

ASSESSING TARGETED OBJECTIVES OF THE TRANSFORMING THE INSTRUCTIONAL LANDSCAPE (TIL) PROJECT: Active Learning Classrooms at the University of Toronto

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We appreciate the time and expertise shared with us by our interviewees for this assessment. Your experiences and reflections will support the next phase of our work in supporting Active Learning within these new Active Learning Classrooms across the University of Toronto.

EXECUTIVE SUMMARY

In the past few years, a number of classrooms at the University of Toronto St. George campus have been built or refurbished to provide more conducive spaces for Active Learning (AL). These Active Learning Classrooms (ALCs) offer more square footage per student, are outfitted with furniture that facilitate small group work, and are equipped with a variety of audio-visual (AV) technology to allow instructor-to-students and students-to-class presentations. However, these spaces vary in their capacity and their level of technological affordances. Between March 2019 to February 2020 The Centre for Teaching Support & Innovation (CTSI) at the University of Toronto (U of T) conducted an assessment project to examine how these Active Learning Classrooms were designed and being used at the U of T St. George campus. Specifically, the assessment project explored the U of T St. George administrative vision for developing ALCs, the instructors' pedagogical decision-making and teaching experience in various types of ALCs, and pedagogical support—existing or required—that facilitated opportunities for Active Learning in the ALCs.

After receiving approval from the Research Ethics Board Manager, Social Sciences and Humanities, Office of Research Ethics, University of Toronto to conduct the assessment project within a Quality Assurance/Quality Improvement framework, the project team interviewed five senior university administrators who are involved in decision making regarding ALCs and 21 instructors from various disciplines who had taught courses in different types of ALCs. The team also conducted three classroom observations and collected syllabi and other relevant documents from all participating instructors.

The assessment project team found a lack of common language across the U of T St. George campus regarding: (1) the defining characteristics of Active Learning and (2) a standard classification of the ALCs. To meet the first need, the assessment team consulted relevant literature to develop an initial working definition of Active Learning. While conducting the interviews, the team iteratively refined the working definition based on input from the interviewees. Below is the resulting set of Active Learning characteristics proposed by the assessment project team:

- Active learning encompasses learning processes that require students to collect and synthesize information, practice critical thinking, and engage in problem solving activities.
- Active Learning strategies can emulate real-life situations that graduates will experience in a professional setting.
- Active Learning strategies fall into a continuum (simple to complex) of instructional strategies to engage learners in the learning process.
- An Active Learning classroom promotes students' self-regulation aimed at understanding one's learning needs, content knowledge and discipline-specific methods, and action to improve in the identified areas.
- Active Learning promotes sharing of agency between instructor/students.

- Active Learning can also be enhanced with technology.

Another foundational step was to create a classification matrix of the different types of ALCs at U of T St. George campus. The assessment project team collaborated with the office of Academic + Campus Events (ACE) to revise an existing classification of the ALCs. The matrix is shared in the report and includes four types of ALCs (see Table 1, pg. 14):

- **Standard ALCs** have reconfigurable furniture, whiteboard/chalkboard, and a dedicated front of class.
- **ALC1s** feature reconfigurable furniture, digital wall mounted displays in addition to whiteboards, and no dedicated front of the room.
- **ALC2s** are distinguished from ALC1s in that they have dedicated monitors for each table. Tables and chairs in ALC2s are arranged into small groups and are often not reconfigurable.
- **ALC3s** are larger auditorium style classroom designed for small-group work in high enrolment courses. This type of ALC includes an array of technological affordances, including multiple screens that support different types of input devices. As of June 2020, a single unique classroom at St. George campus, Myhal 150, with capacity for 468 students, represents this type of ALC.

Below, we highlight key findings from this assessment project:

ALCs to foster Active Learning: U of T's administrator vision for developing ALCs at the St. George campus was to promote Active Learning and other high-impact pedagogical practices in classes with various enrolment sizes. Specifically, they envisioned increased interaction between instructors and students and among students in a class in the form of classroom discussion or small group work. However, two factors were identified by them as impacting the realization of that vision at this point in time. First, there was no baseline data regarding current pedagogical practices in traditional and non-ALC classrooms, so this impeded inferences about the potential impact of new classroom designs on pedagogical practices. Second, they identified a need to understand instructors evolving approaches to active learning and how these align with high impact pedagogies that the design of the ALCs may foster. Designing and implementing support sources to promote high impact pedagogies was highlighted as a precondition to studying the changes in the instructors' pedagogical approaches.

- **The complex process of ALC assignment.** Most of the ALCs in which the participating instructors had taught are assigned through the Academic + Campus Events' (ACE) central classroom assignment system. The term Active Learning Classroom was not well-defined for participating instructors as many of them were not aware of the different types of ALCs across campus that could be booked through the classroom assignment system. We also observed differences across departments regarding whether and when the instructors could communicate their preferences for certain types of classrooms that matched their pedagogical needs. A logistical issue for some instructors was the very short window between classroom assignment and the start of the semester. This short window, the instructors explained, was insufficient to identify strategies to

capitalize on ALC affordances to increase Active Learning opportunities for their students.

- **Existing orientation opportunities for different types of ALCs.** The most technologically advanced ALC, ALC3, has dedicated orientation sessions along with dedicated tech-support staff. Some of the instructor interviewees had booked individual time in the ALC3 to test the teaching station either alone or along with a tech support staff member. Instructors teaching in the ALC2s in the Myhal Engineering building could also ask for orientation to the classrooms. At the time of conducting this assessment, there was no specific orientation provisions for ALC1s and Standard ALCs. Most instructors teaching in these two types of ALCs had checked out the classrooms on their own prior to teaching in them.
- **Resources and time requirements to prepare for teaching in the ALCs.** Time and resources needed to prepare to teach in the ALCs varied significantly across different types of ALCs. For instructors teaching in the ALC3, with a 468-student capacity, redesigning their course activities to maximize the use of technological and physical affordances of this classroom required ample time. Moreover, the instructors had to carefully plan which presentation technology would be used for teaching material before starting the class. For other types of ALCs, the main concern for the instructors was to ensure they had necessary hardware and connectors to be able to use the available AV equipment. Instructors also shared their desired support sources such as a collection of exemplary pedagogical practices in various ALCs. Currently, departments across U of T St. George offer different levels of pedagogical and technological support around ALCs and this challenge surfaced in the interviews.
- **Pedagogical and technological advantages of the ALCs and considerations for teaching in the ALCs.** Instructors who had taught in the ALCs observed that they were communicating with more students as the physical characteristics of the ALCs allowed them to move easily between tables. Some of the instructors noticed that the arrangement of tables and chairs in the ALCs facilitated group work since the tables provided a dedicated shared space for the students in each group. Lack of a defined front of the room led the instructors in ALC1s and ALC2s to rethink their position in the classroom and how they communicate with students when students are looking at screens on different classroom walls. In the ALC3, bringing students' attention back to whole class instruction was sometimes challenging due to the size of this room. Instructors suggested strategies such as setting up timers and having a signal for transitioning between small group work back to whole class instruction.
- **Revisiting the role of Teaching Assistants (TAs) in the ALCs.** Changes to TAs' responsibilities arose in the ALC3. Engineering and computer science interviewees worked with their TAs to adapt the TAs' role in the context of a very large classroom with a novel design and numerous technological affordances.

Informed by the findings, we propose recommendations aimed at four stakeholder groups: academic administrators, Academic + Campus Events (ACE), the Centre for Teaching Support & Innovation (CTSI), and divisions/departments. These recommendations focus on supporting instructors' use of the ALCs to engage students in Active Learning experiences. Our

recommendations ([see summary table recommendations starting on pg. 51](#)) are organized into broad categories including: identified enabling factors at the institutional level, ALC Room assignments and related logistical processes, and instructor orientation to ALCs, including preparation for teaching in an ALC and other pedagogical considerations. We also offer direction regarding the technological affordances of the ALCs, directing the discourse around Active Learning and providing guidance for supporting TAs in these new contexts. Finally, our recommendations close with a discussion around increased transparency for selected design features in ALCs, enhanced pedagogical and technological support sources aligned with instructors' needs, and a call for continued feedback around future ALC development.

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INTRODUCTION

A number of classrooms at the University of Toronto (U of T) have undergone upgrades to support and facilitate Active Learning pedagogy. These Active Learning Classrooms (ALCs) accommodate small group work in classes of various enrollment sizes. However, the ALCs vary in their technological affordance. To understand how different types of Active Learning Classrooms are conceptualized and used, the Centre for Teaching Support & Innovation (CTSI) conducted a Quality Assurance/Quality Improvement project entitled Transforming the Instructional Landscape Assessment Project: Active Learning Classrooms at the University of Toronto between March 2019 to February 2020 at U of T St. George campus. In this report, we refer to the Transforming the Instructional Landscape (TIL) Assessment Project as TIL Assessment Project or Assessment Project.

The goals of the Assessment Project were:

- to understand the U of T St. George administrative vision for the ALCs,
- to understand how faculty members' pedagogical decision-making interacts with design features and technological affordances of the ALCs,
- to understand instructors' experiences while teaching in these ALCs, and
- to understand pedagogical support that can maximize opportunities for Active Learning in the ALCs.

This present report is organized in four chapters:

1. introduction, background, and objectives,
2. methodology of the Assessment Project,
3. explanation of findings, and
4. recommendations for stakeholders.

Review of Related Literature

Existing research provides evidence for the effectiveness of Active Learning approaches in higher education in a variety of disciplines in both low-tech (Carlson & Winquist, 2014) and high-tech (Gordy et al., 2018) classrooms. Nevertheless, examining the impact of learning in ALCs

cannot exclude instructors' pedagogical decision-making given the physical and technological affordance of the ALCs (Talbert & Mor-Avi, 2018). In their review of literature that included 37 papers on learning in ALCs, Talbert and Mor-Avi (2018) contend that instructors' experience preparing to teach and their teaching in the ALCs are understudied. Here, we focus on instructors' experience in technology integrated classrooms where, for example, small groups can share their work with the class through screen sharing.

To examine the experience of instructors who taught in two high-tech ALCs in a Swedish university, Mozelius and Sundgren (2018) conducted interviews with nine instructors and held a focus group for tech support and maintenance personnel. Those instructors had faced minimal technical difficulties and found flexible small-group seating conducive to collaborative work. However, the instructors in Mozelius and Sundgren's (2018) study were still exploring ways to effectively use the technological capacity of the classrooms and integrate Active Learning approaches in their teaching.

The importance of pedagogical practices in relation to the technological affordance of high-tech ALCs is highlighted in Brooks and Solheim (2014) study where one instructor redesigned her course to maximize the technological affordance of an ALC in line with a student-centered pedagogical approach. The instructor had taught the lecture-based version of the same course in the same ALC in the previous academic year. Brooks and Solheim (2014) compared final course grades in both years to detect any potential impact of curriculum redesign on students' learning and found that the students in the redesigned course achieved significantly higher grades.

Another study examined faculty members' and students' teaching and learning experiences in a high-tech ALC as an interaction among pedagogy, space, and technology (Lee et al., 2018). Four faculty members participated in interviews and 19 others responded to online surveys. Lecture followed by group work and whole class discussion was the dominant instructional flow, yet the instructors expressed some frustration with lecturing and facilitating whole class discussions in the ALC as it lacked a focal point and a central view (Lee et al., 2018). The design of the ALC, Lee et al. (2018) assert, supported group work. The instructors also indicated that teaching assistants could further facilitate small group activities.

Regardless of the level of technology used in classrooms, implementing Active Learning approaches in higher education can also entail administrative, pedagogical, and logistical challenges. One example is a large-scale initiative to integrate team-based learning in a college of pharmacy (Remington et al., 2015) where room layout, faculty concerns about the impact of such a shift on students' learning, and competing research and professional practice priorities were identified as some of the barriers to the sustainability of the initiative. Michael (2007) reports similar concerns raised by faculty members about adopting an Active Learning approach in their instruction. Often, the number of high-tech ALCs are limited (Mozelius & Sundgren, 2018) which may lead to concerns about access to these rooms. Another challenge for the instructors is becoming familiar with the integrated technology and layout of the ALCs before they can maximize the pedagogical potentials of these room. Faculty members in Lee et al.'s (2018) study suggested more training and consultation resources to overcome this challenge.

One implication for studies and evaluation projects that target ALCs of various technological affordances, according to Talbert and Mor-Avi (2018), is to consider how the technological affordance of space interacts with pedagogical approaches.

A number of ALCs at the U of T St. George campus have been used for instruction since 2014. However, given the recent ramping up of the number of new ALCs, assessing the institutional expectations for the ALCs, instructors' experiences teaching in the ALCs, and support structures in place or needed to facilitate Active Learning in the ALCs, this assessment is timely. In this Assessment Project we also examined a less-explored dimension of ALC-related initiatives: the university administrators' goals and their expectations from such intentionally designed learning spaces.

This Assessment Project explored current pedagogical practices in ALCs at the St. George campus within the mandate of the office of the Vice-Provost, Innovations in Undergraduate Education and the Centre for Teaching Support & Innovation (CTSI) as a central educational development provider. Examining students' learning experience in ALCs was beyond the scope of the Assessment Project.



METHODOLOGY

Overall Design and Timeline

The TIL Assessment Project was approved as a Quality Assurance (QA)/Quality Improvement (QI) project (Appendix A) by the Research Ethics Board Manager, Social Sciences and Humanities, Office of Research Ethics, University of Toronto. To conduct the TIL Assessment Project, we used qualitative methods with the condition that the participants remain anonymous in all forms of dissemination resulting from this project. The TIL Assessment Project started in March 2019, with plans for concluding in March 2020. Within this timeline, we collected data in two phases:

- Phase 1: March 2019-July 2019
- Phase 2: September 2019-December 2019

Before explaining participant selection and data collection methods, we clarify our characterization of Active Learning within the U of T St. George campus and explain our classification of Active Learning Classrooms (ALCs).

Characterizing Active Learning

As an initial step in the TIL Assessment Project, we consulted relevant literature to characterize the term Active Learning. We iteratively revised the initial characterization based on insights of the administrators and the instructors who participated in this Assessment Project. The resulting characterization of Active Learning at the time of writing this report reflects the following attributes:

- Active learning encompasses learning processes that require students to collect and synthesize information, practice critical thinking, and engage in problem solving activities.
- Active Learning strategies can emulate real-life situations that graduates will experience in a professional setting.
- Active Learning strategies fall into a continuum (simple to complex) of instructional strategies to engage learners in the learning process
- Active Learning promotes students' self-regulation aimed at understanding one's learning needs, content knowledge and discipline-specific methods, and to take action to improve in the identified areas
- Active Learning promotes sharing of agency between instructor/students
- Active Learning can also be enhanced with technology





We explain the cyclical process of improving the characterization of Active Learning in the findings chapter under *Teaching and Learning in U of T St. George ALCs from the Instructors' Perspective* heading.

Active Learning Classrooms (ALCs) at U of T

Within the St. George campus, ALCs are classrooms with layouts and furniture that lend themselves to Active Learning strategies and facilitate students' participation in small group and whole class discussions. Another fundamental step in the TIL Assessment Project was to create a classification of the ALCs informed by an existing classification available at the time through Academic + Campus Events office (ACE) and our own environmental scan across U of T. As shown in Table 1, in classifying ALCs into a matrix we used room layout, table size, number of wall mounted writing surfaces, and the flexibility of presentation options to identify four types of ALCs:

- Standard ALCs have reconfigurable furniture, whiteboard/chalkboard, and dedicated front of class
- ALC1s feature reconfigurable furniture, digital wall mounted displays in addition to whiteboards, and no dedicated front of the room
- ALC2s are distinguished from ALC1s in that they have dedicated monitors for each table. Tables and chairs in ALC2s are arranged into small groups and are often not reconfigurable.
- ALC3s are larger auditorium style classroom designed for small-group work in high enrolment courses. This type of ALC includes an array of technological affordances, including multiple screens that support different types of input devices. As of June 2020, a single unique classroom at St. George campus, Myhal 150, with capacity for 468 students represents this type of ALC. For more information regarding this classroom please see: (<https://news.engineering.utoronto.ca/classroom-2-0-how-u-of-t-engineering-is-inspiring-new-innovative-accessible-learning-spaces/>)

Table 1*Types of ALCs at the University of Toronto St. George campus*

ALC Categories	Standard ALC	ALC1	ALC2	ALC3
Room Layout	Easily reconfigurable with movable chairs and tables	Easily reconfigurable with movable chairs and tables	Easily reconfigurable with movable chairs and tables	Large auditorium style lecture halls designed to facilitate small group work. Chairs are fixed around tables. As of June 2020, Myhal 150, a 468-seat auditorium, is the only lecture hall of its kind in North America, featuring small-group seating and interactive learning.
Table Size	1 to 8 students	1 to 8 students	4 to 8 students	4 or 6 students per table
Writing Surface	Single/Multiple Chalkboard or Whiteboard	Multiple Whiteboards	Multiple Whiteboards	Multiple input devices including document camera
Presentation Options	Dedicated Front of Room	Flexible: Teacher to class and student/small group to class - Preset number of Technology Enhanced Presentation Options - Wireless presentation option	Flexible: Teacher to class and student/small group to class - Flexible number of Technology Enhanced Presentation Options (independent collaborative presentation and ad hoc presentation group formation) - Wireless presentation option	Flexible: Teacher to class and student/small group to class - Flexible number of Technology Enhanced Presentation Options (independent collaborative presentation and ad hoc presentation group formation); each table is fitted with a microphone; instructors control the presentation order to the whole class - Wireless presentation option
Photos	WI 523 	MP 118 	MY 490 	MY 150 

(Photos by Academic + Campus Events)

Assessment Project Design

Participants

The purpose of the TIL Assessment Project is to examine the interaction amongst U of T administrative vision for the ALCs, instructors' pedagogical approaches while teaching in these ALCs, and pedagogical support that can maximize opportunities for Active Learning in the ALCs. Accordingly, we invited U of T administrators involved in decision making about ALCs and U of T instructors who had taught in the ALCs to participate in an hour-long interview during the first phase of the project. In the second phase, we conducted further interviews and performed classroom observations in some of the ALCs.

In the first phase of the project, to identify a diverse group of instructors who would be representative of various disciplines and who had recently taught across Standard ALCs, ALC1s, ALC2s, and ALC3, we obtained a list of courses taught in the ALCs from ACE. We sent an email to university administrators and the identified instructors to invite them for a voice-recorded, hour-long interview at a time and place of their convenience. Five university administrators and 18 instructors participated in phase 1 of the TIL Assessment Project.

