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Increase Student Learning in Only 3 Seconds

I CREDIT MY husband as the inspiration for this article. He is a writing professor who is exceptionally good at waiting. He has a unique ability (and probably disturbing to some) to ask his students a question and then wait...wait through the awkward silence, wait through the students' sideways glances and shifting in desk chairs until a brave student decides to volunteer and answer his question. His willingness to wait inspires me and has challenged me to use this technique with my own students. Interestingly, there is a lot of research on teacher's use of waiting in the classroom and the positive effects it can have for student engagement and learning. The best news of all? Improving student learning only takes 3 seconds.

In 1972, Mary Budd Rowe coined the phrase "wait time" to describe the period of time between a teacher's question and a student's response. Rowe found that teachers typically wait between .7 seconds and 1.5 seconds before speaking after they have asked a question. However, when teachers utilize wait times of 3 seconds or more, Rowe found that there were demonstrated increases in student creativity and learning. Robert Stahl further expanded on Mary Budd Rowe's concept in 1994 by coining the term "think time"—the period of uninterrupted silence for both teachers and students to reflect on and process their thoughts, feelings, and reactions. Stahl's definition, although similar to "wait time," more specifically labeled the action that teachers and students undergo during the period of silence as thinking.

Brain Processing Takes Time

Wait time provides a necessary opportunity for student brains to organize the complex tasks that are involved in thinking and reflecting after a question is asked. Even the fastest student brain needs time to hear the teacher's question, reflect about possible answers, select the appropriate answer, and then raise their hand to share with their peers. Therefore, increasing wait time provides an opportunity for students to hear a question and formulate a response—allowing time for brain processing.

Another important reason for faculty to

utilize wait time is because it provides an opportunity for students to think creatively, deeply, and beyond the 'easy to reach' solution. Growing up in a Google-search world, our students are expecting answers and solutions to come quickly. However, the fastest answer isn't always the best answer. Wait time allows students to sort and filter their thoughts, a foundational skill needed in order to think critically. Similar to a shopping website such as Amazon, sometimes the answers that appear first aren't necessarily what we are looking for. Students need time to filter and analyze their thoughts. Does this thought make sense? Does this thought answer the question that was asked? Does this thought connect to something we've learned in this class?

In fact, when faculty increase their wait time to 3 seconds or more it can have positive benefits for student learning and engagement:

1. The Length and Accuracy of Student Responses Increases

Rowe and other researchers have concluded that when teachers wait 3 or more seconds "there are pronounced changes in student language and logic." Research has also shown that wait time is positively correlated with increased quality of student responses. So when teachers wait longer, student responses improve.

A strategy I use in my undergraduate courses is to wait 3 seconds for students to answer, and once I receive a response, I provide praise along with a follow-up challenge, "Excellent idea! I like the way you are thinking. Who else can think of an 'outside of the box' answer?" This type of response provides reinforcement to the student who was brave enough to answer and lets other students know that I value all types of answers, especially non-traditional, out-of-the-box responses. In my experience, praising students who respond is important, but then I challenge all students to come up with different and varied answers. These creative and varied answers are only shared in my classroom if I provide space and wait time.

2. Increase in Responses by Students Who Don't Typically Respond

Students that are shy or introverts, as well as those with slower processing speed, will be more likely to participate in class discussions when given silent opportunities for thinking. Rowe believed that students who are typically not active in class discussions can "become visible" when given the opportunity for silent reflection. As an introvert myself, I remember sitting in my college classes and staying silent as the more outgoing students raised their hands first and were called on by my teachers. Thinking about my own teaching practice—do I call on the first raised hand I see? Or do I wait 3 seconds to allow an opportunity for more hands to go up?

3. Higher Order Cognitive Responses

Increased wait time has been associated with increased student reflection and critical thinking. Rowe and others found that when students were given 3 seconds or more of time to think, student answers were more thoughtful and supported by evidence. Similar to the increased length and accuracy of student responses, increased wait time allows students to access higher

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Center for Effective
Undergraduate Teaching
Carnel Learning Center, Suite 106.
Phone: 388-8426

Instructional Design Basics

INSTRUCTIONAL DESIGNERS can help with many different course-based problems and challenges, including helping you figure out where and how to start with your course design. When a course is new or needs a little design love, knowing where to start can be difficult. By starting with your main goals and then moving to assessments and content, it is easier for your course to stay in alignment with your goals than working from topics and assessments to objectives. Starting is as easy as asking yourself one simple question.

