Journal of Learning Spaces
Volume 6, Number 1. 2017

ISSN 21586195

Monitoring Implementation of Active Learning Classrooms at Lethbridge College, 2014-2015

Andy Benoit
Lethbridge College

Having experienced preliminary success in designing two active learning classrooms, Lethbridge College developed an additional eight active learning classrooms as part of a three-year initiative spanning 2014-2017. Year one of the initiative entailed purchasing new audio-visual equipment and classroom furniture followed by installation. This significant increase in scale created opportunities to expose an even broader group of instructors and students to active learning classrooms. Year one research entailed investigating student and instructor perceptions on three topics, (1) equipment and technology, (2) learning environment design and (3) interaction. Collectively, twelve key findings and eight recommendations were generated.

Background and Context

Building on two small scale active learning projects at Lethbridge College completed in 2012-2013, the current active learning classroom initiative, titled 21st Century Learning Environments, commenced September 2014 with a three-year timeline. It recognizes the interrelationships between space, people, curriculum and technology while beginning to consider learning environments as a place where students can develop 21st century learning skills. Upon completion in 2017, the intent is that our institution will have ten functioning active learning classrooms designed to meet student and instructor needs.

Specific objectives include: (1) generating insights that will help to inform the design and/or redesign of formal learning spaces in relation to technology, furniture and the configuration of space; (2) remaining responsive to students' changing relationships with technology; (3) creating innovative and collaborative learning experiences and (4) accelerating the integration of 21st century skills in the classroom. Our focus in year one entailed purchasing new audio-visual equipment and classroom furniture, resulting in the implementation of two types of active learning classrooms: Round rooms and Node rooms.

Andy Benoit is the Manager of Educational Technology at Lethbridge College.

[1] Wesch, M. (2007). A Vision of Students Today. https://www.youtube.com/watch?v=dGCJ46vyR9o

Making a Case for Active Learning Classrooms

Numerous post-secondary educational institutions are questioning the efficacy of traditional classroom design in relation to learner success (See examples at Queens University; McGill University; University of Calgary; University of Lethbridge). Such spaces, characterized by a grid of tables and chairs, are seen as being predominantly optimized for the transmission of information from one to many. Nowhere is the seeming disconnect between traditional classrooms and student needs better elucidated than in Wesch's 2007 viral video, "A Vision of Students Today [1] " as was cited by Whiteside, Jorn, Duin, and Fitzgerald (2009). A wide range of factors are at play in relation to learning space design, including: learning theory, changing student demographics, technology and more recently, employability skills. Collectively, they underscore the complexity and importance of designing spaces that support both teaching and learning.

Long and Ehrmann (2005), for instance, drew a contrast between traditional spaces and spaces designed to enable effective learning, which they describe as being situated, collaborative and active. In so doing, they highlight the importance of ascertaining the purpose for which and for whom learning spaces are designed. Van Note Chism (2006) considered factors that included a more varied student demographic, contemporary learning theory, and students' changing relationships with technology prior to listing the importance of space attributes such as flexibility, comfort and de-centeredness.[2]

[2] "decenteredness" as used by the author here means ensuring the front of the class is not designed as "privileged" space for the instructor.

Central to learning space design is the notion of active learning, described as a range of instructional methods that emphasize higher order thinking and student engagement through activities, discussion and group work (Prince, 2004). Having completed three years of empirical research on learning environments, Whiteside, Brooks and Walker's (2012) findings indicated that grades exceeded expectations in the active learning classrooms when compared to a traditional classroom despite holding constant the instructor, course type, time of day, course materials, assignments, schedules, exams and pedagogical approaches. More recently, Valenti (2015) articulated a vision for next generation learning spaces, essentially, active learning classrooms optimized for creating and making. Such places create authentic learning opportunities for students to develop not only disciplinary knowledge, but also the "boundary crossing" competencies such as teamwork and collaboration, readily valued by employers.

