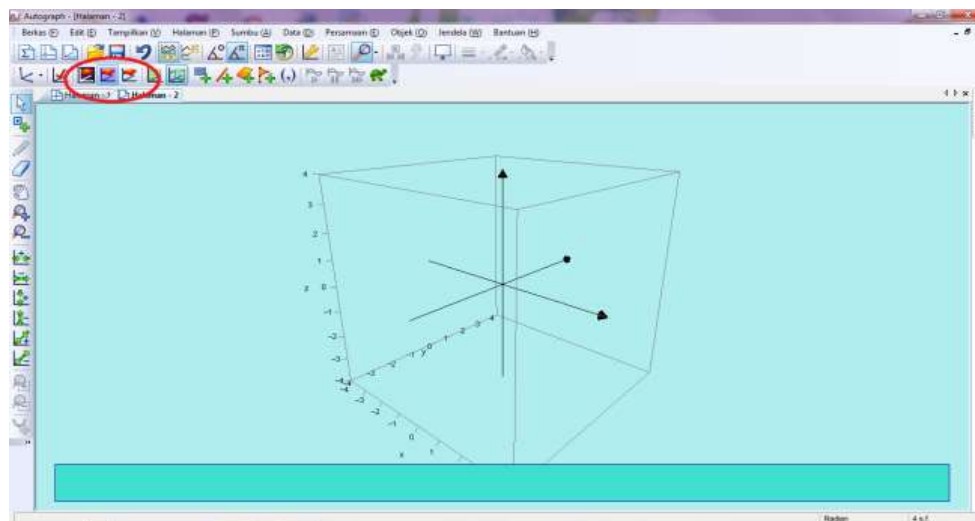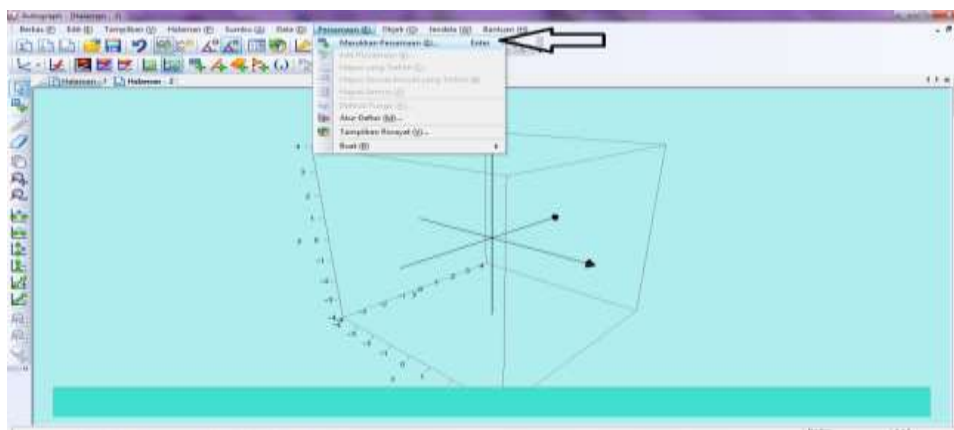

Figure 2. Dimensional Menu Options

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Then select the desired color from the *toolbar* circled in red below:
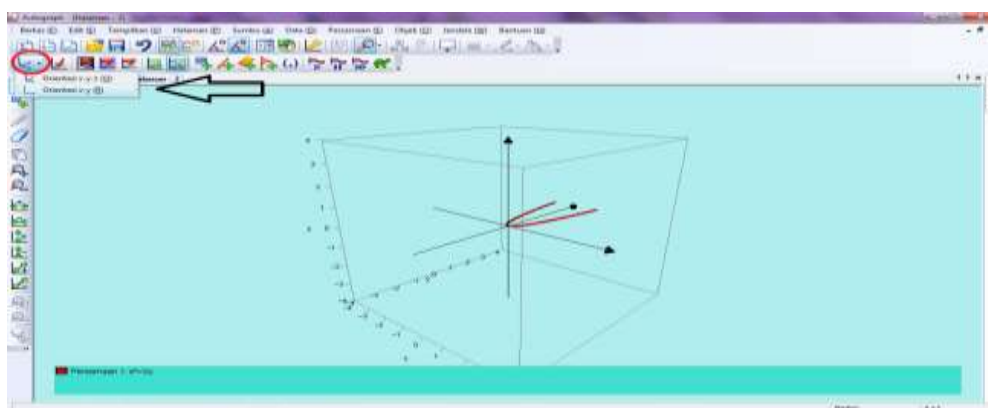
Figure 3. Selection *of* Autograph *Display Background Color*

