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Designing a Hypothetical Learning Trajectory using the Local Wisdom of South Sumatera as a Context through Hybrid Learning

Rahma Siska Utari, Ratu Ilma Indra Putri*, Zulkardi

Department of Mathematics Education, Universitas Sriwijaya, Palembang, Indonesia
*Email: ratuilma@unsri.ac.id

Abstract

Data visualization and interpretation are important statistical literacy skills for prospective mathematics teachers. Intervention in the learning process can be done by designing Hypothetical Learning Trajectory (HLT) and integrating local wisdom which can develop students' statistical literacy skills. This research aimed to describe the HLT design with the topic of data visualization using the local wisdom of South Sumatra through hybrid learning. The method used was design research, with three stages, namely: preparation for the experiment, the design experiment, and the retrospective analysis. In this study, the design experiment was carried out at the pilot experiment stage. A total of 10 students from the mathematics education study program participated in this research. Data was collected through observation, interviews, and documentation. The HLT was compared with the Actual Learning Trajectory (ALT) that occurred in the class. The results of the research show that students can be given contextual problems using the local wisdom context of South Sumatra, explore data visualization in various forms of data presentation, and interpret data from the visualization that have been created. Data visualization can help students understand and interpret data better.

Keywords: Data Visualization, Design Research, Local Wisdom's Context, Hybrid Learning, Hypothetical Learning Trajectory

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INTRODUCTION

Data is important in the era of disruption. The President of the Republic of Indonesia, Joko Widodo in his speech stated that data is new oil, a new source of wealth for development and the most potential commodity of a country (Lestariningsih, 2022). As a result, demands for data must be met quickly, correctly, and in real time. Data is something that is known or considered, and provides an overview of a situation or problem (Revina, 2022). Statistics are a tool which provides an overview of an event in simple forms, either in the form of numbers or graphs (Rose, 2017). One of the skills that students must have to learn about data is statistical literacy (Ben-Zvi, 2020; Gal, 2019). Tiro (2018a) stated that the curriculum in Indonesia needs to synchronize the learning of statistics and mathematics from elementary school to university level, because both have an important role in developing statistical literacy and quality of human resources in Indonesia.

Statistical literacy is the ability to understand, evaluate, interpret, and criticize statistical data or information to make decisions and express them through various media, both print and digital media, as well as written and oral communications (Gal, 2019; Sharma, 2017). Data visualization is one of key skills in statistical literacy (Rumsey, 2002; Tiro, 2018b). Data visualization is a graphical representation of information and data using visual elements such as charts, graphs, maps, and others (Hartono, 2017). Data is important to visualize because with a clear and good form, visualization of the data can be used for further reports and/or analysis (Irianto, 2015). An international animation company Wyzowl

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conducted a survey about the importance of visualization. The company found that people tend to remember 80% of what they see, 10% of what they hear, and 20% of what they read. This shows that the right data visualization can help people read data and remember information contained in data visualization.

Mathematics teachers play an important role in ensuring that students can have skills in presenting data and interpreting graphics from data visualization (Muñiz-Rodríguez et al., 2020). This indicates that prospective mathematics teachers are required to have good data visualization skills to teach students to face the digital era and its challenges. Prospective teacher students must be given a good understanding of data visualization (Setiani & Suyitno, 2021; Setiawan et al., 2023; Setiawan & Sukoco, 2021; Utari et al., 2023). According to Utari et al (2023) students were able to visualize data while constructing statistical literacy questions that combined reading and visualizing data, but they failed in interpreting the data of produced problems. Setiawan and Sukoco (2021) conducted a study on prospective mathematics teachers taking statistics courses. Half of the students in the study had a high level of literacy in descriptive statistics but a middling level of literacy in data visualization. Further Setiani and Suyitno (2021) stated that there are students who have difficulties in reading data properly. They even did mistakes in interpreting the courses schedule table. This might be due to a lack of references to learn about data visualization. Setiawan et al (2023) stated that almost all textbooks on statistical learning provide explanations about graphs and histograms, while it is necessary to add further exercises related to statistical interpretation and evaluation.

In statistics, data visualization is usually taught to students by drawing graphs. Combining images and text in data visualization can be an effective method for students to develop their statistical literacy skills because to visualize data, they require an understanding of the unique attributes of images and text (Sansone, 2015). Using technology, data visualization, especially for statistical concepts, can be taught using media, software and other visualization tools which are widely used (Forbes et al., 2014). Data visualization can be developed by planning meaningful statistical learning and integrating certain interventions in learning to achieve data visualization skills and critical reasoning (Watson, 2011).

