The Category Creator: An Interactive Online Gallery for Bridging Student-Generated Artifacts and Whole-Classroom Reflection

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The Category Creator is a flexible, web-based interactive gallery designed to support the bridging of private constructive and public communicative activity (Hegedus & Moreno-Amiel, 2009; Stroup et al., 2002) by turning independent or small-group computationally-mediated projects into a body of work that students can reflect upon and analyze in itself. The next iteration will provide facilitators with real-time feedback data about the extent to which learners agree on different artifact groupings. Throughout this poster, I present data from an implementation of the Category Creator within the specific context of fractals and fractal structure conducted using a NetLogo (Wilensky, 1999) based construction tool. However, CC can be used with anything encoded as a digital image (for example, graphs, equations, photographs, etc.).

Theory and Motivation

The project is motivated by four interrelated theoretical perspectives:

1. Constructivism:
   Deep learning is likely to occur when learners are engaged in the active construction of knowledge, and active in a variety of modalities (digital or physical) public artifacts.

2. Making Knowledge Explicit:
   By actually creating, describing, and justifying different categories students who are engaged in the construction of artifacts can gain insight into what they believe is important about a content area.

3. Accountable and Connected Knowing:
   Learning is especially well motivated and situated if learners are accountable for their role as producers of knowledge.

4. Negotiating Shared Discourses:
   Negotiating shared discourses to describe new and different phenomena plays an important role in both the internalization of disciplinary knowledge, and the ability to participate within a given community of practice.

Fractals as a content area highlights key features of these perspectives:

- Constructing public fractals can provide learners with new lenses into the structure of the content area.
- Fractals as a content area facilitates the bridging of private constructive and public communicative activity.
- Fractals as a content area can provide learners with new lenses into the structure of the content area.
- Constructing public fractals can provide learners with new lenses into the structure of the content area.

Implications

Given that such student who developed categorization schemes within the Category Creator also participated in contributing items to the gallery, I expected that their knowledge of how artifcats were constructed would play a larger role in students’ categorizations of the artifacts post-construction. However, there is evidence from pre-post tasks that suggest students did indeed learn how to (1) better predict fractal structures from their foundational rules, and (2) better predict foundational rules from completed fractal images. Finding 1 suggests that few students used this knowledge when defining their categorization schemes. Finding 1 identifies the main theme within the scheme. The four most popular categorized fractals are based on different types of fractals: recursive, rule-based, properties, and self-similarity. The most well-linked cycles of construction-sharing-analysis were motivated by students’ desire to recreate fractals with similar features to their peers. This category is for squares that were doubled up so many times they became triangles and when they were drawn appeared as multiple triangle doubling on themselves.

Future Plans

To provide teachers and facilitators access to emergent themes as they develop, to investigate and sustain classroom discussions around the construction-sharing-categorization cycle.

Selected References


In-situ Interviews = Selected Contamia Captures User logfiles = Pre-post Workscheets