The goal of this experiment was to determine whether the incorporate scaffolding and white space in the construction of a question would promote better understanding of the question’s content as well as facilitate group discussion.

**Motivation**

Students often have difficulty when beginning to answer a workshop question. We believe this inability stems from the students:

- initial perception of difficulty
- inability to break the question into its components

Our research focuses on incorporating white space and scaffolding into questions. This is in an effort to increase group participation and understanding of concepts.

**Background**

- **White Space:**
  - Page layout w/o margins → faster reading speed
  - Page layout w/margins → greater reading comprehension
  - Leading → easier for students to read yet had little impact on reading comprehension
  - Page layout w/white space between a graphic and text showed decreased comprehension

- **Cognitive Apprenticeship**
  - Provides framework for question. "Makes thinking visible."
  - Scaffolding: Provides support for the student, while allowing them to infer and make connections independently.
  - Students have been found to perform better when taught through situated instruction, rather than through abstracted instruction.

**Hypothesis**

The goal of this experiment was to determine whether the incorporate scaffolding and white space in the construction of a question would promote better understanding of the question’s content as well as facilitate group discussion.

**Methods**

Figure 1 shows the mean of the student’s initial perception of the level of difficulty of the question.

![Perception of Difficulty](image)

Figure 2 represents the overall understanding of the concept the students felt after answering the question.

![Level of Understanding](image)

Figure 3 shows the mean of how well the students felt the group worked together to answer the question.

![Level of Group Work](image)

**Discussion**

Interestingly the standard workshop question (SWQ) and the question with added white space and scaffolding (WQ+WS) both received similar feedback.

- The level of difficulty perceived by students was lower with the WQ+WS
- Consistent with literature, the level of comprehension was higher for the SWQ
- Most surprising, the students with the SWQ rated their group participation at a higher level than the WQ+WS

**Conclusion**

Overall the initial perception of difficulty did not seem to impact the students ability to learn the concept. In fact students worked better in groups when presented with a question they deemed more challenging.

**References**


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