Learning interventions that can be carried out to develop statistical literacy skills is designing learning that integrates context, models, and technology (Ben-Zvi, 2020; Gal, 2019; Pratt et al., 2011). Gal (2019) stated that context and models are required for intervention in the learning of statistical literacy. Meanwhile, technology in statistical learning is required for calculations, data visualization, and supporting the learning process, so that statistical literacy learning can be done more effectively and accurately (Ben-Zvi, 2020; Pratt et al., 2011). Besides that, based on the regulation of the Minister of Education, Culture, Research and Technology of the Republic of Indonesia Number 13 of 2022 concerning the Ministry of Education and Culture's Strategic Plan for 2023-2024. It is urgent for teachers and lecturers to use technology in online and face-to-face learning stated as hybrid learning (Kemdikbud, 2022). In Indonesia, hybrid learning is carried out by combining one or more media, models and learning methods with the implementation of face-to-face learning, synchronous virtual

collaboration, asynchronous virtual collaboration, accelerated asynchronous independent learning for students (Aristika et al., 2021). Cahyono and Asikin (2019) stated that hybrid learning had a positive impact on prospective mathematics teacher students to improve learning outcomes.

Hybrid learning is a form of support for the government's program called *Merdeka Belajar Kampus Merdeka* (MBKM) which facilitates students to be able to study both face-to-face and using an online system (Sinaga, 2022). Hybrid learning is a learning process developed with an instructional design that integrates traditional activities, digital classes, print and recording in a planned manner (Nurlaelah et al., 2023). Statistics are numbers in context and context is the source of meaning and the basis for applying statistical procedures and interpreting the results obtained. Diverse contexts such as social, economic, cultural, and environmental context brought into statistics classes directly provide the development of functional competence for prospective mathematics teacher students (Gal, 2019). Therefore, based on Gal's study about context, the context of local wisdom which contains customs, economics, social, and culture in an area can be used in statistical literacy learning.

The context of local wisdom has been widely used in several studies with varying results. Idris (2019) stated that the local context can be used in learning statistical literacy based on Islamic context and culture. Komar et al (2022) stated that the use of Palembang's local wisdom could improve the literacy skills of prospective mathematics teacher students and their mathematical literacy skills. There has been no previous research that uses the local wisdom of South Sumatra in statistical literacy learning. The local wisdom of South Sumatra is explored using ethnography related to data visualization of statistical literacy in the real world. Furthermore, the local wisdom of South Sumatra is integrated into learning through hybrid learning that supports statistical literacy skills. Hybrid learning is a form of intervention to develop more effective learning and offer learning opportunities during the research process. The use of the South Sumatra Local Wisdom is aimed at introducing and preserving South Sumatra Local Wisdom. The novelty in this research lies in the intervention used in learning, namely designing HLT with the context of South Sumatra local wisdom through hybrid learning. The study aimed to design HLT of data visualization through hybrid learning using the local wisdom context of South Sumatra to support the statistical literacy skills of prospective mathematics teachers.

METHODS

Research Approach

This research used the design research method of the validation study type for designing Hypothetical Learning Trajectory (HLT) in collaboration with researchers and courses lecturers of statistics to improve the quality of learning (Bakker, 2018; Gravemeijer & Cobb, 2006). HLT included provisional learning activities and presumed learning processes that anticipate how students' thinking and understanding might develop as learning activities take place in the classroom. Figure 1 depicts the

cyclic process of design research.

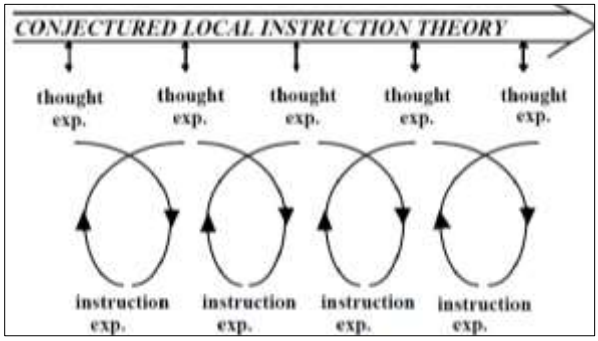


Figure 1. The cyclic process of design research (Gravemeijer & Cobb, 2006)

There are three stages in implementing design research, namely: preparing the experiment, the design experiment stage which is divided into two stages, pilot experiment (1st cyclic) and teaching experiment (2nd cyclic), and retrospective analysis stage. However, in this study, the HLT to LIT design process was only stated at the design experiment - pilot experiment stage (1st Cyclic). The aim of the pilot experiment is to try the HLT that has been designed to collect data to adjust and revise (if required). In this experimental research, discussions were held with the model lecturer so that the HLT could achieve the learning objectives. Lecturers who teach model courses really know the conditions and situations of the class. So, it is necessary to hold discussions with lecturers about HLT design.

