

Summary and Checklists: How do I help students engage productively in active learning classrooms?

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This document contains all the summaries and checklists of things to consider for helping students to engage productively in active learning, along with concrete examples of how to incorporate these ideas in your classroom. This introductory article will discuss student engagement in general, with links to individual articles that address key strategies that support student engagement.

You can find all our articles online at PhysPort on our [Expert Recommendation: How do I help students engage productively in active learning classrooms?](#)



About this project

The goals of this project is to identify and disseminate strategies that instructors use to engage students in active learning classrooms. This project arose from the Framing the Interactive Engagement Classroom project, led by Stephanie Chasteen (University of Colorado Boulder), with collaboration from Jon Gaffney (Eastern Kentucky University) and Andrew Boudreaux (Western Washington University). This work was generously supported by the [University of Colorado Science Education Initiative](#) and the [University of Colorado Center for STEM Learning](#), via a Chancellor's Award.

Introduction

What is productive student engagement?

While many instructors talk about student “buy-in” (how much the students agree with the rationale for active learning), buy-in is only one component of what it means for a student to be actively engaged. You may have seen worksheet activities in which students were deeply engaged, due to the high cognitive demand of the task, but they don’t *like* the activity (“it’s like eating my spinach”). And while many students say they love clickers, you have likely observed students off-task during clicker questions, just waiting for the instructor to give them the answers. In this series of chapters, we consider “**productive student engagement**” as the goal for our classes. Productive engagement includes behavioral, emotional, and cognitive engagement. How can we support students so they participate in active-learning activities, and feel that the activities are both worthwhile and fulfilling?

How common is student resistance?

Active resistance, especially during class time, happens much less often than instructors anticipate – several studies have found that students respond positively to active learning strategies (Nguyen et al., in press; Nguyen et al., 2016). However, resistance can happen (Seidel and Tanner, 2013; Ellis, 2015). There may be “implementation dips”, where student evaluations decline during first implementation of an active learning strategy, and then recover over time (Allen, Wedman and Folk, 2001). Students may resist active learning if they feel that it is more work: For example, in implementation of an active learning environment called SCALE-UP, students resisted the change, believing that they could have achieved the same grade with less work in a lecture class (Beichner, 2007).

What can I do?

Negative feedback from students can sometimes cause an instructor to prematurely give up on the idea of using active learning strategies, saying that students “didn’t like it.” Usually, the problem isn’t so much that students truly don’t like active learning, but that it isn’t quite what they expected. Students, like anybody else, need help in figuring out how to work well and succeed in a new environment. Luckily, there is much we can do to help our students. Some students may be easier to engage than others. For example, younger students, those with prior experience with active learning, and/or a higher tolerance for ambiguity and risk, may be easier to engage (Ellis, 2013). Thus, there is no single “magic bullet” for increasing engagement, but using a constellation of approaches – such as creating a respectful atmosphere, setting appropriate expectations for students, and helping students take ownership of their learning – can have positive impacts on student engagement.

The main work of this project has been to collect specific approaches to promote engagement. What follows is a list of general factors – social, emotional, structural and cultural -- which promote student engagement.. You might focus on factors that seem particularly relevant for your course. Or you might try one strategy from within each factor. For specific strategies, and downloadable activities, [see the full article on PhysPort](#).

1. Setting Expectations

How can I set clear expectations in active learning classrooms, so students will know what they need to do to succeed?

When students encounter an active learning classroom, they may be unsure of what is expected of them. They may fear they won't be evaluated fairly, or won't see a clear path towards success. This anxiety and uncertainty can cause them to withdraw from interactive learning activities. So, to get off on the right foot, explaining the value of active learning can go a long way towards promoting student engagement.

