“ATLE’s Top Lists” - 2014 Articles about Teaching and Learning

   a. Summary: Taking notes on laptops rather than in longhand is increasingly common. Many researchers have suggested that laptop note taking is less effective than longhand note taking for learning. Prior studies have primarily focused on students’ capacity for multitasking and distraction when using laptops. The present research suggests that even when laptops are used solely to take notes, they may still be impairing learning because their use results in shallower processing. In three studies, we found that students who took notes on laptops performed worse on conceptual questions than students who took notes longhand. We show that whereas taking more notes can be beneficial, laptop note takers’ tendency to transcribe lectures verbatim rather than processing information and reframing it in their own words is detrimental to learning.
   b. Why this is important: Seemingly half of the students in a typical college lecture hall are using electronic devices. There is a clear risk of distraction and thus split attention when such devices are used. Many students resist the banning of laptops, as they are accustomed to using the devices to take notes. This study provides critical information faculty can use to help convince students that laptop use is still not superior to longhand note-taking, even when students resist temptations and remain on-task.

   a. Summary: Human memory is imperfect; thus, periodic review is required for the long-term preservation of knowledge and skills. However, students at every educational level are challenged by an ever-growing amount of material to review and an ongoing imperative to master new material. We developed a method for efficient, systematic, personalized review that combines statistical techniques for inferring individual differences with a psychological theory of memory. The method was integrated into a semester-long middle-school foreign-language course via retrieval-practice software. Using a cumulative exam administered after the semester’s end, we compared time-matched review strategies and found that personalized review yielded a 16.5% boost in course retention over current educational practice (massed study) and a 10.0% improvement over a one-size-fits-all strategy for spaced study.
   b. Why this is important: While many faculty members know theoretically that distributed practice (rather than “massed study”) yields better long-term learning, we sometimes lack the ability to translate this concept into classroom practice. We can take the lessons of retrieval-practice mentioned here and apply them in various ways to our own curricula, such as infusing regular assessments with intentional reflection, and re-practice, related to material learned earlier in the semester.

Summary: Previous research has shown that children benefit from gesturing during math instruction. We asked whether gesturing promotes learning because it is itself a physical action, or because it uses physical action to represent abstract ideas. To address this question, we taught third-grade children a strategy for solving mathematical-equivalence problems that was instantiated in one of three ways: (a) in a physical action children performed on objects, (b) in a concrete gesture miming that action, or (c) in an abstract gesture. All three types of hand movements helped children learn how to solve the problems on which they were trained. However, only gesture led to success on problems that required generalizing the knowledge gained. The results provide the first evidence that gesture promotes transfer of knowledge better than direct action on objects and suggest that the beneficial effects gesture has on learning may reside in the features that differentiate it from action.

Why this is important: This study makes an argument for including tactile, kinesthetic activities in the classroom, even for abstract subjects that normally do not lend themselves well to hand gestures. If the results are as equally applicable to a college setting, faculty members might wish to consider building in more hands-on, and hands-active, types of interactions and even requirements into their curricula and lecture delivery.

   a. Summary: A college education is expected to improve students’ critical thinking skills. Keeping students active in class—through writing activities and class discussion—has been shown to help students think critically. In this article, creative hands-on activities, which are common in engineering courses, are shown to improve students’ critical thinking skills in a general education course. The activities were sandwiched between pre-writing, reflecting, and writing assignments. Improvements in critical thinking skills were evaluated by comparing student pre-writing with the final paper. Overall, carefully developed hands-on activities increased student critical thinking, especially when students wrote reflections in a journal shortly after completing an activity.
   b. Why this is important: There is much contemporary discussion about the importance of developing critical thinking skills among college students. From accrediting bodies and legislatures to potential employers and college administrators, there is tremendous pressure being placed upon faculty to design and deliver courses that enhance students’ ability to think critically. In fact, students themselves are growing weary of models of teaching that only demand recall and regurgitation of factoids that seem to have little relevance for their “real lives” after college. What is often missing from conversations intended to motivate faculty to reimagine and reengineer their courses to meet this growing demand, is practical, how-to-do-it suggestions that have been tested and tried in the context of real classrooms, working with real students. This article fills that gap and offers readers findings that may be transferable to their specific teaching contexts.

