



## Visualization and Message Design Concepts of Presenting Statistical Data through Videos to Improve Understanding

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### ABSTRACT

Learning statistics generally still presented in the form of stories in the books. This study aims to determine the visualization of the basic concepts of presenting statistical data using video. video designs stories into real stories experienced by students so that fact objectivity is created. it aims to make the messages in the story match the experiences experienced by students. this creating recaling knowledge and creating understanding. The research method used in this research is qualitative research with the phenomenological type, where the video is visually used to present messages, namely the concept of presenting data in tables and diagrams. The presentation technique in the video is in the form of a message demonstration that contains facts, concepts, procedures and principles. As for the data analysis used later, namely the observation data, interviews and documentation after using the video by means of data triangulasi. The research of this study were to compare the observation data, interviews and documentation in the form of student understanding data. Based on the observation data, it shows that students pay attention to the video and can explain the story again in the video. interview data shows and answers many type of data and its presentation. documentation data in the form of activity data in class at the second meeting compared to data at the first meeting without using video. Observations, interviews and the results obtained that observations with the aim of knowing whether students understand the sequence in the story is worth 74%, remembering the presentation data 86%, understanding the explanation of data in tables and diagrams 84%, explaining and explaining problems when the video is repeated 75%. This data was obtained when making observations and asking students when they were shown a video.

### INTRODUCTION

Statistics is one of the materials in mathematics that needs to be reached by vocational high schools and higher education. Statistical material is related to the type of data, data presentation and processing techniques. In vocational high school education, statistics are introduced since grade XII, including types of data material and data collection in the form of tables and diagrams. The basic concepts of statistics are used to study further statistical material. With the achievement of this material, students can understand the types of data and their presentation. This ability is measured classically on the basis of minimal completeness. Measuring classical learning outcomes following the Regulation of the Minister of Education

re of the Republic of Indonesia Number 104 of 2014 concerning Assessment of Learning Outcomes by Educators in Elementary and Secondary Education explains that "Learning Mastery is the level of competence, knowledge, and skills including mastery of substance and completeness of learning in the context of the future." learning (Permendikbud No. 104/2014)

The concept of statistical learning that discusses the types of data and the presentation of data in tabular form is presented through observing stories in story books, then followed by activities to ask questions, collect information, associate and communicate. The five activities are learning activities using a

scientific approach. The activity of observing data through stories is an activity of reading words that contain an event or story related to statistical material. The weakness of observing this way is that students must be able to memorize events and remember stories for a long time. It requires long term memory skills. Though the ability of students in the class is different. Therefore, the activity of observing stories related to statistics using textbooks is considered less effective

The learning resources used to present the material are still limited to facts and concepts. It is said to be a fact because the sequence of stories from real conditions is said to be a concept because it describes the type of data. The use of stories is limited to the reading method, not in accordance with the student's auditory learning style. Classically, from 34 students there are 21 students who tend to like listening or auditory learning styles. This causes story books to be less easy for students to remember. This problem arises and a solution is needed, namely the use of media. Firmansah (2013:3) in his research explains that video can be used to observe statistical data. Through videos students can see events like in real life

Video media is used on the basis of selecting learning stimuli that will be received by students. The learning stimulus received by students through video is a series of images and sounds. In this study, a series of pictures and sounds containing a story about a student got the data after the discussion process even though at first it was difficult and finally it could be presented in tables and diagrams. By using video stories can be demonstrated and explained in a coherent manner to facilitate students who have an auditory learning style. It also makes it easier for students to remember the material. In addition, the presentation of stories in videos not only presents facts and concepts but also procedures and principles for presenting data. The basis of media selection is based on the cone of Edgar Dale's experience. Learning experiences can be obtained well, namely through direct events. In the classical learning process it is impossible to direct students to direct the learning situation in the field. For that we need a medium that facilitates the stimulation to be achieved. The selection of media should fit the cone of Edgar Dale's experience as follows:

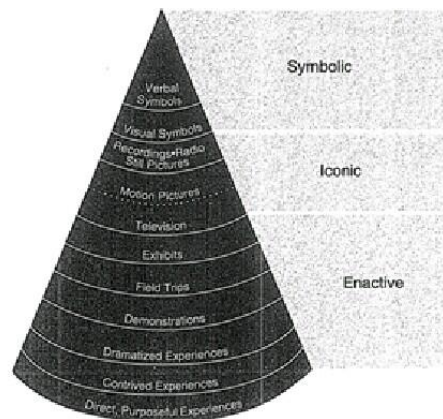


Figure 1. Edgare Dale . Cone of Experience

From the point of view of Edgare Dale, immediate events are active. Realizing the presentation through the media, namely by using video, where the stimuli from the story are transformed into images and sounds. First, a story is made following or according to the concept, then made into a synopsis then converted into a story board and followed by making a learning video. In this process, the validity of the video content is tested to show that the video content is in accordance with the concept to be explained. Video consists of several stages that follow the statistical concept of data presentation, starting from how to find out data, determine, collect, process and present it.

