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Active Learning Classroom Observation Tool: A Practical Tool for Classroom Observation and Instructor Reflection in Active Learning Classrooms

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Centers for Teaching and Learning (CTLs) have long offered the service of classroom observations to instructors who seek to improve in-class teaching effectiveness. Classroom observations, however, have not explicitly addressed the recent emergence of "active learning classrooms," classrooms that are designed to support active and collaborative learning approaches. Given the absence of an observation protocol explicitly designed to address instructional approaches within active learning classrooms, in spring and fall of 2015, CTL faculty developers and researchers at Indiana University-Bloomington created the Active Learning Classroom Observation Tool (ALCOT). The ALCOT allows a holistic consideration of the learning experience, providing a view to the instructor's attempt to combine the spatial and technological affordances of a classroom with active and collaborative learning pedagogies. Faculty developers and researchers developed and piloted the Active Learning Classroom Observation Tool to elicit thoughtful reflection and meaningful feedback on teaching and learning undertaken within these new learning spaces.

Introduction

Centers for Teaching and Learning (CTLs) have long offered the service of classroom observations to instructors who seek to improve in-class teaching effectiveness. Classroom observations, however, have not explicitly addressed the recent emergence of "active learning classrooms," classrooms that are designed to support active and collaborative learning approaches. As such, there is a need for a reflective pedagogical observation tool specific to the context of active learning classrooms, given the rising prevalence of these classrooms. For example, in the past four years, Indiana University Bloomington has designed many active learning classrooms. Instructors who taught in these active learning classrooms increasingly sought out the university's teaching and learning center for assistance in rethinking their teaching practices and strategies in these new settings. Instructors requested teaching observations from faculty developers at IU-Bloomington's Center for Innovative Teaching and Learning (CITL) to help them create effective instruction that would coherently bring together the design features and affordances of an instructional space with new active learning pedagogies.

The classroom observation is commonly employed at university centers for teaching and learning to help instructors improve their instruction and course designs. When a formative assessment is the goal of an observation, rather than a summative assessment (Chism, 2007), the classroom observation itself is usually situated between a pre-observation meeting and a post-observation meeting. The process is characterized by instructor reflection, feedback from the observer, and an ongoing dialogue between the two about the observed class and the instructor's teaching goals (Fullerton, 1999). Implementations of classroom observations are sometimes designed to generate quantitative data, such as in the well-established Reformed Teaching Observation Protocol (RTOP; Sawada et al., 2002) and the Classroom Observation Protocol for Undergraduate STEM (COPUS; Smith, Jones, Gilbert, & Wieman, 2013). However, the majority of observation approaches tend to feature structured forms that the observer uses to gather qualitative data, which are, in turn, used to facilitate further discussion and reflection (Gosling, 2000; Millis, 1992).

Numerous peer observation approaches feature instructor reflection and feedback from teaching experts, what Gosling has labeled the "development model" of peer evaluation (2002). When observation protocols call for instructor reflections, the instructor benefits from engaging in a process of self-directed professional development for their role as an instructor (Schön,

1983). The instructor also benefits from a dialogue with, and feedback from, a teaching expert who can introduce the instructor to different teaching strategies that may better help the instructor facilitate student learning (Hattie & Timperley, 2007). Other benefits are institutional, such as improvements in instructional quality, especially when the instructor controls the process of observation (McMahon, Barrett, & O'Neill, 2007). Although faculty developers at teaching centers generally offer the service of classroom observations to improve faculty instruction, few of their classroom observation protocols explicitly address the relationship of instructional approaches to the spatial and technological features of a classroom.