In the second phase of the TIL Assessment Project we used a similar method to identify instructors who had taught in an ALC. Three instructors, a phase 1 participant and two new participants, agreed to participate in the In-Class Observation (ICO) and interviews. We conducted 3 in-class observations in ALC2s and the ALC3. Another instructor agreed to be interviewed in the phase two of the project. We conducted two face-to-face interviews, and one modified email interview. Table 2 summarizes information related to interview participants regarding their disciplinary affiliation and the ALC where they taught.

Table 2

Summary of information about the TIL Assessment Project participants

ALC Category	Number of Participants per Disciplinary Affiliation			
	Social Sciences	Humanities	Engineering/ Computer Science/Math	Life Sciences
Standard ALC	2			1
ALC1		2		1
ALC2	3	1	2	1
ALC3		1	7	
Add total	5	4	9	3

Confidentiality

The TIL Assessment Project was approved as quality control/quality assurance and was deemed exempt from review for ethics approval. Nevertheless, we decided to keep the identity of the participants confidential. In this report, we do not identify the administrators and instructors who participated in the interviews or classroom observations, and we do not identify the title of the course that they taught in an ALC.

Data sources

Semi-Structured Interviews with U of T St. George Administrators. We interviewed five U of T administrators who were involved in decision making about the design and construction of the ALCs at U of T St. George. The overarching purpose of the interviews was to understand “How do leadership and administrators envision ALCs’ role in contributing to the teaching and learning landscape at U of T?” A copy of the interview guideline is available in Appendix B. We customized the interview guidelines for each administrator interviewee and asked probing questions when needed. These semi-structured interviews were voice recorded.

Semi-Structured Interviews with U of T St. George ALC Instructors. We interviewed 21 instructors who had recently taught in the ALCs. The semi-structured, voice-recorded interviews were conducted face-to-face or via Skype or phone depending on the interviewee’s availability and preference. In one case, we used a modified protocol for an email interview. In the interviews, we asked the instructors to comment on their:

- interpretation of Active Learning,
- preparation for teaching in ALCs,
- experience while teaching in the ALC, and
- reflection about teaching in the ALCs in the future.

A copy of the interview guideline is available in Appendix C.

Course Syllabi and other Supporting Documents. We asked the instructors to provide a copy of their course syllabi for the course that they taught in an ALC and the same course taught in a non-ALC classroom. While course syllabi may not include the details of learning activities or assessments, they informed our interviews and allowed us to ask probing questions about any changes made to the course due to it being taught in an ALC.

In-Class Observations (ICOs). Between September 2019 and November 2019, we invited instructors who taught in the ALCs in the Fall 2019 semester to participate in an in-class observation (ICO). The ICO is conducted in three steps. First, the instructor completes a pre-observation questionnaire (Appendix D) that the TIL Assessment

Project team members sent to them via email. In the second step, two or three TIL Assessment Project team members observed 60 minutes of the class at a time and date convenient to the instructor. During the class visit, the team took observational notes in the form of narrative logs (Appendix E) regarding how the instructor and the students used the AL features of the room. After the observation, the TIL Assessment Project team completed a checklist (criterion-based) form (Appendix F), reviewed their individual notes and, if necessary, contacted the instructor with feedback and follow-up questions. For more information regarding ICO please see:

<https://teaching.utoronto.ca/teaching-support/peer-observation-of-teaching/part-iii-tools-instruments-observation/>

Field Notes. At least two members of the three TIL Assessment Project team co-conducted each interview or the in-class observations. In addition to the voice-recording, each interviewer took notes during the interviews and later shared their notes as part of the collective documentation.

Data Management

All data collected were stored in a folder only accessible to the TIL Assessment Project team. For each interviewee, we created a folder that contained each interview protocol, interview audio file, interview transcript, interviewer's notes, and digital copies of all supporting documents. Interviews were transcribed verbatim and checked for accuracy by two TIL Assessment Project team members.

Data Analysis

We used open coding to code the interview data. Open coding is content driven and iterative. One TIL team member read an interview transcript several times and assigned initial codes to excerpts of interviews that conveyed a cohesive meaning related to teaching and learning in the ALCs. A list of the preliminary codes was applied to a second interview transcript which allowed the coder to identify new codes and eliminate redundant ones. This process was repeated for four more interview transcripts. At each coding session, the descriptive codes were revised based on cumulative insights gained from reviewing more interview data. By the end of this phase, a code table was created in two columns. Column one contained a code and column two provided a short description of the code.

The team reviewed the code table and proceeded to categorize related codes under code categories. Two coders applied the revised coding table to all interviews in tandem and discussed disagreements in case they each used a different code for an interview transcript excerpt. Supporting documents and the ICOs were coded in a similar manner.

Synthesis

Once all interview data and supportive documents were coded, TIL Assessment Project team members created one file for each code category and collated in one place all interview excerpts coded with sub-codes of the coding category. Each file was named with the coding category title and sub-codes were used as subheadings. For each interview excerpt, we added the interview file name and type of ALC as metadata. Next, using each collated file, we wrote up findings related to sub-codes. We interpreted the text excerpts by describing the emerging findings and explaining similarities and differences in participants' beliefs and perceptions and their approach to teaching in the ALCs. At this phase we eliminated identifying information from data to keep the identity of the participants confidential.



FINDINGS

In this chapter, we present the findings of the Assessment Project in two main sections: U of T St. George leadership position towards ALCs; and U of T St. George instructors' experience in the ALCs.

Active Learning Classrooms (ALCs) at U of T St. George from the Perspective of Senior Leadership

Classroom renewal, e.g. updating furniture or technology, is an ongoing process at U of T, St. George campus. However, within the past ten years concerns were raised about the state of classrooms in general that called for a departure from traditional teaching spaces to classrooms that promote group work and discussion. Characterized by the umbrella term Active Learning Classrooms (ALCs), these spaces already existed in some of the departments, such as the Ontario Institute for Studies in Education (OISE) or the Bissel building. The interest in systematic classroom renewal to create more ALCs was also motivated by similar spaces being developed by many other higher education institutions such as MIT and Northwestern University in the United States.

In response to the need for more Active Learning spaces at the St. George campus the Office of the Vice Provost, Innovations in Undergraduate Education, the Office of Vice-President University Operations and Real Estate Partnerships, and Academic + Campus Events took various initiatives to design and construct ALCs. One prominent example is the Myhal Center for Engineering and Entrepreneurship that houses the unique ALC3 and various types of high-tech ALC2s (for a complete history see <https://www.engineering.utoronto.ca/myhal-centre-for-engineering-innovation-entrepreneurship/>). Classroom design in the Myhal Center was driven mainly by the pedagogical need of engineering courses—e.g. spaces that facilitate design and prototyping—and by the progressive intention of significantly minimizing lecture time as a teaching strategy. The Myhal Center is home to a unique space, Myhal 150 that is conceptualized as an innovative 468 seat classroom to meet the need of the increasing number

of high enrolment courses at U of T St. George. Myhal 150, the only ALC3 on the St. George campus, was designed as an inverted classroom for active and collaborative learning and was first prototyped in the Galbraith building.

Another initiative is a collaboration between the Offices of the Vice-President University Operations and Real Estate Partnerships and Academic + Campus Events aimed to renew more than 150 classrooms across the St. George campus. Due to the large number of classrooms involved, the project was scheduled to be completed over eight years. The Deans' Advisory Committee allocated an annual budget for eight years to fund the classroom renewal initiative. A portion of the revenue from leasing classroom spaces to outside groups complements this budget. These renewed spaces mostly fall into the Standard ALC and ALC1 categories. U of T administration leadership who participated in our interviews explained that ALC1s and the Standard ALCs were designed to include the essential elements of the Myhal Center ALC2s, including furniture that allows for small group formation and multiple writing surfaces. The construction of these classrooms proved to be challenging logistically as few construction firms were willing to take up such a distributed project.

Rationale for ALC Design Categories

As we described in the methods section, there are four main groups of ALCs on the St. George campus. A common design feature among these four categories is increased square footage per student in comparison to traditional classrooms. However, classrooms within each group are designed differently. Administration interviewees attributed this variety in design to the purpose and the pedagogical affordances of the classrooms, specifically Myhal Center ALC2s. Consultations with teaching and learning committees and email communications with faculty members and instructors, with a moderate response rate, informed the design of Standard ALCs and ALC1s.

The Transforming the Instructional Landscape (TIL) Initiative

According to U of T administrators interviewed, ALC development at U of T is one component of the Transforming the Instructional Landscape (TIL) Project which, in a broader sense, encompasses the full spectrum of activities from the design and management of the classroom assignment system, development of physical classroom design, consideration of high impact pedagogical approaches, and finally, enhancing students' learning experience in their undergraduate degree. The broad goal of the project is to provide spaces that enable U of T faculty members and instructors to implement best pedagogical practices. The multiple facets of the project bring several stakeholders together and functions within the dynamic budget allocation of U of T. While acknowledging that it would be impractical to assume the new spaces will meet every instructor's needs, the increased variety of teaching spaces will allow the instructors to integrate more Active Learning strategies into their teaching approaches. Due to time constraints of the TIL project, the administrator interviewees commented, a complete baseline study of U of T instructors' pedagogical practices at the onset of the TIL initiative was impractical. Later on, the project brought together diverse U of T offices that

serve various stakeholders and, thus, represented them in the process of designing the ALCs, improving the room booking system, identifying faculty development needs, and exploring students' learning experience. Those offices include: Office of the Vice Provost, Innovations in Undergraduate Education; Academic + Campus Events; Center for Teaching Support & Innovation; and Student Life's Innovation Hub. Such collaborations can facilitate stakeholders' needs assessment in designing and constructing a variety of classrooms that promote AL. Specifically, U of T administrators highlighted the importance of the design process being informed by instructors.

U of T administration also emphasized the importance of identifying measures of effectiveness to evaluate how the TIL project has improved instructors' access to desired spaces and students' learning experience. At the time of conducting the interviews, U of T administrators recognized the need for independent research to examine the pedagogical implications of the different ALC designs on instructors' and students' experiences and outcomes.

Perception of Success

Pedagogical improvement was a prominent perceived success factor in the development of the new ALCs. One interviewee stressed that ALCs should support a variety of high impact pedagogical approaches, including Active Learning strategies. Design features of different ALCs can imply specific pedagogical affordances that can be implemented in that specific space. One U of T administrator described how monitors that are installed in the middle of an ALC2 made it undesirable for lecturing while providing a conducive space for design work. To maximize the affordance of ALCs, instructors may need to change their pedagogical approaches. The synergy between ALCs and instructors' pedagogical choices was identified as a success indicator. Administrator interviewees recognized higher levels of student engagement with instructors, peers, and learning activities as another success indicator. For instance, the layout of most ALCs facilitate more interactions between students and the instructors and the instructors and teaching assistants can move freely between tables and interact with more students independent of where they sit in the classroom. When observed, such increased interaction between instructors and students can indicate a desired change in teaching and learning experience.

Success Enablers and Barriers

While ALCs are conceptualized to promote and facilitate Active Learning approaches, U of T administrators interviewed unanimously agreed that for positive pedagogical changes to actualize, effective support structures need to be in place. Barriers to successful use of ALCs cannot be ignored or downplayed either. Synthesizing U of T admin comments, here we summarize enabling and impeding factors that can impact effective teaching and learning experience in U of T St. George ALCs.

A room assignment system that allows matching of an instructor's desired course design with a classroom that enables them to enact their planned pedagogy is one success enabler. At the time of writing this report, such a system is not in place partly due to the complex course schedule of U of T St. George. In the interviews, U of T administrators noted that a more effective room assignment system is currently being discussed which will ideally better match courses with rooms that promote effective teaching and learning experience informed by the characteristics of the course and the course instructor's pedagogical intentions. A desirable feature of this system would be to provide comprehensive information on the affordances of each ALC to the instructors who are assigned to teach in them. Based on such information, instructors can partially or fully redesign their courses to leverage available ALC affordances. However, this would also necessitate having such information enough in advance to allow for this kind of intentional course design. Creating a common language (e.g., the range of classrooms available of the St. George campus, along with their various features and affordances) among departmental staff and offices across the St. George campus that deal with room booking was highlighted as another opportunity to improve this complex process. An important enabling factor, U of T administrators emphasized, is to provide pedagogical design support to faculty members who are willing to integrate Active Learning strategies in their teaching. This includes opportunities for instructors to reconceptualize their teaching in response to the new spaces. Some departments have already started peer networks of support where instructors share their experiences teaching in the ALCs and work with each other to address identified issues. According to U of T administrators, pedagogical support needs to be available both centrally and at the departmental and divisional levels. Pedagogical support could also be in the form of a database of successful practices in different types of ALCs.

ALC2 and ALC3 have more advanced technological features compared to standard ALCs and ALC1s which allows for technology enhanced pedagogical design. However, the administrator interviewees stressed the importance of flexibility and having a non-technology dependent backup while teaching in the technology enhanced ALCs. Those interviewees were also concerned about ALC-specific course redesign that may not translate from one category of ALCs to another or to non-ALC classrooms. A course that is designed to be taught in ALC3, for example, will need to be significantly revised if ALC3 cannot be assigned to that course. A related issue was whether instructors would use the rooms as traditional classrooms in which case the affordances of the ALCs will be underutilized. In the case of ALC3, traditional classroom management will not work, a U of T administrator explained, as the space is designed to incorporate students as partners in the teaching and learning process. A desirable and effective experience in the ALC3, the administrator contended, requires a responsive pedagogy and an active role for the students.

Teaching and Learning in U of T St. George ALCs from the Instructors' Perspective

To ground our conversations, we asked the instructors for their definition of Active Learning. All instructors responded with a general understanding of the term. Some instructors appeared quite intentional in their application of Active Learning activities in their class while others

explained Active Learning strategies are deeply integrated with their teaching due to disciplinary or professional expectations.

Some instructors defined Active Learning in contrast to passive learning. One instructor stated “I want their gears turning. I don't want them watching TV passively. I want them to be thinking through the things that we're doing. That's the most important. That's the heart of it.” (Sciences/Engineering instructor, ALC3) From a student's perspective, several instructors described how Active Learning requires deeper cognitive processing emphasizing the student's role in knowledge construction. Other instructors defined Active Learning in relation to group work and the importance of students' application of their learning. Many instructors emphasized application of academic knowledge to real life problems as a cornerstone of their Active Learning teaching approach. Projects, simulations or case-based activities were among the strategies used to achieve this goal.

As explained in the Methods chapter, before conducting the interviews we constructed a working definition of Active Learning based on relevant literature to establish a common language for the Assessment project. When presented with the definition, the instructors generally agreed with the characteristics listed. Two instructors, however, questioned the need to distinguish Active Learning in that they identified the characteristics as essential to any learning environment.

Based on feedback that we received from one instructor during an interview, we expanded the definition of Active Learning to include shared agency between instructor and students and acknowledging learners as co-constructors of knowledge. Following the reworking of the definition and in subsequent interviews, many instructors commented that shared agency is particularly important for their teaching context. The changing role of the instructor was also raised in several instructors' definitions of Active Learning, comparing the role of an instructor in an Active Learning classroom to that of a coach, rather than a traditional lecturer. Fostering reflection and self-regulation in this context was recognized as relevant issues. Two instructors expressed concern with the mention of technology, fearing that its focus could dilute the definition of Active Learning and take away from the more important characteristics.

In addition to the definition, a continuum of Active Learning strategies was shown to instructors to illustrate example Active Learning teaching strategies organized based on their level of complexity, time to execute and whether they were collaborative or individual. When presented with the continuum for comment, instructors responded positively, many highlighting specific strategies they use in their own teaching. Several instructors commented that a continuum structure invited broader participation in Active Learning as it showcased multiple entry points in terms of activities.

Active Learning Classroom Assignment Process

In our interviews, we noticed that the term Active Learning Classroom was still mainly applied to the classrooms in the Myhal building, specifically those labeled as TEAL (Technology

Enhanced Active Learning) classrooms. Instructors teaching in standard ALCs, ALC1s, and non-Myhal ALC2s were generally unaware of the underlying design considerations of these rooms or they did not know that other ALC options were available to them at the St. George campus. Many of the instructors had noticed that their departments sent inquiries regarding instructor's desired teaching spaces:

Over the years, I've noticed that that's really shifted so that now... there's much more consultation, they're much more interested in, like he was saying, having included instructors involved in the process early on. (Social Sciences instructor, ALC2)

However, such requests could not always be granted. For example, an instructor had two sections of their course assigned to two different classrooms, an ALC2 and a non-ALC room. The instructor observed drastic differences between the two sections due to the configuration of the rooms. The ALC2 seamlessly facilitated group work while the furniture arrangement in the non-ALC room worked against group work. Another instructor expressed their frustration about being assigned to a room that did not match their required AV requests.

Some of the instructors mentioned they received their room assignment close to the beginning of the semester and thus did not have the opportunity to leverage the affordances of the ALCs in their course design. Earlier room assignment notices would help these instructors to consider such affordances when planning their course as an instructor stated: "if you're trying to encourage people to use these rooms, encouraging them to adopt Active Learning pedagogy, then the more lead time you can give them, the better for sure." (Social Sciences instructor, ALC2)

Another room assignment issue was lack of information about design specifications of each room. Instructors suggested that it would be helpful if they were offered an opportunity to visit the classroom beforehand or to have access to more online information about their assigned room prior to teaching in it. We will further expand on this issue in the "Desired Support Sources" section of the findings.

I didn't even know this [classroom] existed, so maybe some more knowledge about it. And then when I did get the room assignment, it was just I thought, 'Oh, I'm gonna look up that room.' So, then I went online, and I was able to bring up this picture. And I thought, 'oh, okay, this is different, this is interesting'. And then I popped by and opened the door and took a look. But if that door hadn't been open, right, at the time, I wouldn't have been able to see it. So maybe some sort of visitation period for a classroom? Maybe a couple months ahead or a month ahead, would be really helpful. Maybe sometimes when you can go and see the classroom. Trying to think I can't remember how they're organized online, but I think they're just done by room. Right? So maybe some keywords online that would help people identify rather than having to go through every single room to see what it looks like to say, these are our rooms that are like for active Learning for 30 students or Active Learning for small group groups like 10 are Active Learning for I don't know, if you do it larger than 30 students, that would be tricky. (Social Sciences instructor, ALC1)

For the more high-demand ALCs, the instructors suggested a priority system based on class size and/or approach to teaching to be in place to identify courses with higher priority to be assigned to ALCs. For example, one instructor noticed that a course with less than half the student capacity was assigned to a larger ALC.