Case Description: Room Designs at Lethbridge College

All active learning classrooms were retrofitted from the "traditional" room design in our institution with the exception of TE 2231, a nursing lab.[3] For each of the room types (see Figures 1 to 4) the "front" of the room was retained, which included an interactive whiteboard and projection system with whiteboards typically being located on each side. An instructor workstation, which contained audio-visual controls in addition to providing a surface for instructor resources, was positioned off to one side and orientated so that the instructor faced the class. Classroom evergreening, led by institutional facilities, had resulted in a change from carpet to marmoleum.

The seating capacity in the six Round rooms (see Figure 1) ranged from twenty to forty-five seats. In terms of design, each room had one colored feature wall; round, forty-eight inch tables with fixed-legs (no casters); five chairs on casters per table; between one to four additional LCD monitors mounted on side walls (depending on classroom layout); one wall-mounted rack contains portable whiteboards and one mobile charging station. Some rooms contained glass whiteboards.

The four "Node" rooms were more variable in their design. Two of these classrooms had a similar design (see Figure 2) albeit with seating capacities of either thirty-two or forty students. The rooms were characterized by one feature wall similar to that in the Round rooms as well as Node chairs with casters that contained an integrated writing surface (22 1/4" w x 12" d), a cup holder and under seat storage. These rooms also contained either one or three thirty-six inch round tables (fixed leg, no casters) with seating for three per table using identical chairs to those in the Round rooms (see Appendix 1). These were installed for students that might find the Node seating to be uncomfortable. Other features, similar to those in the Round rooms, included a wall-mounted rack containing portable whiteboards, one mobile charging station, additional LCD displays mounted on the side wall and glass whiteboards.

The third "Node" room was a nursing lab, (TE2231) (see Figure 3). It had seating capacity for twenty-four students. In addition to a wide range of nursing equipment, including hospital beds on each side of the room, it contained Node chairs on casters with an integrated writing surface (22 1/4" w x 12" d), a cup holder and under seat storage, as well as one thirty-six inch round table with seating for three. An interactive display, projection system and instructor station were also present. Though not a typical active learning classroom at our college, it did contain furniture and audio-visual equipment similar to that found in the other active learning classrooms and for this reason was included as part of our research project.

The fourth "Node" room, of which there is only one (see Figure 4), had seating capacity for thirty-two students. Furniture for this room was purchased in support of an active learning classroom project implemented in 2013. The room design included rectangular tables with four Node chairs (five-star base) per table, a colored feature wall and equipment similar to that found in the Round and Node rooms: interactive display, projection system and an instructor station.

Methodology

Given a four-fold increase in the number of active learning classrooms, year one research efforts were designed with an evaluative lens, with the intent being that feedback would inform ongoing implementation. Two separate online surveys were developed for students and instructors that utilized the active learning classrooms during the Fall 2014 semester. Questions were developed based on consideration for three topical areas: (1) equipment and technology, (2) learning environment design and (3) interaction.

Both surveys utilized Likert type questions to explore perceptions, a combination of yes/no and frequency type questions to identify the extent of technology utilization and a series of open-ended questions, so that both groups could

[3] TE 2231 is a unique active learning environment. Unlike the other active learning classrooms, it is not part of the general classroom inventory as it has been designed to enable nursing curriculum. Some active learning furniture was added to this classroom at the request of the program chair.

