# Active Learning Strategy 1 – Using Technology

Working definition of technology: Technological tools that assist in the analysis of data, communication, development, and exchange of knowledge in the student learning process. When using active learning, technology is about designing a lesson that allows students to acquire information through discovering material for themselves. This may include having students work with Tableau, CODAP, R, Tinkerplots, applets, etc. to discover concepts. This does not include passive technology, such as displaying a PowerPoint or using a calculator.

## Definition Feedback Questions

* Do you agree with the working definition of technology? If not, please explain.
* Do you find this definition specific enough to clearly describe these activities to a general graduate student teaching audience? If not, please explain.

*Definition Feedback:*

* Is creating graphs implicitly included in your definition? I think it is under communication but wonder if GSIs will. I wonder if including “presentation” is another word to include in your definition.
* The “when using active learning, technology is …” sentence does not feel specific enough to the use of technology. It’s a good definition for active learning but doesn’t yet quite capture the *use of technology* in an active learning environment because I can remove technology from that sentence and the sentence would still be true.
* Maybe something like “Using technology in an active learning environment is about the instructor effectively using technology as a cognitive tool that allows students to discover statistical knowledge for themselves and deepen their conceptual understanding of the material.”
* Do you need to include the last two sentences? In a way that could sway GSIs to talk about one sort of technology and I think it is interesting to see what they say on their own. I could also argue that one could effectively use a calculator in a cognitive (and non-computational way) – I don’t think it happens a lot but it’s possible to conduct a simulation with a calculator.
  + Maybe instead of the last two sentences you could give general statements about effective or cognitive uses of technology versus procedural uses of technology. For instance, “technology can be uses as a productivity tool (placing emphasis on efficiency and computation) and as a cognitive tool (placing emphasis on conceptual understanding)

## Construct 1: Intrinsic Motivation

Intrinsic Motivation – Performing an activity for oneself, in order to experience pleasure and satisfaction inherent in the activity.

### Feedback Questions: Wording

Please respond to the following questions after each item below in the *Wording Feedback* area.

* Are their concerns about the wording of the question (e.g., double-barreled, idioms, jargon, etc.)?
* Are their concerns about how items are phrased (e.g., leading items, items that may be misinterpreted, items that may not be appropriate for GSIs)?

### Feedback Questions: Relationship

Please respond to the following questions at the end of the items in the *Relationship Feedback area.*

* Do you believe each item reflect qualities of intrinsic motivation?
* Do you believe there are missing items?
* Are aspects of intrinsic motivation’s definition mis or underrepresented within the set of items?

### Items

Directions: Read each item carefully. Using the scale below, please circle the number that best describes the reason why you are currently engaged in this activity. Answer each item according to the following scale: 1: corresponds not all; 2: corresponds very little; 3: corresponds a little; 4: corresponds moderately; 5: corresponds enough; 6: corresponds a lot; 7: corresponds exactly. (The scale has been removed during the item review phase).

1. I find it enjoyable to discover new technologies that work in my classroom
2. I am happy when using technology to teach statistics
3. I find using technology satisfying when teaching statistics
4. I find it enjoyable to teach statistics using technology
5. I would describe using technology to teach as very interesting
6. I naturally think about using technology when preparing a lesson
7. I’m committed to continuously using technology to teach statistics in my classroom
8. I get excited when using technology to teach statistics

*Wording Feedback*

* Since your scale is 1 to 7, could you list these items (in all categories) with A., B., C., D., etc. instead of numerating them. I think this will help avoid any confusion.
* *“*please circle the number that best describes the reason why you are **currently engaged in this activity**.” ---- this wording is throwing me off. At first, I was wondering if that GSIs are participating in an activity themselves, but I think you mean the activity that’s in each of the 8 statements.
  + Maybe something like “... that best describes your **reaction** to each of the eight statements below.” 🡪 reaction isn’t the best word here though….
* Scale – Why so many options? Would including % be more helpful here? For example, corresponds 50% of the time or something similar. If that doesn’t seem practical, I’d reconsider the words, “a little”, “moderately”, “enough” because those are very subjective and left up to the person completing the interview. What I consider “enough” could be very different from what another considers as “enough.”
* Is there a distinct difference in #2 and 4? They seem to be getting at the same thing.
* Is there a reason #5 is worded differently from others? It could be phrased (similar to #3, 4) as “I find it very interesting to use technology to teach statistics.”
* Do you want just likert-scale responses? I think it would be interesting to offer a place where they can write in comments, but I’m not sure if you are looking for that kind of survey.

