

HOW STUDENTS LEARN VS. HOW WE TEACH

Excerpts from Lion F. Gardiner's Article "Why We Must Change: The Research Evidence"

Thought & Action, Spring, 1998. Excerpted by Doug Madden.

Sponsored by HCC Faculty Development, Prof. Gardiner was a guest speaker at HCC, August of 1998.

Lion Gardiner's article is fairly long and not appropriate for posting (with permission) here. It contains, however, a number of salient points about how students learn and the rather ineffective job American education is doing in addressing their needs as learners. He writes:

... we find a substantial body of evidence that clearly demonstrates a crisis of educational quality in our nation's colleges and universities.

This crisis should evoke a serious and determined response from the entire professorate. But rather, ... we too often find complacency within our ranks. We seem to turn a blind eye to the quality of our educational processes and results. The busyness of daily routine and the seeming rightness of the familiar obscures the need to change.

What makes Gardiner's article very credible and

powerful are the myriad studies and associated data he presents. Some excerpts:

- "We know that a strong relationship exists between students' formal operational ability and their success in their courses.

Critical thinking is a form of higher-order cognition that society requires and faculty esteem. ...

We urge our students to think critically and give them activities we believe will help them to learn how. Yet, 30 years of research show us that most of our students hold epistemological assumptions that prevent them from understanding and, therefore, engaging in critical thinking."

- "... the relationship between [students'] active involvement and effective learning is so strong that 'the effectiveness of any educational policy or practice is directly related to the capacity of that policy to increase involvement in learning.'

Active involvement includes frequent student-faculty interaction, both in and outside of class."

- "For tens of thousands of students in a large national study, specific curricular design had little effect on most of 22 general education outcomes examined. The types or breadth of courses, specific courses available, or relative flexibility to choose among courses had little impact on these outcomes. On the other hand, a core curriculum had salutary effects on many developmental outcomes. ...

These curricula, where students took, in common, interdisciplinary general education courses, represented less than 2 percent of the hundreds of curricula in the study."

- "One national study has revealed that only 35 percent of faculty strongly emphasize their institution's curricular goals. Only 12 percent utilize feedback from their earlier students,

and 8 percent use the viewpoints of experts in instruction. The conclusion: 'The faculty interviewed seemed to teach as they had been taught ...'"

- "Faculty in another national study 'overwhelmingly' said developing effective thinking was their primary educational purpose, but most of the 4,000 course goals they submitted related to teaching concepts in their disciplines, rather than developing the intellectual skills they said were so important."
- "... involving students in discussion fosters retention of information, application of knowledge to new situations, and development of higher-order thinking skills -- and discussions do this much better than lectures do. ...

... Yet 70 to 90 percent of professors use the traditional lecture as their primary instructional strategy."

- "In a study of 155 class sessions at four different institutions, questioning of students comprised 0.2 percent to 9.2 percent of class time."
- "... in most courses, transmission of facts from teacher to students and discussion that requires only the recall of facts are the dominant class activities, regardless of discipline, the number of weeks into the semester, or size of institution.

In one study, 89.3 percent of questions asked by the faculty required only recall to answer, not comprehension of concepts. ...

In only 0.3 percent to 2.5 percent of class time were students required to use the much more complex skill of evaluation."

- "The median cognitive level in classes of 15 or fewer students was analysis. In classes of 16 to 45 students the median was comprehension. In large classes of 46 to 300 students the median intellectual activity was recall."

- "If students are not thinking during lectures, what *are* they doing? Their attention drifts after only 10 to 20 minutes. They are listening, asking or responding to questions, or taking notes only half of the time. Up to 15 percent of their time is spent fantasizing."
- "Only 14 percent of 745 research university students said they had ever been formally taught how to study, in high school or in college."
- "... how much course content do students retain? Studies sometimes find rare high values where students retain 50 percent of the content, but values of 20 percent or less are common."
- "Although engineering students used memorized formulas successfully to solve physics problems, there were 'widespread misconceptions' when they were required to provide 'coherent verbal descriptions of abstract concepts' inherent in the problems.

After watching their teachers work 1,000 problems in class and solving another 3,000 themselves outside class, 'after four years, engineering students showed negligible improvement in problem-solving skills.'

- "The 1992 National Adult Literacy Survey of 26,000 native-born Americans discovered major deficiencies in two- and four-year college graduates' ability to work with text and numbers in straightforward, pre-college tasks such as understanding the meaning of newspaper articles, using bus timetables, and calculating prices of supermarket items."
- "Only 17 percent of 1,700 faculty respondents at a research university said they use essay tests. These same respondents claimed only 13 percent of their questions required problem-solving."

- "... numerous studies demonstrate widespread cheating among students on classroom tests, possibly involving 40 to 90 percent of all students. ...

One-third of students [in a national study of 6,165 respondents] with A's and B+'s cheated, as did two-thirds of 6,000 students at 'highly selective' colleges."

- "For well over a decade we have been warned that if we do not put our academic house in order, others ... will step in to do so. They have begun to do this. We must act quickly."

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