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Prior knowledge assessment strategies

Designing a lesson for all sizes assumes that each student starts from the same point. The reality is that students enter our classrooms with different skills and prior knowledge. If teachers assess their students' knowledge before stepping into an explanation, lesson, or unit, they may be surprised by the wealth of experience and information students bring to the classroom. I had the pleasure of working with teachers in Texas this week. During the workshop, we explored strategies designed to assess prior knowledge (before the lesson), check understanding (during the lesson), and encourage students to think about their learning (after the lesson). I realized I hadn't blogged about these strategies. I dedicate the following three blogs to discuss strategies that teachers can use to collect informal data before, during, and after a lesson. The more teachers incorporate mechanisms into their data collection lessons, the more likely they are to tailor their lessons to students at different levels. Below are the strategies I used to measure what students know before a lesson or unit. For any of these strategies to be effective, students need to feel safe taking risks. While they may have some prior knowledge, they may not feel sure they are right. I explain that these strategies will help me understand what they know about the topic, so that they can tailor the lesson or unit to their needs. Students need to know that they will not be evaluated or judged based on the accuracy of their responses. 1. Conceptual map Give students a conceptual map with a theme, problem, historical event or person's name. Then ask them to fill in as much information as possible using the structure of the concept map, such as the one in the photo below. Alternatively, students can create a free map of the concept of form that connects key ideas and information with a central theme. 2. Online discussion Unlike a class discussion in which only a handful of students get the opportunity to share their ideas, online discussions give everyone a voice. You can post a discussion question online using a Google classroom or school class and give students 5-10 minutes to describe what they know about a topic, concept, problem, historical event, or famous person. Ask them to describe where they learned this information—a conversation with a parent, a book, or a movie, a second grade, or life experience. 3. Carousel Brainstorm Put posters with a word, concept or problem in each of the four corners of the room. As students move around the room, the goal is to add their thoughts, ideas and prior knowledge to the posters. If you use large pieces of poster paper, students can write information directly on the poster. Alternatively, you can print the topics on computer paper and ask students to write post-it note information and stick it on the wall. If you publish mathematical problems around room, ask the participants to explain how they think they might solve any problem. What strategies would we use? Why? 4. Three things... Word Association Ask students to share the first three words that are being played when they hear a topic, concept, problem, historical event, or celebrity name. Asking students to share the first three words they link to a theme can reveal a lot about what information or misconceptions they bring into the learning environment. You can share these words offline with a post-your or post them online using Mentimeter. Mentimeter will turn his answers into a real-time word cloud. The words entered by more students will appear larger in the cloud by reinforcing the common associations that students make. Teachers who use Mentimeter cannot see the contributions of individual students of the word cloud, so this activity works better to read the room in terms of prior knowledge. 5. Two-minute conversations pair students and ask them to spend a minute each describing what they believe they know about the subject. Encourage them to explain where they learned this information. During these quick conversations, you can circle the room watching and listening. It amazes me how much I learn by simply looking at students and listening to their conversations. In just a few minutes, I have a clear sense of who has prior knowledge of the subject and who doesn't. 90 Second Brain Dump Teachers who enjoy quick writing can give students 90 seconds to write everything they know about the topic. I use the Google form for these fast brain dumps so that students' responses are transferred to Google List. This makes it easy to defend their responses or use Control +F to search for keywords to see how often they appear in a sheet. This provides insight into what the class knows about this topic, but I can also look at individual answers to assess a particular student's knowledge of the subject. If you have a strategy that you use to evaluate your previous knowledge, post a comment and share it! I like to hear what works well for other educators. Assessing students' previous knowledge allows the instructor to focus and adjust their curriculum. For students, it helps them build connections between old and new knowledge. Why assess students' previous knowledge? Determining what students already know allows you to: targeted knowledge gaps and misconceptions become aware of the diversity of backgrounds in your classroom create a bridge between students' previous knowledge and new substantive considerations to evaluate prior knowledge When using background knowledge assessments: don't require students to put their name to assessment communicate that assessment is not evaluated by usage technology: Payment systems , qualtricks and classroom responses will quantify