ALC Classroom Tools in the Literature

A review of literature, and search of observation tools to use within IU Bloomington's designated active learning classrooms, revealed that no published tools featured classroom space and affordances as an important consideration in the context of teaching. For example, Millis (1992) provides several possible observation tools, highlighting different approaches to classroom observation, but only one mentions a category linked to classroom space, asking the observer to note classroom inadequacies, such as size and temperature. Dezure (1999) also considers the classroom environment, but not as an active support or element of pedagogy, and the classroom technological affordances are not considered. The ISTE Classroom observation tool (ICOT) accounts for the use of classroom technologies as an affordance of ALCs (Bielefeldt, 2012), but the ICOT does not consider the context of classroom environment and pedagogy. The Classroom Observation Protocol for Undergraduate STEM (COPUS) is an instrument employing twenty-five different codes to document classroom behaviors for both students and instructors in two-minute intervals (Smith et al., 2013) but, while providing quantitative evidence of behaviors, it does not measure the efficacy of the practices witnessed nor offer a means to provide guidance to the instructor to improve one's teaching practices. While it should be noted that Millis (1992) and Dezure (1999) acknowledge that the spatial characteristics and affordances of classrooms may diminish the effectiveness of certain teaching practices, neither these existing protocols nor others emphasize the ways in which an instructor leverages and integrates the design of a classroom and its affordances in the creation of coherent and effective teaching strategies.

Given the absence of an observation protocol explicitly designed to address instructional approaches within active learning classrooms, in

spring and fall of 2015, CTL faculty developers and researchers at Indiana University created the Active Learning Classroom Observation Tool (ALCOT). The ALCOT allows a holistic consideration of the learning experience, providing a view to the instructor's attempt to combine the spatial and technological affordances of a classroom with active learning pedagogies. The intent of the instrument was to support an emerging group of instructors at the university who sought feedback on their teaching practices within the new active learning classrooms on campus. Faculty developers and researchers developed and piloted the Active Learning Classroom Observation Tool to elicit thoughtful reflection and meaningful feedback on teaching and learning undertaken within these new learning spaces.

Designing the Active Learning Classroom Observation Tool

The design of active learning classrooms at Indiana University heavily influenced the development of the Active Learning Classroom Observation Tool (ALCOT). Indiana University's active learning classrooms, known as Mosaic classrooms, represent a rich variety of spaces designed to meet widely varying instructional needs—much like the unique tiles that comprise a mosaic. Specifically, Mosaic classrooms are designed differently, each with particular consideration given to the size of the class, the choice of teaching approaches, and the variety of disciplines that will teach in them. All Mosaic classrooms feature sharable screens or whiteboard surfaces intended for student collaboration and presentation, flexible or fixed furniture that allow natural student grouping, and square footage requirements that provide students and instructors the space move and engage in a variety of ways. Thus, given that the instrument would be used in classrooms with dissimilar design, the ALCOT had to be inclusive of variations of space, furniture, and technologies.

The Active Learning Classroom Observation Tool was designed primarily to be used during the classroom observation to guide reflection on the ways that a given instructor employs the capabilities of the classroom—the room's physical arrangements and technologies—in support of teaching and learning. The faculty developers and researchers at this institution considered several factors in the process of creating the reflective tool.

First, the ALCOT development team wanted instructors to consider the intersections of space, technology, and pedagogy (Radcliffe, 2008) as they reflected on their teaching. Applying pressure, so to speak, on any one of these intersections changes the way students can be engaged, and in an

active learning classroom, the results of these interactions are more apparent than in the context of other learning classrooms employing traditional lecture-style strategies. ALCOT was designed to raise the awareness of the interdependent relationships between classroom design, technology-enhanced instruction, and pedagogical strategies supporting active learning.

Next, the ALCOT development team recognized that teaching in spaces designed for active and collaborative learning is often uncomfortable for instructors at first due to changes in the expected role of the instructors and more flexible design in the layouts of many active learning classrooms. The ALCOT development team wanted to take into account the unique classroom management issues that active learning classrooms can present. Depending on the learning space, some of these concerns can include a lack of focal point and multiple distractions (Petersen & Gorman, 2014). In addition to the unique concerns of teaching in an active learning classroom, the ALCOT development team also took into consideration issues of concern often addressed in general classroom observation, including presentation, classroom management, learning activities, and instructor-student interaction.

Additionally, the ALCOT development team took a prescriptive approach to the categories observed, in that observation categories were based on what *should* be happening in an active learning classroom. Recent literature suggests that students fair worse academically in an active learning classroom when instructors lecture instead of engage students in active learning and collaborative approaches (Brooks, 2012). Based on the above research, the ALCOT categories for observation encourage instructors who teach in active learning classrooms to implement instructional approaches that best facilitate student learning outcomes through collaboration and active learning strategies when possible.

