



Interactivity in the classroom

Foundations for Teaching in Higher Education

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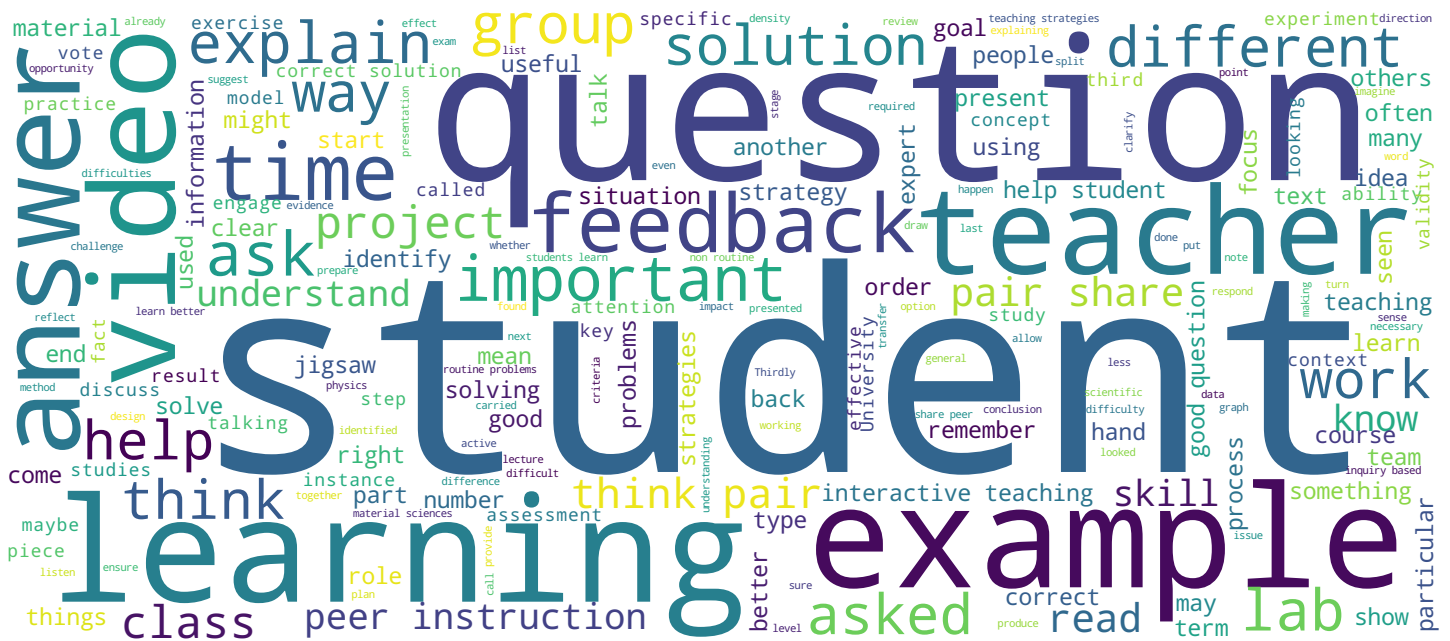

ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

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EPFL

The goals of this videos are:



- Explain why interactive teaching increases learning.
- Present three interactive teaching strategies that you can use in your class
 - Think-Pair-Share
 - Peer instruction
 - The Jigsaw

Hello. This video will talk about interactive teaching in your class. My goal here is to persuade you to use interactive teaching strategies because they have the highest potential for student learning. I will speak about a framework and I will talk about a study that helps to explain how and why interactive teaching is better for learning. The video will end with a presentation of think-pair-share, peer instruction and the jigsaw. Three interactive strategies you might want to use in your teaching. But let me explain first why I insist on interactive teaching.

