

Manual for creating interactive sequences

In interactive sequences, we want to change the paradigm from “It’s always the same 10% of students who answer” to creating boundary conditions where *all* students will become involved and participate. Stepwise guidelines for creating such a setting are given below.

1. *Selecting a question*

Use constructive alignment

Start with the central learning objectives of your lecture course. Focus on the learning process.

- Which activities / tasks / discussions / concepts do you wish your students to focus on during the semester? Which can profit from active discussion, guidance and feedback from you (“guide on the side”) during classroom time?
- In which tasks / discussions / concepts do you want to observe the learning processes of your students first hand?
- Where do you need more information from your students to make your teaching more effective?
- Where are you curious as to your students ideas / abilities / prior knowledge / application contexts, etc.?

2. *Formulating your question*

Use taxonomy of learning objectives

- What level of learning would you like your students to reach? Formulate your main question at this level. If the task is very challenging, you can have some building block “hints” or “guiding questions” at lower taxonomy levels, ready to use if it becomes necessary.
- Ensure your question is not of the “quizmaster” variety (These often start with, “Who knows...” or “Who can tell me...”).

Checkpoint: Characteristics of a well-formulated question

- arouses curiosity of students (may have the elements of a detective story or a puzzle)
- is relevant to students’ experience (use contexts, examples, applications they care about. Current newspaper headlines are particularly “sexy”.)
- challenges and stretches students’ knowledge and abilities
- focuses on the person doing the learning: How would you solve..? What would your next step be? Which method do you find most appropriate? Where would you set priorities?

Checkpoint: Characteristics of a question suitable for discussion

- has more than one possible solution
- emphasizes creativity, problem-solving ingenuity, critical thinking abilities
- or allows for various viewpoints, various evaluation criteria

Prepare your question in advance

Formulate your question in written form. Particularly if you have a large class, you might want to check the clarity and appeal of the question with a graduate student or colleague before trying it out on your students.

The question and task at hand need to be visible / available to the students for the entire time they are working on it.

3. Selecting the social form

Creating an atmosphere where risk & learning are possible

To avoid “losing face”, students need time to:

- think through their answer
- get feedback on the validity of their answer in a small group before exposing themselves to the plenum
- rehearse saying their answer in a small group before they say it in plenum (this is especially true if the lecture course is not being held in their mother tongue)

To avoid “losing face”, it’s also easier if responsibility for the answer is shared jointly. It is less exposing to say, “We thought..” than “I thought..”

Clear logistics

You are responsible for deciding

- how much time the students have to prepare their answer
- how large the groups will be and how they will be formed

Variety is good here! If the instructions are always, “Work with your neighbour...”, it will get monotonous by the end of the semester.

Rule of thumb – larger groups need more time to prepare their answers.

Communicate the logistics clearly.

4. Selecting the presentation form

Clear expectations

Decide in advance and communicate in written form:

- what form the answer should take (eg., diagram, 1-sentence summary, “our next question”, “our best point”, “our highest priority”, “our first step”, table, classroom voting, etc.)
- how long / short, detailed / concise the answer should be
- how the answers will be gathered in plenum

Calculate in advance how much time you need to allot to gather answers in plenum.

Rule of thumb: it often takes as much time in plenum as students had in small groups.

Variety is important!

Here are some ideas of different products / presentation forms for interactive sequences:

1. Create a knowledge map (put knowledge into context)
2. Create a mind map on topic (hierarchical summary of topic at hand)
3. Identify gaps in knowledge
4. Formulate an exam question
5. Draw a sketch
6. Create a model
7. Find a metaphor / analogy to describe a particular concept
8. Develop a research question / research hypothesis
9. Create a "Gutachten" (expert report)
10. Work on one isolated stage of a project (eg. analysis, goal-setting, experimental methods, evaluation)
11. Create a problem-solving strategy
12. Create a step-by-step flow chart showing your problem-solving process
13. Create a priority list or a flow chart
14. Do a risk analysis
15. Role play: eg., You have your own company and submit an offer for a contract
16. Prepare a parliamentary brief for your local member of parliament
17. Voting on answers or on conclusions

5. Collecting answers from students

Logistics

To avoid "losing face", it is easier if students do not have to *volunteer* to give their answer (at least at the beginning of the semester).

It is easier if you let students know in advance that you will spontaneously select (random) groups to answer in plenum.

- Variety is important here – try to choose from different parts of the lecture hall, and be sure to consciously ask some men and some women to answer.
- After hearing 2 - 3 answers, you can ask, "Which groups have a different approach?" Now that the ice is broken, this will often elicit vigorous responses from groups with something new to add to the discussion.

Logistics for classroom voting

- There are low-tech solutions like raising hands or using coloured cards.
- There are high-tech solutions like "classroom response systems" ("clickers") that let you track individual students responses over the semester and visualise voting results on-line.

Visualisation

- If students' answers are oral, you will need to visualise the main points for use in the discussion later. Think through a logical structure of this visualisation in advance. Where will you set priorities? What key words / subtitles might be helpful?
- Ownership – note down the name of the people / groups contributing. Or use an aide-memoire so you can give appropriate ownership to the ideas later in the discussion.

Creating an environment where risk & learning are possible

- Gather answers / ideas without qualifying them as “good” or “bad”.
- Don't interrupt, fill in the gaps or jump to conclusions. If there is something that is unclear, ask specific, clarifying questions. If there is a gap, leave it for the time being (very likely another group will fill it later).
- Most common error of teachers: “fishing” for a particular answer, and then taking over the discussion from that point onwards.

Try to wait 3 secs after student has finished speaking before moving on!

6. Selecting consolidation themes

Discussion

- What central themes do you want to focus on in the discussion of the students' presentations?
- What is the learning objective of the discussion?
- How will you structure the discussion?

The discussion should take the students' answers “one step further”, eg.,

- put into larger context
- compare with actual real-life solutions to the same questions
- show the larger structure of what has been learned, or put it into a theoretical framework
- crystallise out where tricky places / concepts are and how one can deal with them with more confidence
- draw conclusions

Meta-analysis

Meta-analysis is another strategy useful to further develop a topic and consolidate what students have prepared. Most important criteria: Choose an aspect of the topic that interests *you* personally and will further the learning objectives, goals of the day.

Examples:

1. Where is agreement among the various student answers?
2. Where is conflict, disagreement?
3. What is the most important point from their proposals?
4. Most surprising or unexpected result?
5. Most difficult point to discuss and why?
6. Most emotional point to discuss and why?
7. What open questions remain?
8. What question would they like to ask president of General Motors, Exxon, IBM, Bundesrat, etc.?
9. Draw a map of the landscape of the discussion

Creating an environment where risk & learning are possible

- Use the material provided by the students. Give students ownership of their answers (use your aide-memoire).
- Give recognition to the learning steps that you observe. Be specific, factual and concrete in your praise.

Logistics

- Decide in advance how much time you will allot to this consolidation phase.
- How will you visualise the results of the discussion?

Take-home message

- What is most important to you in the discussion? Formulate in advance this “take-home message”.
- It might be more appropriate to formulate only the form of the message: eg. “the three biggest priorities...”, leaving the actual content to arise out of the discussion itself.