The experience gained through observation using video makes it easier for students to remember the statistical concepts of presenting data. videos facilitate student learning in auditory and visual learning styles. and this minimizes the difference in ability between students with different learning styles. The process of remembering material in videos is easier than material in story books. One of the advantages of video is the concept of a real story, how to get statistical data and process it, it can be played back and timed

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The main sections (headings) include Introduction, Literature Review, Methods, Result, Discussion, and Conclusion. In the introduction, researchers are expected to be able to explain the existing phenomena or background information such as prior work, hypotheses, problems are to be discussed. This is followed by a statement of the purpose of the research issue or problem and/or set of questions you attempt to answer in your research.

**LITERATURE REVIEW**

A literature review is a critical, analytical summary and synthesis of the current knowledge of a topic. It should compare and relate different theories/research, findings, and so on, rather than just summarize them individually. It should also have a particular focus or theme to organize the review. In this section, the researcher can describe some of the related previous studies. Researchers can review the gaps in the research, then it can be used as a basis for research to be carried out

**METHOD**

The type of qualitative used qualitative phenomenology is used to data what happened in the field and get comments to conclude the data. In phenomenology research involves careful and thorough examination of the consciousness of human experience. The main concept in phenomenology is the mean. (Hajaroh, 2010: 9)

In qualitative phenomenology there are several data analysis techniques, including (1) Reading and Rereading, (2) There is no Beginning, (3) Developing Emerging Themes, (4) Looking for relationships between emerging themes, (5) Moving on to the next themes. case , (6) Look for the pattern of cross cases. Data analysis is used to obtain credible data in stages. (Hajaroh, 2010: 13)

Subjects conducted a study of 36 participants, and 6 participants who will be observed, interviewed and carried out in the form of photos during the activity. Observational data in the form of observation of student data while watching videos, interview data in the form of data after observing the video and data documentation is documentation of data analyzed during the process in the form of photos of participants watching videos. The observation instrument uses a measurement scale such as very good, sufficient, less, and very poor. While the interview instrument contains a comment column from the questions. The observation instrument is presented in the following table

Table 1. Participant Observation Instruments

<i>NO</i>	<i>OBSERVATION</i>	<i>PERCENT</i>	<i>COMMENT</i>
1	Understand the story sequence in the video		
2	Given the order in which the statistical data is presented		
3	Understand the explanation of data in tables and diagrams		
4	Explain and work on problems when the video is repeated		

Documentation technique is used to explain that participants actively participate in the learning process. Then document and analyze that visualization using instructional video media can facilitate learning and various understandings. Of the three data collection techniques which include observation, interviews and documentation, then a triangulation technique is used to obtain data validity

**Materials and Data**

Primary data were obtained from research subjects who collected 6 participants with data collection techniques of observation, interviews and documentation. While the secondary data comes from the validity of the expert when the expert sees the content of the video using an observation instrument. Primary and secondary data are used to conclude the research results. Expert validation instruments can be seen in the following table:

Table 3. Expert Validation Instruments

<i>NO</i>	<i>OBSERVATION</i>	<i>EXPERT</i>	<i>COMMENT</i>
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1	The story is in accordance with the concept of presenting statistical data		
2	Storyboards illustrate concepts		
3	Story sequence		
4	Time and sequence of pictures and sounds		

The results of the study were obtained by reading and reading observation data, interviews and documentation. Percentage of observations based on (1) 0-20 = very poor category, (2) 21 – 40 = poor, (3) 41 – 60 = sufficient, (4) 61-80 = Good, (5) 81 -100 (very good ). The interval is the processing of data from 6 participants with a Likert scale, then converted to participant scores and percentages classically and grouped. The data is used as commentary data that videos can be used to explain statistical concepts to students. The data from the observations are shown in the following figure.

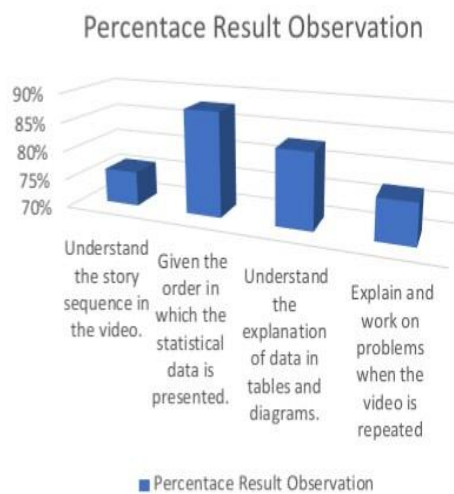


Figure 2. Bar chart of observed data percentage

The form of this activity is to write interview transcripts from audio recordings to written transcripts. Interview data were taken from 6 participants from 36 participants. Data based on scale rating. It aims to record answers in the same category/same answers and assessments by participants. The interview data are as follows