General approaches	Specific strategies
<p>First Day: Be explicit about your pedagogical choices Let your students know why you're using the approaches that you're using, and help them see the value in them, but try to avoid lecturing about how active learning is good for them.</p>	<ul style="list-style-type: none"><input type="checkbox"/> Explain to students why you have chosen to teach this way.<input type="checkbox"/> Highlight the shortcomings of traditional lecture.<input type="checkbox"/> Solicit student ideas about the course.<input type="checkbox"/> Ask students to reflect on their learning strategies and goals.<input type="checkbox"/> Use a syllabus quiz.
<p>First Day: Introduce students to active learning, actively Beginning the semester with active learning strategies from the very first day sets clear classroom norms and aligns your first day activities with the actual structure of the course. The challenge can be to find an activity in which students can engage, which does not require content knowledge.</p>	<ul style="list-style-type: none"><input type="checkbox"/> Discuss the course approach or goals.<input type="checkbox"/> Open the floor for questions.<input type="checkbox"/> Engage students in accessible course content.
<p>Make sure students know how to do well in the course It is also critical that students know how to do well, because they will feel that they are in charge of their own learning. Student resistance often stems from anxiety about grades.</p>	<ul style="list-style-type: none"><input type="checkbox"/> Share success strategies from past students.<input type="checkbox"/> Clearly communicate expectations for student work<input type="checkbox"/> Use early, low-stakes assessments.<input type="checkbox"/> Give regular, clear feedback.<input type="checkbox"/> Mitigate overconfidence.
<p>Help students navigate group work Students may feel anxious when presented with group learning opportunities, as the familiar routine of traditional lecture has been disrupted.</p>	<ul style="list-style-type: none"><input type="checkbox"/> Establish a routine.<input type="checkbox"/> Structure the groups for success.<input type="checkbox"/> Provide clear goals and instructions for tasks.

For more information, and examples of how to accomplish each of these items, see the main article in PhysPort.

2. Metacognition and Mastery

How can I help students become more expert learners, so they engage in and benefit from active learning?

Students may approach coursework from a fairly mechanistic stance: If the instructor gives me information, I will memorize it, and get a good grade. This approach to learning doesn't lend itself well to an active classroom, which requires students to wrestle with difficult ideas in order to lead to deeper conceptual learning. Help students engage productively in active learning classrooms by teaching students reflect on their learning and develop productive mindsets towards learning.

General approaches	Specific strategies
<p>Help students think about their approach to learning</p> <p>Students benefit from reflecting on their own ideas about teaching and learning, and how your teaching approaches align with their internal beliefs. Engagement in this reflection will empower them to make adjustments in their approach to learning in the future.</p>	<ul style="list-style-type: none"><input type="checkbox"/> Probe student beliefs about learning.<input type="checkbox"/> Be explicit about your learning goals and teaching strategies.<input type="checkbox"/> Model self-reflection in class.<input type="checkbox"/> Have students self-reflect on their exams and homework.<input type="checkbox"/> Embed epistemology directly into the course.
<p>Give students feedback so they can adjust their learning approach</p> <p>The use of frequent assessment for purposes of feedback to students (i.e., “formative assessment”) is valuable both for setting clear expectations for student learning, and for guiding students to continually gauge their progress towards mastery, without significant risk to their course grade.</p>	<ul style="list-style-type: none"><input type="checkbox"/> Provide frequent, low-stakes assessments of learning.<input type="checkbox"/> Use group or two-stage exams.<input type="checkbox"/> Give students opportunities to assess their work (or that of their peers).
<p>Help students see learning as a process, which requires effort</p> <p>Support students’ “mastery” orientation towards learning (see introduction) by helping them to see that they can succeed with effort and practice, rather than natural talent. If students see learning as requiring effortful practice, then the benefit of active learning strategies becomes clearer.</p>	<ul style="list-style-type: none"><input type="checkbox"/> Communicate that it’s normal for learning to take effort.<input type="checkbox"/> Give students opportunity to revise and resubmit work.<input type="checkbox"/> Have high standards and don’t hastily encourage students.<input type="checkbox"/> Focus your feedback on learning and growth.

For more information, and examples of how to accomplish each of these items, see the main article in PhysPort.

3. Motivation

How can I help students feel intrinsically and extrinsically motivated to engage in active learning activities?