*Relationship Feedback*

* #6 and particularly #7 seem like a different flavor than the other questions. Being committed to use technology could be because of external pressures, the coordination of a class, etc. I don’t think it is directly and solely tied to intrinsic motivation.
* Would a question about “curiosity” also relate to intrinsic motivation? For example, “I am curious to learn more about using technology to teach statistics.” Similarly, how about “accomplished” or “challenged” – “I feel accomplished/challenged when I use technology to teach statistics” (not the best sentence but the idea is there).

## Construct 2: Integrated Regulation

Integrated Regulation – Non-intrinsically motivated behavior has been completely internalized, there is no internal resistance, and there is a willingness to do the behavior because it is

### Feedback Questions: Wording

Please respond to the following questions after each item below in the *Wording Feedback* area.

* Are their concerns about the wording of the question (e.g., double-barreled, idioms, jargon, etc.)?
* Are their concerns about how items are phrased (e.g., leading items, items that may be misinterpreted, items that may not be appropriate for GSIs)?

### Feedback Questions: Relationship

Please respond to the following questions at the end of the items in the *Relationship Feedback area.*

* Do you believe each item reflect qualities of integrated regulation?
* Do you believe there are missing items?
* Are aspects of integrated regulation’s definition mis or underrepresented within the set of items?

### Items

1. I believe using technology is necessary when teaching statistics
2. Using technology is consistent with my values as an instructor
3. Using technology is part of the way I have chosen to teach statistics
4. Using technology is a part of who I am as a statistics instructor
5. Using technology is important for me as a statistics instructor
6. Using technology is a better way to teach statistics than through strictly lecture
7. I find the use of technology extremely valuable when teaching

*Wording Feedback*

* #1 and 7 are phrased differently than the rest. Can/Should they be rephrased to match others? For example, #1. Using technology is necessary when teaching statistics. And #7. Using technology is extremely valuable when teaching statistics.
* #6 – is this needed? This sentence makes more sense to me in the context of group work strategies, but not necessarily technology use. A GSI could still entirely lecture while using technology.

*Relationship Feedback*

* I like how some of the questions get at understanding if a GSI is using technology because they want to rather than they *have* to (i.e., if they are teaching in a coordinated course). But I also wonder if a more direct question along those lines would help you make that statement in a findings. Would a question about whether or not it’s part of their requirements when teaching be a useful addition here? For example, “Using technology is part of what I’m required to implement, as indicated by my department”.

## Construct 3: External Regulation

External Regulation – Motivation behavior where that has not been internalized. A willingness to do a behavior to obtain something tangible that satisfies an eternal demand or avoids punishment.

### Feedback Questions: Wording

Please respond to the following questions after each item below in the *Wording Feedback* area.

* Are their concerns about the wording of the question (e.g., double-barreled, idioms, jargon, etc.)?
* Are their concerns about how items are phrased (e.g., leading items, items that may be misinterpreted, items that may not be appropriate for GSIs)?

### Feedback Questions: Relationship

Please respond to the following questions at the end of the items in the *Relationship Feedback area.*

* Do you believe each item reflect qualities of external regulation?
* Do you believe there are missing items?
* Are aspects of external regulation’s definition mis or underrepresented within the set of items?

### Items

1. I use technology because it is recommended to me by another
2. I use technology because it feels like this is the way I have to teach statistics
3. I use technology because I would get in trouble by others if I didn’t teach using it
4. I use technology because I believe students would be upset with me if I didn’t teach using it
5. I use technology because I think it will help me earn a teaching award
6. I use technology because it will help me gain an external benefit
7. I use technology because I am praised for doing so
8. I use technology only when I am being observed by a another
9. I use technology because others think of me as a better instructor

*Wording Feedback*

* #1 – recommended or required? Or maybe have a separate section that asks the same question but with required instead.
* #6 – what do you mean by external benefit? Could that be interpreted as a teaching award as well? If so, I wonder what distinguishes #5 and #6.
* I like how these statements are all structured the same way.

*Relationship Feedback*

* Do you want a question to get at the productivity/cognitive use of technology? For example, “I use technology because it helps deepen my students’ understanding” or “I use technology because it quickly performs computations”
* Another possible question “I use technology because it makes me a better instructor” – slightly different than #9, but it’s more internal so would that be more intrinsic?

## Construct 4: Amotivation Items

Amotivation – The absence of intention or clear motives to engage in the use of active learning. A lack of both intrinsic and extrinsic motivation.

### Feedback Questions: Wording

Please respond to the following questions after each item below in the *Wording Feedback* area.

* Are their concerns about the wording of the question (e.g., double-barreled, idioms, jargon, etc.)?
* Are their concerns about how items are phrased (e.g., leading items, items that may be misinterpreted, items that may not be appropriate for GSIs)?