   a. Summary: Understanding fear, its causes, and its impact on students can be important for educators who seek ways to help students manage their fears. This paper explores common types of student fears such as performance-based anxiety, fear of failure, fear
of being laughed at, and cultural components of fear that impact learning. The cognitive, emotional, and physiological components of fear are also investigated, including its role in memory deficits and key functions of the central nervous system that may be short-circuited when students are overwhelmed by feelings of fear. Specific strategies for educators are provided to help students manage fear-based behaviors and achieve emotional balance and academic success in the classroom. These strategies include educating oneself and students about fear, creating a nurturing environment for students, taking advantage of campus resources, being proactive about communicating with students outside of the classroom, and incorporating active learning strategies. Further, implications for practice are included, which may be used by faculty to redress the fear that students bring with them to class.

   a. Summary: Vygotsky’s Zone of Proximal Development (ZPD) provides an important understanding of learning, but its implications for teachers are often unclear or limited and could be further explored. We use conceptual analysis to sharpen the ZPD as a teaching tool, illustrated with examples from teaching critical thinking in zoology. Our conclusions are the following: teachers should assign tasks that students cannot do on their own, but which they can do with assistance; they should provide just enough assistance so that students learn to complete the tasks independently and, finally, teachers can increase learning gains by providing learning environments that enable students to do harder tasks than would otherwise be possible and by assigning the hardest tasks students can do with assistance. This analysis provides a sharp and useful tool for supporting learning across all curriculum areas.
   b. Why this is important: There are a number of theoretical frameworks that populate the field of education, but it is not always clear how those theories can be applied to everyday teaching practice. This article describes the specific ways that instructors can be more effective in the teaching of new concepts by utilizing Vygotsky’s Zone of Proximal Development – an area within a student’s learning process in which learning takes place with a specific amount of assistance from a more knowledgeable peer or teacher. Sometimes students are just on the cusp of grasping a concept, and instructors may not know what more they can do to get them there. Developing assignments and lessons with the ZPD in mind can help to give students an extra boost if they are having difficulty mastering new material.

   a. Summary: Participating in communities of practice (CoPs) is an important way of learning. For newcomers in such communities, the learning process can be described as
legitimate peripheral participation (LPP). Although a body of knowledge on LPP has been accumulated from qualitative case studies, mostly focusing on the use of practices, the concrete mechanisms that shape the LPP process have not yet been systematically analyzed. In this study, we examined participation support structures with a focus on activities that senior CoP members demonstrate to foster newcomers’ participation. The use of 8 distinct participation support structures was identified in interviews with experienced members of faculty student councils. A hierarchical linear model based on data from 68 newcomers in 14 faculty student councils was computed. The model showed that in addition to exposure time and CoP size, 2 participation support structures (recruitment strategies and accessibility of community knowledge) were predictive of the newcomers’ level of participation. We conclude that senior members’ specific participation support structures can facilitate or hinder newcomers’ participation in CoPs and that the original LPP approach needs to be enhanced by taking participation support structures into account.

b. Why this is important: Communities of Practice are employed in a variety of higher ed settings. They provide a support structure that can encourage group member participation, a challenge that many instructors who implement group work face in their classes. This article particularly emphasizes how new group members can become incorporated into a community of practice (which can then be extrapolated to classroom group work).

   http://www.tandfonline.com/doi/full/10.1080/87567555.2014.956039#.VLkG3id31NI
   a. Abstract: Within their classrooms, instructors may engage in a variety of behaviors including those perceived to be charismatic. Though researchers have uncovered instructor behaviors that have been postulated to theoretically represent charisma in the classroom, to date no quantitative data have been presented to support these claims. The current study examined 237 students’ perceptions of their instructors and confirmed that teachers may communicate charisma through nonverbal immediacy, humor, caring, and confirmation. Results are discussed as they pertain to charismatic teaching’s influence on students' intrinsic motivation and students’ perceptions of their learning.
   b. Why this is important: As individual faculty bring a wide variety of personality traits to their experience as college teachers, it is interesting to note the specific ways of interaction that are perceived by students as charismatic. The findings of this study may help faculty identify and isolate specific behaviors they can engage in to build rapport, motivate students, and ultimately impact student learning.