I guess I'd like more transparency regarding how those decisions are made, like how are these rooms really allocated? ... I would like priority over someone's not going to fill the room or who's just going to lecture to them. So, I mean, that's a bigger challenge. (Sciences/Engineering instructor, ALC3)

A priority system would ensure instructors with larger classes, for example, might be prioritized for such a classroom.

Reasons for Teaching in Active Learning Classrooms (ALCs). We identified three different room assignment processes with regard to instructors' pedagogical needs in their courses.

1. ***Request for a Specific Room.*** Four instructors had specifically requested that their course be assigned the ALC3. One reason for this request was that the instructors wanted to leverage the Active Learning affordances of the ALC3, thus redesigning their course and maximizing Active Learning opportunities for their growing number of students.

We requested it soon as we saw this, we were all of us talking 'gotta get in there!' We have to be in the room in the first year because it was something completely new and different. And we just had to pilot it. Like we just felt like we're innovators and we just had to be part of it... So we made that commitment and took the plunge. We did a total course redesign. (Sciences/Engineering instructor, ALC3)

Most of these instructors were aware of the specification of the ALC3 and were even involved in its design process. Three other instructors did not directly request the ALC3 but were aware that they would be assigned to it due to their departmental affiliations or due to the size of their courses. For large courses, ALC3 allowed the instructors to scale up their teaching while providing Active Learning experiences for their students. One instructor had also specifically requested the ALC3 to experiment with teaching techniques in this unique classroom.

2. ***Request for a Specific Type of Room.*** Some of the instructors had let their department know about their willingness to teach in rooms that supported their pedagogical approaches, specifically group work. For one of the instructors, moveable furniture and not the technological features in the ALC2 classrooms

that they had previously taught in, was what they felt made the room suitable for their course.

The emphasis on collaboration within the class, I think is very important for me, and why the biggest thing for me was less than technology, it was more the flexibility of the room to allow easier facilitation of group discussion and kind of that part of it. So the technology, as maybe we'll talk about later, to me was not the main draw... And as a result, it wasn't actually the main benefit. I think it was more the structure of the room to facilitate just discussion. (Social Sciences instructor, ALC2)

This instructor explained their emphasis on collaboration and small group work which was not as easy to implement in a theatre style classroom. When the department administrator announced the availability of ALC2s, this instructor requested to be assigned to one of these rooms. Similarly, another instructor had communicated with their departmental administration a desired classroom configuration that would allow them to have whole class and small group discussions. Both of these instructors indicated, however, that assignment to the desired type of room was not always feasible. A third instructor had communicated with ACE that they needed a bigger room to increase the number of students in their course and ACE had offered an ALC2 which the instructor found to be a good match for the course. Finally, one instructor wanted their graduate students to experience learning in an Active Learning classroom to inform their approach to teaching should they become higher education instructors in the future.

3. **No Direct Requests.** The rest of the instructors had not made a specific request for their desired type of room and were assigned to their ALCs through usual ACE room assignment processes.

It was just assigned to me... And I think that somebody, either I assume someone in my department who knows the style of that course, and that I've taught in Collaboratory, before, somebody just assumed that I would want to be in there, which was fine with me. But I it was a bit of a surprise. (Social Sciences instructor, ALC2)

An exception was an instructor whose departmental administration had requested an ALC2 for their course to suit their teaching approach and course design. The instructors in this group had taught their courses in a variety of classrooms but found their assigned ALC suitable to their course.

Match between Course and ALC. The instructors who were either assigned to ALCs or had made general requests about the classroom features, elaborated on how the

ALCs matched their teaching approaches and their course as highlighted in the following quote:

It actually was a natural fit, where what I needed to do was I needed to be able to display my screen... I needed to be able to show sort of interacting with Python and all the little features that happened in it. And I needed to be able to have the students replicate that on their own laptops, and having the screens right there at each table was actually key. (Sciences/Engineering instructor, ALC2)

One instructor commented that for courses with intense group work elements ALC2 provided a conducive setting that facilitated small group work resembling a professional setting. Alternatively, presentation options, writing surfaces, and moveable furniture in the standard ALCs in one building allowed the students to implement best practices of their future work-space as they engaged in learning activities of the course. Concerns were also raised about the design of ALCs being more relevant to requirements of certain disciplines.

Related to a comment that we highlighted in the previous section regarding a priority system, two instructors indicated that the right classroom size may greatly enhance instructor and students' experience with small group discussions, a popular Active Learning strategy. One Social Sciences instructor explained that "... I found in the past most of the rooms, they'd say it would fit 30 students, but it doesn't really fit 30 students in this, you know, to be able to have discussion and everything."

The same is true for furniture in classrooms. For example, some of the instructors indicated that a shared writing space as opposed to individual tablets on chairs provided a better group work experience. Sometimes the course required certain technological specifications, such as one laptop per student that was not readily available through the assigned ALC. In one course, while the assigned ALC2 provided multiple screens, the students needed individual laptops or computers to be able to fully participate in course activities: "So in a room like that, if you have, you know, 25 students, and six of them don't have laptops, they functionally can't take advantage of the technological and pedagogical goal of the course." (Humanities instructor, ALC2) The instructor, in this case, thought that a computer lab would suit their course better than an ALC2.

ALC Between Class Transition. With regard to class schedules, some instructors highlighted a logistical consideration regarding transition between classes. In their experience, they needed more time to prepare the class for teaching in an ALC, whether rearranging the chairs and tables after the previous class ended or preparing the technology. Also, three instructors had noticed that some chairs had disappeared from their standard ALC and ALC2s.

It's so messy and chaotic, especially like if you're teaching in there, like at the end of Thursday, as opposed to the beginning of Monday. Right, so they don't start out in these nice rows... So the picture you showed me, I actually had to do a double

take to make sure that was actually the room that I was in, because it never looks like that. (Social Sciences instructor, Standard ALC)

In the case of larger ALCs, it would take the students more than the 10 minutes to transition from leaving the classroom and for the instructors to wrap up the previous class and set up for the next class.

ALC Orientation Opportunities

ALCs differ in their technological features and in their layout with Standard ALCs resembling rather typical classrooms at one end of the spectrum and at the other end, ALC3 offering a complex array of presentation options and a novel layout. Instructors' comments on the orientation they received or requested before they taught in the ALCs reflected the aforementioned design and affordance differences. For the purposes of this report we distinguish between orientation to ALCs before instruction and access to AV/tech support during instruction. In this section, we focus on the instructors' experiences with availability and the quality of orientation options to ALCs under two groups: (1) ALC3, and (2) Standard ALC, ALC1, and ALC2.

ALC3. Instructors teaching in ALC3 had participated in at least one orientation session. The dedicated ALC3 support staff provided guidance and training to the instructors in groups or individually. Regarding other training and information resources, a brochure that introduces the room and a manual that has been developed by an instructor also exist.

We noticed variations in the number of sessions the instructors had attended or had access to partly dependent on their departmental affiliation. A handful of the instructors were involved in or had closely followed the construction process of Myhal ALC2 and the ALC3 either due to their departmental affiliation, their administrative appointment, or their involvement in a relevant fellowship program.

Some of the ALC3 instructors had requested a one-on-one training and orientation session during which the technology support person worked with them to use the AV facilities and to work with the sound system. For example, a Sciences/Engineering instructor commented:

So I didn't get offered to go in, I think but I asked and I knew this is the freshman class of my Myhal 150. They're going to give us whatever we want. So I asked and I got a full hour in there with AV tech by myself... having them there every day at the beginning was critical, because they were there every single day all term long. And in fact, at the end, I was kind of saying, you know, you know you just go, I've got this ... but it took a while to feel that way. (Sciences/Engineering instructor, ALC3)

Rather than being offered a pre-designed training session, in these sessions the instructors had the opportunity to test the affordances of the room and ask questions. One of the instructors indicated that while it took them a while to test various features of the room, the orientation session helped them become comfortable. This instructor appreciated the extended time they were offered in the ALC3. In addition, this instructor had previously participated in a group orientation with other instructors who taught in the same department. Another instructor from this group referred to this group session as “a private tour” which they found helpful. Two other ALC3 instructors recounted their immersive approach to learning the functionality of the room as they frequently visited the room during the construction period and afterwards to test the equipment. One instructor recounted having spent more than seven hours in the ALC3 for this purpose: “For Myhal 150, one hour was nowhere near enough. I got a fob to get into Myhal 150. And over the winter break, I spent seven and a half hours just playing with all the tech.” (Sciences/Engineering instructor, ALC3)

Not all the instructors, however, declared this level of extended access to training or orientation for ALC3. For one instructor, the training provided on how to use the teaching station did not give them enough confidence to fully leverage different presentation options that the station afforded. This session, based on the instructor’s comments, was not hands-on and a technology support staff member explained to them how to switch between display inputs. Lack of practice became a barrier to fully benefit from the possible options. While a facilitated orientation opportunity in the ALC3 could introduce the instructors to the array of technological features, the opportunity to practice using the teaching station and other AV affordances could be a more important enabling factor. Also, one instructor highlighted lack of time and competing priorities as reasons for not attending an orientation session. We will later examine how having access to TAs who are comfortable using the teaching station in the ALC3 may also contribute to how extensively the instructors use the AV affordances.

From these interviews, we could not conclude if training and orientation sessions were consistently offered to instructors or if the instructors needed to request them. Moreover, we could not confirm if such sessions were open to instructors with all appointments or if they were exclusively offered to continuing appointment instructors. Our further inquiry with ACE showed that all instructors who were assigned to ALC3 received an email with multiple dates offered for a training session. Moreover, they were encouraged to schedule one-on-one orientation sessions with the ALC3 staff. Additionally, a comprehensive guide to using the ALC3 is available on the ACE website. The manual was prepared by Shai Cohen, Engineering.

ALC2, ALC1, and Standard ALCs. Two instructors who had taught in the standard ALCs had different experiences with orientation to the rooms. The program lead of one the instructors showed them around the standard ALC that was assigned to them. The other instructor did not seek or was not offered a tour, but they were able to operate the teaching station without any problems. Similar remarks were made by an ALC1

instructor. They experimented themselves with the teaching station and tested the various configurations of the available displays.

ALC2s that were identified for this study belonged to two different departments. Two of out four instructors who commented on orientation options in the Myhal building ALC2s, had either received a tour of the room or had a technology staff member with them in the room during class and asked them questions as needed. The first instructor did not feel confident to use all the options available in the room as they found the one-time tour overwhelming:

*So, we just said, okay, we don't need that. We just want to do the basic things, right? Because I learned that you can show different things and the different screens? And you can I think that you can connect the students can actually connect their devices and show something. Wow, that's just too much!
(Humanities instructor, ALC2)*

This instructor did not try to experiment with the various affordances of the room and for the rest of their instruction used the basic functionality of the ALC2. However, another tech-savvy instructor tried out the AV system and the teaching station of a Myhal ALC2 on their own and were comfortable using it in their instruction. For the other ALC2s, a department staff member from the instructors' home department, provided an orientation which both instructors found useful. To them, the technological features of the room were intuitive. Our interview data did not point to any manuals or information booklets, print or online, available for standard ALCs, ALC1s, or ALC2s.

In addition to orientation and training opportunities prior to teaching in the ALCs, we explored instructors' experience with the level of support throughout the semester which we explain in the upcoming sections.

Preparing to Teach in the ALCs

Instructors' Overall Experience in the ALCs. We selected the interviewees based on their assigned ALC and their disciplinary affiliation. Some of the instructors had taught in different ALCs. For example, most of the science and engineering instructors had experience teaching in the ALC3 and ALC2s. Or, a humanities instructor had taught in an ALC1 and an ALC2. Instructors were generally happy with their experience teaching in ALCs as long as the ALC met their instructional requirements such as technological affordances and facilitation of student-student and student-instructor interactions. Some instructors found their assigned ALC to enable increased level of student interaction and to facilitate their desired learning outcomes. Others noted that they would foster similar learning activities in all their classrooms regardless of the layout and technological affordances of the room.

Time and Resources Required for Instructor Preparation. Instructors who taught in the ALC3 were most likely to need careful and extensive planning before starting their course. Issues that the instructors had to be cognizant of included where to stand in the ALC3 as they taught and how to facilitate class-wide Q and A. In addition to usual prep for teaching a course, ALC3 instructors had to make sure they organized all the required cables and digital devices (e.g. iPads, laptops, digital pencils) that they were using in the room. A Sciences/Engineering instructor, described their preparation process:

*...going in those classes I felt like I had to block it out like it was a theater performance. I had to know where I was even going to be standing at all times. And I had to manage how many times I asked a question... So I needed three dongles, two power cords, my Apple Pencil and I had to make sure my laptop, iPad and pencil are charged, turn off notifications, make sure--and this is specific to my teaching--that the software was ready, and it was oriented in the right folder to work in. And any starter code I was going to be using was handy that would happen in any class. I need a paper and a pencil and make sure my laptop and iPad wouldn't go to sleep. Had a lot to carry, and the worksheets, 470 worksheets. And if you have two worksheet sets you need a special bag for carrying them.
(Sciences/Engineering instructor, ALC3)*

The instructors mentioned that due to the size of the ALC3 and the number of enrolled students, they sometimes needed to carry a sizable amount of paper with them to the class. Also, in the ALC3, the instructors could display information in different ways and from different sources. Keeping track of where the content is stored and where it would be displayed was important so that their instruction was not delayed. One of the instructors had spent up to six hours preparing for one class session. The instructors expected that their extensive initial planning would reduce planning time for subsequent semesters.

Logistical preparation was not as intense for ALC2s, ALC1s, or Standards ALCs. In those rooms, the instructor needed to have necessary AV cables for their laptop. Sometimes they had to carry a variety of cables to be ready for any kind of tech configuration that the teaching station provided:

*I have a whole pocket of all the different adapters and things I need for all the different classrooms. So, I have HDMI to VGA. I have the USB to what hardwired internet because I can't connect to wireless and all of the buildings on campus.
(Social Sciences instructor, Standard ALC)*

One instructor could not use the AV facilities of an ALC2 as there was not a computer or a laptop available in the room and bringing a laptop to the class was impractical for them.

Changes in Course Design. Teaching in the ALCs could encourage the instructors to push the boundaries of course design or as one instructor who taught in an ALC1 commented, the new space allowed them to reflect on how the ALC could help them enhance their teaching. Reviewing their experience teaching in ALC3, an instructor stated that their existing approaches would not scale to this room and they need to specifically think about how to increase students' engagement in this expansive space.

We noted that one of the courses had gone through a major redesign before it was offered in the ALC3. The assignment to the ALC3 had coincided with the instructor's intention to increase the level of Active Learning in the course among other changes such as pre-readings and prep exercises. Advance notice about room assignment could greatly facilitate changes to course design. At the time of conducting the interviews, some of the instructors had very little preparation time between room assignment and the start of their classes. The aforementioned course design example took almost seven months. Instructors teaching in other ALC categories stated that making changes in their courses to utilize the affordances of an ALC may require a few months. Advance notice was less of an issue compared to instructors' concern about being reassigned to the same or a similar ALC. For the instructors, making changes to their courses only to find out that they were reassigned to a more traditional classroom was not an effective use of time.

Instructors may adapt their teaching approaches to suit different types of classrooms or "Adapt dynamically" as one instructor specified, to achieve desired learning outcomes independent of the type of classroom. Making too many changes at once, however, was cautioned against. Being in an ALC may not necessarily lead to changes in learning outcomes. Yet the instructors could make spontaneous or planned changes to their course activities. ALC3's affordance for group work inspired instructors to increase small group work opportunities where students could discuss their approaches to solving a problem or where students could complete and submit their tasks during class time. Students in this following course example also had a new opportunity to share their work with the whole class using a document camera.

*I had students do something in class and submit it while they were in class. Like, that was a totally new thing for me. I might have asked them in the past to leave a card or something like a ticket out the door type thing, but never like submitting a piece of work that students did. And towards the end of the class, I even started getting students to come down and share with the class. We tried to do it from the seats, but we were having trouble with the tech. So, they came down to use the doc camera - that was a new thing, like I've never done before.
(Sciences/Engineering instructor, ALC3)*

Another ALC3 instructor observed changes in lecture style as more Q and A and group work were integrated into traditional lectures. The design of the space made it unsuitable for traditional lecture as the affordances would enable a more participatory and interactive approach.

Pedagogical Considerations in the ALCs

Classroom Management and Student Engagement in ALC3. Most of the instructors speculated that students could be more easily distracted or disengaged in the ALC3 due to the size of the room and the large number of students. The instructors suspected that the students, especially the students who were sitting far from the front of the class, would be on their phones, use class time to do other work, or engage in conversation. The distance between upper rows of the ALC3 and the instructor seemed to create some level of disengagement even for highly engaged students.

And what I hadn't realized was that there's a limit to how far you can physically move your engaged students before they'll disengage...The pylons were because we were about 262, 300 and we were in a room size for 475. And so it's like, "No, you don't get to sit out in the back where I can't see you". (Sciences/Engineering instructor, ALC3)

Some ALC3 instructors expressed a sense of disconnect with students sitting in the upper rows. A Sciences/Engineering instructor stated: "I would go to the very back of the room just to make sure that those people had attention and then work my way down. But the people in the front, maybe did connect more." Students who sat in the front rows appeared more active during instruction. In their informal communication with the instructors, some students also pointed out that being distracted was an issue that interfered with their learning in the ALC3.

In the ALC3, two instructors explained the tension between the benefits of posing questions to the class or running an Active Learning strategy, and then running the risk that students might engage in extended discussions with possibly less desirable learning benefits. Gaining back the attention of students proved more challenging in the ALC3 compared to other classrooms where the instructors had previously taught.

It's really hard to get their attention back. Every time you release attention, you have to get it back. And in that room, it's like turning around the QE2. Some students said to me, it's like a cafeteria in here. Like it's really hard to get them to stop talking. (Sciences/Engineering instructor, ALC3)

In their second time teaching in the ALC3, one instructor explained that they had not faced any challenges in the beginning of the term, at the time of the interview, and they had thought of strategies to address potential issues later in the term when students get to know each other more and may engage in additional conversation.