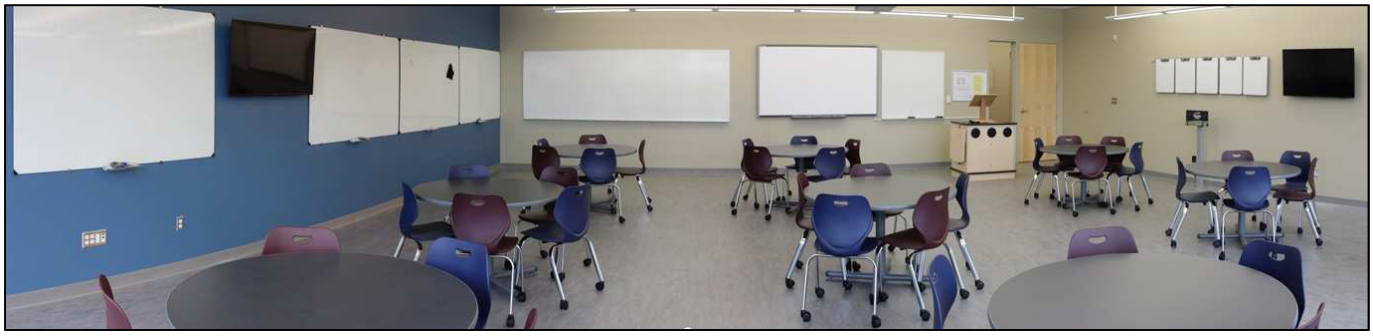


Figure 1. Round room (IB 2145)

Figure 2. Node room (AN 2742)

Figure 3. TE 2231 (Nursing Lab)

Figure 4. AN 2739

elaborate as necessary. The student survey, totaling fourteen questions, was released by academic program chairs in January 2015 after the term had concluded and the instructor survey, totaling nineteen questions, was released in May 2015.

Results and Discussion

All student (n=120) and instructor feedback (n=31) was reviewed. Open-ended responses were reviewed with an eye towards generating insights that could be used to make formative improvements in active classroom design. Only comments appearing a minimum of two times were selected to provide illustrative feedback. Quantitative results were analyzed with results labeled as "Strongly Agree" and "Agree" and results labeled as "Strongly Disagree" or "Disagree" being aggregated respectively, as "Agree" or "Disagree". Means are provided for each aggregated response. Results labeled "neutral" and "not applicable" were omitted.

Two student sub-groups were identified on the basis of room design. Sub-group one being students in rooms with round tables (n=96), and sub-group two being students in rooms with Node furniture (n=24). Two instructor sub-groups were identified on the basis of whether they specifically requested to teach in an active learning classroom or not. The first sub-group encompasses the "requestors" (n=16), while the second sub-group encompasses the "non-requestors" (n=15).[4] Some instructors taught in both types of rooms and therefore provided feedback on more than one room type. The evaluative focus of this research does not necessitate the inclusion of demographic data for students, e.g., age and year of study, or for instructors, e.g., discipline and years of teaching experience.

Tables 1, 2 and 3 summarize aggregated student and instructor responses for each of the three focus areas. Discussion follows each table.

1. Technology and Equipment

Mobile Charging Stations

Students had little use for the mobile charging stations (see Figure 5) installed in either classroom type (Round or Node room) as students brought their own cables or found their phones/tablets capable of maintaining a charge throughout the day. Secondary feedback gathered during the year, however, indicated that the same mobile charging stations saw significant usage within the library. This finding raises questions about the optimal location to deploy such types of equipment. Illustrative feedback as follows:

> *"I charge my phone every night and it stays charged never needed to use one." (Student)*

Table 1. Technology and Equipment. Student and Instructor Results.