Research Subject

The subjects in this research were ten students from the mathematics education study program who took part in the pilot experiment stage. They were students of the first level of undergraduate program of mathematics education with heterogeneous abilities. Subject selection is based on recommendations from lecturers who taught introductory statistics courses with high, medium, and low abilities as shown by the lecturers' assessment. They worked in groups to follow the learning process through designed learning activities.

Data Collection

Data were collected through interviews, observations, student learning activity sheet, and documentation/video recordings. Interviews were conducted with subject lecturers to explore the learning process that had taken place. Interviews also involved students to explore students' thinking processes. Observations were conducted to see the learning implementation process and how students interacted in discussion groups in class. This activity sheet was developed from HLT which has been designed and developed based on data visualization learning theory, which is described in student learning activities to see the learning process. Student learning activity sheets are also adjusted to student pretest results that aimed to see the achievement of a given set of activities so that it can be used

as one of the guidelines for improving the design of HLT activities that have been designed after being implemented in the next stage. Documentation using cameras and video recordings was carried out at the pilot experiment and teaching experiment stages to record the learning process during the research.

Data Analysis

The data obtained were analyzed retrospectively together with HLT as a reference. Data analysis was carried out by the researchers and in collaboration with supervisors to increase the validity and reliability of this study. Data analysis of interviews, observations, student learning activity sheet, as well as documentation was carried out qualitatively. Validity is carried out to see the quality of a set of data that influences withdrawal conclusions from this research, consisting of: (a) HLT to support validity, namely as a guide and reference point in answering research questions, (b) trackability aimed to enable researchers to re-describe the learning process in detail so that readers can follow the storyline and draw conclusions. Reliability in this research is how to describe the research conducted so that a conclusion can be drawn, consisting of: (a) data triangulation using data sources to see the relationships obtained from data sources in the form of observation sheets, interviews, documentation and video recordings towards the learning trajectory plan, (b) cross interpretation, the data in the research that has been selected to be analyzed are interpreted crossly between the researcher and observer, aiming to avoid the subjectivity of the researcher in interpreting the data.

RESULTS AND DISCUSSION

The Preparing for the Experiment Stage

At this stage the researcher has produced an initial HLT in the learning process. The researcher together with the course lecturer discussed the initial HLT that had been created. Apart from that, at this stage, for the implementation of hybrid learning, learning activities related to data visualization have been prepared which can support students to take part in hybrid learning, using Nearpod. Figure 2 below presents an interactive learning activity sheet related to data visualization.

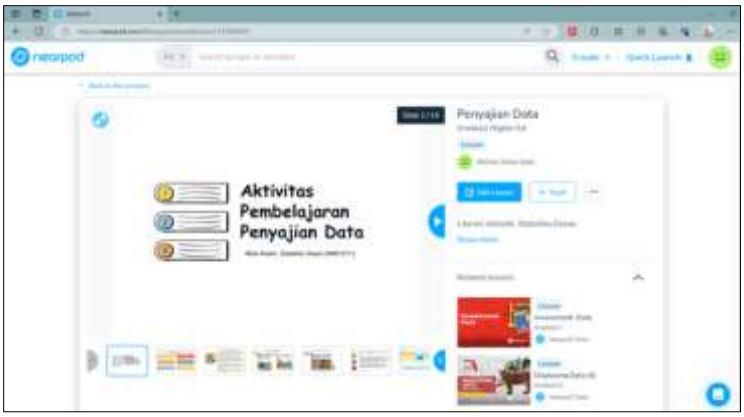


Figure 2. Data visualization learning activities using Nearpod

Figure 2 presents the data visualization learning activity designed using the Nearpod application. The Nearpod application is a learning space platform that can support hybrid and online learning. The Nearpod application can invite students to interact directly with interactive presentations that contain images, text, video, sound, quizzes, and other activities.