Notes

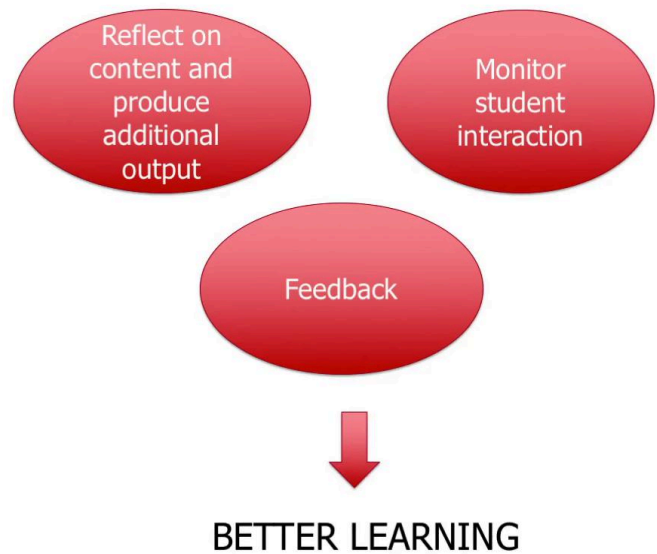
Summary



0m 04s



Interactivity in the classroom



You might remember that activating prior knowledge will 'lead in' your students to what you will present. Once students remember and focus their attention on what's important, they will be ready to engage in your class. Interactivity in the classroom means three things; the first is that students will engage by interacting with the content, they will be asked to reflect but also to produce some additional output to what has been presented. The second thing interactivity means is that as a facilitator for learning, your role as a teacher is to ensure an equal participation of every student. This is the same time to share and to talk, you can monitor this using a clock or by clearly attributing rotating roles to group members. The third aspect of interactivity is the feedback that students will receive on what they have produced in an environment that feels safe for learning. This feedback will allow them to realize what they do well but also what they need to review and to correct. What is important to remember is that students learn better when there is a fair distribution of time to talk, time to listen and time to produce.

Notes

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A framework for interactive teaching strategies



I-C-A-P= Interactive-constructive-active-passive

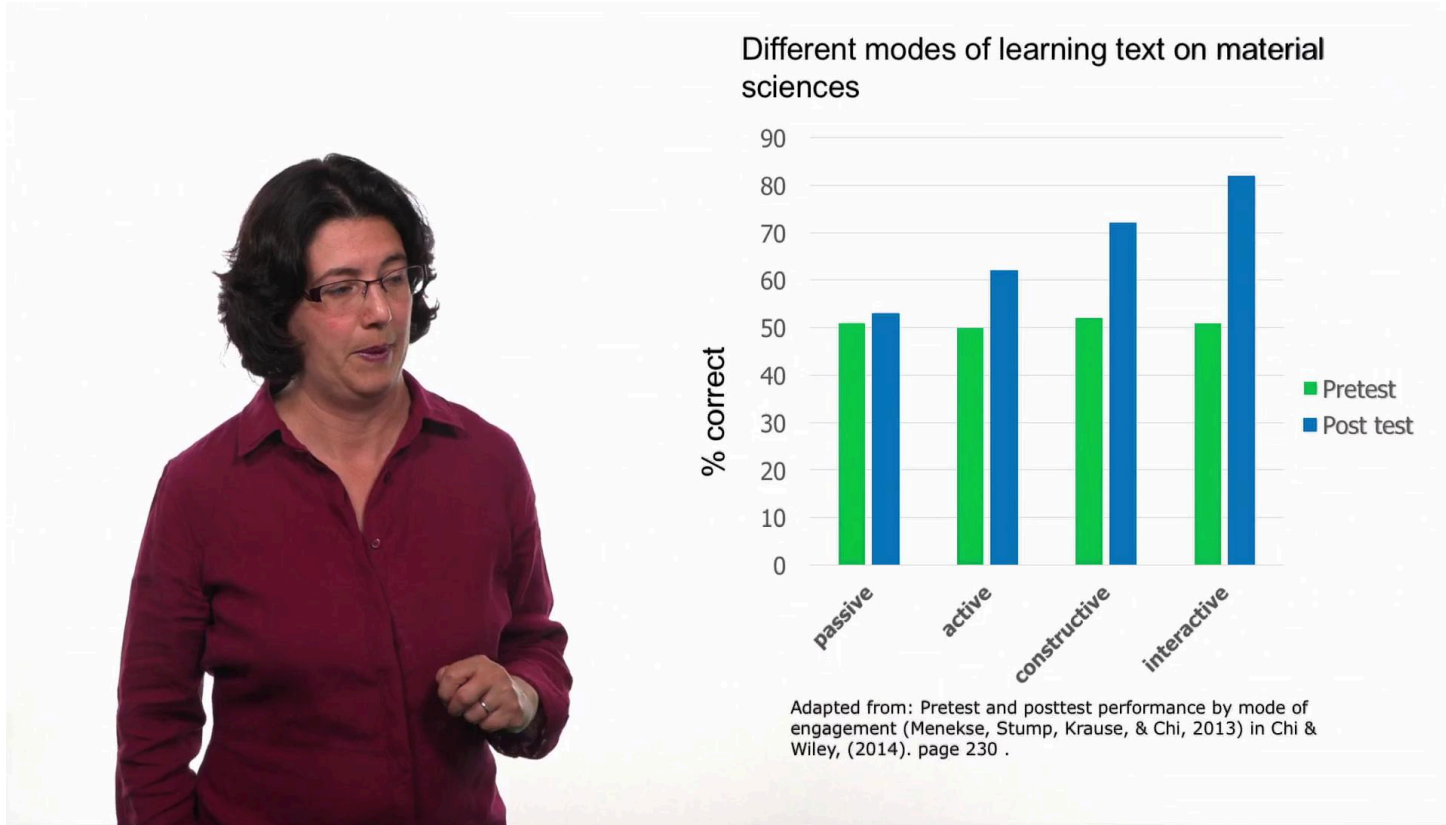
Micheline T. H. Chi & Ruth Wylie (2014) The ICAP Framework: Linking Cognitive Engagement to Active Learning Outcomes, Educational Psychologist, 49:4, 219-243,

