Faculty from 2 & 4 yr. colleges and universities who had previously implemented authentic large data-set lab activities indicated a commonality of students having issues with basic skills of 1) making observations and 2) interpreting graphics, maps, and data graphs. This in turn inhibited understanding concepts and/or successful completion of large data-set driven lab activities. Gallery walks, question or visual-graphic based, in traditional classrooms have been widely studied and indicate that discussion promotes higher order thinking skills that involve analysis, evaluation, and synthesis. In addition, it promotes cooperation, learning skills, and team building (Franczek 2006; Ambrose et al. 2010). Plotnikoff (2013) found that performance increases significantly 25–30% when exploration came before studying text or video rather than after it. Transitioning these activities to an asynchronous online classroom we are calling these Gallery Surfing and transitioning them into group discussions were students can learn to write detailed descriptions about graphics based on their observations using scientific language while benefiting from both peer-to-peer and faculty input. A scaffolding learning cycle approach was used to design curriculum for the 1st half of asynchronous online oceanography classes in an effort to improve students ability to explain and interpret large dataset oceanography lab activities.

In an effort to increase student content knowledge and success, a scaffolding-learning cycle approach was deployed in 3 asynchronous online oceanography classes (n=72 students) using visual gallery surfing activities. Students were introduced to graphics using online gallery surfing group discussions to increase their observation and description abilities. Students receive peer-to-peer and faculty feedback. Faculty written comment feedback were based on the scaffolding pedagogy. Students were also ranked by faculty into 4 categories: proficient, adequate, basic, and inadequate before and after each activity. Assignment grade averages and rankings were compared to previous semester students grades for the marine sediment, primary production, and ocean issues lab discussions.

**Invitation:** spark interest and recall past connections

**Exploration:** Discuss observations, results and Discoveries

**Concept Invention:** generate explanations of concepts from discipline

**Application:** make new connections and apply previous knowledge to a new concept

**Reflection:** Become conscious of what they learned, how they learned and further apply knowledge

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**Methods:**

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**Results:**

Students were ranked into 4 categories:

- **Proficient** - Ability to read and describe graphics, identify data trends, and identify correlations between datasets.
- **Adequate** – Ability to describe basic graph features and makes some detailed observations.
- **Basic** – Ability to describe some graph features and/or make a very basic description.
- **Inadequate** – Inability to read or interpret graphs. May just guess at what it is rather than making observations.

The students were also ranked if they noted a relationship to previous knowledge during GS1 as well as if peer-to-peer knowledge building was noted in their discussion with other students in both GS1 & GS2.

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**Conclusions:**

The results indicate an increase in the percentage of students that were able to make observations, read and interpret different oceanography graphics. This scaffolded learning-cycle approach also indicates peer-to-peer knowledge transfer as well as the students ability to incorporate previous knowledge and revise their previous ideas into their new knowledge base. In addition, Preliminary evidence indicates that students were more successful on later assignments that use large datasets and require higher-order and critical thinking skills in the Concept Invention, Application, Reflection and Scientific literacy stages.

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**Literature Cited:**

- The Regents of the University of California. 2018. Examples of long-term cycle designed solutions. The Lawrence Hall of Science, UC Berkeley.