The Design Experiment Stage – Pilot Experiment

Several activities were designed based on hypothetical learning trajectories and students' thinking processes related to data visualization. Data visualization learning activities are divided into three learning activities, where each activity is shown to understand the basic concepts of data visualization and interpretation of data visualization. The relationship between learning activities and the concept of data visualization can be seen in Table 1.

Table 1. The relationship between learning activities and the concept of data presentation

Learning Path	Learning Activity	Data Visualization Concept
Activity 1: Reading news headlines related to demand and sales of pempek	• reading news headlines and news texts related to the demand production and sales of Pempek ahead of Ramadan and Eid al-Fitr for the last 5 years • understanding and being able to identify important information in the text related to the demand and production of pempek	Understanding the information of data handling
Activity 2: Predicting and creating data visualization from text	• predicting the number of requests and sales of pempek over the last 5 years based on the information contained in the text • visualizing prediction data in various forms of data visualization that are easy to understand	Data visualization in various form
Activity 3: Understanding data visualization so that they can interpret data in various media	• Interpreting data based on text information and data visualization to provide ideas for future demand and sales of pempek	Interpretation of data handling

The series of learning activities in the HLT consists of three activities, which are described as follows.

Activity 1: Reading News Headlines Related to Demand, Production, and Sales of Pempek

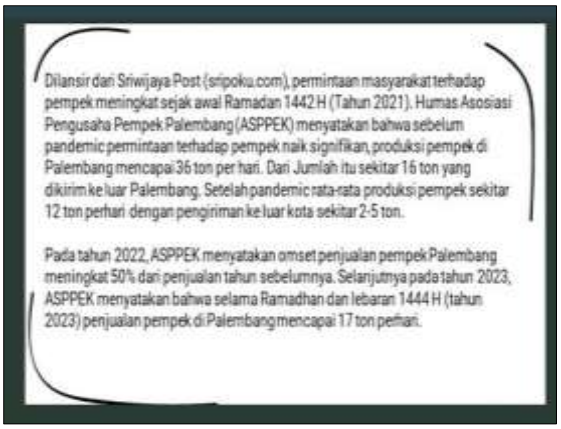
Pempek is a typical food in Palembang, and is a cultural heritage that has existed and been passed down from generation to generation. Pempek is a local wisdom from South Sumatra which is well known nationally and is in demand by people throughout Indonesia. During Ramadan and Eid al-Fitr celebrations, the homecoming tradition also occurs in Indonesia, causing people's demand for pempek to increase compared to normal days. This also has an impact on the production and sales of pempek in Palembang. This information is used as a starting point in designing learning activities for data visualization. The first learning activity is for students to read the information contained in news headlines and text. Figure 3 is a Nearpod display related to news headlines given to students regarding the demand, production, and sales of pempek in Palembang.

Figure 3. Nearpod display of news headline

Figure 3 presents a news headline that provides information regarding the number of public requests for pempek from year to year, for the last three years. In addition to the headlines above, there is also text that contains information related to the number of requests, production, and sales of pempek which can be seen in Figure 4.

(a)

(b)



(c)

Translated to English:

Reporting from Sriwijaya Post (sripoku.com), public demand for pempek has increased since the beginning of Ramadan 1442 H (2021). Public Relations of the Palembang Pempek Entrepreneurs Association (ASPPEK) stated that before the pandemic demand for pempek increased significantly, pempek sale in Palembang reached 36 tons per day. Of that amount, around 16 tons were sent outside Palembang. After the pandemic, the average pempek production and sales was around 12 tons per day with shipments out of town around 2-5 tons. In 2022, ASPPEK states that Palembang's pempek sales turnover will increase by 50% from the previous year's sales. Furthermore, in 2023, ASPPEK stated that during Ramadan and Eid 1444 H (2023) sales of pempek in Palembang reached 17 tons per day.

Figure 4. The information about requests, production, and sales of pempek

Figures 4(a) and 4(b) show the implementation of online and face-to-face learning or the implementation of hybrid learning. Figure 4(c) presents a picture of a nearpod slide containing information of demand, production and sales of pempek. From this information, students were asked to discuss in groups which were divided into 2 groups via breakout rooms on Zoom and students also discussed in class. Students can discuss interactively using nearpod as the application provides a space for students to discuss.