### Feedback Questions: Relationship

Please respond to the following questions at the end of the items in the *Relationship Feedback area.*

* Do you believe each item reflect qualities of amotivation?
* Do you believe there are missing items?
* Are aspects of amotivation’s definition mis or underrepresented within the set of items?

### Items

1. I don’t see any value in using technology in the classroom
2. I’m not sure using technology helps my students learn the material better
3. I don’t see any value using technology brings me as the instructor
4. I often question if I should use technology to teach statistics
5. Technology’s place in teaching statistics is unclear to me
6. I believe using technology wastes class time
7. I do not wish to continue to learn about how to use technology in the classroom when teaching statistics
8. I don’t know why you would use technology to teach statistics
9. I don’t know why I use technology to teach.
10. I don’t see me using it in the future

*Wording Feedback*

* #4 – rewording suggestion – “I question if I should use technology to teach statistics”. A GSI may sometimes question this but not often so I think removing often will help GSIs answer this question.
* #6 – rewording suggestion -- “I believe using technology to teach statistics is not a good use of class time”
* #10 – rewording suggestion – “I don’t see myself using technology in my future statistics instruction.”
* Generally, do you want to keep reminding them it’s about teaching statistics in these (and all of your questions)?

*Relationship Feedback*

* If you are open to open-ended questions, I wonder if you include the following question:   
  “Describe the value you find in using technology to teach statistics and describe what motivates you to use technology.”

## General Comments

* In a couple of places above, I made some comments about including open-ended questions. I think having some open-ended questions, especially during your first implementation of this instrument, will help you fine tune your instrument even more once you collect GSIs responses to it. I think it will help see if they are interpreting your questions as you think they are which will lead to better revisions. For instance, if the open-ended question prompts them to answer in a way that clearly conflicts which their choice in the likert scale question, than you know to change that likert scale question to minimize the interpretation that GSIs might take when reading that question.
* I could see GSIs forgetting that the focus is on using technology for active learning and answer some of these questions without that focus. I wonder if there is a way to constantly remind GSIs what focus of technology use they should be thinking about when answering these questions.

# Active Learning Strategy 2 – Group Work

Group work refers to: Method of instruction that provides students opportunities to work together in groups of two or more. Implementing group work involves using strategies that encourage students to collaboratively communicate with group members, share their ideas equally across group members, and engage students to think critically about the topic(s) with their group members. This includes active learning strategies such as think-pair-share, group presentations, or other small group work activities that have the characteristics described above.

Question for Feedback:

## Definition Feedback Questions

* Do you agree with the working definition of technology? If not, please explain.
* Do you find this definition specific enough to clearly describe these activities to a general graduate student teaching audience? If not, please explain.

*Definition Feedback*

* See track changes above. Thought that would be easiest.
* I think the idea of “group work” is pretty clear based on its name. But I don’t think *all* GSIs will understand the strategies you list in the last sentence, especially think-pair-share. Is it too much to include more description to this strategy? How does the IP guide define it?

## Construct 1: Intrinsic Motivation

Intrinsic Motivation – Performing an activity for oneself, in order to experience pleasure and satisfaction inherent in the activity.

### Feedback Questions: Wording

Please respond to the following questions after each item below in the *Wording Feedback* area.

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### Feedback Questions: Relationship

Please respond to the following questions at the end of the items in the *Relationship Feedback area.*

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### Items

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2. I am happy when using group work to teach statistics
3. I find using group work satisfying when teaching statistics
4. I find it enjoyable to teach statistics using group work
5. I would describe using group work to teach as very interesting
6. I naturally think about using group work when preparing a lesson
7. I’m committed to continuously using group work to teach statistics in my classroom
8. I get excited when using group work to teach statistics

*Wording Feedback*

* #1 Rewording suggestion – “I find it enjoyable to discover new group work strategies to implement in my statistics classroom.”
* I feel that saying “group work strategies” is more specific/precise that “group work.”

*Relationship Feedback*

* New thought about these questions and technology ones – I’m wondering if you want them to first identify technology tools or group work strategies them implement. Like include a question that says: “List the group work strategies you have implemented in your statistics instruction: \_\_\_\_\_\_\_\_\_” Then say, with the strategies/technologies you identified above, answer the following questions” 🡪 This or something like that may be a way to remind them of their focus and help you understand the context they are thinking about when answering these questions.

## Construct 2: Integrated Regulation

Integrated Regulation – Non-intrinsically motivated behavior has been completely internalized, there is no internal resistance, and there is a willingness to do the behavior because it is

### Feedback Questions: Wording

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*Wording Feedback*

*Relationship Feedback*

## Construct 3: External Regulation

External Regulation – Motivation behavior where that has not been internalized. A willingness to do a behavior to obtain something tangible that satisfies an eternal demand or avoids punishment.