If students don't want to engage in active learning, it's pretty hard to force them. You can't rely solely on grades to spark students to action. Motivate students to engage productively in active learning classrooms through the use of various internal and external rewards.

General approaches	Specific strategies
<p>The First Day: Connect to students' interest and identity Seek to learn about your students' interests and clearly connect the course to those interests and goals.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Find out about your students. <input type="checkbox"/> Make explicit connections between the course content and students' lives.
<p>Use grading and praise effectively Grading can be a poor motivator for students to engage; instead, you can choose to offer small external incentives that show the value you place on engagement, and that are directly linked to the behavior.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Avoid curving or competitive grading. <input type="checkbox"/> Grade for participation and effort. <input type="checkbox"/> Use praise as a reward. <input type="checkbox"/> Provide both group and individual accountability. <input type="checkbox"/> Call on students at random to share their ideas. <input type="checkbox"/> Hold students accountable for pre-class preparation. <input type="checkbox"/> Use group or two-stage exams.
<p>Support students' ownership over their learning Teachers need to cede control of learning to the students, allowing students' own interests to drive the process of learning. Let students make choices regarding their learning, ask for student input, and act on student suggestions and ideas.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Set clear expectations for student behavior and work. <input type="checkbox"/> Give students choices in their learning. <input type="checkbox"/> Welcome student voice. <input type="checkbox"/> Give students enough time. <input type="checkbox"/> Use language that supports ownership.
<p>Support students' sense of competence and capability Help students to feel capable by giving reasonable challenges, and opportunities to feel successful. Framing tasks as helping students improve, rather than to evaluate their performance, can increase student engagement, particularly for those who are struggling.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Ramp up the difficulty. <input type="checkbox"/> Let students know you believe they can be successful. <input type="checkbox"/> Praise student success and focus on improvement.

For more information, and examples of how to accomplish each of these items, see the main article in PhysPort.

4. Class Community

How can I create a positive community in an active classroom, so that students feel respected and encouraged to engage?

It is challenging for instructors to create and maintain a classroom environment where students are comfortable engaging with each other and sharing their results with the class. This difficulty increases with class size. Help students to engage productively in active learning classrooms, through creating a supportive and respectful classroom community that welcomes engagement.

General approaches	Specific strategies
The First Day: Set appropriate norms for collaboration From the first day, you can communicate norms for collaboration, and have students engage in the types of interaction that you will be expecting during the rest of the semester.	<input type="checkbox"/> Decide on your norms and goals and assert them. <input type="checkbox"/> Break the ice. <input type="checkbox"/> Jump into active learning. <input type="checkbox"/> Create a class contract.
Show respectful interest in student ideas The way that you respond to student ideas and contributions sends a powerful message about the classroom norms and your expectations.	<input type="checkbox"/> Validate and build on student ideas. <input type="checkbox"/> Hear from multiple students. <input type="checkbox"/> Do not judge responses.
Create a respectful, safe atmosphere for active learning Through your facilitation of conversation and discussion you can create an atmosphere where students feel that they can contribute – and that they are not at risk of looking stupid.	<input type="checkbox"/> Collaboratively decide on the meaning of vocabulary. <input type="checkbox"/> Use communication tools to facilitate discussion. <input type="checkbox"/> Seed questions and ideas. <input type="checkbox"/> Frame yourself as the guide, but not the leader of discussions. <input type="checkbox"/> Correct errors in a way that is not embarrassing. <input type="checkbox"/> Intentionally fail to provide closure. <input type="checkbox"/> Personally reflect on the discussion. <input type="checkbox"/> Train instructional assistants to use productive discourse.
Create a positive relationship with your students To create trust and a “side by side” relationship with students, you can use a variety of verbal and non-verbal techniques such as humor, learning student names, body language, and vulnerability. All of these techniques are likely to create a sense of social immediacy and increase student participation.	<input type="checkbox"/> Use positive body language. <input type="checkbox"/> Be vulnerable and take risks. <input type="checkbox"/> Learn student names. <input type="checkbox"/> Listen to student feedback and complaints.

