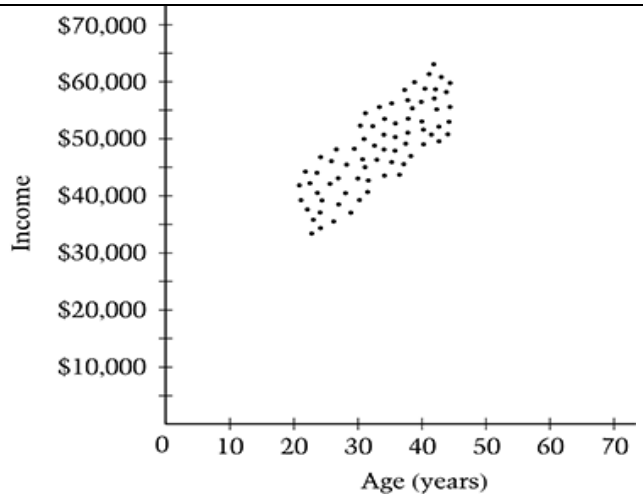
Analyzing Students' Thinking about Bivariate Data

The following item appeared on the 2009 National Assessment of Educational Progress (NAEP):



A random sample of graduates from a particular college program reported their ages and incomes in response to a survey. Each point on the scatterplot above represents the age and income of a different graduate.

Based on the data in the scatterplot, predictions can be made about the income of a 35 year old and the income of a 55 year old. For which age is the prediction more likely to be accurate?

◯ 35 year old ◯ 55 year old

Justify your answer.

Here are some students' responses to the NAEP item:

Student 1

Based on the data in the scatterplot, predictions can be made about the income of a 35 year old and the income of a 55 year old. For which age is the prediction more likely to be accurate?

● 35 year old ○ 55 year old

Justify your answer.

There is actual data that can be referenced for 35 year olds

Student 2

Based on the data in the scatterplot, predictions can be made about the income of a 35 year old and the income of a 55 year old. For which age is the prediction more likely to be accurate?

● 35 year old ○ 55 year old

Justify your answer.

There are no data points for 55 years old, so it would just be a prediction. For 35 years old, there are data points, so it would not just be a prediction.

Student 3

Based on the data in the scatterplot, predictions can be made about the income of a 35 year old and the income of a 55 year old. For which age is the prediction more likely to be accurate?

○ 35 year old ● 55 year old

Justify your answer.

because the graph does not show a 55 years old person's income

Student 4

Based on the data in the scatterplot, predictions can be made about the income of a 35 year old and the income of a 55 year old. For which age is the prediction more likely to be accurate?

○ 35 year old ● 55 year old

Justify your answer.

The 35 year old has data and the 55 year old does not.

Student 5

Based on the data in the scatterplot, predictions can be made about the income of a 35 year old and the income of a 55 year old. For which age is the prediction more likely to be accurate?

● 35 year old ○ 55 year old

Justify your answer.

because they are still working.

Student 6

Based on the data in the scatterplot, predictions can be made about the income of a 35 year old and the income of a 55 year old. For which age is the prediction more likely to be accurate?

○ 35 year old ● 55 year old

Justify your answer.

The older you get the more work experience you will have

Student 7

Based on the data in the scatterplot, predictions can be made about the income of a 35 year old and the income of a 55 year old. For which age is the prediction more likely to be accurate?

○ 35 year old ● 55 year old

Justify your answer.

A fifty five year old would be more likely to accumulate that much wealth than a thirty five year old.

Source: Twelfth-grade NAEP test item, block: 2009-12M2, number 4 (NAEP 2009); National Assessment of Educational Progress

After reading each student response presented above, do the following:

1. Organize the responses from “most developed” to “least developed.” You can use as many categories to organize the responses as you wish. Explain why you categorized the students’ responses in the manner you chose.

2. Describe the steps you would take to further support each student’s learning.