some of the data for you Provide charts that you can then share with students to share questions with classmates or teaching assistants to confirm that questions make sense To begin evaluating your previous knowledge plan by asking the following questions: What do you assume students already know? What questions will help you confirm your assumptions? What are some common misconceptions or myths associated with your theme? How will you analyze and respond to the data provided by your pre-assessment? Some strategies Make a list of 10-15 statements related to the content of the course, including common misconceptions. Do students mark true or false next to each statement? Canvas Quizzes and Qualtrics Surveys: Create a series of multiple-choice questions to Canvas as a task for a first-grade non-class task, except perhaps assign participation points Prepare two or three open questions. Ask students to answer two or three sentences to each question. Walk through the gallery: Place pictures, charts, and excerpts from upcoming course content in the middle of poster paper. This leaves space around the material for students to write hung images around the room created by groups of two to four students who place one group in front of each poster. Give them five minutes to write observations, what they know or what they are wondering about the material In order to gauge how much students have learned, it is not enough to evaluate their knowledge and skills at the end of the course or program. We also need to find out what they know is coming so that we can more accurately identify the knowledge and skills they acquired during the course or program. You can choose from different methods to assess your students' previous knowledge and skills. Some methods (e.g. portfolios, pre-test, auditions) are direct measures of a student's ability to enter a course or program. Other methods (e.g. self-reporting of students, stocks of previous courses or experience) are indirect measures. Here are links to several methods that instructors can use to measure the students' previous knowledge. CONTACT US to speak to an Eberly colleague in person! Eberly Center Eberly: (412) 268-2896 Carnegie Mellon University5000 Forbes AvePittsburgh, PA 15213 Contact us © 2019 Carnegie Mellon University students come into the classroom with a wide range of pre-existing knowledge, skills, beliefs and attitudes, which influence how they attend, interpret and organize upcoming information. The way they process and integrate new information will, in turn, affect how they remember, think, log in and create new knowledge. Since new knowledge and skills depend on already existing knowledge and skills, knowing what students know and can do when they come into the classroom or before starting a new study topic, they can use craft teaching activities that build on student strengths and acknowledge and address their weaknesses. After assessing previous knowledge and skills, there are a number of potential answers, depending on the type of course, the uniformity of the results and the availability and type of additional materials and alternatives. For example, if most classes have misconceptions or poor understanding of a concept that you considered a critical prerequisite, you can choose to include coverage in the class, provide an additional session about it, or provide links to materials that students can independently engage with. Similarly, if most students demonstrate expertise in the skill you planned to cover, you can choose to drop it and replace it with another skill they haven't yet developed or adjust the level of complexity or time you spend based on it. Individual students without many necessary skills and knowledge could be encouraged to take the necessary courses or be warned that they must develop knowledge independently in areas if they are to succeed in the course. Thus, assessing previous knowledge can allow both the instructor and the student to allocate their time and energy in ways that will be most productive. Examples of methods for assessing previous knowledge and skillsThere are several different methods for evaluating already existing knowledge and skills in students. Some are direct measures, such as tests, concept maps, portfolios, auditions, etc., and others are more indirect, such as self-reporting, a list of previous courses and experiences, etc. Below are links to some methods that instructors at Carnegie Mellon and elsewhere have used. The InventoryKoncept Inventory concept is multiple choice or short test responses that target core concepts within the domain. These tests are designed to detect systemic misconceptions. Example 1: Mechanics This link contains samples of items from the mechanics of the basic test (Hestenes & Wells, 1992). The test is intended for students who have received some formal instruction on mechanics and is intended to evaluate conceptual understanding rather than quantitative skills. Example 2: Statics This link contains samples of items from static inventory developed by Paul Steif, Carnegie Mellon.Concept mapsConcept cartographic activities can reveal the underlying structure or organization of students' knowledge of the concept or conection of concepts. This is very useful when the types of causal theories and relationships between ideas are key to understanding the material of the course. How to create the MapsSelf-Assessment ProbesSelf-assessment concept of the assessment probe are indirect assessment methods that ask students to reflect and comment on their level of knowledge and skills in a range of items. These items may include knowledge and skills that are prerequisites for the course, as well as which will be dealt with during the course. Methods of student self-assessment method