The categories that compose the Active Learning Classroom Observation Tool are prompts intended to elicit descriptive responses to questions about the instructor's classroom practices (Dezure, 1999; Millis 1992). Descriptive prompts tend to be more contextual (Evertson & Holley, 1981). The descriptive nature of the responses are a critical characteristic of the ALCOT, given the importance of the spatial context in this type of observation (Radcliffe, 2008).

Finally, the ALCOT development team sought to streamline the tool by limiting it to just four categories: (1) support of active learning, (2) creation and implementation of student collaborative learning activities, (3) formative assessment in the classroom, and (4) classroom management. By limiting

the number of categories observed and considered, an observer's attention is more focused during an observation. Fewer prompts also allow for a more directed post-observation discussion between a given instructor and faculty developer.

The Observation Protocol

Most observation protocol designs entail a pre-observation meeting, the observation itself, and a post-observation meeting, with the emphasis on the post-observation meeting exchange between instructor and observer (Fullerton, 1999; Hammersley-Fletcher & Orsmond, 2004). The ALCOT observation protocol conforms to this common structure. A pre-observation meeting is held between the instructor and the observer to discuss the observation process, the background and goals of the instructor, and the questions for reflection that will be posed to the instructor. A set of pre-observation questions (see Appendix A) shape the conversation between the instructor and the observer.

During the actual observation, the observer constructs a chronological representation of the class-meeting using the Chronological Note-Taking Instrument (see Appendix B). The data gathered using this instrument is then used to help the observer complete the ALCOT (see Appendix C). The instructor does not see the Chronological Note-Taking Instrument, but is permitted to view the ALCOT.

Following the observation of the class-meeting, the observer completes the ALCOT. The observer then meets with the instructor to discuss the observation while using the completed ALCOT as a prompt for conversation and questions.

It is recommended that a blueprint or diagram of the room where the observation takes place be used during the pre-observation and the post observation meetings. The blueprint of the room can be a useful tool for the notation and discussion of issues regarding instructor and student movement in the space, use of affordances in the room, and the arrangement or re-arrangement of configurable furniture. See *Figure 1* for an example of the blueprint that was shared with instructors who taught in the Collaborative Learning Studio, SB 015.