Then select *the* "equation" toolbar and then click "enter equation" indicated by the following arrow:
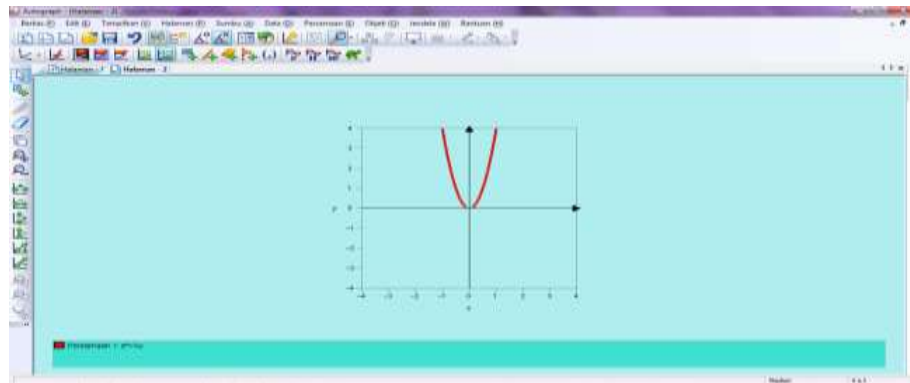
Figure 4. *Mathematical Equations* Toolbar Input

Next, click on the *tool* circled in red, then select and click "x-y orientation" which is indicated by the following arrow:

Figure 5. x-y Orientation Toolbar Display

Then the curve display changes to the form of *cartesius* coordinates as follows:


Figure 6. Cartesian Coordinate Curve Display

To display the *cartesius axis* in the x-y line, click the "Axis" tool then click "Edit Axis" and the "Edit Axis settings" table will appear, then click "Options" and remove the check mark on "always outside" then the following image will appear:
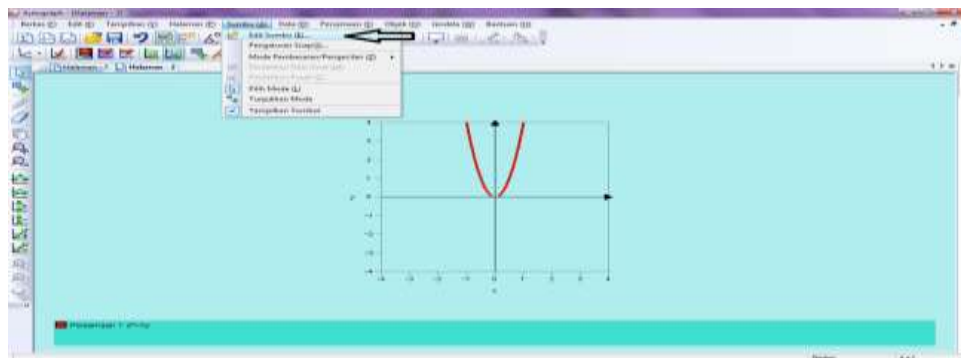
Figure 7. Editing the *Cartesius* xy axis

Next, right-click on the curve, then left-click and select "find surface area", then the "edit field" table will appear, then in the "method" section you can choose the partition method in the curve, in the "parameters" section you can specify the number of partitions and in the "endpoint" section you can specify the partition limit. Then if selected on the "rectangle (+)" method and then click "OK" or "ENTER" will appear as follows:

a	b
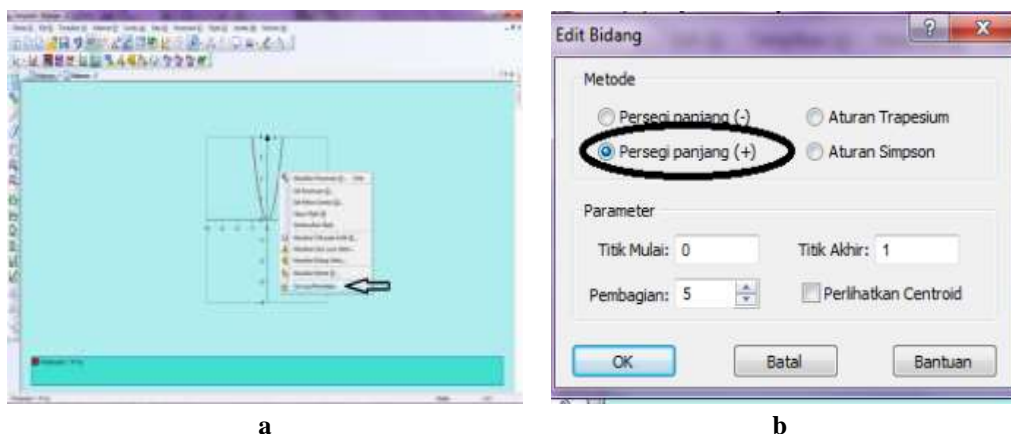
Figure 8. a.Edit Fields, b. Curve

Then right-click on the partition and then left-click, after that click "search volume" then a dialog table will appear to determine the X rotation axis you want for example: 4, then click "OK" then a display will appear as shown in the following picture:
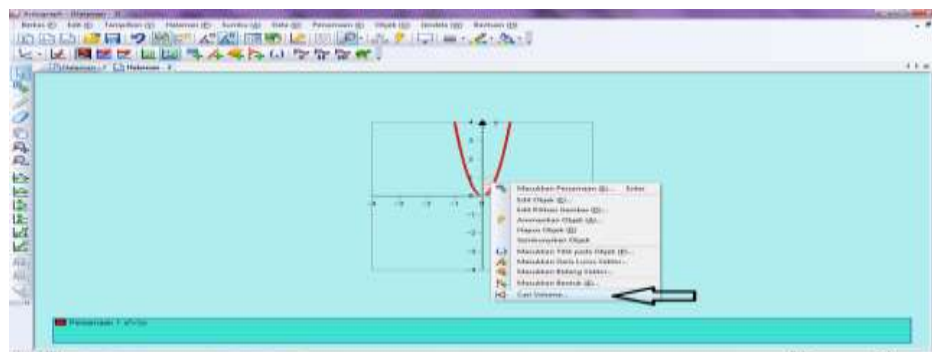

Figure 9. X Axis of Rotation

Then right-click on the curve and then left-click and select "Animate Object". In the dialog box "adjust volume" replace it with "share" and type as you want. Then it will look like the picture below:
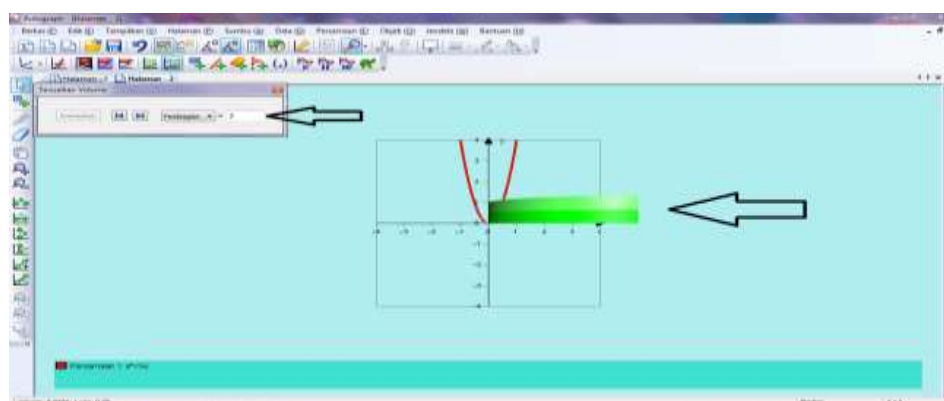

Figure 10. Curve Display X2=1/4

DISCUSSION

Using the Autograph5 *app*: Graphs, algebra and tables are dynamically connected; Easy to use has advanced features, *authoring tools* for interactive learning web pages; available in many languages, *open source* apps can be *downloaded.* So that it makes it easier for students to solve problems in mathematics lessons. Students work on authentic problems with the intention of compiling their own knowledge, developing inquiry and higher-order thinking skills, developing independence and self-confidence that can enhance the growth and development of student learning activities both individually and in groups. By utilizing *Autograph5 software*, it can improve students' understanding of concepts, reasoning, critical thinking skills and mathematical communication

CONCLUSION

This research explores the implementation of an inventory information system at SMA Negeri 14 Medan, showing that its implementation significantly improves the efficiency of resource management and strengthens technology learning in education management. Practical recommendations for the implementation of this system include training for teaching and management staff, integration of the information system into the learning curriculum, and

periodic evaluation to ensure the system remains relevant to educational needs. For future research, it is suggested that the scope of the study be extended to different types of educational institutions and explore the long-term impact of inventory information systems on student learning outcomes and educational management effectiveness, to provide a more comprehensive insight into the role of technology in education.

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