For more information, and examples of how to accomplish each of these items, see the main article in PhysPort.

5. The First Day – And Beyond

How can I set the stage for student engagement in an active learning classroom, from the first day?

When students come into your class, they may not be expecting the energy and risk that an active classroom demands. The first day (or really, the first week) is particularly important for framing the norms, expectations, and rationale for your class approach, tapping into students' internal motivations and creating a supportive class community. Here are some activities that can be done in an active learning classroom in the first week of class, to increase student engagement throughout the semester.

General approaches	Specific strategies
<p>Frame the entire course Make sure that students know how class will be conducted, the goals of the course, and why you are teaching this way. This helps to establish clear expectations.</p>	<ul style="list-style-type: none"><input type="checkbox"/> Discuss the course approach or goals.<input type="checkbox"/> Explain to students why you have chosen to teach this way.<input type="checkbox"/> Highlight the shortcomings of traditional lecture.<input type="checkbox"/> Share success strategies from past students.<input type="checkbox"/> Solicit student ideas about the course.<input type="checkbox"/> Ask students to reflect on their learning.
<p>Use active learning Beginning the semester with active learning strategies sets clear classroom norms for interactivity.</p>	<ul style="list-style-type: none"><input type="checkbox"/> Open the floor for questions.<input type="checkbox"/> Engage students in accessible course content.<input type="checkbox"/> Structure groups for success.
<p>Create a positive classroom environment Student engagement is heavily influenced by the culture and norms of the classroom. Think about how to set those norms, and begin to generate an environment that feels welcoming to all students, and establish yourself as a trustworthy instructor who will listen to students.</p>	<ul style="list-style-type: none"><input type="checkbox"/> Break the ice.<input type="checkbox"/> Learn student names.<input type="checkbox"/> Call on students at random to share their ideas.
<p>Connect to students' motivation and goals Seek to learn about your students' interests and clearly connect the course to those interests and goals. This strategy is very powerful for engaging students' intrinsic motivations, as well as helping them to feel a sense of identity and belonging in the course.</p>	<ul style="list-style-type: none"><input type="checkbox"/> Find out about your students.<input type="checkbox"/> Make explicit connections between the course content and students' lives.

For more information, and examples of how to accomplish each of these items, see the main article in PhysPort.

6. Group work

How can I help students have a positive learning experience when working in small groups, so they are more likely to engage?

Most active learning techniques involve the creation of student groups, but groups do not always work productively, and not all tasks are suited to group work. Poor group dynamics, or ill-suited tasks, can reduce student engagement in active learning. This chapter focuses on helping students engage productively in active learning classrooms through the type of tasks that are used, and support of productive group dynamics.

General approaches	Specific strategies
<p>Hold students individually accountable for group work Students must have some accountability for their individual learning in order for groups to work effectively.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Follow up group work with individual assessments of learning. <input type="checkbox"/> Use assessments of individual effort to adjust grades.
<p>Give groups a collaborative goal It is important to have the group working together to achieve a collaborative goal, and that the group's success is dependent on the individual learning of all members.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Give students goals as a group. <input type="checkbox"/> Use achievement rewards. <input type="checkbox"/> Use group exams.
<p>Use productive group structures The structure of groups is important for success and engagement. The group size should be well suited to the task, and so that each student will be able to contribute.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Use team-building exercises. <input type="checkbox"/> Coach students and model effective behavior. <input type="checkbox"/> Help teams develop productive goals. <input type="checkbox"/> Require groups to self-reflect.
<p>Help groups collaborate effectively and monitor their performance Students are likely to need some help in working together well.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Use team-building exercises. <input type="checkbox"/> Coach students and model effective behavior. <input type="checkbox"/> Help teams develop productive goals. <input type="checkbox"/> Require groups to self-reflect.
<p>Build motivating tasks Build “motivational embellishments” into your activities, leveraging students’ psychology to draw them in naturally to the task and make them want to engage due to intrinsic interest and value for the activity. Motivational embellishments include the insertion of specific challenges, material based on student interest, or giving students perceived control over the outcome of the task.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Don't bite off more than you can chew. Vary group learning methods. <input type="checkbox"/> Give clear, written instruction. <input type="checkbox"/> Focus on authentic, real world scenarios. <input type="checkbox"/> Allow for fun. <input type="checkbox"/> Give tasks that are just above student ability. <input type="checkbox"/> Give students choice and autonomy.