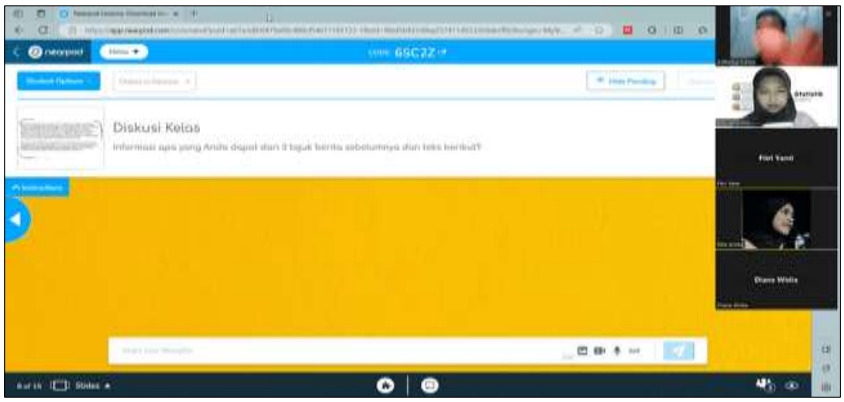


Figure 5. Interactive class discussion trough Nearpod

Figure 5 depicts the activity of students engaged in a discussion on Nearpod. Some students turned off their camera with the lecturer's permission, as they were studying trough mobile device and simultaneously using two applications, namely Zoom and Nearpod. The weak network connection caused issues when running both applications, hence the decision to disable the camera during the learning process, which did not impede the class's discussion flow. The discussion continued smoothly, and the lecturers were able to monitor students' participation by tracking the numbers of students who had joined. Throughout the class discussion, topics related to statistical literacy data comprehension, and reasoning were covered before delving into data visualization skills. Transcript 1 below pertains to the student's discussion regarding the provided information. (Note: L=lecturer, S1=Student 1, S2=Student 2, S3=Student 3).

Transcript 1. Understanding the information about data handling

L	:	*Do you understand the meaning of the information in the text?*
S1	:	*Yes, the text informs those sales of pempek in the city of Palembang during the fasting month and Eid increase. I did not expect that pempek production in Palembang would reach tons a day.*
L	:	*What about the others, do you have an opinion on the sale of pempek in Palembang during the month of Ramadan and ahead of Eid al-Fitr?*
S2	:	*But it seems that it doesn't always increase, ma'am, there is also a decrease. In 2021 the number of pempek sales is around 12 tons a day. In 2022 it will increase by 50% so 12 + 6 = 18 tons, while in 2023 it will only be 17 tons a day. This means that there has been a decrease in the number of declines from 2022 to 2023. In fact, this number has decreased significantly from 2019 (before the pandemic) because sales can reach up to 36 tons per day during Ramadan.*
L	:	*How can you say that in 2019 pempek production reached 36 tons per day? Maybe there are other friends who can help answer?*
S3	:	*The covid pandemic started to enter Indonesia around march 2020 ma'am, so before 2020 ma'am, it means 2019.*
Lecturer	:	*Ok, that means you can understand, can you proceed to answer the next question.*

Transcript 1 revealed that some students adopted the practice of crafting news headlines to obtain information without delving into the full news articles. News headline are often designed with compelling language to capture the reader's interest and encourage them to explore the articles further, as the comprehensive information is contained within the text. Within the group discussion, there were students who demonstrated an aptitude for extracting insight from the existing text by drawing on information and real-life phenomena. Table 2 provides a comparison between the Hypothetical Learning Trajectory (HLT) and the Actual Learning Trajectory (ALT).