The distraction and noise level in ALC3 did not seem to be unresolvable. Some of the instructors had already put strategies in place to orient the students to creating a classroom environment that is more conducive to learning. For example, one of the ALC3 instructors recommended using timers on the screens for students to self-monitor

their time for particular activities. To encourage the students to listen attentively, another instructor refrained from using a microphone when addressing the class so that the students themselves lower the overall noise level. Another strategy to foster more student engagement was to incorporate the outcome and product of small group work into the whole class discussions, thus increasing students sense of agency in their own learning. In our observation of two high enrolment classes in the ALC3, we did not notice excess noise and the instructors could be heard clearly throughout the classroom.

Instructor-Student Interactions in the ALCs. A common thread regarding instructor-student interactions in the ALCs was how the arrangement of the rooms enabled the instructors to walk around and interact with more students. ALC3 instructors were mostly positive about this feature compared to amphitheater style classrooms where they found it difficult to reach students who sit in the middle of the rows. In the ALC3 they could check with more groups and identify groups that were falling behind or not making progress. The size of the ALC3 and the number of enrolled students made connecting to all students, e.g. learning their names, and checking on all groups, rather cumbersome. An ALC3 instructor suggested that TAs could assist in connecting with the students and encourage more active participation. Indeed, this approach was used by a number of instructors.

One exception was a standard ALC with castered chairs that hindered students-instructor interactions:

I like to be able to circulate. But it's actually really hard to do it in rooms like that, because it's like, chairs get shoved in the middle, and people throw their bags on the ground anyway, even though there are the things under the chairs. So, it's actually really hard to physically navigate the space. (Social Sciences instructor, standard ALC)

Factors impacting the choice of furniture for ALCs did not surface in the administration and leadership interviews. Further follow up to identify such decision-making factors is needed.

Instructors' Position in the ALCs. Some of the ALC2 and ALC1 instructors noticed that multiple displays on the classroom walls or on the tables caused the students to look in different directions while looking at the same material. This was very different from other non-ALC classrooms where students would look in the same direction facing one shared screen. Anticipating that such an unfamiliar situation would impact students who were presenting to class, an instructor warned them beforehand:

But it is a strange feeling that everyone's looking away from you while you're talking to them. And it takes a little getting used to. And then so what I found was that when the week before they were doing their own presentations, I warned

them about this. I said “you're going to find this actually kind of challenging to present in this room”. And why. (Social Sciences instructor, ALC2)

In ALC2s and ALC1s, the instructors noticed the absence of a “front of the room”. This absence, plus the layout of the rooms with increased square footage for each student, allowed the instructors to move more easily around the class and amongst the students. Instructors also became more aware of how they positioned themselves in the classroom and where they stood in relation to the display(s) in use.

I always use rooms with movable desks and chairs. But I think a big difference was not always feeling like there's as much of a defined front of the room. So, we still make a front of the room. But it doesn't quite look like a front of the room. So I did find myself walking around the class and teaching from the middle of the class and looking around me. And I think that changes the dynamic like I found myself going to people differently. Going to more people like not always going to the same people. I think it does change the dynamic of the room in a really positive way. (Sciences/Engineering instructor, ALC2)

An ALC1 instructor suggested that a remote control would greatly facilitate their movement in the classroom as they would not have to frequently walk back to the teaching station to change a slide, for example. With more than one shared screen where materials were displayed or projected, the instructors were unsure if the students were paying attention or if they were busy with non-class-related activities.

While regarded as a potential source of distraction, the decentralized display system was a new feature that the instructors had started to accommodate in their teaching process. For example, when all students needed to pay attention to the instructor or look at a single screen, an instructor suggested that it was possible to turn off the other screens. One instructor shared how they explained to the students that they will experience a different presenter-audience dynamic in an ALC2 before student groups presented their project work with the class towards the end of the semester. In this instance, after consulting with a colleague, the instructor changed the presentation format where each group used their table display to present their work as digital posters.

ALC3 presented other issues with regard to the instructor’s position in the room. The size of the ALC made some instructors feel physically distant from the students and some instructors mentioned that they could not easily see students who were sitting in the upper rows. The following interview excerpt describes the sense of physical distance in ALC3.

Think even just with the design of the room, it feels like there's a bit of a barrier between the instructor and the students...you're down on this... kind of stage with all this tech and all the stuff, and then they're up in these tables, and it just feels... so far away from them. And they said that to me too. like, we feel like there's a

real distance... Like I think the room on its own has some real problems and limitations. So, if I go back in, I'm gonna need to think how do I work in this context to make it the environment that I want it to be? Because I don't want them to feel far for me. You know? (Sciences/Engineering instructor, ALC3)

Small Groupwork and Discussion in the ALCS. Table arrangement in ALC3 lent itself to group discussion as the tables allowed the students to face each other. Plus, there was already a group in place and the instructors did not have to ask the students to find a group to join. This opportunity for the students to engage in small group discussion was less common in other classrooms, a Social Sciences instructor observed. Moreover, a Sciences/Engineering instructor commented in their interview:

There was an obvious group of students to work with. Whereas previously, I would encourage them to find some people around them to talk to. But then you know, if you're shy, you have to kind of look at these people around you and like try to initiate a conversation and it's awkward, and they don't talk to anyone. But just in those little tables, it's obvious. (Sciences/Engineering instructor, ALC3)

The size of the ALC3 also presented challenges regarding group work especially when the class was not full and the students could sit at a table alone. Most of the ALC3 instructors mentioned having observed a number of students sitting alone at a table or in groups of less than four.

We received positive remarks about ALC2s, ALC1s and standard ALCs. The arrangement of furniture and the shape of tables in these ALCs were inviting and facilitated small group discussions. This was especially an advantage for those courses where the bulk of learning took place in small groups:

The physical space actually helps them to be intimate, I believe. Yeah. And often I said that, for the group discussions that sometimes on purpose, give them just a one piece of paper. Some questions, not just individually. So, they really have to share it. That means the table is very useful. (Humanities instructor, ALC1)

An ALC2 instructor pointed out the physical space between each group as a positive design feature since the groups would not distract each other. Note that in some ALC2s, including this specific classroom, the tables are secured to the floor. Dedicated whiteboards for each table in an ALC2 was identified as another design advantage. Students could use the board to summarize their discussion and present their work to the class.

Based on the instructors' thoughts, classroom furniture enabled students' interaction in different ways. Comparing castered chairs with an attached writing tablet and a table that accommodates a small group, one instructor stated that the larger shared writing space of the tables made collaboration easier. Moveable furniture, as in the castered chairs in a standard ALC, could also facilitate large group activities such as poster

sessions since it was possible to bring the chairs in the middle of the class and make space for the students to walk around the room and to review their peers' posters.

While in the majority of the ALCs the classroom design afforded groupwork, an instructor stated that not all students were either ready for or willing to engage in small group or whole class discussions. The arrangement of the tables and chairs allowed the students to sit with their back to the class if they were unwilling to participate in classroom discussions.

Scaffolding Students' Participation. We followed up on instructors' concern about students' participation in small group and whole class learning activities and asked the instructors to share some of the strategies that they either had used or were planning to use in their classrooms to facilitate students' participation. As we later explain in the "Students and Active Learning" section of this chapter, a general strategy to foster students' participation in class was to clarify participation expectations either in the course syllabus or during early class meetings. In one program, instructors shared a consistent code of conduct in their course syllabi. Relevance of group work to students' professional future was also discussed and in one class where the instructor worked with students to create group charters:

[I have them] do a team exercise, to do a fun one, the first class when they are put into their teams, just to kind of give them a sense. We do spend some time in that class... talking about teamwork, and you know, just kind of helping them, reminding them about team. And you know, being an effective team member, and they do a team charter as well. So, I kind of feel like I'm setting them up. (Social Sciences instructor, ALC2)

Three instructors assigned students to small groups based on specific criteria such as diversity of ideas, academic abilities, or language facility. The composition of the small groups changed periodically to maximize students' chances of getting to know their peers and being exposed to a variety of viewpoints. For example:

One of the intents of discourse was not just to put them into groups, not randomly, but selected so that they get the diversity of views. And then to shift that throughout the course, just to give them exposure to as many people as possible, which I think is an important part of it. (Social Sciences instructor, ALC2)

Recognizing students' contributions to small group and whole class discussions and assessing the quality of such contributions was, however, an unresolved issue. We noted that the instructors were concerned about ways to measure students' contributions in an inclusive manner.

Technological Affordances of the ALCs

In all ALC categories, the instructors recognized multiple presentation options to be a valuable feature. In most non-ALC classrooms, the instructors explained, the projection screen would obstruct the whiteboard or blackboard making it impossible to project an image while writing on the boards. One instructor recalled telling the students that they were going to switch between a projected image and the board and switch back again afterwards. However, in our interviews we noted that simultaneous presentation options in ALC1, ALC2, and ALC3 provided other advantages and affordances. In the ALC1s where the interviewed instructors had taught, the screens on the wall were on the smaller side. The ALC1 instructors stated that multiple screens on different walls made it easier for all students to view the projected content no matter where they sat in the classroom. Most ALC2 instructors commented how seamlessly they could switch the screens and share table screens with the class and that students could easily use this feature:

There were the instances where we were having discussions and critiquing. And the students who were really comfortable with basically switching to projecting via the connected system, were then doing that. And so, you know, there were kind of points where, you know, someone was talking about some things and said “here, I’ll show you” and right, and then actually working with that. So when that happened, that was great. (Humanities instructor, ALC2)

In ALC3, the AV facilities were distinctive as the room afforded multiple input types in addition to high quality displays. The instructors positively commented on how seamlessly they could display different content on screens of their choice and also switch easily between input sources. For example, it was possible to write on the document camera while slides or other content were displayed on other screens. As we explained before, to maximize the AV affordances of the ALC3 the instructors spent time preparing content on different devices. The instructors also mentioned that the ALC3 technology staff facilitated this process, which allowed the instructors to focus on teaching rather than having to pay explicit attention to AV equipment.

Technology and AV Support in the ALCs. ALC3 had a different tech and AV support structure compared to the other ALCs as two staff members had been assigned exclusively to this room to assist the instructors. The instructors highly rated the quality of technology support whenever a problem occurred although the service was sometimes delayed. An ALC3 tech team member sometimes sat in class to provide direct assistance, if needed. This was the case for the inaugural semester of the ALC3 where demand for tech-related issues, as the instructors experienced, was high, as evident in the following interview excerpt:

You would contact them, and they would come really fast. Especially in 150 in the Fall, I think everybody was on their tip top, you know, like we better put our best

*foot forward here. So yeah, like, I can't say enough good things about that.
(Sciences/Engineering instructor, ALC3)*

Note that the ALC3 instructors that we interviewed in the first phase of the assessment were among the first cohort of instructors who taught in that room and who would experience technological glitches of a new and highly technologically advanced room.

In other ALCs, the instructors could press a tech support button on the teaching station to ask for assistance. A technician would come to the class to examine the issue. However, sometimes this would take several minutes. The instructors emphasized that they would not delay instruction to wait for the technical issue to be resolved, as noted: “takes someone 10 to 15 minutes. You've got two hours per class, and are you going to spend all that time, like are you spending 25 minutes trying to solve a tech problem? Or you going to move on?” (Humanities instructor, ALC2) Instead, they would switch to an alternative plan or activity. The quality of technological support was generally, according to the instructors, high.

Technological issues in the ALCs. The main technology issues in the standard ALCs and ALC1s were spotty wireless and, in two occasions, flickering displays. Moreover, the new displays were incompatible with laser pointers, which one instructor relied on to emphasize key sections of displayed slides or other resources. A similar tool, they commented, facilitated their teaching as they could point to the content on display from anywhere in the room. To ensure having connectivity while teaching, one instructor carried a USB connector to be able to use U of T's ethernet connection.

Tables in ALC2s had HDMI connectors so that students could plug in their laptops. HDMI cables, nevertheless, were not provided and the instructors or the students needed to bring their own cables and, if necessary, display port adaptors. While doable, ALC2 instructors thought such practice was suboptimal. To ameliorate this problem, one instructor suggested installing lockboxes in the classroom that would contain cables. The instructor was inspired by a classroom lockbox in another building where they had previously taught. In one course, the instructor noticed that from the two HDMI ports on the tables, only one was connected to the monitor. Lack of clear labeling caused the class to spend some time solving this problem. It will be important to follow up with ACE regarding how this issue has been addressed.

In the most technologically advanced ALC, the ALC3, each table has a microphone that students can tap to be placed in a queue for individual or table responses. Sometimes students accidentally tapped the microphones and the instructors had to manually clear the queue or they asked the student to refrain from touching the microphones altogether. The feedback on microphones, another instructor stated, required a TA to manually activate and deactivate them so that students talking on the microphone could be clearly heard.

The problem with table microphones in ALC3 was addressed in the Fall of 2019 according to an instructor who had previously faced the issue but had noticed that the table microphones were functional the second year they taught a course in the ALC3. This improvement, the instructor observed, facilitated more interaction between the students and the instructor, a desired approach for the instructor:

Last year I had a very hard time taking student questions and soliciting answers to my questions. The desk microphones weren't working at the beginning of the year and I went the whole term without using them. This year I started using the mics from day one and although it takes a couple of seconds to get it going, it has made a big difference. I can interact with students throughout the room and take/pose more questions, which is what I'm used to doing! Last year I didn't feel like myself in that room, because my interactions with students while "lecturing" were so minimal. I'm much more comfortable with the AV set up and more confident about trying things like desk mics. I also know that getting attention back can be problematic (especially later in the term when students know each other well and are tempted to keep talking) and I have some strategies ready to try for that too. It hasn't been an issue so far though. I still have a hard time learning names in a classroom this size. (Sciences/Engineering instructor, ALC3)

During the first semester of offering classes in the ALC3, one of the instructors faced multiple technology challenges and stated that they had to be ready to switch to a less tech-intensive mode of instruction at any time.

Technology related issues could prolong activities and add unnecessary workload for the instructional team. One instructor questioned the necessity of all the technological affordances in the ALC3 to facilitate learning. Part of this speculation, when compared with other instructors' remarks, could be related to the complexity of technological affordances that sometimes required a dedicated TA to support the instructors' teaching processes.

Active Learning in Practice

After sharing a diagram of Active Learning strategies (Figure 1. Active Learning Strategies Continuum) we asked the instructors to describe AL strategies that they frequently used in their courses. We encouraged them to use the diagram as a representation of a subset of AL strategies rather than a comprehensive reference list. Table 3 shows AL strategies that the instructors used in their teaching categorized as individual or collaborative (small or large group) activities. As well, a revised continuum, with descriptions and video examples, is now available on the [CTSI website](#).

Figure 1
Active Learning Strategies Continuum

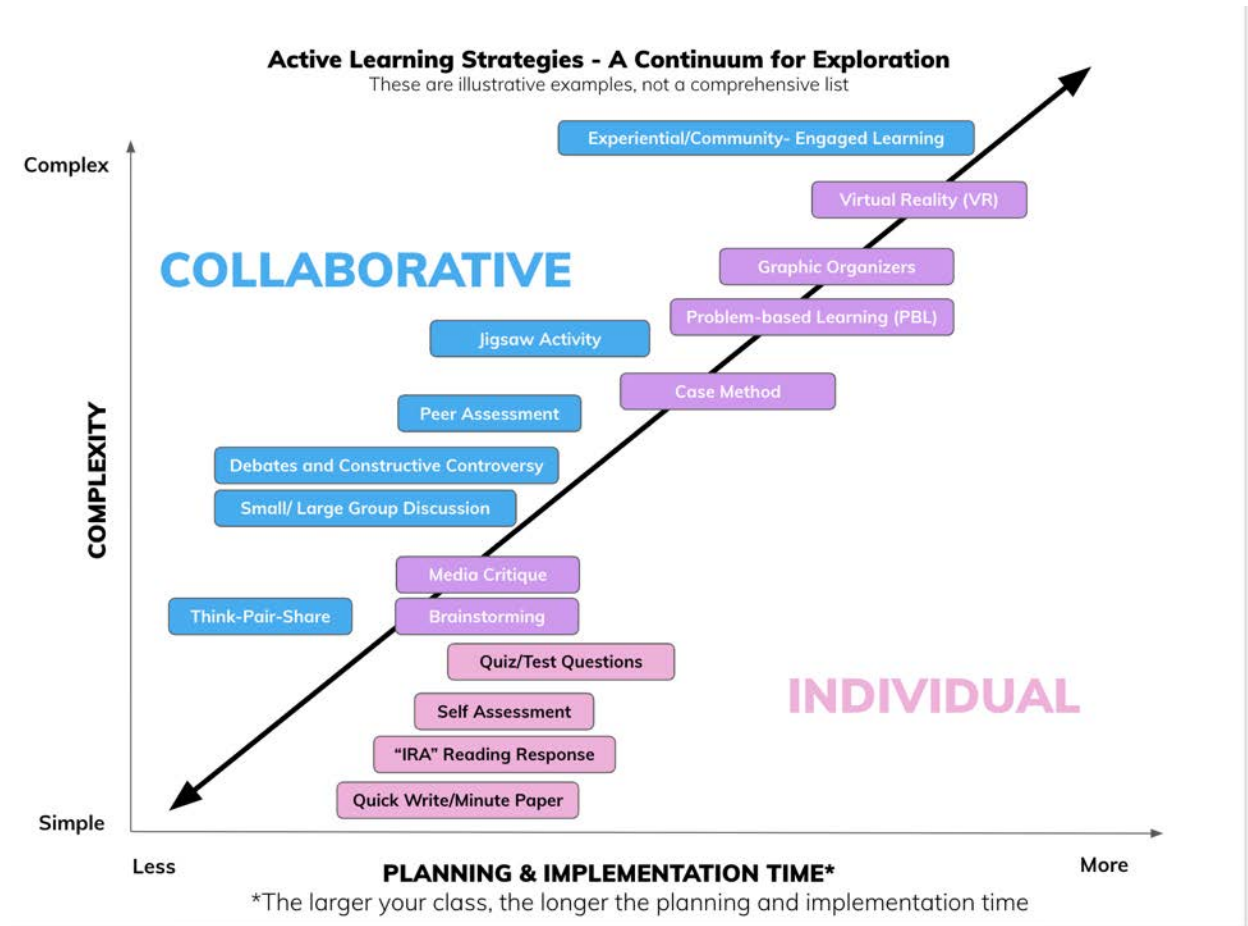


Table 3*Active Learning strategies participants used in their classes*

Format	Strategy
Individual	<ul style="list-style-type: none"> • problem solving worksheet • progressive problem solving (reading, quiz, application) • reflection • self-assessment • one-minute paper • reverse engineering hands-on activity • inquiry-based activities • authentic tasks • mini-reports • critique
Small group	<ul style="list-style-type: none"> • informal group discussion • think-pair-share • collaborative problem solving • adapted peer instruction • workbook • case-based problem-solving activity • peer assessment • problem-based learning
Whole class	<ul style="list-style-type: none"> • discovery learning • brainstorming • enacting a tree data structure • crowd-sourcing authentic cases that represent issues discussed in class • stakeholder simulation • simulations for applied problem solving • fishbowl discussion

Some of the strategies listed in Table 3 are generic while others are more discipline specific or specialized. Instructors highlighted the importance of identifying or creating disciplinary relevant AL strategies to enhance students' learning and engagement, while most of the instructors also used a variety of individual, small, or large group strategies. Of note is that instructors in some of the courses included in the interviews used a flipped classroom model where students could access some course material, lectures or lectures with embedded quizzes, for example, prior to class so that in-class activities could be more Active Learning oriented. None of the instructors identified strategies that were ALC-specific. However, as we present in the following section of the findings, they appreciated that the ALCs could facilitate strategies such as small group discussions.