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6. I use group work because it will help me gain an external benefit
7. I use group work because I am praised for doing so
8. I use group work only when I am being observed by a another
9. I use group work because others think of me as a better instructor

*Wording Feedback*

*Relationship Feedback*

## Construct 4: Amotivation Items

Amotivation – The absence of intention or clear motives to engage in the use of active learning. A lack of both intrinsic and extrinsic motivation.

### Feedback Questions: Wording

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* Are their concerns about the wording of the question (e.g., double-barreled, idioms, jargon, etc.)?
* Are their concerns about how items are phrased (e.g., leading items, items that may be misinterpreted, items that may not be appropriate for GSIs)?

### Feedback Questions: Relationship

Please respond to the following questions at the end of the items in the *Relationship Feedback area.*

* Do you believe each item reflect qualities of amotivation?
* Do you believe there are missing items?
* Are aspects of amotivation’s definition mis or underrepresented within the set of items?

### Items

1. I don’t see any value in using group work in the classroom
2. I’m not sure using group work helps my students learn the material better
3. I don’t see any value using group work brings me as the instructor
4. I often question if I should use group work to teach statistics
5. Group work’s place in teaching statistics is unclear to me
6. I believe using group work wastes class time
7. I do not wish to continue to learn about how to use group work in the classroom when teaching statistics
8. I don’t know why you would use group work to teach statistics
9. I don’t know why I use group work to teach.
10. I don’t see me using it in the future

*Wording Feedback*

*Relationship Feedback*

## General Comments

Part 2: Background Questions Review

# Directions – Background Question Review

Background questions will be given at the beginning of the instrument to collect background data on each GSI filling out the survey. We please ask you to review these background items and consider the following:

* Are the background questions written clearly?
* Are the background questions appropriate for GSIs?
* Are GSIs unable to answer certain background questions?
* Are there any additional background questions you suggest we consider collecting data on?

Please write feedback in the *Background Questions Feedback* area at the end of the background questions.

## Background Questions

1. Are you currently enrolled as a graduate student?
2. Please list the name of the university you are currently enrolled in.
3. Please list the degree program you are enrolled in. Ex. Doctorate in Statistics
4. Please list the subject area you are studying. Ex. Statistics
5. Please enter the number of years you have completed in your current graduate degree program. Round up (e.g., if you have completed 3.25 years, please enter 4).
6. Are you currently involved in teaching a statistics course, or leading a recitation section?
7. Please list the number of semesters you have taught or lead a recitation section while being enrolled as a graduate student.
8. Please list the number of semesters you have taught a statistics course or lead a recitation section while being enrolled as a graduate student.
9. Prior to becoming a graduate student at your current institution, did you have experience as a full-time teacher in an elementary, secondary classroom, or college university?
10. Do you engage in conversations about teaching with other graduate students? If so, how often?
11. Describe the type of classroom you teach in. Ex. Lecture hall. Technology Enhanced Classroom. Number of students. Ect.
12. Please read the following definition of using technology in your classroom:

Technological tools that assist in the analysis of data, communication, development, and exchange of knowledge in the student learning process. When using active learning, technology is about designing a lesson that allows students to acquire information through discovering material for themselves. This may include having students work with Tableau, CODAP, R, Tinkerplots, applets, etc. to discover concepts. This does not include passive technology, such as displaying a PowerPoint or using a calculator.

Based on this definition, describe how you use technology when teaching statistics. If you do not use technology when teaching statistics, please write “N/A.”

1. Please read the following definition of using group work in your classroom:

Method of instruction that gets students to work together in groups of two or more. Group work involves strategies that involve students to communicate with peers, share their ideas more equally across group members, and engage students to think critically about the topic(s) with their peers. This includes think-pair-share, group presentations, or other small group work activities that have the characteristics described above.

Based on this definition, describe how you use group work when teaching statistics.

*Background Question Feedback*

## Survey Feedback

Thank you for taking the time to review the items on this survey. Your participation is highly valued, and we sincerely appreciate the time and effort you’ve invested into this project. We would like to invite you to comment on the structure of this review. Specifically, please comment on the following:

* Were the review instructions clear?
* Did you have any lingering questions during or after the review process.
* In what ways could this review be improved prior to the next wave of experts?

Please write feedback in the *Survey Feedback* area.

*Survey Feedback*

* How about including a question about any PD or support they are given at their university? A question like, “Does your department offer a training program for new graduate students?” and “What kind of support does your department provide graduate student instructors?”