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THE INFORMED PRACTICE OF SCHOLARLY TEACHING

"*If we do not consciously think about and reflect on our practice, we become nothing more than automatons following a dubious set of rules or principles–rules or principles that are unlikely to be relevant in the ever-changing, complex context of teaching and learning.*"

(Cranton and King, 2003, p. 32)

Why do we study theory?
So we can fly by navigation rather than by the seat of our pants.

(Anonymous)

In one respect, teaching is an art, the result of innate talent and intuition. RIT has many highly talented faculty who are inspirational teachers. But what teacher hasn't experienced the feeling that the students aren't learning? How do we facilitate the acquisition of knowledge and the development of critical thinking and problem solving in our students? Even the most talented teachers need analytical tools to support their instincts.

Teaching is also a science, the result of a sound theoretical foundation, practice, and effort. In this respect, college faculty often begin their teaching careers at a disadvantage, with little or no formal training in education. They develop their craft through trial and error, reflection, and imitation of the teachers who taught them.

Good teachers are great lifelong learners, expanding their understanding of teaching as well as content. They understand that teaching and learning are two sides of the same coin; both are developmental in nature. Just as learning is developmental for students, so is teaching developmental for faculty; both improve with knowledge and experience.

In the last issue of *ASC Quarterly*, we highlighted the milestones of our history and the evolution of our work in the areas of teaching and learning. In this issue, we will discuss our current scholarly teaching, how scholarly teaching is different from the scholarship of teaching, and a few of the theories that inform our practice. We've included a list of some best practices. For our next issue, we invite you to share what has worked for you to improve student learning.

Scholarly Teaching and the Scholarship of Teaching

What's the Difference?

Most RIT faculty identify their primary professional activity as teaching. They are experts in their content areas, and their purpose is to facilitate the transfer of knowledge and skills to students. A second expectation of RIT faculty is scholarship, one type being "the scholarship of teaching/pedagogy." Meanwhile, the phrase "scholarly teaching" is being tossed around. Confused? You're not alone.

Scholarly teaching is classroom practice that is informed by the existing literature and research. It includes learning theory, educational research, pedagogy, psychosocial development theory, and relevant scientific brain research. It also assumes a commitment on the part of faculty to be aware of theoretical shifts and to consciously try new interventions and observe the results systematically. Essentially, any time a faculty member consults the literature, tries a new strategy, or observes and evaluates its effectiveness, that instructor is practicing scholarly teaching. A good example at RIT is in the College of Science. Learning theory tells us how powerful same-day review is for the retention of new learning. The math department's new calculus A, B, C, D sequence provides additional workshop time designed for students to work in groups on problems to review and reinforce concepts.

The scholarship of teaching, on the other hand, involves a research methodology: "The scholarship of teaching...is problem posing about an issue of teaching or learning, study of the problem through methods appropriate to disciplinary epistemologies, application of results to practice, communication of results, self-reflection, and peer review" (AAHE, 1998). The final step is dissemination of findings through a presentation or publishing, thereby contributing to the existing literature.

One informs the other in an ongoing cycle of scholarly teaching and the scholarship of teaching.

Why Do We Do What We Do?

Here in the Academic Support Center, we provide academic support for RIT students. As such, ASC faculty are devoted to both teaching and learning. We are de facto a vital learning community. Collaboration, professional development, reflection, and ongoing dialogue among colleagues in a supportive environment allow us to continue our development as college teachers. Pedagogy, the art and science of teaching and learning, is one of our content specialties, and like all content areas, it is informed by theory that changes and evolves as the knowledge base advances.

Shifts and Theories that Inform Our Current Scholarly Teaching

The Changing Social Context of Teaching and Learning: Wider Accessibility to Higher Education

The elite stereotype of higher education is changing. Ivy League schools notwithstanding, colleges and universities are admitting more and more students with increasingly diverse backgrounds.