I like how the ICAP framework helps to explain the effect that interactive teaching has on activating cognition and learning. By placing student classroom behavior in a continuum going from Passive, to Active, Constructive and then Interactive, ICAP explains how and why the activities we commonly use in the classroom help students to learn better. Take the example of explaining to others, where we can observe students being active when talking to the larger class. They can additionally be constructive when talking about content and adding their understanding about it. If they explain to others in small groups and also listen to others explanations, they will be learning interactively. While explaining to others is an observable learning behavior, the exam results are measurable and studies show that students who learn interactively do better at the exam. Let me now show you an example of increased student learning in a material sciences course.

Notes

Summary





So let's go on to see a few examples of how ICAP helps explain how certain learning activities activate learning differently. In a pretest and posttest performance study done by my Menekse, Stump, Krause and Chi, they asked different groups of students to carry out a task related to a text on material sciences, in four different ways. The first group they were asked to just read it, they were tested before and after and as you can see, what they read, what the learning was quite insignificant. The second group was asked to read the same text and to underline and to highlight somehow what was important to learn. They did slightly better on the post-test. A third group however was asked to see a graph and to try to understand what it was representing without having read the text it was about. That was the 'constructive' group, they did much better than the 'active' group. The last group was asked in couples to read the same graph and to try to explain it together with the peer. And this is group that shows a higher increase in learning.

Notes

Summary

3m 30s





Think-pair-share

Peer instruction

The jigsaw

Now let's look at three ways to introduce interactivity in your class.

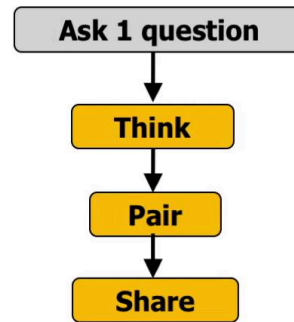
Notes

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4m 56s



Think-pair-share



Lyman (1981) in Kober, N. (2015),
question in Bruff (2009)

The first strategy is the think-pair-share. Think-pair-share was proposed by Frank Lyman of the University of Maryland. This instructional strategy has three key moments for students to solve a problem or answer a question. The first is to think individually, the second is to pair with someone and discuss that individual answer, and the third is to share with the larger group. Your role as a teacher is to come up with a question with one or several possible answers or solutions. Students will be required to step back and think their answer. You might want to ask them to write down their answer.