Start with a Question

In any course design, whether it is a brand-new course or a redesign, the best place to start is to write down what you hope your students will carry with them several years down the road. What do you want your students to be able to do, and what content is crucial for them to remember? It doesn't have to be the formalized language of objectives and goals that you put into your syllabus but just a straightforward list.

We do this for a few reasons. One is because sometimes the goals of a course change once we have taught it or once we have started to dedicate some brainpower to it. The second is that it creates a short checklist for you as you move forward with the design. No matter what content, interactions, and assignments you decide to put into the course, you should be able to trace a direct path to that list.

Once you have your course designed and content settled, you can revisit this list and solidify the language into course goals and objectives. By waiting to solidify the language, you will also have a second opportunity to check that all of your assessments, activities, and content align with your course goals and objectives.

Build Your Assessments

Once you have your end goals in place, you can start to figure out how you are doing to determine if students can meet those goals. There are a couple of tricks here as

well. Look at the skills and content you want students to know. What kind of summative assessment is going to help you determine if students can accomplish those skills or understand the material? If you want them to be able to recall information, a multiple-choice exam could work. If you want them to be able to write a business plan or conduct lab-based experiments, you will need to design a summative assessment that makes them do those things.

When you have your summative assessments in place, make your formative assessments. These should be the practice tests, rough drafts, discussions, and brainstorming that the students will need to perfect the skills necessary to be successful on the big assignment. One great way to figure out what these should be is to break down the big task into smaller tasks or steps. Making this kind of list will also allow you to make sure that you are varying the types of assessments and opportunities for feedback to students.

Outline Your Assessments

Once you have your goals, summative assessments, and ideas for formative assessments in place, break out your favorite planning process. Make sure that your method is one that allows for items to be moved around. For this type of task, many instructors use a Google Doc or Word document.

Start by making rows for each week of your course and marking any holidays or breaks. If you are doing any traveling or know of any big deadlines, make a note of these as well. Place your summative assessments on the table where appropriate. Then, place your formative assessments in an order that makes sense and maximizes student efficiency. Be careful not to put anything that requires careful feedback during the big deadline weeks or travel weeks. Also, make sure things are spaced well enough that you give yourself time to grade and your students

enough time to reflect.

Outline Your Content

After these are in place, start to plan your content. Make sure that you're not leaving too much room between covering a topic and the practice. If you are teaching students a new concept, have them practice immediately and then once more in a week or two. Spacing out the practice of the skills and content will help them recall it later.

Once the content, discussions, and assignments are in place, craft the objectives for that week. It helps to number your informal course goals and place the number of the course goal next to the objective or assessment that aligns with it. This will help you do a quick visual check that all goals are being assessed and covered and help you identify where there needs to be more coverage. This visual assessment can be done as you go along but should also be redone when the course design is complete.

While executing these four steps will help you in your course, they will also help you when it comes time to do your course quality check later. You'll have all of your alignment—where you check if your course content and assessments are aligned to your course goals and objectives—done from the start. It also creates a document that you can use after the course is being delivered to reflect and make notes for future changes and ideas.

Krys Ziska Strange is the curriculum and learning innovation designer at the Office of Digital Learning at University of Arizona and is focused on STEM courses for Arizona Online. She holds a master's of library and information science from Wayne State University and is currently completing her doctorate in curriculum and instruction.

Kristin Ziska Strange; Instructional Design Basics; Faculty Focus; October 25, 2019; [<https://www.facultyfocus.com/articles/course-design-ideas/instructional-design-2/>] October 31, 2019.

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level thinking. Deep, concentrated thought needs time to occur. I tell my students that when I ask critical thinking questions, I am challenging their thinking to be circular rather than linear. I want them to ask questions of each other and, likewise, to take the time to think about each others' questions. If I tell students that I expect them to critically think, I have an obligation to provide them with opportunities to engage in this type of thought. I am obligated to give them time.

As faculty begin this new semester, I hope they will consider adding this technique to

their teaching toolbox to increase student learning—it only takes 3 seconds!

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Jennifer Sullivan is a community and caregiver liaison for LEARN. She is an educator of 16 years with a masters degree in multicultural and urban education. Currently, Sullivan is an adjunct at several universities including the University of Connecticut at Avery Point.

Jennifer Sullivan; Increases Student Learning in Only 3 Seconds; Faculty Focus; October 28, 2019; [<https://www.facultyfocus.com/articles/effective-teaching-strategies/student-learning-in-3-seconds/>] October 31, 2019.