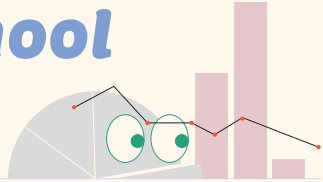A Case Study of

Data Visualization and Storytelling Workshop *for* Middle School Students

ABSTRACT

Visualization and storytelling skills can be trained during early school years. We aimed to teach visualization knowledge through a workshop whose participants were 100 middle school students across Thailand. With several tangible materials and an assigned topic, a group of five students collected data, mostly from a primary source, produced a visualization and gave a short presentation on data insights. Despite different backgrounds, all groups shared similar visualization types. Concrete and abstract data representations in pictographs, bar charts, and pie charts were popular.
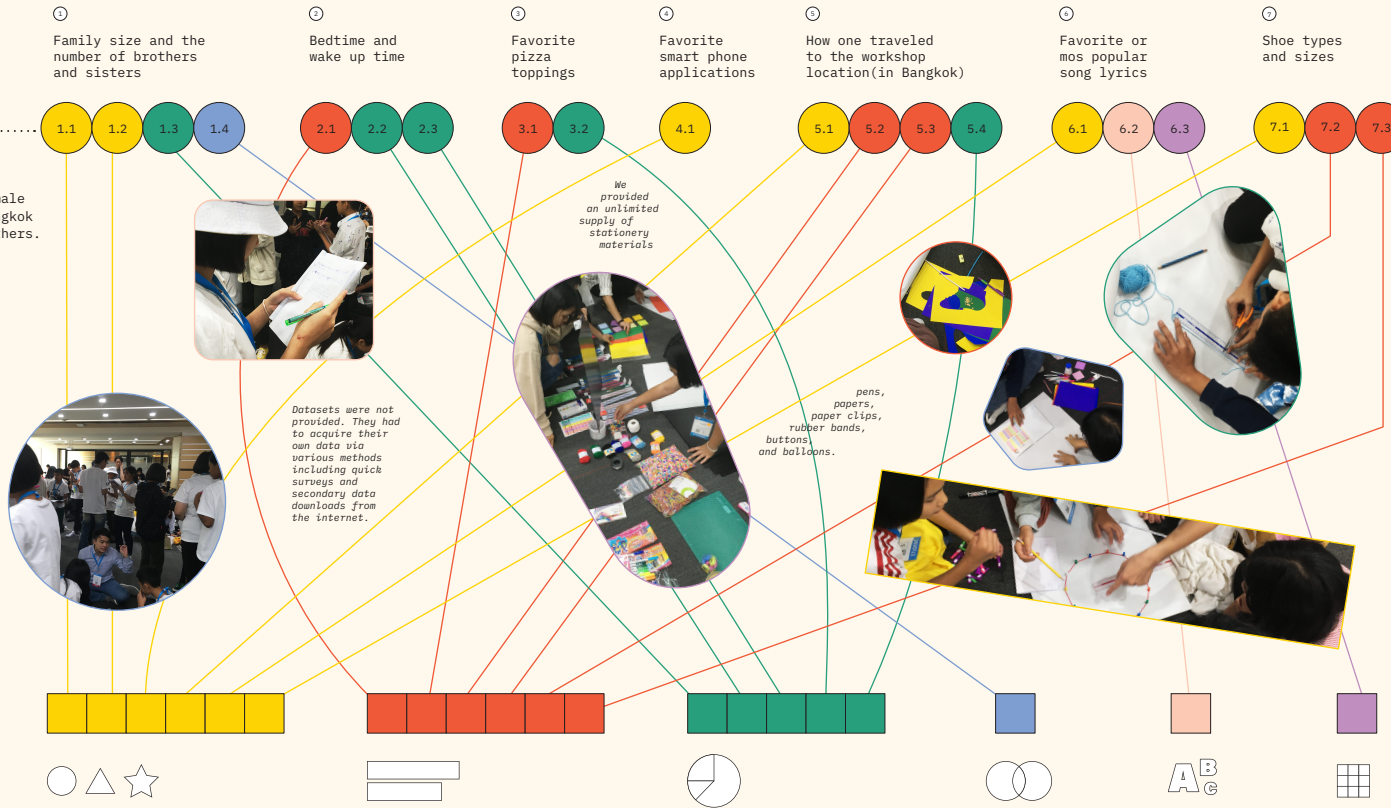
7 TOPICS

① Family size and the number of brothers and sisters
② Bedtime and wake up time
③ Favorite pizza toppings
④ Favorite smart phone applications
⑤ How one traveled to the workshop location (in Bangkok)
⑥ Favorite or most popular song lyrics
⑦ Shoe types and sizes

20 GROUPS OF 5 STUDENTS

- age 12 to 15
- 57 female and 43 male
- 7 schools from Bangkok 13 schools from others.

60 minutes to create

1.1 1.2 1.3 1.4 2.1 2.2 2.3 3.1 3.2 4.1 5.1 5.2 5.3 5.4 6.1 6.2 6.3 7.1 7.2 7.3

Datasets were not provided. They had to acquire their own data via various methods including quick surveys and secondary data downloads from the internet.

We provided an unlimited supply of stationery materials

pens, papers, paper clips, rubber bands, buttons and balloons.

VISUAL DATA STORY

Pictograph
X 6

Bar Chart
X 6

Pie Chart
X 5

Venn Diagram
X 1

Word Cloud
X 1

Table
X 1

RESULTS AND DISCUSSION

There were a variety of visual data stories. Some stories consisted of multiple visualizations. Some stories had no visual encodings; their data were simply written in big numbers of equal size and they were not organized in any visual way.

Pictographs and bar charts were the most popular. Pie charts came in a close second. Other visualizations, Venn diagram and word cloud, were used once. A table might not be universally classified as a visualization but the data were, at least, structurally organized. When there was more than one visualization in a story, a pictograph was among the visualizations.

Venn diagram was the only visualization type we did not mention in the workshop introduction. We conjectured that the students learned about the diagram from their class materials at school. They might have seen one from a website or through social media as well.

Notice that both table and word cloud were only present in the topic on song lyrics. Except the word cloud for song lyrics. We observed that the topic of phone applications seemed to be the hardest to visually illustrate. Only one group did it in a pictograph, arguably one of less abstract visualizations.

The degrees of abstraction varied. Due to our workshop materials, most visualizations were composed of tangible objects and drawings. The visual elements in the charts and diagram were more abstract, compared with the units of a pictograph and a word cloud. In total, the number of abstract data representations was slightly more than the number of concrete or pictorial depictions.

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