During the 1990s four factors signifi-

cantly impacted the development of students attending American colleges and universities:

- **Section 504 and the Americans with Disabilities Act** required institutions of higher learning receiving federal funds to now provide reasonable accommodations for students with documented disabilities. These students cannot be denied access to higher education if they meet admission requirements, and colleges are now responsible for providing accommodations that would allow them to compete on the same level as their non-disabled peers.
- **The number of students entering higher education has grown exponentially.** In 1994, 62% of high school graduates went directly to college following high school, compared to 47% in 1973 (Silverman and Casazza, 2000). Today, approximately 75% of high school graduates enter college (Hoffman, 2003).
- **The number of students needing skills instruction once they arrive at college also has grown exponentially**. By the late 1990s, nearly 73% of college deans reported an increase since the 1980s in the number of students needing skills education. By 1998, almost one third (32%) of undergraduates reported having taken a remedial or basic skills course in reading, writing, or math (Levine and Cureton, 1998, pp. 4-9).
- **The number of non-traditional students,** such as professionals moving into a second career or seeking further credentials, parents returning to college after raising their children, or part-time adult students wishing to complete a degree, has grown significantly, impacting the social context of higher education.

What does wider accessibility to higher education mean for college faculty? It means a more diverse mix of students with a wider range of developmental levels and issues. This can be a challenge for faculty who are not familiar with learning theory, psychosocial development, pedagogy, and the impact of brain research on how people learn.

The Biology of Learning

MRI (magnetic resonance imaging) technology has changed our understanding of the human brain's structure and the physiology of learning. However, even with the strides in brain research, theories of brain development have continued to echo the existing psychological literature on cognitive development, most notably Jean Piaget's work. Piaget identified age twelve as the approximate time when young minds reach their full potential, and he designated "formal operations" as the final stage in cognitive development. After that, development was thought to be largely a refining process of selectively reinforcing certain neural pathways and pruning away that which was not used. The belief was that adult brains could not grow new neurons and that the slow but steady loss of brain cells was an inevitable part of the aging process.

More recently, with the availability of fMRIs (functional magnetic resonance imaging), researchers can observe brain activity as the subject is performing a particular task. The imaging studies by Dr. Jay Giedd at the National Institute of Mental Health have challenged the existing model of brain development as it had been understood.

A critical point from brain research is that brain development proceeds from the back of the brain to the frontal cortex. Development occurs in fits and starts over a much longer period than assumed previously– through age twenty-five and beyond (Park, 2004, pp. 56-65). This has enormous implications for teachers of undergraduate students and for the parents of those students.

The last part of the brain to develop is the prefrontal cortex which is responsible for the more adult executive functions such as planning, prioritizing, organizing, decision-making, anticipating, and suppressing impulses. In order for students to succeed in a college or university setting where there's lots of freedom, little structure, and high expectations for learning, they need to

(continued on page 6)

Curriculum Design

Curriculum design starts with a plan, but is an ongoing process that takes the dynamics of the class into account every step of the way. The path that an instructor takes may vary each time the course is taught due to adjustments made based on feedback and information collected regularly throughout the course.

As the course begins...

Effective instruction begins with a diagnostic activity to determine students' previous content knowledge, beliefs about the subject, beliefs about themselves as learners, and experience. Consider offering one or more of the following:

- an online survey to be completed outside of class;
- a diagnostic test covering prerequisite topics given as a homework assignment on the first night;
- a short writing sample in class;
- a knowledge probe that reveals if the student 1) knows the topic well, 2) can guess, or 3) doesn't know the topic.

During the quarter…

During each class session, the instructor elicits information from the students as a means to monitor their progress and ultimately fine tune the delivery and content. This can be done in a variety of formal and informal ways including any of the diagnostic activities completed as the course began. Any of the following also provide the instructor with valuable feedback:

- **small-group discussions** - instructor or students form small groups to recap main ideas and report on topics that they feel comfortable with; topics that aren't mentioned are on the instructor's list of topics to revisit and approach differently;
- **large-group discussions** - same as small-group but only if the dynamics of the class make it worthwhile; students who are open, honest and respectful will share valuable information;
- **journal entries** - many uses; e.g. ask students to list all they know on an upcoming topic;
- **portfolio entries;**
- **exit cards** - students write down the day's topic as "mastered," "comfortable," or "uncomfortable," or have students list "three things I learned today." Collect the cards as the students exit the room;
- **pre-tests** - ask questions on prerequisite topics and on future topics;
- **collected homework assignments;**
- **student opinion/interest surveys.**

As the quarter comes to a close…

Once again, reflection is a necessary part of the process. Instructors themselves can use a journal to assess the strengths and weaknesses of the past quarter in order to modify curriculum for the next quarter. When reviewing course evaluations, the instructor can set reasonable goals with specific strategies to implement next quarter. It can be as simple as "do more of what is working well and eliminate what is not working." It is unreasonable to expect to change everything at once.