Table 2. Comparison between HLT & ALT of activity 1

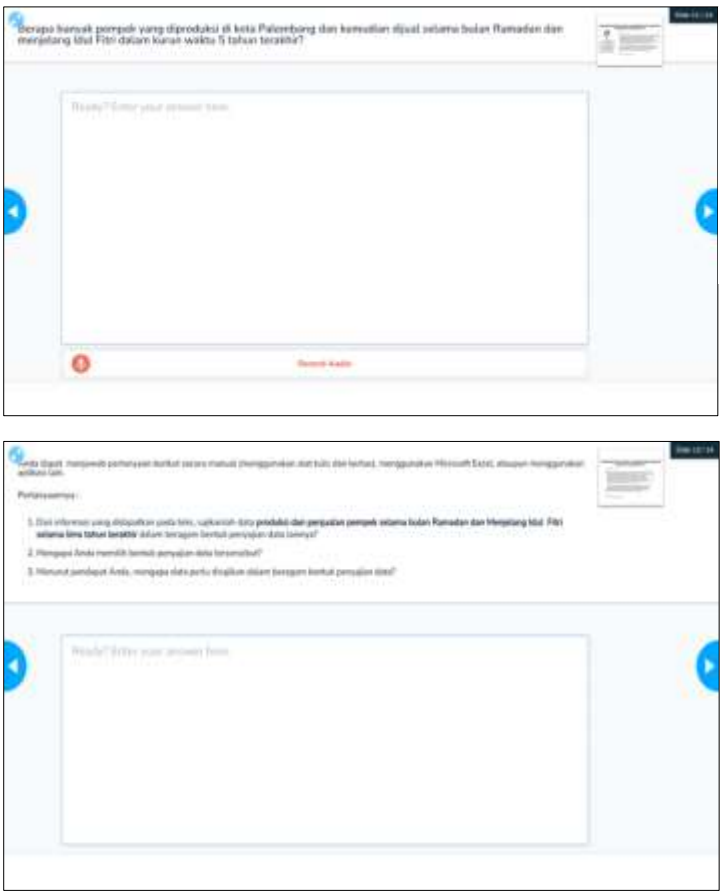
Learning Activity	HLT	ALT
• read news headlines and read news texts related to the demand production and sales of Pempek ahead of Ramadan and Eid al-Fitr for the last 5 years	• students can read the news headlines and news text information properly related to the demand production and sales of Pempek ahead of Ramadan and Eid al-Fitr for the last 5 years	• students immediately draw conclusions without reading the entire text • students read the text properly
• understand and be able to identify important information in the text	• students understand and be able to identify important information in the text related to the demand,	• students understand and be able to identify important information

Learning Activity	HLT	ALT
related to the demand, production, and sales of pempek	production, and sales of pempek	in the text related to the demand, production, and sales of pempek

Table 2 above is a comparison of HLT and ALT from activity 1. The results of this comparison are used to improve the HLT in the activity for further research at the teaching experiment stage.

Activity 2: Predict and Create Data Visualization from Text

The aim of activity 2 is for students to be able to predict how much pempek will be produced and sold during the month of Ramadan in the last 5 years. Figure 6 is a question from activity 2.



Translated to English:

- How many pempek are produced in the city of Palembang and then sold during the month of Ramadan and before Eid al-Fitr in the last 5 years?
- You can answer the following questions manually (using stationery and paper), using Microsoft Excel, or using other applications.

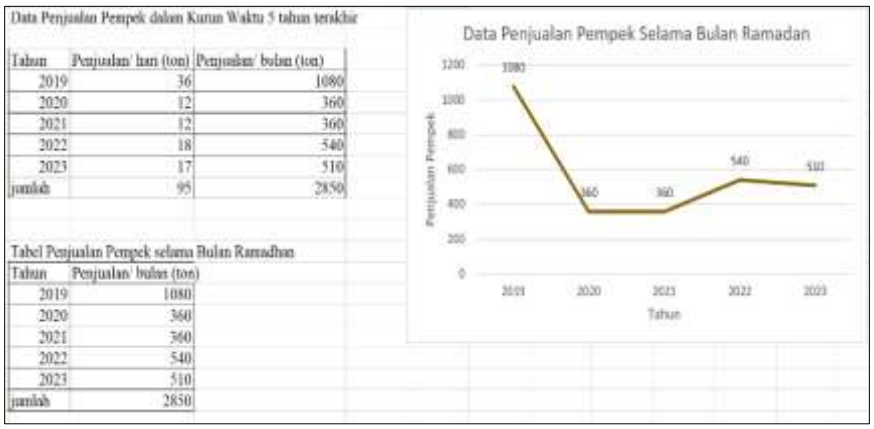
The question:

1. From the information obtained in the text, visualize data on the production and sales of pempek during the month of Ramadan and before Eid al-Fitr for the last five years in various other forms of data presentation?
2. Why did you choose this form of data presentation?
3. In your opinion, why does data need to be presented in various forms of data presentation?

Figure 6. Students learning activity in activity 2

Figure 6 illustrates students learning activities related to predicting the quantity of Pempek production and sales in Palembang. Following the prediction of the total number of students, the data is presented in a visualization format. In this scenario, students have the option to access and interpret the data using additional tools like Excel or manual. Figure 7 provides a visual representation of student responses to Activity 2. Here are some examples of student responses to Activity 2 as shown in Figure 7.