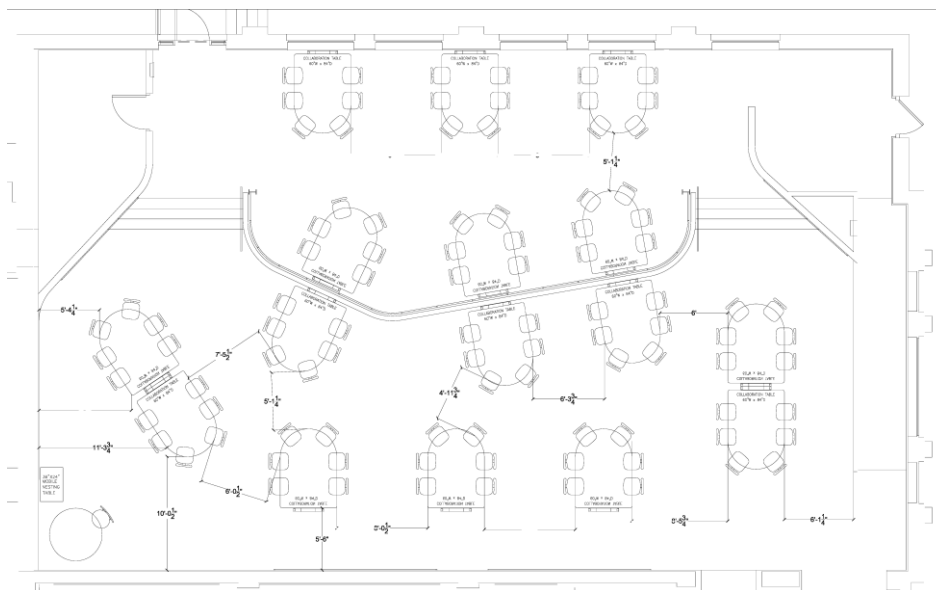


Figure 1. Blueprint of the Collaborative Learning Studio, SB 015

Items Intentionally Omitted from Observation Protocol

It is important to emphasize that the Active Learning Classroom Observation Tool is intended *for development rather than for evaluation*. The tool is intended to help instructors develop their approach to teaching in the room and facilitate reflection on active learning instructional practices. As such, check box categories are not included within the tool. Although checkboxes offer greater standardization among the observations, and are quite common (Brent & Felder, 2004; Jarzabkowski & Bone, 1998) checklists can be distracting (DeZure, 1999) and cumbersome (Millis, 1992). Checkboxes often do not give a sense of the duration of an activity, nor do they allow for descriptions of quality or context in interactions.

Checkboxes were considered as a means to record technologies present in active learning classrooms, as they could be used to make instructors aware of the technologies available within the rooms while also being used as a use-reporting aid for faculty developers. Checkboxes that focused on available classroom technologies were not included in the development of the tool due to the variation of technologies between classrooms. Additionally, because there are so many technologies within the active learning classrooms, it was essential that when instructors had an opportunity to review their observation, the ALCOT development team did not want them to feel like they were

not using the rooms to their full potential if they only engaged with certain affordances given their instructional needs.

One category for consideration that has since been removed from ALCOT's current draft pertains to instructor presentation. Most observation forms do include instructor presentation as a main category for observation. At first, this category was included in the ALCOT as a way for instructors to reflect on their presentations in the context of the space and the technology (e.g., Did they move around the room? Could students make eye contact with them? Did they make smooth transitions?). However, in order to focus the ALCOT on student engagement rather than instructor presentations, instructor presentations are addressed within a sub-category of classroom management (see Appendix C, question 4b).

Piloting and Applications of the ALCOT Instrument

In the spring and fall of 2015, faculty developers and researchers at Indiana University-Bloomington piloted the Active Learning Classroom Observation Tool with eight instructors from a variety of disciplines. The ALCOT was piloted in three different Mosaic classrooms (see *Figures 2-4*). Below are the three classrooms in which faculty developers and researchers piloted the ALCOT:

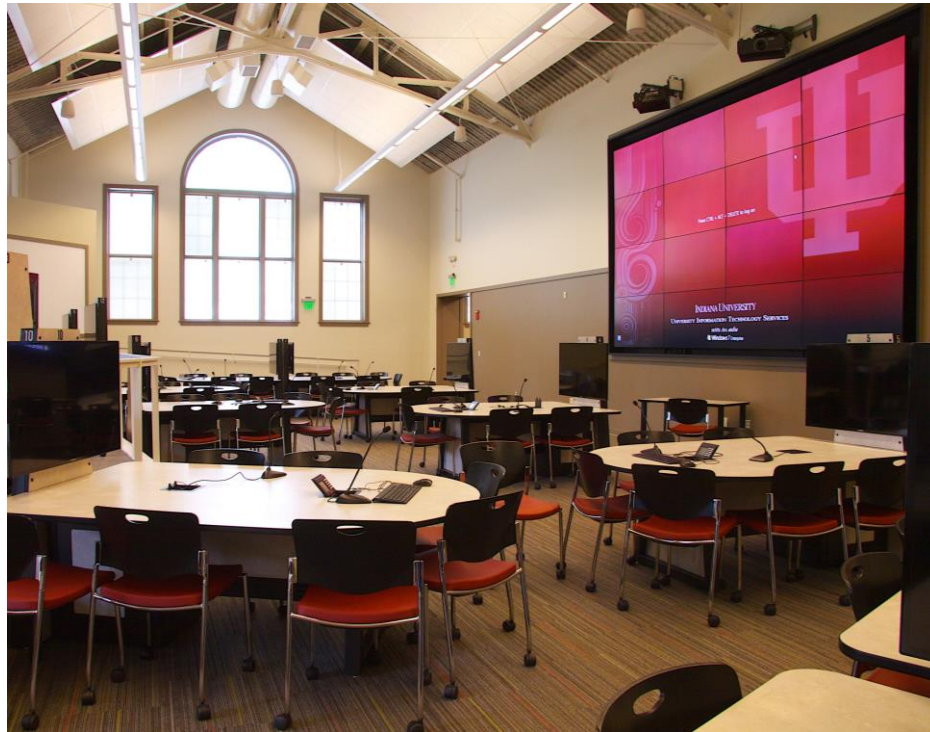


Figure 2. Image of Collaborative Learning Studio SB 015.