AL in Lecture vs. Tutorial or Lab. Some of the courses covered in the interviews that we conducted with the instructors had two components: a lecture and a tutorial or lab.

Those courses usually had larger enrollments with at least one component being held in the ALC3. Instructors of some of these courses indicated that course tutorials or labs have an integral Active Learning component to them and sometimes in the lecture component of the course the instructors may use some of that class time to discuss expert knowledge and foundational concepts that the students need to master in order to further engage in the rest of course activities, including the labs. However, this raises the issue as to whether or not the lecture component of such classes necessitates an ALC, or if this is more needed for the lab or tutorial components. Sometimes, in the case of more abstract concepts, the students appreciated the information coming from the instructor, in addition to information or coaching from peers. Other times, Active Learning strategies would provide time for the students to reflect on the material that they had covered in class through a lecture format.

TAs and the ALCs

Teaching Assistants' Role in the ALCs. Teaching Assistants' (TAs) responsibilities in the course that instructors we interviewed taught included running tutorials and seminars, grading assessments, and holding office hours. Those tasks would take place outside the ALCs in most cases. Some of the TAs never attended a class in the ALCs as their main responsibility was grading the assignments and tests. In cases where the assignments were automatically graded, TAs had more time to hold one-on-one office hours for the students.

TAs were more actively involved during class time in at least five courses held in the ALC3. Instructors described their TAs' role in light of the expectations that they had communicated to their TAs. In computer science courses, for example, the TAs were encouraged to cover different zones of the ALC3 so that all students could have access to help when needed. They were also encouraged to walk around during class and communicate with the students in order to facilitate peer interaction and discussion or address students' questions. One instructor emphasized that this interactive and proactive approach aligned with their own teaching style. While instructors promoted a more proactive and engaged role for the TAs in these classes, they also noticed that sometimes TAs would wait for the students to raise their hands for guidance or help:

So there were periods, you know, when I was taking up solutions, or doing sort of summary, where they just kind of stood around. If a student raised their hand, you know, they would go and help them out. (Sciences/Engineering instructor, ALC3)

In an Engineering course, TAs had a distinct role of contributing to classroom management by, for instance, monitoring content displayed on the screen for congruency with the lesson plans and with the instruction taking place at that very moment. Alternatively, they would communicate real-time with the instructor to facilitate instructors' communications with all students no matter where in the ALC3 they were located. For example, a Sciences/Engineering instructor explained that in

their course the TAs will “usually be checking on what's on the screens, on the laptops to see, you know, and I'll get a texting. So we're doing a real time back channel.”

In two courses held in ALC3 a TA had the distinct role of technology coordinator. The TA who was assigned this role would operate the teaching station, thus freeing the instructor to mainly focus on teaching and facilitating learning activities. Responsibilities of the tech-TA included displaying material on screens from different sources and monitoring the desk microphone activities. In one such course: “this person is anticipating it. I'm going to use this analogy: it is like being in surgery. And the doctor doesn't need to say I need the scalpel... that person is already anticipating what it is you need” (Sciences/Engineering instructor, ALC3)

As we will explain in the next sections of the findings, feedback on table microphones caused less desirable interactions in ALC3. To address this issue, the tech-TA would manually mute and unmute the table microphones to enhance the quality of sound during discussions.

Closely related to the role and responsibilities of the TAs in each course, is the training that they receive, especially when they are in a unique classroom such as ALC3. The following section focuses on TA training programs and instructors' suggestions for improvements in such programs in light of the emphasis on Active Learning in the ALCs.

TA Training for the ALCs. To the instructors' knowledge their TAs in standard ALCs, ALC1s, or ALC2s did not receive specific training beyond the training that is provided by U of T to all TAs. The tech-TAs, that we mentioned previously, were self-taught and could consult with ALC3 technical support staff as needed. However, in our interviews one of the instructors described a unique TA training program for an introductory computer science course where the TAs attended training that facilitated them reflecting on their own experience as students to understand the many perspectives related to content-related challenges that the students may face in the course and to also gain a deeper insight into effective pedagogical practices. The program was described as follows: “Most of our training, this term was focused on getting them to think from the students' point of view, getting them to empathize with the students, understand their challenges and really be aware of bias and inclusivity.” (Sciences/Engineering instructor, ALC3) We followed up with Jacqueline Smith who organized and supervised the program. We present this TA training program as a case in Appendix G.

Instructors' Thoughts on ALC Design Features

Instructors noticed differences and similarities between the classrooms where they had previously taught and the new ALCs in which they were teaching. This mostly applied to standard ALCs, ALC1s, and ALC2s as ALC3 presented a completely new and unique design. Instructors recounted having taught in rooms that had moveable furniture and, in one case, large displays. Overall, interviewed instructors believed that the ALCs provided a better learning experience for the students with more individual space and with increased opportunity for instructor-students and student-student interaction. In theatre style classrooms, an instructor explained, long rows prevented them from checking in with all students and students were not able to easily form small groups to work together. The instructors also had suggestions to improve the design of the ALCs.

The ALCs that are referenced for this assessment are either new constructions or existing classrooms that were renovated to accommodate more writing spaces, displays, and furniture that can facilitate small group work. Instructors commented on natural light in some of the rooms as a desired feature.

With regard to furniture in the ALC1s, we received two different viewpoints. In one class the instructor noticed that some students ended up having their back to the front of the class. Another instructor, however, preferred the triangle shaped tables to square ones as they could turn the tables so that all students could easily turn their head to the front of the class when needed.

We noticed that the limitations of the existing space, such as narrow and long classrooms, may affect the design of the ALCs. In one room, the instructor found it difficult to walk among the tables as the room was very narrow. Tables and chairs were preferred to chairs on casters because tables provided a shared work space for groups. Moveable tables, as opposed to stationary tables, provided more flexibility for group work. In terms of different types of moveable chairs and tables, instructors found the castered chairs roll very easily and can therefore be unstable.

Instructors in ALC1s suggested a larger board in the front of the room and, in general, writing surfaces that can be viewed and accessed easily as the subject matter required use of writing: "A whiteboard is really critical, because I deal with words and terms that in foreign, ancient languages, and you need to write them for students to be able to see." (Humanities instructor, ALC1)

For a standard ALC, one instructor suggested that more electrical outlets would be helpful as many of the students bring their electronic devices with them. In terms of AV equipment, two instructors explained how video and audio recording facility installed in the room will allow them to record their instruction and have remote students sign in to join the class. Or the instructor could record students' presentations and later provide an opportunity for the students to reflect on their presentation and communication skills.

Desired Support Sources

In our interviews with the instructors we explored their thoughts and input about support and resources that would enable and facilitate the integration of Active Learning in their instruction, specifically in the ALCs.

At the time of conducting the interviews in the Spring and Summer of 2019, ALC3 was the only Active Learning classroom with an organized orientation session. However, not all faculty interviewees had attended those sessions. What's more, while a comprehensive manual of the ALC3 prepared by instructor Shai Cohen was uploaded on the Myhal 150 webpage, none of the instructors were aware of this resource. Instructors highlighted the importance of raising awareness about existing departmental or central support resources.

Regardless of the type of ALC where courses were taught, the majority of instructors suggested a resource collection consisting of video clips that could showcase effective Active Learning strategy integration with direct links made to the characteristics of Active Learning in an accompanying document. In one such comment, a Humanities instructor stated:

If there are faculty who are successful in Active Learning strategies that would allow a class or part of their class to be recorded. So other people could look at people who have had an experience of trying out this strategy ...if there was some sort of central repository... I think that would be a great, great help. (Humanities instructor, ALC1)

These video clips could showcase an instructor's teaching in an ALC and using the affordances of the room to enhance opportunities for Active Learning. Such case studies would inspire instructors to reflect on ways that they can meaningfully integrate Active Learning strategies in their courses:

This kind of training, I think it needs to be really concrete and specific. So maybe even a bunch of little case studies, yeah, that are written up with little video clips, or pictures or sample activities, it'd be really wonderful, really, really specific. I think the sample activities, it's a great idea too because a lot of instructors sometimes just you know, are overwhelmed and having something that they can try, they would never even think about. (Sciences/Engineering instructor, ALC3)

The instructors proposed that a centrally hosted and curated resource collection might be something CTSI consider.

Workshops could be another source of capacity-building for Active Learning. Workshops offered to prepare the instructors for other teaching and learning innovations had been helpful in the past for both advancing the instructors' knowledge and for identifying key contact personnel whom the instructors could reach out to for further support. The instructors also reflected on possible disciplinary differences and variations in integrating Active Learning strategies in teaching practices. Resources, workshops, and hands-on sessions, the instructors suggested, could be both discipline-specific and cross-disciplinary. Discipline specific support

would provide more focused and context-specific support. However, in the case of face-to-face workshops, it would be difficult to find a time that would work with the busy schedules of instructors.

There were multiple requests for resources that orient the instructors to the technological and AV affordances of the room so that the instructors can maximize the benefits of Active Learning for their students. Such resources would be a collection of videos, manuals, suggestions from previous instructors who have used the same room, plus a guided hands-on session scheduled at a time convenient for the instructors. Short video clips that explain how different teaching stations can be operated could be self-directed and provide on-demand learning resources for the instructors. One instructor stated that visiting the ALC prior to teaching and also learning about previous instructors' experiences in the ALCs would be useful when planning a course, as the layout of the ALC may require adjustments to teaching strategies or classroom management approaches, as was the case in some ALC2s with no front of the room.

As an instructor explained, without knowledge and understanding of the technological features of ALC3, it would not be possible to confidently use such affordances while teaching. Video clips or manuals could facilitate instructors' use of more complex teaching stations and help them become more comfortable in using multiple display options, for example. Continued support and facilitation in the ALC3 would also support instructors. TAs who are trained to handle the technological features of the room, one instructor suggested, would allow the instructor to implement Active Learning strategies more effectively. Instructors who had a designated technology-focused TA, as explained in the "TAs in the ALCs" section, reflected positively on their experience.

Students' Learning Experience in the ALCs

Students' readiness to engage in Active Learning and specifically in classrooms that are designed to facilitate Active Learning may inform instructors' decisions to provide specific scaffolds when needed. None of the instructors had noticed any strictly technology-related lack of knowledge on the part of the students that would interfere with their learning in the more technologically advanced ALCs.

The instructors noticed that the majority of students were comfortable with Active Learning strategies regardless of the classroom. Such competency with Active Learning strategies, collaborative group work for example, could be the result of previous implicit or explicit learning experiences. One of the programs, an instructor pointed out, has provided resources and training for teamwork and collaboration as an integral part of the students' educational experiences. Another instructor noted that students may have gained familiarity with Active Learning through their previous courses. This applied to all types of ALCs. Students who had previously taken a class in the ALC3, for example, did not have problems working in groups in the same room in a subsequent course.

Some of the instructors, however, identified a need to have interventions in place to familiarize the students with the concept of Active Learning and, when needed, learning in an ALC. In at

least four courses, the instructors talked to the students about participation expectations. The following excerpt from our interview with a Sciences/Engineering instructor showcases one such intervention:

We have to teach them every term, how to behave in an Active Learning classroom and what to expect. And we talked about that in the first lecture... you're going to really have to be thinking and working, can't be passive in this classroom. I give them some references to the literature and talk about our own research that shows improved learning. And they buy in. (Sciences/Engineering instructor, ALC3)

Two instructors noticed an initial adjustment in the first few weeks of their classes in the ALC3. They continued to provide guidance through this period.

Students Feedback Regarding the ALCs. Students' feedback regarding their thoughts on learning in the ALCs was another topic of our interest. Since this assessment project focused exclusively on data collected from instructors and administrative interviews and documents provided by them, we can only report on students' experience through the lens of the instructors' observations and informal interactions with their students.

Overall, students expressed their satisfaction with learning in the ALCs. In the absence of any student remarks regarding the ALCs, the instructors assumed that the students either felt comfortable in the class or had previously attended another course in a similar classroom. Students had commented positively about the ALCs when the configuration of the room or the technological affordance directly facilitated their learning. For example, students in two courses assigned to ALC1s commented on how the tables in the room facilitated their group work. Those students also commented on the multiple screens on the walls that made looking at the projected images or videos easier. In a standard ALC, the students could present their work from anywhere in the room as the chairs and tables were moveable.

An instructor who had taught one section of their course in an ALC2 indicated that students had provided positive feedback about tables that allowed group work and access to multiple writing surfaces. Students in another ALC2 classroom indicated that the layout, furniture, and dedicated screens for each group closely matched the structure of their course. As for the ALC3, students in one course had shared their thoughts about the room with their instructor through an informal survey. Those students indicated that sitting arrangements in the ALC3 facilitated their communication with their peers. Moreover, they recognized the outlets at each table, more writing space, comfortable seats, and extra space to easily move through the rows, as other positive features of the ALC3. According to the instructor, the students:

...seem to find it much easier to connect with their classmates in that room. And they found it much harder to connect with their instructor. Which is kind of what's expected. They liked it. I mean, I think the things that make a room comfortable

for them are not things we even think about, right? Like the things they were saying was like, oh, there's plugins in the table. And there's room to put your bag and your computer and maybe your snacks...Like the actual having some personal space, I think was a big thing for them. (Sciences/Engineering instructor, ALC3)

The students in all four types of ALCs communicated their concerns related to the layout, furniture, and technological features of these room either informally with the instructors or in their course evaluations. For example, chairs in one standard ALC would roll around very easily causing some distraction or room temperature was not always easy to adjust. Multiple screens, while allowing the students to have a better view of the displayed material, could be also distracting to some students. In the ALC1s, two instructors noticed that sometimes students had to turn towards the front of the class with their back to the table which caused them to lose their writing surface. In the ALC3, some students also shared their concern that they could be more easily distracted especially when the class was discussing a complex topic. They also found it more difficult to connect with the instructor.

We reiterate that in this assessment project we did not directly collect student feedback. The above-mentioned comments were informally communicated to the interviewers by the instructors. [A report prepared by the Innovation Hub](#) provides deeper insight into students' perspective towards the elements that support learning in the ALCs.

Reflections for Future Practice

Depending on their perceived chance to be assigned to a certain type of ALC, the instructors had different dispositions toward making changes to their courses that would respond to the affordances of those ALCs. While many of the ALC3 instructors already knew that they would teach in that same classroom again in the upcoming academic year, instructors who had taught in the rest of the other ALC categories were not certain that they would be assigned to the same or to a similar room. When a course had more than one section, for instance, there was a chance that not all sections could be assigned to an ALC. This complexity had implications for their approach to course design.

The instructors who were not certain to be assigned to an ALC were less likely to make drastic changes to their courses in the anticipation that they would teach in an ALC in the future. However, they already had ideas about how students' learning experiences could be enhanced in the ALCs. Increasing group work and using AV affordances such as multiple screens to display the work of small groups for the whole class to compare or to discuss, were two common ideas. A conversation with a colleague, one instructor mentioned, inspired a new way of thinking about students' in-class presentations:

...she said, well, you know, an idea that she'd seen is to not do presentations, but instead use the monitors for, like digital posters, basically. And have the students walk around to

each other's and... could be like a peer assessment, you know, to kind of see what the final product of their other groups were doing. So, I thought it was kind of an interesting idea. It's sort of leveraging the room and using it, I think to an advantage as opposed to trying to get them to present when the room was not suited for it. (Social Sciences instructor, ALC2)

ALC3 instructors who knew that they would teach in that classroom again had more well-defined ideas for the type of changes they wanted to make, or the type of changes they needed to make in their instruction based on the affordances of this unique space. In previous sections of the findings, we explained ALC3 instructors' concerns about releasing and regaining control which is complicated due to the large number of enrolled students being taught in ALC3 (sometimes into 400s). Timers displayed on the screens were already used by at least one instructor. Other instructors suggested that they would test timers, use songs, or employ other consistent signals to gain students' attention back at the end of an allocated time for small group or individual activities.

The instructors of high enrollment course in the ALC3 were planning to facilitate students' contribution to the class without hindering or delaying the overall instructional flow. Ideas to improve students' active contribution in future courses included using the HDMI ports in the tables to display students' work on one of the screens and developing conversational agents that would allow the students to submit their ideas or questions with the class. According to an instructor, one advantage of sharing students' work with the whole class would be to discuss common errors or misconceptions in a specific type of learning activity and highlighting important approaches or results from problems or questions.

Final Note


In this chapter, we presented the findings of the TIL Assessment project regarding Active Learning Classrooms from the point of view of two stakeholder groups at U of T St. George campus: administrative staff in leadership positions and instructors from a variety of disciplines. The administrative staff envisioned the alternative design of the ALCs would inspire progressive pedagogical approaches. They also identified continued pedagogical and technological support as enabling conditions for such change to take place. The instructors unpacked the multiple facets of teaching in the ALCs, including the complexities of the classroom assignment process, pedagogical and technological preparation required for each type of ALCs, new classroom management issues, and their desired support sources to maximize Active Learning integration in their courses.





