

Tomorrow's Teaching and Learning

The posting below looks at the potential damaging effects of active learning activities on learning disabled students. It is by Fernando Gonzalez* and is from the December 2016 issue of Prism, Volume 26, No. 4, the magazine of the American Society for Engineering Education. [www.asee.org]
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Regards,

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For Some, Active Learning Can Be a Nightmare

Learning-disabled students face failure and isolation as they struggle to absorb content.

One of the latest trends in STEM education is active learning, a collection of practices that engage students in the learning process, including critical thinking and problem solving, in order to help them learn and retain material. Most strategies consist of a lecture where the student listens passively, followed by an activity that serves to clarify and reinforce what the student has learned. While not always necessary, this is generally performed immediately after the lecture while the students are still in class. The students are expected to gain a certain level of knowledge from the lecture in order to participate in the activity.

The benefit for the average student is well understood, supported by research, and endorsed by the White House Office of Science and Technology Policy. However, it can be a nightmare for students with learning disabilities (LD). While learning disabled students' including those with dyslexia, dyscalculia, dysgraphia, visual and auditory processing deficits, ADHD, nonverbal learning disabilities, and many others' vary in how they learn and on the type of accommodation they require, a common characteristic found in most LD students is needing more time to assimilate information from a lecture. Given that learning disabilities affect a person's ability to receive, store, and process information, these students cannot absorb material with just the lecture itself and in the time the instructor is speaking. It is very common for learning disabled students to only gather notes and some loose ideas during class and rely on further study or tutoring after class to understand the material sufficiently to participate in a related activity. In addition, since learning disabilities also affect a person's abilities to retrieve and communicate information, the activity itself may present additional challenges. For example, the Minute Paper technique requires the student to write about a topic for one minute. This is particularly difficult for students whose disability affects reading and

written expression. In essence, the learning disabled student may not be able to learn the material in time to participate in the active learning activity immediately following the lecture or may have problems with the activity itself.

For this group of students, an active learning activity not only may result in a failing grade for the activity but can also isolate them from the rest of the class. Those students' inability to participate may leave them embarrassed, discouraged, and at greater risk of dropping out of the program.

I myself have severe dyslexia and am very fortunate that active learning was not popular when I was a student. I would not have survived, and certainly would not have gone on to earn a PhD degree in engineering. After class, I typically had a good set of notes but otherwise no clue about the material just covered. It would take as much as two weeks after a lecture before I was in a position to participate in any activity related to the material.

Many instructors are overlooking the potentially damaging effects active learning can have on this group of students, who are underrepresented in STEM education and already have their share of challenges. According to the U.S. Department of Education, one can expect, on average, that 3 percent to 4 percent of the students in a typical class will have some type of documented learning disability, many more undocumented. The problem is complicated by the large variation in abilities among the learning disabled. Yet while there are abundant funding opportunities to support active learning research, comparatively little is available for research on how to make active learning inclusive for learning disabled students. This needs to change before the active learning trend ends up denying one group of students their chance to learn.

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