(a)



(b)

Figure 7. Student answering in activity 2

Figure 7 illustrated students' prediction and calculation of the number of Pempek sales. In answer Figure 7(a). students calculate the number of sales per day, whereas the desired activity on the activity sheet pertains to a monthly calculation. Therefore, as seen in the second response in Figure 7(b). the table was adjusted to include sales for an entire month. Transcript 2, which contains students' responses, is provided below. (Note: L= Lecturer, S4 = Student 4, S5 = Student 5).

Transcript 2. Predict and create data visualization from text

L : *"Can you explain about your answer?"*

S4 : *"From previous activities ma'am, we know the production and sales of pempek in the last five years. namely, 36, 12, 12, 18 and 17. By using the chart feature in Excel we can create a visualization ma'am."*

L : *"How about you AS, from your answer I found that the amount of pempek production that you get is up to 2000 tons more. Can you explain??"*

S5 : *"I think the question is a month, so I estimate that in one month 30 days. So, for each year during the month of Ramadan, 30 days I multiply by the production and sales of pempek for each year. so the results are very big. The overall total reaches 2850 tons.".*

L : *"OK, good reasoning. AS can you help me to explain with your other friends. Why can*

you get big numbers?

S5 : "With pleasure."

The transcript of Activity 2 revealed that S5 provided explanations for the total sales of Pempek, which amounted to nearly 2850 tons, and supported this explanation with reasons. These findings have an impact on the presentation of data visualization. Despite this, the general outcomes of data visualization remain consistent, with graph and line chart illustrating fluctuations in Pempek production and sales. Table 3 provides a comparison between the Hypothetical Learning Trajectory (HLT) and the Actual Learning Trajectory (ALT).

Table 3. Comparison between HLT & ALT of activity 2

Learning Activity	HLT	ALT
• predict the number of requests and sales of pempek over the last 5 years based on the information contained in the text	• students predict the number of requests and sales of pempek over the last 5 years based on the information contained in the text	• students predict the number of requests and sales of pempek over the last 5 years based on the information contained in the text • students can't predict the number of requests and sales of pempek over the last 5 years based on the information contained in the text
• visualize prediction data in various forms of data visualization that are easy to understand production and sales of Pempek ahead of Ramadan and Eid al-Fitr for the last 5 years	• students visualize prediction data in various forms of data visualization that are easy to understand production and sales of Pempek ahead of Ramadan and Eid al-Fitr for the last 5 years	• students visualize prediction data in various forms of data visualization that are easy to understand production and sales of Pempek ahead of Ramadan and Eid al-Fitr for the last 5 years

Table 3 presents a comparison between the Hypothetical Learning Trajectory (HLT) and the Actual Learning Trajectory (ALT) from Activity 2. The findings from this comparison serve as valuable insights to enhance the HLT for future research during the teaching experiment stage.

Activity 3: Understand Data Visualization So That They Can Interpret Data in Various Media

Activity 3 aimed to encourage students to consider the perspectives of both the government and Generation Z, concerning the exceptional demand, production, and sales data of Pempek during the month of Ramadan. The objective was to explore the measures that could be taken to support the economic well-being of Palembang residents, particularly in the Pempek industry. This is in the context of South Sumatera cuisine consumers expanding across the nation, reaching various islands and regions in Indonesia. Figure 8 presented below, depicts the discussion processes regarding the actions that should be taken by the government and the innovative ideas that Generation Z should implement to address the phenomenon of Pempek sales during Ramadan.

Figure 8. Students provide interpretation of the data

Some students believe that the government should take steps to ensure the stability of raw material prices for Pempek production during Ramadan and maintain a consistent supply of these materials to prevent disruption in manufacturing. Others propose optimizing the use of social media and market platforms to enhance sales. Additionally, one student viewpoint involves innovating Pempek production to create product that will not spoil during transportation, employing methods like drying or other innovation. Table 4 provides a comparison between the HLT and the ALT.

Table 4. Comparison between HLT & ALT of activity 3

Learning Activity	HLT	ALT
• Interpreting data based on text information and data visualization to provide ideas for future demand and sales of pempek	• students are interpreting data based on text information and data visualization to provide ideas for future demand and sales of pempek	• students are interpreting data based on text information and data visualization to provide ideas for future demand and sales of pempek

Table 4 demonstrates that students' thought processes regarding suggestions for future Pempek sales policies align with the previously established assumption. The students are now capable of articulating their ideas in their own words, relying on prediction grounded in exiting facts and supported by data. This ability to engage in statistical literacy involves drawing conclusions from data and forming prediction based on empirical evidence.