RECOMMENDATIONS

Distilling our key findings, we propose the following recommendations for consideration by senior leadership, Academic and Campus Events (ACE), CTSI, and departments/divisions to support progressive transformation of the instructional landscape to promote Active Learning across U of T St. George. These recommendations address design aspects of ALCs, classroom assignment issues, and pedagogical and technological support required to facilitate Active Learning in the ALCs. Under each heading below, we summarize key findings and offer recommendations to stakeholders.

Summary of Recommendations

	Recommendations for All Stakeholders
Clarifying the term “Lecture”	
<ol style="list-style-type: none">1. Changing the discourse and use of the term “lecture classroom” for classroom bookings in order to promote consistency with pedagogical language across U of T. Clarifying what instructors mean by lecture could differentiate between lecture as a primary mode of one-way instruction or lecture as a process that is interspersed with Active Learning strategies. Such clarification would support assignment to appropriate classrooms based on intended use.	

	Recommendations for Academic Administrators
Success Enablers	
<ol style="list-style-type: none">1. Identify measures of pedagogical success in the ALCs.2. Implement an assessment cycle to examine how ALCs are used, to identify pedagogical and technological support that facilitate higher impact pedagogies, and then implement those support structures. A continued quality assurance cycle will inform institutional decision making regarding ALC development and use.	
Students’ learning experience in the ALCs	
<ol style="list-style-type: none">3. In collaboration with relevant stakeholders, provide ongoing support and resources for the study of students’ experience with Active Learning in ALCs. (e.g. create an ALC Scholarship of Teaching and Learning Sandbox)	

	Recommendations for Academic + Campus Events (ACE)
Success Enablers	
<ol style="list-style-type: none">1. Findings of this evaluation study under the "Classroom assignment" heading can inform the design of an enhanced classroom assignment system.2. Create institution-wide typology around ALCs to facilitate communication across all stakeholder groups. The first version of such a typology is presented in this report and can be utilized as part of the classroom assignment system and pedagogical/technological support.	

ALC Assignment Process and Logistics

3. Provide earlier room assignment notices to help instructors consider ALC affordances when planning their course.
4. Prepare a one-stop online resource with information about design specifications of each ALC.
5. For the more high-demand ALCs, a priority system based on class size and/or approach to teaching could help identify courses with higher priority to be assigned to ALCs.
6. Initiate a triage approach to determine priorities for the ALCs, including requested rooms, or type of preferred ALCs.
7. Consider transition time proportionate to class size (ALC3).

ALC Orientation

8. Continue offering personalized communication regarding orientation sessions for instructors assigned to ALC3. The orientation can be enhanced by including two follow-up activities: 1) a practice session in ALC3, and 2) a link sent to the instructor to MY Manual prepared by Shai Cohen, FASE.

Preparing to teach in the ALC

9. ALC information: Improving classroom booking system to label ALCs, add descriptions of the affordances of each ALC, and photos of possible room layouts. Such information helps instructors make informed choices when selecting classrooms.
10. Preparation: Send notification to instructors upon ALC assignment and connect them to CTSI pedagogical and local/centralized technological support resources to help them capitalize on the ALC's affordances.
11. Changes in course design: ACE representatives can participate in course design educational development offerings (e.g., workshops, webinars) to observe actual use of ALCs and to brainstorm with faculty about leveraging the ALCs.


Pedagogical Considerations in the ALCs

12. Classroom Management and Student Engagement in ALC3: All instructors scheduled to teach in the ALC3 receive the CTSI ALC Classroom Management tip sheet as part of their orientation.

Technological Affordances of the ALCs

13. Technology and AV Support:
 - a. Sustained AV support for the ALC3 is essential for seamless teaching and learning experience.
 - b. AV support for other ALC categories may need institutional review to increase efficiency and decrease response time.
14. Technological issues:
 - a. Provide lockbox with necessary connectors in ALCs to facilitate instructors' planning and preparation or generate another comparable solution.
 - b. Provide a list of connectors needed in each ALC on the ACE website.

Instructors' Thoughts on ALC Design Features
15. Following up on reasons for furnishing some ALCs with tables and chairs and others with chairs with writing tablets. This may help the classroom designers clarify the justification for the choice of furniture.
Desired Support Sources
16. Continue technological and pedagogical support for ALC3 given it is a uniquely designed classroom. Such support is essential for ongoing onboarding of new instructors to use ALC3 in creating an effective learning environment.

	Recommendations for the Centre for Teaching Support & Innovation (CTSI)
Success Enablers	
<ol style="list-style-type: none"> 1. Encourage Scholarship of Teaching and Learning (SoTL) regarding instructors' and students' experiences and outcomes in the ALCs and to identify effective practices to be broadly disseminated. 2. An enhanced classroom assignment system that allows instructors sufficient time to develop their course in light of the assigned room's affordances and to allow them time to better orient themselves to the room. 	
ALC Orientation	
<ol style="list-style-type: none"> 3. In collaboration with ACE and divisional partners, offer online resources that provide support for physical and technical room orientation. 	
Preparing to Teach in the ALC	
<ol style="list-style-type: none"> 4. Preparation: Promote the Active Learning section of the CTSI website that provides Active Learning resources to instructors, including ideas for activities to use in the ALCs, existing examples from the U of T community, and scheduling consultations. 5. Changes in course design: Include an ALC track in current CTSI programming; for example, the Course Design Institute or Tune Into Teaching workshops. Instructors who have previously taught in the ALCs can share their experience with other instructors. 	
Pedagogical Considerations in the ALCs	
<ol style="list-style-type: none"> 6. Classroom Management and Student Engagement in ALC3: <ol style="list-style-type: none"> a. Disseminate effective strategies identified through this Assessment Project such as using timers on screens for students to self-monitor their time or using a microphone when addressing the class to encourage the students to listen attentively. b. Continue updating and promoting the newly created CTSI ALC "Classroom Management" tip sheet to instructors teaching in ALCs. 	

7. Instructor-Student Interactions in the ALCs: Use findings of the Assessment Project to inform a new resource on supporting discussions in ALCs.
8. Instructor's Position in the ALCs: Create a resource that shows photos of different room layouts and different Active Learning activities these layouts afford. Highlight the instructor's physical position and the importance of moving among students during instruction.
9. Small Groupwork and Discussion in the ALCs: Provide ongoing training and support for classroom management in ALCs such as techniques for resuming whole class discussion after groupwork or deciding how to form small groups depending on a course context.
10. Scaffolding Students' Participation:
 - a. Explore new stream of "Open Doors" initiative focused on Active Learning and ALCs. Instructors can observe their colleagues address common challenges and can access course-related documents and resources that have successfully facilitated student participation.
 - b. Work with senior leadership to identify ongoing cycles of data collection regarding instructor and student experiences (e.g., identified streams in LEAF grants, work with Innovation Hub to engage community partners).

Technological Affordances of the ALCs

11. Advantages of AV Facilities: Consider how AV facilities can foster whole class and group-to-class presentations and design self-directed guides or videos for instructors on how to use AV in their instruction. Effective examples can be included.

Active Learning in Practice

12. AL Strategies: Collaborate with department-based groups to raise awareness about AL strategies with a link to CTSI Continuum of AL strategies (<https://teaching.utoronto.ca/teaching-support/active-learning-pedagogies/continuum/>)


Teaching Assistants (TAs) and the ALCs

13. Role: Roles and expectations from the TAs varied significantly based on type of ALC, class size, and disciplinary affiliation of courses. An environmental scan of expectations from and responsibilities of TAs could maximize their involvement in facilitating AL in all ALCs.
14. Training: A review of general TA training programs will reveal how AL approaches are addressed for all TAs. An alignment between U of T's vision for AL and TA training programs can be initiated.

Desired Support and Resources

15. ALC guide: Create a comprehensive guide to teaching in the ALCs, including:
 - a. In-person workshops to support and encourage innovation within ALCs.
 - b. Self-directed section with examples of AL strategies and possible furniture configurations that can facilitate lesson design to incorporate AL strategies.

- c. A best practices database within the guide that includes annotated videos of how an activity or a lesson was redesigned to enhance students' Active Learning experiences.

	Recommendations for Departments
Success Enablers	
<p>1. Supporting departmental/divisional Communities of Practice and databases of successful practices in different types of ALCs. Such support mechanisms need to be more targeted and communicated more broadly in order to enhance practices over time and ensure full utilization of the ALCs.</p>	
ALC Assignment Process and Logistics	
<p>2. Provide information to registrars and departmental administrators around the ALC matrix so that they are informed of the technological and physical space options when communicating with instructors around room assignments.</p> <p>3. Departments to review their classroom assignment processes including input from instructors and timelines in light of the development of these ALCs and the findings of the report.</p>	
ALC Orientation	
<p>4. All ALCs: Facilitate opportunities for instructors to share their effective practices for teaching in the ALCs.</p>	
Teaching Assistants (TAs) and ALCs	
<p>5. Training: Instructors and departments may need to be involved in revising TA responsibilities in the teaching and learning process.</p>	
Desired Support Sources	
<p>6. A peer network focused on AL practices could supplement the best practices database.</p>	
Students' Learning Experiences in the ALCs	
<p>7. Students and Active Learning: Departments may want to revisit the explicit teaching of academic and career-related skills (e.g., teamwork, self and peer regulation) within their curriculum as this relates to the new opportunities provided by these Active Learning spaces in supporting the development of these skills.</p>	

Further details on each of the above recommendations are provided in the following section.

Elaboration on Recommendations

Success Enablers at the Institutional Level

ALCs at U of T St. George were envisioned to promote high-impact pedagogical practices such as Active Learning in classes with various enrolment sizes. High-impact pedagogical practices would lead to a desired increase in instructor-to-student and student-to-student interactions. Success criteria identified by senior leaders for the development of new ALCs included impact on pedagogy, and use of high impact pedagogical approaches, such as Active Learning strategies; and higher levels of student engagement with instructors, peers and learning activities. Administrative interviewees identified at least two factors that impacted the success of that vision. First, lack of a baseline knowledge regarding current pedagogical practices in traditional and non-ALC classrooms may impede inferences about the potential impact of classroom design on pedagogical practices. Second, the current classroom assignment system presents logistical complexities in assigning courses/instructors to ALCs that best support their identified pedagogical goals.

Academic Administration

- Identify measures of pedagogical success in the ALCs.
- Implement an assessment cycle to examine how ALCs are used, to identify pedagogical and technological supports that facilitate higher impact pedagogies, and implement those support structures. A continued quality assurance cycle will inform institutional decision making regarding ALC development and use.

Academic + Campus Events (ACE)

- Findings of this evaluation study under the “Classroom assignment” heading can inform the design of an enhanced classroom assignment system.
- Create institution-wide typology around ALCs to facilitate communication across all stakeholder groups. The first version of such a typology is presented in this report and can be utilized as part of the classroom assignment system and pedagogical/ technological support.

Centre for Teaching Support & Innovation (CTSI)

- Encourage Scholarship of Teaching and Learning (SoTL) regarding instructors and students’ experiences and outcomes in the ALCs and to identify effective practices to be broadly disseminated.
- An enhanced classroom assignment system that allows instructors sufficient time to develop their course in light of the assigned room’s affordances and to allow them time to better orient themselves to the room.

Departments

- Supporting departmental/divisional Communities of Practice and databases of successful practices in different types of ALCs. Such support mechanisms need to be

more targeted and communicated more broadly in order to enhance practices over time and ensure full utilization of the ALCs.

ALC Assignment Process and Logistics

The term ALC was mainly applied to classrooms in the Myhal building. Instructors teaching in standard ALCs, ALC1s, and non-Myhal ALC2s were generally unaware of the underlying design considerations or affordances of these classrooms or they did not know other ALC options were available to them on the St. George campus. Also, while requesting a certain type of classroom is at this time possible, the assignment is not guaranteed. A recurring issue for the instructors was being assigned to their classroom close to the beginning of the semester, depriving them of the opportunity to redesign their courses in order to leverage the affordances of the ALCs. Insufficient transition time between classes in the ALC3 was another issue that may need further attention.

Recommendations

Academic + Campus Events (ACE)
<ul style="list-style-type: none">• Provide earlier room assignment notices to help instructors consider ALC affordances when planning their course.• Prepare a one-stop online resource with information about design specifications of each ALC.• For the more high-demand ALCs, a priority system based on class size and/or approach to teaching could help identify courses with higher priority to be assigned to ALCs.• Initiating a triage approach to determine priorities for the ALCs, including requested rooms, or type of preferred ALCs.• Consider transition time proportionate to class size (ALC3).

Departments
<ul style="list-style-type: none">• Provide information to registrars and departmental administrators around the ALC matrix so that they are informed of the technological and physical space options when communicating with instructors around room assignments.• Departments to review their classroom assignment processes including input from instructors and timelines in light of the development of these ALCs and the findings of the report.

ALC Orientation

ALC3 has dedicated orientation sessions communicated by invitation to all instructors assigned to teach in this classroom. For other types of ALCs, interviewees identified a range of orientation opportunities. Some departmental staff proactively offered ALC tours and orientation to their instructors. In certain buildings, instructors could ask for a guided session in the ALC, yet other instructors visited the classroom on their own to become familiar with the existing affordances. As well, many instructors had no orientation offered or that they carried

out on their own. A finding was the lack of identified best practices and coordinated onboarding support for Standard ALCs, ALC1s, and ALC2s.

Recommendations

ALC3
Academic + Campus Events (ACE)
Continued provision of orientation for instructors assigned to ALC3. The orientation can be enhanced by including two follow-up activities: 1) a practice session in ALC3, and 2) a link sent to the instructor to MY Manual prepared by Shai Cohen.

All ALCs
Centre for Teaching Support & Innovation (CTSI)
In collaboration with ACE and divisional partners, offer online resources that provide support for physical and technical room orientation.
Departments
Facilitate opportunities for instructors to share their effective practices for teaching in the ALCs.

Preparing to teach in the ALCs

Teaching in an ALC3 requires more preparation time as instructors need to think about where to position themselves in the room, how to engage a large group of students in learning activities, plan their use of AV affordances and prepare their personal devices to plug in the required AV system seamlessly and quickly. Instructors in standard ALCs, ALC1s and ALC2s did not express as much concern about preparation except for making sure they had appropriate connectors at hand to connect to the AV facilities of the room and to understand the affordances of the room.

Recommendations

ALC Information
Academic + Campus Events (ACE)
Improving classroom booking system to label ALCs, add descriptions of the affordances of each ALC, and photos of possible room layouts. Such information helps instructors make informed choices when selecting classrooms.

Preparation
Academic + Campus Events (ACE)

Send notification to instructors upon ALC assignment and connect them to CTSI pedagogical and local/centralized technological support resources to help them capitalize on the ALC's affordances.

Centre for Teaching Support & Innovation (CTSI)

Promote the Active Learning section of the CTSI website that provides Active Learning resources to instructors, including ideas for activities to use in the ALCs, existing examples from the U of T community, and scheduling consultations.

Departments/Divisions

Departmental ALC Open Doors event for new instructors will provide an opportunity to observe experienced ALC instructors. CTSI can collaborate with departments/divisions to prepare observation templates and post event reflection forms for new instructors for a more focused observation experience.

Changes in Course Design

Academic + Campus Events (ACE)

ACE representatives can participate in course design workshops to observe actual use of ALCs and to brainstorm with faculty about leveraging the ALCs.

Centre for Teaching Support & Innovation (CTSI)

- Include an ALC track in current CTSI programming; for example, the Course Design Institute or Tune Into Teaching workshops. Instructors who have previously taught in the ALCs can share their experience with other instructors.
- Create "Teaching with Quercus: Innovative Practices" learning resources and sessions for instructors that include
 - How to teach with Quercus and supported educational technologies in ALCs such as iClicker, Wiki Pages, Discussions, collaborative assignments.
 - Videos or faculty profiles that demonstrate how instructors are using Quercus and supported educational technologies in ALCs.

Pedagogical Considerations in the ALCs

Some instructors in ALC3 observed students being distracted or they felt a disconnect with the students due to the physical distance between them. Gaining students' attention back after small group work in ALC3 was another issue highlighted in the interviews. However, the instructors also noticed that the layout of the ALC3 allowed them to move among the rows and connect with more students compared to a traditional amphitheater layout. In other ALCs, many instructors noticed increased and more evenly distributed interactions with their students. ALC1s and ALC2s often lack a defined front of the room. Instructors had to think about how to position themselves in the new settings and how to maintain a collective classroom focus when students had the option to look in different directions at different screens. Instructors who participated in this Assessment project agreed that the ALCs encourage and facilitate small group work. Tables compared to chairs with tablets were preferred for group work.

Instructors shared strategies to increase students’ participation, including clarifying participation expectations, emphasizing the relevance of groupwork in supporting students’ professional and career goals, engaging students in creating group charters, providing incentives for students volunteering to share their ideas with the class, and creating heterogenous groups and changing group configurations often so students get to know their peers and a variety of viewpoints. Assessing students’ contribution to group work is still an issue that the instructors identified as needing support.

Recommendations

Classroom Management and Student Engagement in ALC3
Academic + Campus Events (ACE)
All instructors scheduled to teach in the ALC3 receive the CTSI ALC Classroom Management tip sheet as part of their orientation.
Centre for Teaching Support & Innovation (CTSI)
<ul style="list-style-type: none"> Disseminate effective strategies identified through this Assessment Project such as using timers on screens for students to self-monitor their time or using a microphone when addressing the class to encourage the students to listen attentively Continue updating and promoting the newly created CTSI ALC “Classroom Management” tip sheet to instructors teaching in ALCs.
Instructor-Student Interactions in the ALCs
Centre for Teaching Support & Innovation (CTSI)
<ul style="list-style-type: none"> Use findings of the Assessment Project to inform a new resource on supporting discussions in ALCs.
Instructors’ Position in the ALCs
Centre for Teaching Support & Innovation (CTSI)
<ul style="list-style-type: none"> Create resource that shows photos of different room layouts and different Active Learning activities these layouts afford. Highlight the instructor’s physical position and the importance of moving among students during instruction.
Small Groupwork and Discussion in the ALCS
Centre for Teaching Support & Innovation (CTSI)
<ul style="list-style-type: none"> Provide ongoing training and support for classroom management in ALCs such as techniques for resuming whole class discussion after groupwork or deciding how to form small groups depending on a course context.

