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Curiosity and Questioning: Quality Learning in the Classroom

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Curiosity and Questioning: Quality Learning in the Classroom

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Abstract

- Utilizing constructivist, situated, and biofunctional cognitive theories of teaching and learning, this study investigated active learning in a university-level writing class.
Theoretical Frameworks

- Constructivism
- Situated Learning
- Biofunctional Cognition
Constructivism

- Individuals construct new knowledge based upon their prior knowledge and experiences (see Fosnot, 1996; Shuell, 1986; von Glasersfeld, 1996).

- Knowledge is not passed from one individual to another, but rather knowledge is actively built by the individual involved in the learning process (Driver, Asoko, Leach, Mortimer, & Scott, 1994).
Situated Learning

- The situation is a vital part of the experience of the learner and may impact future learning.
- Learning is the result of a social process encompassing perceiving, problem solving, and interacting inside the immediate context.
- Learning is not separated from the world of action but exists in robust, complex, social environments made up of actors, actions, and situations (Mayer, 2003).
Biofunctional Cognition

- In learning, multiple sources must be first identified and then integrated.
- When multiple sources come together, learners experience “clicks” of understanding. (Iran-Nejad, 2000).
Research Questions

- Does multiple-source learning provide a new lens for the observation of reflective teaching and learning practices?
- Is there evidence showing that the practices adopted by one teacher fostered this kind of thinking among students, and if so, what were those practices?
Participants

- 22 university students and their instructor in a second semester, first year writing class at a major research university in the southern United States
Methodology

1. Observation—Videotapes of classroom discussions were recorded over one semester.

2. Formal and informal interviews with the instructor.

3. First essay grades, final essay grades, mid-term grades, and final grades in the class.
Data Analysis

- Questions quantified according to the number of why or what questions (such as “What kind?”).
- Simple descriptive statistics were used to determine the success of the instruction.
Multiple Sources of Evidence

- Triangulation was used to ensure the trustworthiness of the data including multiple methods of data collection and analysis
Results

The following themes emerged from this data: (1) real-world setting, (2) symbolism, (3) confronting understandings, (4) use of metaphors, and (5) authentic examples.
Real-world setting

- Real-world setting—the instructor posed questions to establish a context for understanding. For example, in discussing Donne’s “Meditation XVII,” the instructor asked, “Does anyone live in a small town where the church is really important and the church bells ring?”
Symbolism

- The teacher wanted the students to see beyond the symbols of the words to enable them to experience the multiple-source nature of symbolism.
Confronting understanding.

- The instructor repeatedly asked students, “Why do you think so?” “What kind of images do we have now?” “Why?” “Can you expand on that idea?” “What are we talking about?”

- The questions were open, encouraging the students to expand the ground of their own opinions with every new explanation they offered.
Metaphors

- The instructor asked for images in the texts.
- The students mentioned “womb” and then associated the word with birth and protection. The instructor then asked, “Why is that? How does the idea of the womb protect?”
- The students mentioned the ideas of poetry, books, and armor. The teacher then asked the students to explain how poetry could protect the poet by asking the students to express directly the analogy to which the poet was alluding.
The instructor asked students to explain church bells from their own experience.

She further asked students to explain what they knew about tigers to relate that experience to what the poets were emphasizing.

The understanding of poetry and symbolic language was sought by relating daily experiences to the texts.
## Quantitative Analysis

<table>
<thead>
<tr>
<th>Paper</th>
<th>Mean</th>
<th>SD</th>
<th>SEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper 1</td>
<td>79.67</td>
<td>12.94</td>
<td>2.82</td>
</tr>
<tr>
<td>Paper 7</td>
<td>87.29</td>
<td>6.7</td>
<td>1.46</td>
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</tbody>
</table>
The differences between the two essay grades were significant using the paired sample two-tailed t-test at a probability of $p < 0.001$. 
<table>
<thead>
<tr>
<th>Grade</th>
<th>Mean</th>
<th>SD</th>
<th>SEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid-term</td>
<td>78.33</td>
<td>16.23</td>
<td>3.54</td>
</tr>
<tr>
<td>Final</td>
<td>85.48</td>
<td>12.84</td>
<td>2.80</td>
</tr>
</tbody>
</table>
The differences between the mid-term and final grades were significant using the paired sample two-tailed t-test at a probability of $p < 0.002$. 
Discussion

- The findings in these class discussions support the importance of prior knowledge in the learning experience.

- The attempts made by the instructor to connect students’ prior experiences to the texts follow conclusions by other researchers concerning the role prior knowledge plays in creating meaning (Dole et al., 1991; Driver et al., 1994; Fosnot, 1996; Prawat, 1992; Shuell, 1986; von Glasersfeld, 1996) and in success in college (Donaldson & Graham, 1999).
The instructor in this study used experiences of some students to assist in the learning of other students. However, rather than elaborate on prior knowledge for its own sake, she attempted to have students relate through multiple sources of understanding.
Conclusion

- Convincing support was found in this study to suggest that constructivist, situated, and biofunctional frameworks for teaching and learning can increase classroom reflection and higher order thinking among university students, which is then reflected in their ability to reason through writing assignments.
It is important to note the distinction between asking the type of question that stops class discussion and asking the type of question that encourages deeper understanding.
Bruner in *The Growth of the Mind* wrote, “We have too easily assumed that learning is learning is learning—that the early version of what was taught did not matter much, one thing being much like another and reducible to a pattern of association, to stimulus-response connections, or to our favorite molecular componentry. We denied there was a problem of association of development beyond the quantitative one of providing more experience” (p. 1010)
Our Challenge

- Provide a learning experience that goes beyond a quantitative one of adding more information.
- Bring in multiple sources or perspectives to the learning situation.