The design of a hypothetical learning trajectory for data visualization, incorporating the local wisdom context of South Sumatera through hybrid learning can enhance students' statistical literacy skills by addressing several key factors including context, technology, and learning models. Leveraging local context, such as the demand, production, and sale of Pempek during the month of Ramadan, serves as an excellent starting point for learning. This context is authentic and ingrained in everyday life, with the phenomenon having persisted in Palembang for many years. As aspiring mathematics teachers, students can view this context as a social, economic, and cultural phenomenon inherent in society. According to Gal (2019), an effective context should be genuine and naturally occurring in the real world, capable of describing various phenomena that can be statistically analyzed. Moreover, a well-chosen context should spark students' curiosity, instilling a desire to understand and connect the context with their lives today and in the future ((Heuvel-panhuizen et al., 2014; Moore, 1997).

The design of data visualization learning path involves three key learning activities comprehending data-inclusive information, representing data in diverse formats, and deciphering data across various media. Bakker (2018) suggests that sharing students' conjectural thinking during the learning process is achieved by integrating prior theories. According to Gal (2004), Rumsey (2002), and Weiland (2017) the ability to visualize data hinges on a through grasp of the underlying problems. A solid understanding of these problems sets students on a path to develop critical thinking and reasoning skills in statistical literacy. When students possess a strong foundation in data comprehension, they can effectively engage in data visualization. In today's context, technology play a vital role in data visualization, making data presentation more captivating, vibrant, and diverse. This aligns with the perspective of Setiawan & Sukoco (2021), who assert that manual data visualization is no longor a pertinent skill for prospective teachers. Forbes et al. (2014) note the proliferation of learning applications that facilitate data visualization, making technology an invaluable asset in the learning process. Upon visualizing data, students can articulate their interpretations, expressing their perspective, even if their language skills are still developing. This marks the initial step for students to cultivate critical thinking in response to societal phenomena. However, on their learning journey, students must continue to absorb information from various source to refine their data interpretation skills, ensuring greater accuracy. Gal (2004, 2019) emphasized that the ultimate goal of statistical literacy is the cultivation of critical thinking skills.

The utilization of Nearpod in hybrid learning is highly beneficial, as it offers free accessibility and various features. Nearpod empowers students to engage in discussion through text, voice recording, and image sharing. However, in a learning environment that employs multiple applications it's crucial

that the chosen tools support connectivity and operate within areas with strong signal strength. This ensures that students can actively interact and participate in their learning process. Hakami's research (2020) underscores Nearpod's utility as a tool that enhances active and interactive learning experiences in higher education. The study also highlights that hybrid learning, combining Zoom and Nearpod, serves as a valuable instrument for fostering socio-mathematics norms within the classroom. Through Nearpod and zoom, students engage in discussions that allow their thought processes to be visible. In the realm of mathematics, socio-mathematical norms hold significant, important, as interactions among peers can facilitate the development of students' cognitive processes, guiding them from a stated of uncertainty to understanding. This aligns with Putri et al.'s finding (2015) which emphasize the need for prospective teacher students to cultivate professional social norm in the classroom. This in turn, prepares them for their future roles as educators and promotes professionalism by fostering social interactions within the mathematical class.

CONCLUSION

Designing Hypothetical Learning Trajectories for data visualization entails several learning phases, including the presentation of contextual problems rooted in the local wisdom of South Sumatera, data comprehension, data visualization, and data interpretation. The implementation of hybrid learning benefits from interactive applications fostering student interactions. Additionally, statistical application can be integrated into hybrid learning, as observed in this study, where students utilize statistical application for data visualization in the form of Excel. Subsequent research endeavors can utilize the insights from the Actual Learning Trajectory (ALT) to refine the Hypothetical Learning Trajectory (HLT). This will lead to adjustments in the planned learning activities for the teaching experiments stage. Specifically, the emphasis will be placed on improving text reading within the learning activities, with continuous reminders to underscore the importance of thorough material reading for adequate data collection. It's important to note that this research exclusively focuses on issues related to the local wisdom of South Sumatera, specifically the social phenomenon of demand and sales of pempek during Ramadan and Eid. For future research, there exist numerous contexts related to statistical literacy that can be explored in connection with local wisdom.

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