Technological Affordances of the ALCs

Multiple presentation options in the ALCs allowed instructors to simultaneously project on one screen and use another surface to write notes. Students can also benefit from following instruction from a screen that is physically closer to them. In the ALC3, simultaneous inputs and presentation options did not generally pose a challenge to the instructors due to dedicated support staff and the training that most instructors had received.

Recommendations

Advantages of AV Facilities
Centre for Teaching Support & Innovation (CTSI)
<ul style="list-style-type: none">• Consider how AV facilities can foster whole class and group-to-class presentations and design self-directed guides or videos for instructors on how to use AV in their instruction. Effective examples can be included.

Technology and AV Support
Academic + Campus Events (ACE)
<ul style="list-style-type: none">• Sustained AV support for the ALC3 is essential for seamless teaching and learning experience• AV support for other ALC categories may need institutional review to increase efficiency and decrease response time.

Technological issues
Academic + Campus Events (ACE)
<ul style="list-style-type: none">• Provide lockbox with necessary connectors in ALCs to facilitate instructors planning and preparation or generate another comparable solution.• Provide a list of connectors needed in each ALC on the ACE website

Active Learning in Practice

We identified both generalist and discipline-specific AL strategies that the instructors are currently using in the course. Awareness about such strategies was overall high among the instructors who participated in this assessment project. Identifying this need, The Centre for Teaching Support and Innovation has curated resources to facilitate instructors' decision making regarding Active Learning strategy integration (Rolheiser et al., 2020). In the interviews we noticed the term lecture being used to refer to a certain type of class arrangement and not necessarily one-way information transmission. Clarifying this term or choosing alternative terms may reduce confusion with regards to using AL strategies in instruction.

Recommendations

AL Strategies
Centre for Teaching Support & Innovation (CTSI)
<ul style="list-style-type: none"> Collaborate with department-based groups to raise awareness about AL strategies with a link to CTSI Continuum of AL strategies (https://teaching.utoronto.ca/teaching-support/active-learning-pedagogies/continuum/) Develop “Teaching with Quercus: Innovative Practices” learning resources that include faculty profile videos that demonstrate how faculty are including active learning strategies in their teaching using Quercus (e.g., investigate updated lecture capture solutions, flipped teaching)

AL in Lecture vs. Tutorial or Lab
All Stakeholders
Changing the discourse and use of the term “lecture classroom” for classroom bookings in order to promote consistency with pedagogical language across U of T. Clarifying what instructors mean by lecture could differentiate between lecture as a primary mode of one-way instruction or lecture as a process that is interspersed with Active Learning strategies. Such clarification would support assignment to appropriate classrooms based on intended use.

Teaching Assistants (TAs) and the ALCs

TAs’ active involvement in instruction depended on the type of ALC and on the departmental affiliation of the courses. In engineering and computer science courses held in ALC3, TAs collaborated with the instructors to cover different zones of the class for Q/A, to distribute handouts, or to take control of the technological side of the teaching process so that the instructor could lead learning activities without having to worry about activating or deactivating table mics, for example. In other ALCs, TAs sometimes did not attend the classes at all and were mostly involved in grading. TA training beyond the four hours of mandatory paid training for first contract/appointment TAs provided by the hiring department is rare. A single program has a special training for ALC TAs made possible by the fact the TAs do not have to mark machine graded assignments.

Recommendations

Role
Centre for Teaching Support & Innovation (CTSI)

Roles and expectations from the TAs varied significantly based on type of ALC, class size, and disciplinary affiliation of courses. An environmental scan of expectations from and responsibilities of TAs could maximize their involvement in facilitating AL in all ALCs.

Training

Centre for Teaching Support & Innovation (CTSI)

A review of general TA training programs will reveal how AL approaches are addressed for all TAs. An alignment between U of T's vision for AL and TA training programs can be initiated.

Departments

Instructors and departments may need to be involved in revising TA responsibilities in the teaching and learning process where ALCs are concerned

Instructors' Thoughts on ALC Design Features

Instructors generally believed that the increased personal space in the ALCs (standard, 1, and 2) along with reconfigurable furniture provided a more desirable learning environment for the students. Reconfigurable furniture enabled students to gather in small groups. Tables as opposed to chairs with writing tablets, were preferred.

Recommendations

Academic + Campus Events (ACE)

- Following up on reasons for furnishing some ALCs with tables and chairs and others with chairs with writing tablets. This may help the classroom designers clarify the justification for the choice of furniture.

Desired Support and Resources

Instructors requested a collection of exemplary lesson designs in various ALCs as a source of inspiration and to facilitate maximum use of technology affordances of the ALCs. Some departments are more proactive in providing information about ALCs to their instructors in advance. There were noted differences between departments with regard to a culture of sharing instructional practice around ALCs.

ALC Guide

In the set of recommendations presented here, we have recommended different types of resources that support instructors with their preparation needs to teach in the ALCs. We have also identified a need for capacity development across divisions for as local support sources. We propose that the Centre for Teaching Support and Innovation oversees the development of a comprehensive multi-media "ALC guide" complemented with a central community of practice

on ALC instruction. The “ALC guide” will include the following self-guided and synchronous/asynchronous resources:

- Self-guided online resources
 - Multimedia support for physical and technical room orientation.
 - Curated examples of AL strategies from U of T community and the broader community
 - Examples of effective AL pedagogies identified through this Assessment Project as a best-practices database with annotated videos of how an activity or a lesson was redesigned to enhance students' Active Learning experiences.
 - Case studies of how the ALC room design impacts instructors' position in classrooms, instructor-student interactions, and transitioning between small group work and whole class discussions
 - Multimedia resources on different furniture configurations and AL strategies that these layouts may afford
 - Using different AV facilities to foster whole class and group-to-class presentations
 - Quercus-specific multimedia resources as related to AL pedagogies
- Moderated online or in-person resources
 - Creating and ALC track in current CTSI programming; for example, the “Course Design Institute” or “Tune Into Teaching” workshops. Instructors who have previously taught in the ALCs can share their experience with their peers.
 - "Open Doors" initiative focused on Active Learning and ALCs. Instructors observe their colleagues address common challenges and access course-related documents and resources that have successfully facilitated student participation.
- Community resources
 - A P2P cohort with specific focus on ALC teaching
 - Fostering a multi-disciplinary core Community of Practice on ALC instruction with local divisional and departmental community of practices to increase contextual relevance of the pedagogical and technological support for teaching in the ALCs.

In recent years, the Centre for Teaching Support and Innovation has raised awareness about potential challenges and addressed the need for capacity development for instructors as they move towards establishing a culture of active learning in their classrooms. For example, Rolheiser et al. (2019) discuss concerns related to classroom management, student engagement, and unique layout of classrooms designed for Active Learning and offer guidelines to address these issues while planning for Active Learning integration.

Recommendations

Academic + Campus Events (ACE)

Continued technological and pedagogical support for ALC3 as a uniquely designed classroom is essential for ongoing onboarding of new instructors to use ALC3 as an effective learning environment.

Centre for Teaching Support & Innovation (CTSI)

- Develop a comprehensive “ALC Guide”
- In-person workshops, and in particular, carried out in an ALC, will support and encourage innovation within ALCs.
- Preparing divisions to provide support on Teaching in ALCs
 - Provide support resources and training resources for divisional educational technology staff professional staff
 - Schedule training sessions for divisional educational technology professional staff who support teaching and learning in ALCs.
- CTSI to facilitate learning data and analytics for courses taught in ALCs
- Self-directed guides with examples of AL strategies and possible furniture configuration can facilitate lesson design to incorporate AL strategies.
- Prepare a best practices database with annotated videos of how an activity or a lesson was redesigned to enhance students’ Active Learning experiences

Departments

A peer network focused on AL practices could supplement the best practices database.

Students’ Learning Experience in the ALCs

Overall, students participated effectively in classroom activities and were comfortable working in peer groups. Some departments provide ample learning opportunities for their students to practice working in teams given that teamwork is an essential skill identified for their discipline/future career learning outcomes.

Recommendations

Students and Active Learning

Departments

Departments may want to revisit the explicit teaching of academic and career-related skills (e.g, teamwork, self and peer regulation) within their curriculum as this relates to the new opportunities provided by these Active Learning spaces in supporting the development of these skills.

Students Feedback Regarding the ALCs
Administration
In collaboration with relevant stakeholders, provide ongoing support and resources for the study of students' experience with Active Learning in ALCs. (e.g. create an ALC Scholarship of Teaching and Learning Sandbox)

Finally, we look forward to working with our broader University of Toronto community on these recommendations and next steps in order to realize the potential offered by these new ALC classrooms in enhancing our students' learning experiences.

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Appendix A. Quality Assurance (QA)/Quality Improvement (AI) Approval Email from University of Toronto Ethics Review

From: Dean Sharpe <dean.sharpe@utoronto.ca>
Date: Monday, February 25, 2019 at 3:57 PM
To: Carol Rolheiser <carol.rolheiser@utoronto.ca>
Subject: RE: QC-QA for Active Learning Classrooms (ALC'S)

Carol,

Thank you for your e-mail.

This activity constitutes program evaluation, quality assurance (QA) or quality improvement (QI) within the mandate of the University of Toronto Vice-Provost, Innovations in Undergraduate Education and Academic Programs, Academic and Campus Events, and the Centre for Teaching Support and Innovation, and is exempt from research ethics review under the federal research ethics guidelines, the Tri-council policy statement: Ethical conduct for research involving humans, 2nd Edition (TCPS-2), Article 2.5 and UT's Principles to determine exemption from research ethics review:

<http://www.pre.ethics.gc.ca/eng/policy-politique/initiatives/tcps2-eptc2/chapter2-chapitre2/#toc02-1a>

<http://www.research.utoronto.ca/wp-content/uploads/documents/2013/05/Principles-to-Determine-Exemptions-from-Research-Ethics-Review-April-2006.pdf>

This e-mail constitutes the official exemption determination.

Sincerely,

Dean

--

Dean Sharpe, Ph.D.
Research Ethics Board Manager--Social Sciences and Humanities
Office of Research Ethics, University of Toronto
McMurrich Building, Second Floor
12 Queen's Park Crescent West
Toronto, ON, M5S 1S8
Tel. 416-978-5585
<http://www.research.utoronto.ca/for-researchers-administrators/ethics/>

Appendix B. Interview Protocol for University Administrators

Interview Questions:





1. When did the TIL initiative launch and what offices were involved in the launch?
 - a. What was your role in the TIL initiative?
 - b. Has that role changed (or the timeline), and if so, how?
2. What was your initial vision for the ALCs? How has this vision changed since then?
 - a. What do you see as the most significant change in teaching and learning that the ALCs can facilitate?
 - b. How will success be measured? Indicators?
3. We have been working with ACE and the broader community to prepare a “user friendly” classification of different types of ALCs at St. George. This is the latest version that we are using for the assessment project (See Table 1 on page 3).
 - a. Could you please describe the process of decision-making regarding:
 - i. The design features/intended purposes of each category of rooms?
 - ii. Approximate number of rooms in each category in each building?
 - iii. Who has been consulted about the pedagogical affordance and expectations of these rooms?
 - iv. What kind of rooms can we expect to see more of in the future and why? Has TIL informed the next generation of ALCs on the U of T St. George campus?
4. Why and how was Myhal150 designed?
 - a. What feedback have you gathered as Myhal150 has become actively used?
5. What are your thoughts on the processes for accessing the ALCs?
 - a. Who was involved in the decision making about these processes?
6. What is your understanding about support and training for the instructors who would be using these rooms?
7. How do you think the administrators/management team in departments/divisions could communicate with instructors who are using the ALCs before/during/after the courses are taught?
 - a. Technological needs and prep
 - b. Course design and unique opportunities for learning
 - c. Pedagogical support needs and prep
 - d. Reflection and redesign
8. We have prepared a working definition of Active Learning that we would like to use to characterize Active Learning at U of T. Here is a copy for your reference.
 - a. What are your thoughts on this working definition?
 - b. Anything that you would like to add or modify?
9. What do you envision as factors that further enhance and maximize the use of the ALCs?

10. When you think of recommendations that might emerge from our current assessment project, what is important to you? What do you feel will optimize the use of these new spaces?
11. Final thoughts or comments?

Table 1:

Characteristics of different types of Active Learning Classrooms (ALC) at the St. George Campus U of T

Suggested New Phrasing for Categories	ALC	ALC1	ALC2	ALC 3: Large
Room Layout	Easily reconfigurable with movable chairs and tables	Easily reconfigurable with movable chairs and tables	Easily reconfigurable with movable chairs and tables	500-seat auditorium is the only lecture hall of its kind in North America, featuring small-group seating and interactive learning Chairs are arranged around tables
Table Size	1 to 8 students	1 to 8 students	4 to 8 students	4 or 6 students per table
Writing Surface	Single/Multiple Chalkboard or Whiteboard	Multiple Whiteboards	Multiple Whiteboards	
Presentation Options	Dedicated Front of Room	Flexible: Teacher to class and Student/small group to class - Preset number of Technology Enhanced Presentation Options - Wireless presentation option	Flexible: Teacher to class and Student/small group to class - Flexible number of Technology Enhanced Presentation Options (independent collaborative presentation and ad hoc presentation	Flexible: Teacher to class and Student/small group to class - Flexible number of Technology Enhanced Presentation Options (independent collaborative presentation and ad hoc presentation

Suggested New Phrasing for Categories	ALC	ALC1	ALC2	ALC 3: Large
			group formation) - Wireless presentation option	group formation); each table is fitted with a microphone; instructors control the presentation order to the whole class - Wireless presentation option
Photos	WI 523 	MP 118 	MY 490 	MY 150 

(Photos by Academic + Campus Events)

Appendix C. Instructors' Interview Protocol

Introduction to interview

In this assessment project we are interested to learn about the instructors' experience preparing for and teaching in the ALCs. Our goal is to understand the process of preparing to teach in these rooms, including faculty development resources that you may have used, and the insights that you now have based on yours and your students' experience. We are also interested to know how you characterize Active Learning within the context of your discipline and your course. We will start with a few demographic questions.

- **Department:**
- **Discipline:**
- **Rank:**
- **Years teaching:**

Preparation

1. Let's start with your interpretation of Active learning. How do you characterize Active Learning in your discipline and in your course?
 - Here is a working definition that we have prepared at CTSI. Anything that you'd like to add or change in this definition, or does this reflect your views?

AL definition

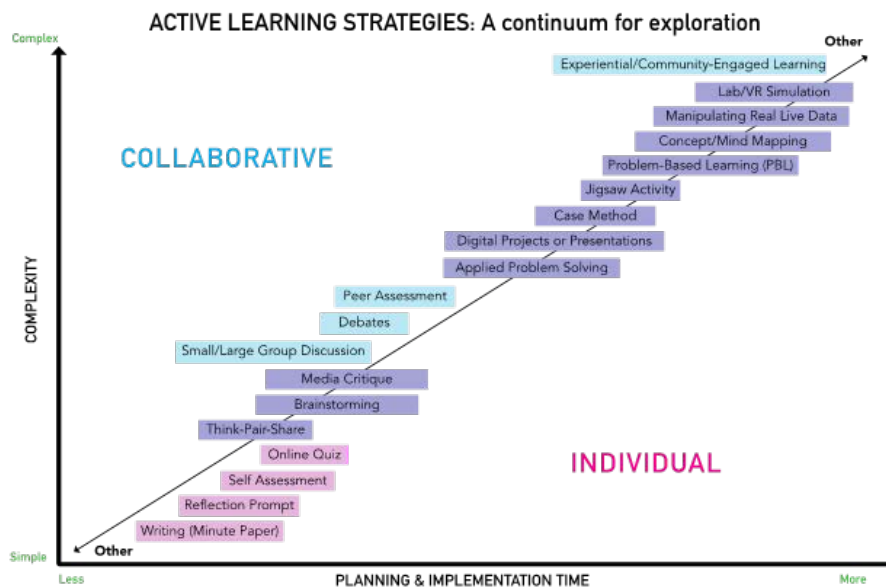
Defining Active Learning (AL): *Reviewed definitions from the literature – common attributes distilled:*

- learning processes that require students to collect and synthesize information, practice critical thinking, and engage in problem solving activities
 - emulate real-life situations that graduates will experience in a professional setting.
 - consideration of a continuum (simple to complex) of instructional strategies to engage learners in the learning process
 - role and goal of self-regulation aimed at understanding one's learning needs, content knowledge and discipline-specific methods, and to take action to improve in the identified areas
 - sharing of agency between instructor/students
 - AL can also be enhanced with technology
2. Why is Active Learning important in the context of your practice? Can you give me one or two examples of an Active Learning approach that you use? (Teaching conceptions?)
 3. How did you come to teach in the ALCs?

- Can you give us a brief overview of the enrolment, level, mandatory/elective, etc. of your course?
 - Who is on the Instructional team (the #s and their roles)? ** will come back to this at the end of the interview
4. How did you learn about the different features of the ALCs and was this accurate/helpful?
 5. We would appreciate if you might share with us your course syllabus. Can you provide any commentary on elements of your syllabus that were influenced by the affordances of the space in which you were going to be teaching in?
 - Is there anything else about your syllabus that is important for us to know?

Possible probes about the syllabus:

- Did your Learning outcomes change
 - Did you think differently about the learning activities (In class, pre class, ongoing) or assessment? E.g., possibly probe around planning for in-class group activities
6. How did the technological features of the room influence your pedagogical decisions?
 7. Did you consult with anyone, were you offered training or support, or did you look for support prior to teaching? (colleagues and/or teaching centres)
 8. Did you incorporate Active Learning strategies in your courses in non ALC classrooms?
 - For example: <http://crlt.umich.edu/print/97516>



9. What did you anticipate – prior to teaching - your biggest challenge, or challenges, would be?

Teaching

10. Did you prepare your students for the Active Learning and technology options in the classroom (e.g., the multi-screens, group tables, tech on tables)? If so, how?
11. What were the strengths/challenges of student engagement within the ALC? (e.g, What aspects did they seem comfortable, where were the learning-curves, etc.?)
12. What was your biggest challenge(s) and strength while actively teaching in the classroom?
13. Were you surprised by anything while teaching this course? A positive outcome that you didn't anticipate?
14. Did you encounter technical or physical space issues – e.g., equipment that doesn't work – while teaching? If so, how did you address them?
15. Do you have any tips for instructors preparing to teach in an ALC?