Notes

Summary



5m 01s



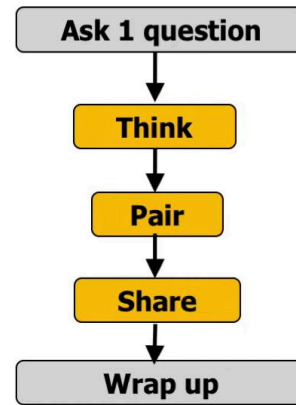
For students think-pair-share is a safe way to participate by not feeling uncomfortably exposed to respond, or to share a solution by oneself. They have the opportunity to try out your initial response with a peer. Assuming they gain confidence in their shared solution, they will contribute to the group discussion.

[illegible]

Summary



Think-pair-share



To which position do your hands return after hitting for defence?

- a. Guard
- b. Pyramid
- c. Resting

Lyman (1981) in Kober, N. (2015),
question in Bruff (2009)

The last thing to do in think-pair-share is to debrief on what was correct, what is to be corrected or what has to be done afterwards. The example below is a think-pair-share question for sports science introductory class to martial arts. It asks; to which position do your hands return after hitting for defense? Guard, pyramid, resting. Now imagine the type of discussion students may have after sharing the response.

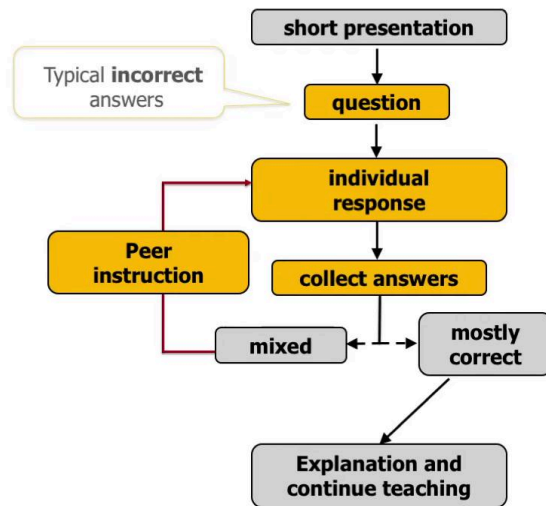
Notes

Summary



6m 06s

Peer instruction



Crouch and Mazur (2001)

Peer instruction. Similar to think per share this active strategy is used to students to explain to each other concepts they might have difficulty with. The strategy was developed by Eric Mazur who believed that students were more likely to share difficulties to one another than to raise her hand and ask the teacher. As a teacher your role in peer instruction is to start by carrying out a brief presentation on the subject. Then you will ask a question. Students will think of an answer or a solution to the question. The correct solution with two other wrong solutions are then put to a vote. Students will vote electronically or physically by raising their hands and after which they are grouped together to discuss their different responses. This is the peer instruction part. During peer instruction, students are expected to justify their vote, present the solutions and solving methods and defend their own reasoning to a peer. This is a longest part of your teaching. Students are then asked to vote again after which the correct solution is given and the teacher will explain it. A debriefing of students on the correct solution might be carried out to clarify what they didn't understand.

Notes

Summary



6m 39s

Peer instruction

Question to identify **problematic** patterns in student thinking about matter and energy.