For more information, and examples of how to accomplish each of these items, see the main article in PhysPort.

7. Student Discussions

Many active learning techniques require students to discuss their ideas either in small groups or in a large class discussion, but, as you know, students don't always erupt into productive conversation. Here are some strategies to help students engage productively in discussions in active learning classrooms.

General approaches	Specific strategies
<p>Help students participate in discussion in small groups</p> <p>Students can experience very real anxiety when asked to discuss their ideas with their peers, especially if they did not anticipate that they would be required to interact in this way.</p>	<ul style="list-style-type: none"><input type="checkbox"/> Circulate and listen in.<input type="checkbox"/> Use questions that students want to discuss.<input type="checkbox"/> Hold students accountable for small group discussions.<input type="checkbox"/> Use “random call” during whole class discussions.<input type="checkbox"/> Use cluster seating.<input type="checkbox"/> Promote a culture where expressing ideas is safe and normal.
<p>Help students speak up during class discussion</p> <p>Many active learning techniques require students to speak up in a whole class discussion. Even more so than in a small group, it is quite intimidating for students to speak up in front of a large group.</p>	<ul style="list-style-type: none"><input type="checkbox"/> Use student response systems (“clickers”).<input type="checkbox"/> Use “random call” during whole class discussions.<input type="checkbox"/> Give points or rewards for speaking up.<input type="checkbox"/> Increase your “wait time.”<input type="checkbox"/> Use Think-Pair-Share to help them process the question.<input type="checkbox"/> Have them write down their responses.<input type="checkbox"/> Assign a group reporter.<input type="checkbox"/> Use the “whip around.”<input type="checkbox"/> Promote a culture where expressing ideas is safe and normal.

For more information, and examples of how to accomplish each of these items, see the main article in PhysPort.

8. Student Complaints

What if I get low student evaluations, or hear complaints about active learning?

While active resistance among students is relatively rare, sometimes students do complain about active learning techniques. Here are some ways to address some common student complaints in active learning classrooms. While student complaints may be challenging or even hurtful to hear, they offer valuable opportunities for you to learn from your students, and possibly improve the overall engagement of the class.

General approaches	Specific strategies
<p>Addressing student complaints You might hear a few vocal complaints from students. Some comment complaints include, “the professor isn’t teaching anything,” “We have to teach ourselves,” “The class is too much work,” “We’re wasting time,” or more personal attacks on the instructor. Often, such initial pushback can decrease over time, as the course structure becomes more normative, and initial difficulties are addressed.</p>	<ul style="list-style-type: none"><input type="checkbox"/> Listen and respond constructively.<input type="checkbox"/> Try to identify the problem.<input type="checkbox"/> Let other students make the point for you.<input type="checkbox"/> Set appropriate expectations for the course.<input type="checkbox"/> Reassure students that learning is hard.
<p>Responding to low student evaluations Active resistance to interactive engagement is relatively rare, but resistance and low evaluations can happen. Please remember that student evaluation results should be taken with a grain of salt, as they are not necessarily measures of student learning.</p>	<ul style="list-style-type: none"><input type="checkbox"/> Use alternative measures of teaching effectiveness.<input type="checkbox"/> Gather mid-semester feedback<input type="checkbox"/> Use group exams.<input type="checkbox"/> Give students choices.<input type="checkbox"/> Find out where problems are and address them.<input type="checkbox"/> Don’t do too much, and stay in touch with your teaching instincts.

For more information, and examples of how to accomplish each of these items, see the main article in PhysPort.