Reflection, future practice

16. After teaching in a room that designed for Active Learning, what was the most significant change in your approach to teaching?
17. How much do you think being in an Active Learning Classroom facilitated active learning?
18. Based on your experiences this year, are there any changes you would make in teaching this course again (e.g., instructional strategies)? Would you want to teach this course in an ALC again? If so, why?
19. How do you think the students benefited from learning in the ALCs? Do you have any evidence?
20. What kind of pedagogical/technological support/training would have better prepared you for capitalizing on the affordances of the ALC? What do you need in the future?
21. What are your thoughts on teaching in a more/less technology enhanced ALC?
22. Questions, comments?

Appendix D. Pre-Observation Questionnaire

PART III: TOOLS & INSTRUMENTS

FOR OBSERVATION



INSTRUCTOR: _____

Date: _____ **Time:** _____

Course Title: _____ **Course Number:** _____

Level of Students: _____ **Format of Course:** _____
(i.e. large class, seminar, lab):

1. What is the content and structure of the class you will be teaching?

2. Describe your students in this class. Is there anything the observer should know about them?

3. What have students been asked to do in preparation for this class?

4. What is your goal for the lesson? What do you hope students learn or be able to do as a result?

Appendix E. Narrative Log for In-Class Observation (ICO)

OBSERVATION SAMPLE TEMPLATES

Observation Sample Templates

In-class observation can be done using a wide variety of both directed and open-ended forms of evaluation aimed at assisting peer observers in critically evaluating the teaching they have observed and identifying how their observations relate to their own experience of and goals for teaching. In the following pages we provide several forms and exemplars that offer different methods of recording an observation of teaching.

It is important to remember that these forms are simply tools. All forms should be accompanied by a narrative analysis and discussion with the instructor being observed. Departments and divisions can and should adapt these forms to their particular needs. For example, you may choose to add scaled items to the Checklist Form, or department-specific questions to the Open-Ended Form.

The Narrative Log

Below we have included a sample narrative log that allows the observer to record the time a behaviour (both instructor and student), a technique or a reaction occurs, as well as the observer's comments or questions related to what is happening in the classroom.

OBSERVATIONS	TIME	ACTION/COMMENT
Opening/warm up – shared anecdote	2:13	A method for establishing rapport with the students.
Review of administrative details	2:15	Details provided regarding an upcoming assignment and related tutorial.
Surveyed students to see what they remembered from previous lecture	2:26	Students remembered little – what do you attribute this to?
Began lecture by sharing goals for this class	2:27	Goals provided direction for the class. How did you feel regarding the amount of time spent setting up the class?

Appendix F. Checklist (Criterion-Based) Form for In-Class Observation (ICO)

OBSERVATION
SAMPLE
TEMPLATE

Checklist
(criterion-
based) Form

This form focuses on description regarding agreed upon items for observation based on the pre-observation meeting. Comments may be used by the observer to explain their observation and to provide reflection and additional insight. A sample format for these comments is as follows:

DURING DISCUSSION, THE INSTRUCTOR PAUSES AFTER ASKING QUESTIONS. Yes No

COMMENTS: Here, the observer may include, examples, further observations and when this observation occurred.

The following categories and items represent a number of possibilities for a departmental or divisional form. Observers should select appropriate items for the observation. Not all need apply in all teaching contexts - try to avoid rigid formulas regarding what "should" be observed.

POSSIBLE ITEMS FOR CHECKLIST FORMS

INSTRUCTOR ORGANIZATION

- The instructor states the relation of the class to the previous one.
- The instructor knows how to use the educational technology needed for the class.
- The instructor posts class goals or objectives on the board or a slide.
- The instructor gives specific instructional outcomes for the course.
- The instructor provides an outline of the organization of the class.
- The instructor conveys the purpose of each class activity.
- The instructor summarizes periodically and at the end of class or has the students do so.
- The instructor revisits objectives at the end of class.
- Students are made aware what preparation (readings or other assignments) they should complete prior to the next class.

INSTRUCTIONAL MATERIALS

- If used, videos, websites and other resource materials have a clear purpose.
- Handouts or digital resources are appropriate in number and subject.
- The instructor gives assistance or insight into reading or using assigned texts.

INSTRUCTIONAL STRATEGIES

- The instructor's choice of teaching techniques is appropriate for the goals.
- During discussion, the instructor pauses after asking questions.
- The instructor acknowledges student contributions to discussion, helping students extend their responses.
- The instructor keeps discussion on track or facilitates small group discussion.
- The instructor mediates conflict or differences of opinion, and encourages students to do the same.
- The instructor demonstrates active learning techniques.

20.

- The instructor provides explicit directions for active learning tasks.
- The instructor allows enough time to complete active learning tasks, such as collaborative work.
- The instructor specifies how active learning tasks will be evaluated.
- The timing of classroom activities considers attention spans.
- The instructor relates class to course goals, students' personal goals, or societal concerns.
- The instructor offers "real world" application.
- The instructor helps students apply theory to solve problems.

CONTENT KNOWLEDGE

- The instructor's statements are accurate according to the standards of the field.
- The instructor incorporates current research in the field.
- The instructor identifies sources, perspectives, and authorities in the field.
- The instructor communicates the reasoning process behind operations or concepts.
- The instructor corrects bias in assigned materials.

PRESENTATION

- The instructor can be seen and heard.
- The instructor avoids extended reading from notes or texts.
- The instructor varies lecturing with active learning techniques.
- The instructor speaks at a pace that allows students to comprehend what is said.
- The instructor uses appropriate examples, metaphors and analogies.
- The instructor uses humour appropriately.
- The instructor is enthusiastic about the subject matter.

RAPPORT WITH AND RESPONSIVENESS TO STUDENTS

- The instructor addresses students by name, as possible.
- Delivery is paced to students' needs.
- The instructor provides feedback at given intervals.
- The instructor uses positive reinforcement.
- The instructor incorporates student ideas into the class.
- The instructor encourages students to build on each other's comments and ideas.

- The atmosphere of the classroom is participative.
- The instructor is available before or after class.
- The instructor pays attention to cues of boredom and confusion.
- The instructor provides students opportunity to mention problems/concerns with the class, either verbally or in writing.
- The instructor models good listening habits.
- The instructor demonstrates flexibility in responding to student concerns or interests.
- The instructor is sensitive to individual interests and abilities.

CLARITY

- The instructor defines new terms or concepts.
- The instructor elaborates or repeats complex information.
- The instructor uses a variety of examples to explain content.
- The instructor makes explicit statements in order to draw student attention to certain ideas.
- The instructor pauses during explanations to allow students to ask questions.

INSTRUCTION IN LABORATORIES, STUDIOS OR FIELD SETTINGS

- Experiments/exercises are well chosen and well organized.
- Procedures/techniques are clearly explained/ demonstrated.
- The instructor is thoroughly familiar with experiments/exercises.
- The instructor is thoroughly familiar with equipment/ tools used.
- Assistance is always available during experiments/ exercises.
- Experiments/exercises are important supplements to the course.
- Experiments/exercises develop important skills.
- Experiments/exercises are of appropriate length.
- Experiments/exercises are of appropriate level of difficulty.
- Experiments/exercises help to develop confidence in the subject area.
- The instructor provides aid with interpretation of data.
- The instructor's emphasis on safety is evident.
- Criticism of procedures/techniques is constructive.
- The instructor works well with student and other parties in the setting.
- Clinical or field experiences are realistic.

IMPACT ON LEARNING

- The instructor helps develop critical thinking skills and problem-solving ability.
- The instructor broadens student views.
- The instructor encourages the development of students' analytic ability.
- The instructor fosters respect for diverse points of view.
- The instructor helps students develop awareness of the process used to gain new knowledge.
- The instructor stimulates independent thinking.

CREATING AN INCLUSIVE CLASSROOM

- Instructor creates an equitable and inclusive classroom that respects gender differences, diverse ethnocultural and faith communities, family structures, student abilities/needs and differences in socioeconomic status.
- Instructor conveys the belief that all students can learn and succeed.

- Instructor conveys openness and warmth and encourages students to interact with others the same way.
- Instructor provides text, resources and learning materials in the classroom that reflects diversity of culture, ethnicity, faith, and language, and differences in socioeconomic status, physical ability and family structure.
- Instructor uses resources that present both local and global images and perspectives.
- Instructor uses technology to provide additional visual, oral, aural and/or physical supports for students who need them.
- Instructor uses instructional strategies that reflect diverse learning styles.
- Instructor uses a variety of assessment tasks so that students with different learning styles can achieve success.
- Instructor provides accommodations for students who require extra time or additional explanations.

Items are adapted from Chism (2007) and University of Minnesota Peer Review of Teaching Guide (2009).



Appendix G. TA Training Program for ALCs

TA Training to Support Student and TA Learning in ALCs

[excerpted from instructor's dossier]

Motivation: A particular challenge in teaching [REDACTED] to very large classes is that, especially for introductory programming courses, students often require one-on-one assistance with finding and fixing errors in their own solution to course exercises. When programming, feedback comes from errors given by the computer, as well as a programmer's own tests. However, it takes practice and experience to learn to interpret the error messages, and even experienced programmers can struggle to find problems that turn out to be very minor. We depend on teaching assistants to provide much of this one-on-one help for students in our first-year [REDACTED] courses, especially as our class sizes increase.

The TAs for our introductory programming courses are typically enthusiastic about teaching beginners, but often lack experience and confidence in their ability to help students effectively. These TAs are also the primary teaching staff who students interact with one-on-one, or in smaller group settings, and so they provide much of the face of the course staff. Thus, TAs play a critical role in providing a supportive and inclusive learning environment in our courses.

An inclusive course culture is especially important in a course like [REDACTED]. Students, TAs, and even new instructors, come to the course with often unconscious ideas of what a programmer looks like, and who can (and can't) learn to program. These stereotypes are most dangerous when a student is struggling. A student who doesn't fit their own model of "programmer" is more likely to think they are struggling because they aren't the kind of person who can learn to program – when instead they are simply working on a difficult problem. A TA trying to help this kind of student may attempt to reassure them, for example by saying "It's OK, not everyone can get this stuff". Well-meaning TAs can discourage students in this way, and even if there are students who truly can't learn to program, mis-diagnosing someone as a non-programmer has serious consequences on their ability to be successful in the course, and on their future perception of themselves as someone who can master technical content.

Approach: In order to provide a supportive environment for all [REDACTED] students to learn in, I designed and implemented an extended training program for teaching assistants of [REDACTED], beginning in Fall 2018. The program involves eight 1-hour sessions through the course of the term, with the sessions timed for when TAs are most likely to need that information. When designing the program, I also was mindful of what would be most useful to the TAs, in terms of their own experience with their TA work, and for professional development for those who were planning academic careers, or other career paths where teaching could be part of their role. I explicitly thought of this program as teaching about teaching, and of my TAs as my students.

In preparing this program, I drew on my experience teaching [REDACTED], as well as my experience with unconscious bias training. I based some of the sessions on resources provided by the UofT Centre for Teaching Support & Innovation, and training materials from a peer mentorship program developed at Mount Holyoke College and funded by a Google initiative to increase [REDACTED] teaching capacity.

The goals of this program are to better prepare TAs to assist students, and to improve the student and TA experience in the following ways:

1. Better equip TAs to provide effective help to students in office hours.
2. Improve TA awareness of and sensitivity to the diversity of our student populations, and encourage interactions between students and TAs that promote the kind of environment we would like in our introductory courses.
3. Provide opportunities for TAs to develop and reflect on their teaching skills.
4. Improve the sense of community among [REDACTED] TAs to help them be more engaged in their teaching, and learn from each other.

To achieve the first goal (better equipping TAs to provide help in office hours), I added significant structure to the way I expected TAs to review each new assignment the students had to work on. Previously, I would have assigned each TA two hours to “review the assignment”. More often than not though, this time was not used effectively, with TAs not uncovering any issues requiring clarification, let alone gaining an understanding of the challenges students would face with the assignment. Instead, drawing from what I have found to be effective in getting students to do pre-lecture preparatory exercises, I gave the TAs concrete homework, assigning them pieces of the assignment to complete that would help them better understand what students were being asked to do. For example, in a programming assignment, I would have them write a few lines of code, or come up with a new example and trace through it. They submitted this work to me, although I reviewed it only to make sure they had done it. During our next training meeting, the TAs would break into groups based on what homework they had been assigned, and begin to collaboratively develop an online document (a “TA Guide”) for reference during office hours. Rather than getting individual feedback from me on their homework, TAs who had made mistakes got feedback from their peers. Any mistakes and misunderstandings from the homework were discussed with their peers and clarified with me, and then documented for future reference. These TA Guides were one of the most positively reviewed parts of the training.

To achieve the second goal of increasing TA awareness of and ability to promote an inclusive culture, I gave short presentations on concepts like unconscious bias, and stereotype threat, then facilitated follow-up discussions. On some topics, TAs did short reflective writing exercises and then, if they were comfortable, shared their answers with a small group. I often shared my own answers here, especially about challenges I faced as an undergraduate student. TAs were often surprised to hear that someone successful in the field had struggled with belonging as an undergrad. We explored stereotypes by building a highly-stereotypical portrait of a programmer, and then discussing how being different from that might affect the way our students perceived struggling to learn to program. I consciously did not push anyone to

participate, but many TAs seemed to have learned a lot from listening quietly to their peers' experiences.

To achieve the third goal of providing more opportunities for TAs to develop their teaching skills, I introduced concepts related to learning, such as self-efficacy, and I facilitated discussion about prior experiences TAs had as learners. For example, the TAs noted experiences they had in the past as learners where their teachers had positive and negative influences on their learning. As a group, we discussed the themes that came out of their examples. I also gave TAs prompts to do some reflective writing on their own strengths and weaknesses as teachers, both at the beginning and end of the training.

To achieve the fourth goal of improving the TA community, I included small group discussion in every training session, and often let the discussions run longer than I had planned if I heard good teaching-related conversation happening. I also spoke often and explicitly about the importance of the work the TAs did, and the role they played in achieving my goal of helping students learn. I acknowledged them as part of our teaching team, but also as learners – they were learning how to teach, and as with my students, I knew there would be lots of things they did not know, and that it was expected that they reach out to me or a fellow TA for help.

Impact: At the end of the session, I collected feedback from the TAs. Their response was overwhelmingly positive, and many commented on having a deeper understanding of the challenges students face.

I think learning not to say "oh this is so easy" was something that was crucial. I actually tested saying that sentence once and tried to read the facial expression of the student, which was not very encouraging.

The models of learning (e.g. self-efficacy) helped me understand my role as a TA and thus "understand" students.

When other TAs talked about their office hour problems they give a different perspective on how to look at a problem. This helped me to better understand why a student asked a question.

A student came to me and said, "I have no idea how to do this." I realized that sometimes they are just too anxious and afraid about things they've never done.

Some TAs also commented on the community that developed because they spent time together, instead of all working independently.

[The meetings] were useful to me because I got to know the other TAs, and this created a sense of camaraderie between us.

It is amazing that we are interacting on a weekly basis. It creates a great working environment.

One of the biggest surprises to me in the TA feedback was the number of people who commented on a single slide I had shown in the first meeting, showing that the vast majority of students in the course had little to no prior programming experience. This is despite the fact that the course explicitly assumed no prior experience. It is common for students in this course to believe that everyone except them knows how to program already, but I had not anticipated TAs thought the students already knew the material too. This revelation alone likely impacted the way TAs interacted with students, treating them more as the beginners they actually were.

Using the materials I developed in Fall 2018, the Fall 2019 instructors of [REDACTED] ran this training again, and collaborative TA Guides have been used in other courses. I also plan to generalize some of the materials for use in general [REDACTED] TA training.

I presented about this TA Training program at the Western Canadian Conference on Computing Education in 2019.

This document is based on the TA Training module from the Fall 2018 offering of **XXXXXX**

Date	Title	Description and Comments
2019-09-10 XXXXXX	Introductory Session	<p>Introduce course. Set expectations.</p> <p>Activity: TAs introduce each other at their tables.</p> <p>Activity: TAs share positive and negative learning experiences with each other.</p>
2019-09-17	Understanding Students	<p>TA questions (have them emailed in advance?)</p> <p>Activity: Scenario/Role-play with frustrated student.</p> <p>Assignment 1 Outline and Tips (assignment due October 1st)</p> <p>Homework: PyTA Practice.</p> <p>Homework: Implement two functions from A1 and write down 1-2 things students will find difficult.</p>
2019-09-24	TA Guide: Assignment 1	<p>Activity: TAs work together in a shared google doc to create a TA guide for assignment 1. For example,</p> <ul style="list-style-type: none"> - Anticipated student questions. - Automated testing and style. - Misunderstandings of specific functions that need to be implemented.

2019-10-01	Student Motivation	<p>Assignment 1 Debrief.</p> <p>Define: Self-regulation, Self-efficacy, Fixed/Growth Mindsets, Goal Orientation.</p> <p>Activity: TAs create a Tip Sheet for improving student motivation using the terminology defined earlier.</p>
2019-10-08	Mindsets, Inclusion, and Diversity	<p>Midterm marking information (for the following week).</p> <p>Activity: Ask TAs how they would encourage a growth mindset for students learning to program?</p> <p>What is diversity?</p> <p>What is inclusion?</p> <p>Activity: Ask what role teachers play in XXX at the XXX. Ask what impedes diversity and inclusion?</p> <p>Activity: List assumptions made about a student.</p> <p>Discuss unconscious bias.</p>
2019-10-15	CrowdMark	<p>How to use crowdmark when grading the midterm.</p> <p>Homework: Implement a subset of A2 and write down 1-2 things that you think students will find difficult.</p>

2019-10-22	TA Guide: Assignment 2	<p>Midterm Questions and Remarks</p> <p>Assignment 2 Outline (assignment due on October 29th).</p> <p>Activity: TAs work together in a shared google doc to create a TA guide for assignment 2. For example,</p> <ul style="list-style-type: none"> - Anticipated student questions. - Automated testing and style. - Misunderstandings of specific functions that need to be implemented.
2019-10-29	No Meeting	
2019-11-05	No Meeting	
2019-11-12	No Meeting	<p>Homework: Implement a subset of A3 and write down 1-2 things that you think students will find difficult.</p>
2019-11-19	TA Guide: Assignment 3	<p>Assignment 3 Outline (assignment due on December 3rd).</p> <p>Activity: TAs work together in a shared google doc to create a TA guide for assignment 3. For example,</p> <ul style="list-style-type: none"> - Anticipated student questions. - Automated testing and style. - Misunderstandings of specific functions that need to be implemented.