Influence of Active Learning Spaces on Teaching & Learning

How Learning Space Affects Learning Outcomes

Active learning is a teaching and learning pedagogy based on student engagement and reflection. Purdue University dedicates resources to design and renovate classroom spaces to accommodate and promote active learning experiences. Through mixed-method data collection, the purpose of this study was to determine how the features and characteristics of active learning spaces influence student learning. This briefing summarizes select findings related to learning outcomes and active learning spaces. Specifically:

How does the learning space affect intended learning outcomes?

Types of Learning Outcomes

First, learning outcomes may be identified in a myriad of ways, possibly as objectives or goals. There also are multiple types of outcomes, but the interviewed instructors using active learning spaces predominantly described two different types:

- Knowledge-based outcomes, identifying what a student should know.
- Skill-based outcomes, identifying things a student should be able to do. For example, an instructor may expect students to develop their interpersonal skills through team activities.

Both an outcome and the outcome type affect the teaching and learning activities interviewed instructors use to meet the outcome.

How the Learning Space Affects Intended Outcomes

Interviewed instructors believe an active learning space enhances (or at a minimum, does not detract from) their ability to achieve learning outcomes, but characteristics of a learning space may limit which teaching and learning activities they choose to use. For example, one interviewed instructor did not have the appropriate safety equipment needed for science demonstrations in an active learning space.

All interviewed instructors were instructors who teach at least one course in an active learning space, but their responses differed based on the amount of in-class time they intended to spend using different teaching and learning strategies. For example, less time was dedicated to lecturing if their arranged use of the learning space does not accommodate lecturing. Interviewed instructors felt it was possible to do a planned or impromptu lecture when needed, but the lecture may inconvenience students if:

- There is no “front” of the room where all students can clearly see the instructor, or
- The acoustics for the room are not conducive to lecturing and a microphone is not available.

Other types of teaching and learning activities similarly possess pros and cons based the features within a learning space.

How the Learning Space Affects Assessment of Outcomes

Interviewed instructors also shared how learning spaces affect assessment of learning outcomes. Nearly all responses showed spaces designed for active learning enhance ongoing assessment of outcomes. For example:

"[The active learning space] makes it much easier to measure their skills, because we actually test the skills."

"When I taught in the traditional [space], they were very passive; now they're active. They're turning something in at every class. They're not just coming there to listen to me, so there are more opportunities to assess those outcomes rather than just large projects. In all honesty I've heard them say that they can't sleep in the class. They know they're coming there to work, so they can't just hide."

Some interviewed instructors struggle with formal assessment via individual exams taken in the active learning space. Students’ furniture in active learning spaces may lead to unintended consequences such as seeing other students’ answers or getting distracted by other students. Student furniture designed to facilitate peer learning experiences can hinder the individual experience desired during individual testing, and instructors may need to consider alternative strategies or locations for individual testing.

Active learning spaces enable instructors to observe students performing skills. One interviewee noted:

"Struggling students are much more obvious to me now and I can reach out and help them quickly as opposed to them failing the course. [I'm talking to them, hearing their thoughts on a weekly basis, as opposed to waiting until the write a paper. [I] know when they need help."

Active learning spaces provide more opportunities for formative assessment and feedback. Each additional instructor or TA within the space also gives the instructor another set of eyes and ears to informally assess learning and give immediate support, encouragement, or correction.

How Instructors Adapt to Meet Outcomes

The interviewed instructors moved their course(s) to a learning space that accommodates the course outcomes and teaching and learning activities. These adaptations require either flexible room scheduling practices, or a flexible instructor. For example, the instructor unable to conduct safe demonstrations in class adapted by recording videos of these demonstrations, and either played the videos in class or made them available for students to watch or rewatch at any time. While recording takes extra time outside of class, the learning expected through a live demonstration was met, but recording reusable videos takes less supplies and time over multiple semesters.

Some interviewed instructors struggle with students who are reluctant to change their behaviors to fit the active learning outcomes. For example, one instructor shared:

"[I'm trying to get [students] to participate and answer questions in a non-majors class that...they don't see why they should have to take it. How do I create an environment where they're not sitting quietly in the back of the room hiding? [How do] they perceive as a non-intimidating way, engage with the material in a no-stakes way?"

1 For more information about learning outcomes, and assessment of outcomes, see:

- Purdue’s Undergraduate Outcomes-based Core Curriculum [https://www.purdue.edu/provost/students/s-initiatives/curriculum/coreCurriculum.html](https://www.purdue.edu/provost/students/s-initiatives/curriculum/coreCurriculum.html)
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Achieving outcomes requires effort by the instructor to establish and uphold expectations. In general, the interviewed instructors were satisfied that outcomes could be met in active learning spaces using desirable teaching and learning activities for the majority of their students; however, the extent to which outcomes are met for an individual student still depends upon each student’s individual knowledge and skills, plus their attitude about the value of the learning experience.

**Spotlight on: An Outcome-Driven Instructor**

One interviewee explained how their series of in- and out-of-class activities achieved the intended outcomes. For a new course topic, the generic cycle of these activities, based on team-based learning\(^2\), included:

- **Before class,** students read (and/or watched videos) to develop basic knowledge.
- **While in class,** students:
  - Completed an individual quiz on the reading, for accountability and basic assessment of knowledge.
  - Completed a team quiz, for peer accountability and further development of basic knowledge.
  - Participated in additional individual or team activities to apply knowledge, reflect on what they know and/or can do, evaluate knowledge, and develop skills (ex: confidence, interpersonal).
- **Outside of class,** students completed additional application exercises.

While this cycle repeats by day or unit, the instructor adapts the cycle depending on the content within the unit; however, this general design exposes students to course content multiple times using different strategies. Collectively, these strategies accommodate diverse learning preferences.

**Conclusions**

Knowledge about a learning space may influence the teaching and learning strategies used to meet these outcomes. Active learning strategies may encourage higher order thinking skills or greater development of skill-based outcomes. When facilitated inside a learning space designed for active learning, active learning strategies help an instructor formally and informally assess outcomes throughout the semester.

**How do I Create Outcomes?**

References for instructional design\(^3\) espouse different strategies and tips to create learning outcomes. The ABCD model is a simple way to facilitate creating outcomes. Four components comprise this model:

- **Audience:** Who are the learners who will participate in the learning experience?
- **Behavior:** What will learners know, or be able to do, as a result of the learning experience?
- **Condition:** Within what circumstances will the learning experience occur?
- **Degree:** To what level (such as rate of proficiency or quantity of something) will the learners perform the behavior?

Using these four components results in a framework for a outcome similar to:

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\text{Through [Condition], [Audience] will [Behavior] to [Degree], or By [Condition], [Audience] will [Degree] of [Behavior].}
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For example:

**Through reading to understand this brief report, faculty will know and be able to identify two types of outcomes.**

For learning outcomes in a course, some instructors might write shorter outcomes emphasizing the behavior and condition. The degree is still important, but may be specified elsewhere within a grading schema.

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