Remember, assessment is today's means of understanding
how to modify tomorrow's instruction (Zull, 2004).

instruction

Instruction

Each instructor has a unique classroom presence and is effective with certain delivery methods. Many offer multiple delivery methods depending on the type of lesson. Although instructors have preferred ways of delivering content, research tells us that students benefit from multiple delivery methods within a class session. For example, although a mini-lecture may be ideal as an introduction to a topic, it could be followed by an activity that allows students to process the information. Consider the following activities:

- using whole class discussions (could be difficult without the right class dynamics);
- allowing for individual reflection followed by sharing with a partner and ultimately with the class (Think-Pair-Share is especially useful with large groups);
- providing time to manipulate the information by letting students create alternative forms of information, e.g., diagrams, lists of key points, graphs, timelines, capture sheets.

Instructors are responsible not only for knowing the content, but also for elaborating on, organizing and consolidating information.

Ongoing assessment is like a good research project.
You state your hypothesis, e.g., "My students can explain the three main ideas that I covered in class today."
You devise a means of collecting data.
You collect the data. You analyze the data.
You interpret the data. You make adjustments.
Repeat regularly...

assessment

Assessment

In an effort to bridge the in-class learning to the out-of-class processing, homework assignments must be meaningful. Each of the suggested activities below can be used as an out-of-class assignment. In addition to assigned reading, practice problems and/or questions, consider homework assignments that manipulate and personalize the material.

- Ask students to bridge the practice problems with real-life applications;
- Give the students an opportunity to share their own personal feelings on a topic;
- Allow the students to bring in information that is related to the topic and to share it with the class;
- Balance the students' interests with the instructor's expertise;
- Ask students to analyze the process that was taken in class and write it in their own words to share with the class;
- Pair homework readings with a specific task such as writing down key ideas and listing questions that arise during the reading;
- Ask students to assess themselves. Students could ask themselves how they are doing with the information, or what is crystal clear and what is not so clear. This type of assessment is an opportunity for students to acknowledge how far they have or have not come.

organize and prioritize tasks, plan their time, marshal intrinsic motivation (especially in the face of adversity), anticipate consequences, and suppress the impulse to engage in risky behavior (alcohol, drugs, unsafe sex). The part of the brain responsible for these tasks may simply not be quite ready for the challenge.

Cognition: The Construction of Learning

Simply being biologically prepared to learn does not guarantee that learning occurs. In the past few decades, the focus of educational research has shifted from teaching strategies and the external environment to the internal thought processes within the learner. The earlier behavioral approach focused on the teacher manipulating the students' behaviors. Examples are instructional cuing and selective reinforcement to guide and motivate students. By constrast, constructivism embraces a more student-centered approach.

By definition, constructivism is "a philosophy of learning founded on the premise that, by reflecting on our experiences, we construct our own understanding of the world we live in. Each of us constructs our own 'rules' and 'mental models,' which we use to make sense of our experiences. Learning, therefore, is simply the process of adjusting our mental models to accommodate new experiences" (Funderstanding, 2004).

Contructivism readily aligns itself with the biological view of constructing knowledge. Essentially, "information enters the brain through existing networks of neurons ... these existing networks, this prior knowledge, ...is the substrate for constructing new understanding. We learn by attaching [new learning to previous learning]" (Zull, 2004). Therefore, the first task of the teacher is to diagnose the existing networks of students. The second task is to build on these existing connections. This requires practice and meaningfulness. The third task is to assess the entire learning situation in order to improve the process the next time around.