The Collaborative Learning Studio (SB 015) has sixteen six-student tables, accommodating 96 individuals. Each table contains a computer, large monitor, connections for three laptops, and two push-to-talk microphones. Huddleboards (portable whiteboards) are available for each table group for collaborative work. A twenty-foot wide video wall allows instructors to display multiple types of content, including computer, document camera, and the screens of individual student tables. Made up of sixteen monitors, the wall can project a view of all sixteen student table computers, a combination of four sources (tables and/or instructor tools), or one large image.



Figure 3. Image of active learning classroom GA 0009.

GA 0009 is located in Indiana University-Bloomington's new Global and International Studies building. GA 0009 has ten tables and twenty-two wheeled chairs to allow for multiple configurations. Three of the four walls are whiteboard walls for student collaboration. The instructor station has a Crestron display with a document camera. On one wall, GA 0009 has two 80" flat panel displays. The room also has an HD video camera for lecture capture and PC-based video conferencing and collaborative technologies.



Figure 4. Image of active learning classroom Cedar Hall 002.

Cedar Hall 002 has seven, eight-person tables and sixty chairs for group collaboration. Students have access to multiple whiteboards on the walls and Huddleboards for collaborative work. Cedar Hall 002 has three projection screens and a Copycam (whiteboard camera), as well as an interactive whiteboard that enables the capture of instructional materials produced in the classroom by both the professor and the students.

Lessons Learned from the Pilot

After eight observations, in three different classrooms of instructors from different disciplines, faculty developers and researchers at IU-Bloomington reflected on several initial lessons learned:

- 1. The Active Learning Classroom Observation Tool allowed for focused observations of the instructor's integration of the room's spatial arrangements, technologies, and pedagogies. It also served as a guide to observers' comments on the instructional choices made in the context of the space.**

The ALCOT guided observers' attention to the use and interactions within the active learning classrooms. In one observation of a class held in GA 0009 (see *Figure 3*), a French language instructor moved seamlessly from an in-class activity with the document camera, to an explanation of a student's question on a whiteboard, to engaging students with an activity using the screens. The observer was impressed with the instructor's comprehensive use of the room's spatial arrangement and technologies.

Significantly, ALCOT's categorizations inspired the observer to focus on recording the instructor's pedagogical approaches, rather than to focus on simply the fact that many room affordances were being used. The observer was able to write an observation report, and hold a post observation conversation, that focused on the integrations of space, technology, and pedagogy instead of merely the use of the technology in the room. The post-observation conversation, then, focused on refining both pedagogy and use of the room's spatial arrangements and technologies in ways that more fully supported the instructors' pedagogical goals.

Observers noted that it could be tempting to focus on how many room affordances an instructor used during a classroom observation in an active learning classroom. But, by focusing on the pedagogical approaches (addressed in the categories for observation), observers found that they could provide more effective feedback to instructors regarding teaching in the space.

2. The Active Learning Classroom Observation Tool inspired conversations about teaching in all types of classrooms.

Even though the focus of the post-observation reflection meeting was to discuss and reflect on an instructor's approach to teaching in an active learning classroom, faculty developers found that conversation often included discussion of teaching in traditional classrooms.

For example, one post-observation conversation highlighted how an instructor moved around the classroom space and interacted with students during an in-class session in an active learning classroom. In a later discussion, the instructor stated that she had rethought how she positions herself in relation to students in all of her courses as the result of the observation in an active learning classroom.

Such an observation has inspired observers to ask informal questions during the post-observation conversation about how the ways that instructors have taught in an active learning classroom could be applied to any classroom. In the future, faculty developers at IU will consider adding a prompt as part of a post-observation conversation protocol to help instructors reflect on ways that the lessons that they have learned from teaching in an active learning classroom could transfer to other classrooms.