Table 4. Interview Participant Data

No	Question	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6
1	What data do you get after viewing the video	Scor 4 Answer accordingly	Scor 3 Answer accordingly	Scor 3 Answer accordingly	Scor 4 Answer accordingly	Scor 4 Answer accordingly	Scor 4 Answer accordingly
2	How is the process of getting data	Scor 3 Answer accordingly	Scor 3 Answer accordingly	Scor 3 Answer accordingly	Scor 3 Answer accordingly	Scor 3 Answer accordingly	Scor 3 Answer accordingly
3	How is the data collection process	Scor 3 Answer accordingly	Scor 3 Answer accordingly	Scor 3 Answer accordingly	Scor 3 Answer accordingly	Scor 3 Answer accordingly	Scor 3 Answer accordingly
4	How is the process of processing and collecting data	Scor 3 Answer accordingly	Scor 3 Answer accordingly	Scor 3 Answer accordingly	Scor 3 Answer accordingly	Scor 3 Answer accordingly	Scor 3 Answer accordingly

Video content is analyzed and assessed whether the content is in accordance with the concept of presenting data. This assessment was assessed by 3 validators with very good instruments with a score of 5, Good = 5, Enough = 3, Less = 2, Very Poor = 1. The validation results can be seen in the following diagram

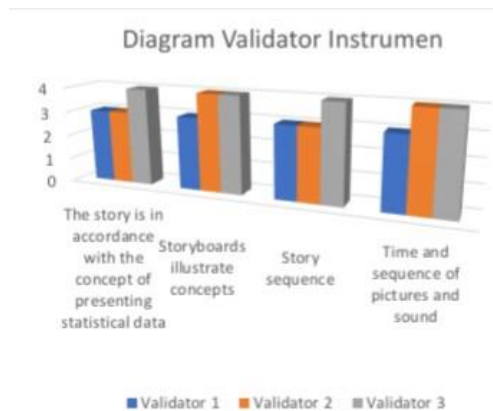


Figure 3. Expert Validator Instrument Diagram

**Research methods**

To measure the correctness of the three data collection data, namely observation, interviews and documentation, the data triangulation method was used. The comparison of the three data is described in a table with a scale (yes or no). The scale means that the use of visualizing the concept of presenting data can be done with video, with the characteristics of the video and the elements in it. Data triangulation indicators were taken from three instruments, namely observation, interviews, and documentation, then compared. The results of data triangulation are as follows:

Table 5 Data Triangulation

No	Indikator	Observation	Interview	Documentation
1	The Story in the video is easy understand	Yes	Yes	Cannot be described
2	The concept of presenting data is presented in the video	Yes	Yes	Yes
3	Visualization of data images and sound is clear	Yes	Yes	Yes
4	The story sequence in the video explains the concept of presenting data	Yes	Yes	Yes

**RESULTS AND DISCUSSION**

Instrument observations, interviews and the results obtained that observations with the aim of knowing whether students understand the sequence in the story is worth 74%, remembering the presentation data 86%, understanding the explanation of data in tables and diagrams 84%, explaining and explaining problems when the video is repeated 75%. This data was obtained when making observations and asking students when they were shown a video. Furthermore, the interview instrument measures the extent to which students' knowledge in studying statistical data uses video. The instruments are:

What data do you get after watching the video with an average participant score of 92%, what is the next instrument for taking the data? obtained with data on the average participant score of 75%. The next instrument How is the data collection process? Obtained with an average participant score of 75%, and the last instrument is about How is the data processing and collection process? Obtained with an average score of 75%.

After evaluating the observations and interviews, then validation of the video is carried out, whether the video is in accordance with the concept of observing data, processing data, presenting data. The indicators of video validation used are the story in accordance with the concept of presenting statistical data from the three



validators with an average total score of 83%, the second indicator storyboard describes the concept with an average score of 92%, the third indicator The sequence of stories with an average score of 83%, and the fourth indicator Time and sequence of pictures and sounds with an average score of 92%. The average of the four indicators shows a value above 80%. This result can be concluded that the video used is suitable to be used to explain the basic concepts of data presentation statistics. And this video has received a patent certificate

## CONCLUSIONS

### Simultaneous

The concept of collecting, processing and presenting data using video can concrete knowledge and make it easier to understand. The knowledge that is formed is concrete and makes long-term memory. Presenting data is as easy and fun as it is in their lives, and they are also familiar with this type of data. This proves the process of transforming the concept into a video that is worthy of being used to present the basic material for data presentation statistics

### Suggestion

The learning video used is a learning video made by Muhammad Lukman Haris Firmansah which has been patented so that the sequence of the process of viewing, collecting and presenting data. Because the video has followed the procedure for observing data, collecting data and presenting data in general

### Thank-you note

This research cannot be separated from various sources, validators, and institutions. For that I thank the validator, namely Professor. Dr Mustaji, M.Pd and Professor Dr Siti Masitoh, M.Pd so that this research can be created and can develop further research

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