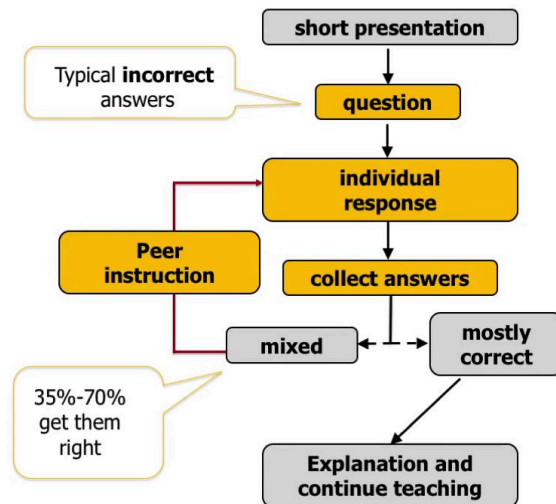
Jared, lost a lot of weight eating a low calorie diet. Where did all the fat/mass go?

a. The mass was released as CO₂ and H₂O.

b. The mass was converted to energy and used up.

c. The mass was converted to ATP molecules.

d. The mass was broken down to amino acids and eliminated from the body.



question by Wilson, 2006 in Avanzo (2008)

Crouch and Mazur (2001)

Now, peer instruction requires to think up good questions. What are good questions? A good question here is drawn from students typical incorrect answers, which might seem underpinned by a wrong understanding of a concept. To identify students common flaws you can go back to recurring questions during the lecture or common mistakes in solving exercises or in past exams. Now, how difficult should this question be? Well Crouch and Mazur suggest that these questions should be challenging enough that 35-70% of students will get them right. This means that there will be sufficient content within the cohort for students to correct each other. This is an example of a concept test question. This diagnostic question is part of test made to identify if students understand well the difference between matter and energy. Read the question; "Jared, lost a lot of weight eating a low-calorie diet. Where did all the fat/mass go?" Look at the answers. The correct answer is A; the question assumes that students typically confuse matter and energy, thinking about them interchangeably. Answering this correctly is necessary for advancing in the study of cells, organisms and ecosystems.

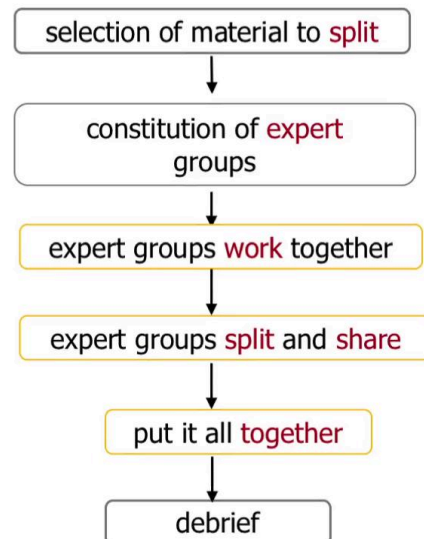
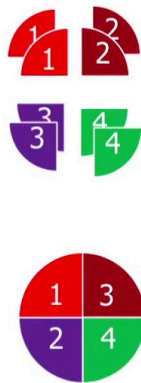
Notes

Summary



8m 05s

The jigsaw



Kober, N. (2015)

The jigsaw. The jigsaw is where everyone becomes an expert of a part of the whole intended knowledge. As a teacher, to do a jigsaw, you start by choosing a text that will be split into parts. You can ask students to prepare in advance or you can decide to devote time during the class to read the material. Students will then be split into expert groups; each group will focus on creating a same unique presentation of their part of the material. It is important to highlight that at this stage each group ignores what the other groups are preparing. Students are then grouped into complementary groups, this means that in all new groups an expert for each original group is present. Expert students will then presenter part of the material. It is important that all experts get equal time to present and to answer questions. Students will then put together the pieces of this jigsaw in order to get a complete view of material. You can provide a guideline with questions or subheadings to guide students to bring together the material. A final debriefing will include questions and clarifications.

Notes

Summary



9m 34s

Summary



- Interactive teaching strategies increase student learning.
- Instructional activities that promote thinking, sharing and doing keep students engaged.
- Three examples: think-pair-share, peer instruction and the jigsaw that you can try in your teaching.
- Ensure that students get equal opportunities to participate.

To sum up, in this video we saw that interactive teaching strategies increased learning. We discussed instructional activities that promote thinking, sharing and doing because they stimulate student engagement. I gave you three examples; the think-pair-share, peer instruction and the jigsaw that you can try in your own teaching. Lastly, ensure the students get equal opportunities to participate.

Notes

Summary



10m 57s