3. The Active Learning Classroom Observation Tool helped faculty developers better identify how faculty were using the active learning classroom. This perspective helped faculty developers better understand how to support the particular faculty being observed, but also rethink broader faculty development efforts.

Through classroom observations and conversations with instructors, faculty developers gained a better sense of how the active learning classrooms were being used or under-used in the context of an instructor's intended pedagogical approach.

For example, in SB 015 (see *Figure 2*), several instructors observed displayed their slides on the three large wall screens in the room but were not displaying slides on the screens at the student tables, even though the technology in the room easily allowed them to do so. In the post-observation protocol, observers asked instructors why they were not sharing content on the student screens, especially since students would better be able see content on slides or see the instructions for a group activity if they did so. Instructors responded that they did not realize that sharing their presentation to the student table screens was an option. Observers then noted that by sharing their slides on student screens, a very small change on their part, they could better support student attention during lecture or small group collaboration by providing students a closer view of course materials.

With this knowledge, faculty developers are able inform faculty who teach in any classroom with student table screens about options in consultations and workshops for instructors teaching in these spaces (Hendry & Oliver, 2012).

Though intended as a classroom observation tool, the ALCOT could also serve faculty developers in Centers of Teaching and Learning in other ways, including:

Traditional classroom observations

The categories presented within the Active Learning Classroom Observation Tool are useful prompts for reflection for traditional classroom observations. The guide can serve as a way for instructors to think more about how their pedagogy, classroom space, and technologies intersect in any learning classroom.

Peer observation of teaching

The ALCOT could be used as part of the Peer Observation of Teaching process for instructors who teach in active learning classrooms. The guide can serve as a way for instructors to help other instructors think more about how their pedagogy, classroom space, and technologies intersect in any classroom.

Guide for self-reflection

Instructors who teach in active learning classrooms can use the ALCOT as a guide for thinking about how they should or could approach teaching in an active learning classroom. It can serve as a self-checking guide for instructors who may wish to prepare for a classroom session or think about teaching a course within an active learning classroom.

Open classroom observations

The ALCOT could be a guide for a Master or Open Classroom, a "model" classroom session where an instructor teaches a class and hosts a discussion with peer observers following the class session. Peer observers could use the ALCOT as a guide for their Open Classroom observation in active learning classrooms. The ALCOT could be used for note taking and as a prompt for post-class observation discussion.

Conclusion

Previous research has shown that active learning classrooms, when used to facilitate the practices of active learning pedagogies, can positively influence student learning (Beichner et al., 2007; Brooks, 2012; Byers, Imms, & Hartnell-Young, 2014; Dori & Belcher, 2005; Gaffney, Richards, Kustus, Ding, & Beichner, 2008). When active learning classrooms are coupled with active learning pedagogies, there is potential to reduce student failure rates, improve students' conceptual understanding of a given topic, increase class attendance, support student problem solving skills and improve student attitudes toward learning (Beichner et al., 2007; Gaffney et al., 2008). Given the benefits of active learning classrooms and pedagogies, it is not surprising that more universities are building active learning classrooms. As more active learning classrooms emerge, the opportunity for faculty developers to support the specific needs of instructors who teach in those spaces will continue to grow.

In this article, faculty developers and researchers describe the creation and application of the Active Learning Classroom Observation Tool (ALCOT) as a reflective observation protocol specific to the context of active learning classrooms. An implicit assumption behind the use of ALCOT is that effective learning experiences require that the instructor use the spatial and technological affordances of a classroom in ways that enhance, rather than undermine, the goals and practices of active and collaborative learning pedagogies. In other words, given the importance of the instructor's choice of spatial, technological, and social arrangements of learners to the success of particular learning activities, it is imperative that these choices be examined and evaluated in classroom observations. As more instructors redesign their pedagogical approaches to exploit a growing number of active learning classrooms, it is imperative that faculty developers offer guidance and support to take advantage of the unique pedagogical possibilities that these rich learning environments offer. Faculty developers and researchers at IU-Bloomington believe that the ALCOT is a useful tool for classroom observations, one that allows faculty developers an opportunity to help instructors design and realize effective active learning pedagogies for their students. Ultimately, however, it is expected that the insights that faculty developers and instructors gain through the use of the ALCOT instrument may be used to leverage the spatial and technological affordances to improve active learning pedagogies in any and all classrooms, not just active learning classrooms.