A contsructivist model assumes that:

- learning is student-centered and the learner is an active meaning-maker rather than a passive receiver of information;
- learners develop personal strategies for encoding and retrieving information with the goal of making sense of the world;
- learners construct their own understanding rather than acquire it from other sources;
- new learning depends on prior knowledge and previous understanding;
- learning is enhanced and facilitated by social interaction;
- teachers serve as facilitators in the learning process by designing learning situations where students can work on meaningful tasks with others (Kauchak & Eggen, 2003).

Implications for College Teaching

Differentiated Instruction

No matter what the content area is, college teaching must be both developmentally informed and delivered in a student-centered manner. Enter Differentiated Instruction.

Differentiated instruction is not so much a technique as it is a mind-set on the part of the teacher. In a differentiated classroom, instructors "accept, embrace and plan for the fact that learners bring many commonalities to school, but that learners also bring the essential differences that make them individuals" (Tomlinson, 1999, p. 2). A differentiated classroom provides different avenues to acquiring content so that students have multiple options for taking in information, making sense of it, and expressing what they learn. According to Tomlinson (1999), essentially, differentiated instruction:

- s student-centered and proactive; the teacher anticipates and therefore uses diagnostic techniques to determine students' baseline levels of ability and readiness *before* formal instruction begins;

• offers multiple approaches to content, process, and evaluation;
• blends whole-class, group, and individual instruction (a combination of activities is more likely to reach and engage a higher percentage of students);
• is more qualitative than quantitative (the teacher has high expectations but provides a variety of options or avenues for determining growth and progress for each student);
• it requires periodic assessment to determine if the instructor needs to adjust the lesson, sequence, pacing or evaluation of learning; instructors who differentiate make adjustments only if they feel the change would benefit the students.

by Belinda Bryce

References

American Association for Higher Education. (1998). *Your invitation to participate in the Carnegie Teaching Academy campus program* (Instruction sheet: Campus conversations, Part One). Washington, D.C.

Cranton, P., & King, K. P. (2003, Summer). Transformative learning as a professional development goal. *New Directions for Adult and Continuing Education, 98*, 31-37.

Funderstanding. (n.d.). *Theories about learning.* Retrieved November, 17, 2004 from http:www.funderstanding.com

Hoffman, N. (2003, July-August). College credit in high school: Increasing college attainment rates for underrepresented students [Electronic version]. *Change, 35,* 43.

Kauchak, D. P., & Eggen, P. D. (2003). *Learning and teaching*: Research based methods. New York: Allyn & Bacon.

Levine, A., & Cureton, J. S. (1998, March-April). What we know about today's college students. *About Campus*, 4-9.

Park, A. (2004, May 10). What makes teens tick? *Time*, 56-65.

Silverman, S., & Casazza, M. E. (2000). *Learning and development: Making connections to enhance teaching.* San Francisco: Jossey-Bass.

Sperling, C. B. (2003). How community colleges understand the scholarship of teaching and learning. *Community College Journal of Research and Practice, 27,* 593-601.

Tomlinson, C. (1999). *The differentiated classroom: Responding to the needs of all learners.* Alexandria, VA: Association for Supervision and Curriculum Development.

Zull, J. (2004, May). What is the "art of changing the brain?" *New Horizons for Learning* [Online serial]. Retrieved August 11, 2004 from http:www.newhorizons.org/zull.htm

Invitation to Faculty:

We are interested in hearing from you! We know that RIT has many remarkably talented and skilled faculty and we would like to hear your ideas. Consider these questions:

- How do you review previous information to help students access prior knowledge before you introduce new material?
- How do you use questioning in your classroom to connect new information to what students already know?
- How do you model for and encourage students to verbalize thinking when solving problems?
- How do you get students to focus on what they think or what they would do rather than having to tell them what you think or what you would do?
- What are some real-life, authentic learning situations you have created to promote understanding and retention?
- How have you promoted students' confidence in their ability to learn by giving them challenging and meaningful tasks?
- What do you think are the best ways to tap into students' intrinsic motivation?

Please take a moment to reflect and then send your best practices to us at jmhldc@rit.edu. We'll share some of the "best of the best" in our upcoming issue.

We reserve the right to edit for content, clarity and length.