   http://www.tandfonline.com/doi/abs/10.1080/87567555.2014.935699#.VLkwHid31NI
   a. Abstract: In fall 2012, an interdisciplinary team of science, English, and library faculty embedded reading, writing, and information literacy strategies in Science, Technology, Engineering, and Mathematics (STEM) curricula as a first step in improving student learning and retention in science courses and aligning them with the Next Generation Science and Common Core State Standards. The authors present their reading, writing, and information literacy contributions, explaining the importance of introducing these concepts and strategies into science courses.
b. Why this is important: In an attempt to prepare more well-rounded learners who are able to appropriately transfer new knowledge to novel contexts, it is important for faculty to consider inter- and cross-disciplinary collaborations that can enhance students’ engagement with and retention of course content.


   a. Abstract: As many as 42% of first and second year students at post-secondary institutions fail to complete their degrees, and of those students, only 15–25% of them drop out due to poor academic performance or for financial reasons. The remainder of them leave college for reasons that are less clear (National Center for Education Statistics 2012). However, positive relationships with key players, including faculty, at colleges and universities have been clearly associated with college persistence and completion. This article is an examination of student-faculty relationships at four-year colleges and universities and the contexts in which their interactions occur. Characteristics of positive relationships are discussed along with descriptions of student and faculty perceptions of the significance of the different contexts in which they interact.

   b. Why this is important: Due to the increased emphasis on student success, which is often translated into improving retention and graduation rates, it is imperative that faculty understand and embrace the significant role they play in helping students persist. Findings from this study may inform faculty interested in evaluating and improving their interpersonal interactions with students.

**Bonus! The 10 best blog entries of 2014**

1. "How to get into the 'Flow' in Your Classroom"
   Steps you can take to work towards achieving the optimal level of engagement in your classroom.

2. "Examining Knowledge Beliefs to Motivate Student Learning"
   A look at how to motivate students using their own interests.

3. "The Modern College Student Infographic"
   A breakdown of the relationship between today's students and technology, by the numbers.

4. "Confuse Students to Help Them Learn"
   Examining the merits of using confusion to help students engage in critical thinking and deeper learning.
5. "Why I'm Asking You Not to Use Laptops"
   Are you of the opinion that your students shouldn't use their electronic devices in class, but
don't know how to enforce your policy without resistance? This article (and a number of the
comments) offers some solutions.

6. "Students Riding Coattails During Group Work? Five Simple Ideas to Try"
   Five practical strategies (including a checklist) you can use to address the ubiquitous challenges
of having students work together.
   http://www.facultyfocus.com/articles/effective-teaching-strategies/students-riding-coattails-
group-work-five-simple-ideas-try/

7. "How Relearning Old Concepts Alongside New Ones Makes It All Stick"
   A look at the concept of interleaving can be used to enhance the learning process (note: this
article features USF psychologist Doug Rohrer!)
   http://blogs.kqed.org/mindshift/2014/10/how-relearning-old-concepts-alongside-new-ones-
makes-it-all-stick/

8. "Teaching Practices Inventory Provides Tool to Help you Examine Your Teaching"
   A self-reflective inventory that will help you evaluate what teaching practices you are actually
using in your classes, and expose you to new ones.
   http://www.facultyfocus.com/articles/teaching-professor-blog/teaching-practices-inventory-
provides-tool-help-examine-teaching/

9. "Teaching International Students"
   An in-depth look at the challenges, implications of, and strategies for teaching international
students.
   https://www.insidehighered.com/news/2014/12/01/increasing-international-enrollments-
faculty-grapple-implications-classrooms

10. "In the Classroom, One Size Does Not Fit All"
    An interesting discussion about the importance of thinking about the appropriateness of a
    teaching tip before incorporating it into one's teaching.