Future Development and Future Use of the ALCOT

The ALCOT development team intends to further refine the tool and the observation process surrounding it. Ideally, after two years of continuous use of the ALCOT, which requires an additional academic year at the time of this writing, the development team will conduct a full analysis of the previous observations. This analysis of the efficacy of the categories used by the ALCOT will include a deeper look into how the pre-observation questions integrate with and support the ALCOT. Faculty developers and researchers at IU speculate that the pre-observation questions and process could be more prescriptive, which would align with the design of the ALCOT questions. Further analysis may prove that the pre-observation process has the potential to be an effectively-timed faculty development opportunity, and it would be interesting to examine whether these conversations alone have an effect on instructor behaviors and attitude in the active learning classroom. Another valuable mechanism to gather feedback on the efficacy of the ALCOT is through instructor interviews to discover how the process helped them teach in active learning classrooms. Refinement of the ALCOT could be achieved through this three-pronged approach, by conducting in-depth analysis of the ALCOT outcomes, considering the role and influence of the pre-observation questions and process, and gauging instructor perception of any change in his/her satisfaction teaching in active learning classrooms as a result of the ALCOT. This approach provides a replicable process for other teaching centers to deploy and refine the ALCOT to suit the needs of their particular institution or teaching situation(s).

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Appendix A

Pre-Observation Checklist for Active Learning Spaces Observation

1. What would you like me to focus on as I observe your course?
2. What is your learning objective for the class I am about to observe?
3. How have you designed your class session to achieve this goal?
4. How are you planning on using the affordances of the room to support your goals? To support active learning? To support collaborative learning?
5. Is there anything else you would like me to consider as I observe this class?

When possible, at each stage of the observation, provide a diagram or blueprint to act as a point of reference for discussion about activities and interactions. A diagram or blueprint can be a particularly useful point of reference in spaces with configurable furniture.



Appendix B

Chronological Note-Taking Instrument

Use this form for note-taking during the observation.

Under the “Time” category, note the time and duration of activities and the various interactions that took place during the observation. Under the “Description” category, note what happened during the class, offering merely descriptions of events observed. Under the “Comments” category, note thoughts, possible suggestions, or reactions to what you are observing. After the observation, use the information and ideas gathered and organized in the form to inform your responses to the ALCOT.

Time	Description	Comments

Appendix C

Active Learning Classroom Observation Tool

Instructor:

Department:

Course:

Section:

Course Enrollment:

Classroom:

Observation Date:

Use the following criteria that apply to guide your classroom observation descriptions, comments, and suggestions:

1. Instructor use of the Active Learning Classroom to support active learning:

- a) In what ways did the instructor engage students in active learning during this class?
- b) How did the instructor use instructional technologies in the room (i.e., media, tables, huddle boards) to engage students in in-class activities and instruction?

2. Collaborative Learning in the Active Learning Classroom:

- a) How did the instructor engage students in collaborative learning?
- b) How did the instructor provide directions for collaborative activities?
- c) How did the instructor ensure that all students participated in collaborative activities?

3. Formative Assessment in an Active Learning Classroom:

- a) What artifact(s) of learning did the instructor ask students to produce during (or prior) to class?
- b) How and with whom did students share their artifacts?
- c) How did the instructor provide feedback to students during learning activities or assessments?
- d) How did the instructor facilitate peer feedback during learning activities or assessments?

4. Classroom Management in the Active Learning Classroom

- a) How did the instructor indicate where students needed to focus for various methods of instruction?
- b) How did the instructor use the classroom space while engaging the entire class in a presentation or a learning activity? Did they walk around? Could students see, hear, or find the instructor?
- c) How did the instructor make transitions between different instructional events (e.g., move from lecture to group activity)?

5. General Observations:

- a) What instructional choices worked exceptionally well?
- b) What instructional choices do you think could be improved and how would you improve them?