Question	Students Round Rooms (n=96)	Students Node Rooms (n=24)	Instructors Requested (n=16)	Instructors Not Requested (n=15)
Used mobile charging station	30% Yes; 70% No	25% Yes; 75% No	n/a	n/a
Used portable whiteboards	30% Yes; 70% No	75% Yes; 25% No	67% Yes; 33% No	64% Yes; 36% No
Used LCD screen	n/a	n/a	38% Yes; 62% No	43% Yes; 57% No
Glass whiteboard readability	40% Satisfied 34% Not satisfied	61% Satisfied 0% Not satisfied	50% Satisfied 6% Not satisfied	47% Satisfied 7% Not satisfied
Prefer chairs with casters	n/a	n/a	88% Yes; 13% No	Yes 64%; No 36%
Chairs more comfortable than traditional chair	43% Agree; 39% Disagree	45% Agree; 35% Disagree	n/a	n/a
Table stability	45% Satisfied 49% Not satisfied	42% Satisfied 26% Not satisfied	50% Satisfied 50% Not satisfied	60% Satisfied 33% Not satisfied
Table size	26% Satisfied 64% Not satisfied	32% Satisfied 53% Not satisfied	56% Satisfied 45% Not satisfied	27% Satisfied 53% Not satisfied
Table personal space	24% Satisfied 65% Not satisfied	32% Satisfied 42% Not satisfied	50% Satisfied 44% Not satisfied	27% Satisfied 53% Not satisfied
Working space at table	23% Satisfied 64% Not satisfied	21% Satisfied 53% Not satisfied	50% Satisfied 44% Not satisfied	47% Satisfied 47% Not satisfied

[4] Instructors were scheduled into classrooms prior to the selection of the active learning classrooms in September 2014. In some instances, it was not possible to provide instructors with the traditional classroom they were expecting.

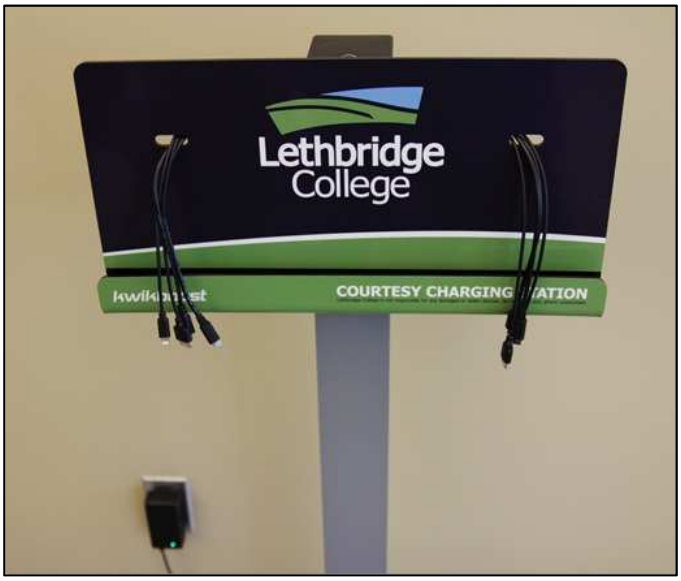


Figure 5. Mobile charging station

Portable whiteboards

Students in the Node rooms used the portable whiteboards (see Figure 6) significantly more than students in the Round rooms. While room design itself may be a contributing factor, instructor feedback revealed that usage may be related more to instructor teaching style and the type of learning activities used during class, a relationship that appeared consistently when reviewing usage of other classroom technologies. Illustrative feedback as follows:

> *"I love the small boards for students to record their collaborative work and report back to the class." (Instructor)*

Anecdotal feedback during the year revealed that each instructor is responsible for bringing a set of dry-erase markers to each class, a finding that draws attention to unforeseen limiting factors. For instance, by adding eight to ten portable whiteboards to classrooms, each instructor would need access to an additional sixteen to twenty markers, assuming students used two colors per board to participate in learning activities

Figure 6. Portable whiteboards

Glass Whiteboards

Though long lasting, a noted limitation of porcelain whiteboards is "whiteboard ghosting", a phenomenon that occurs as ink residue gradually accumulates on the board over time due to improper or infrequent cleaning (see Figure 7, board on right side). Glass whiteboards, in contrast, were understood to be easier to maintain and for this reason were installed in some classrooms. The trade-off, however, particularly for students in the Round rooms, was diminished ease of viewing due to glare (see Figure 7, board on left side) from natural light. The difference in sub-group results, therefore, may be explained by the fact that the Round rooms contained more natural light when compared to the Node rooms which contained fewer, if any, windows.

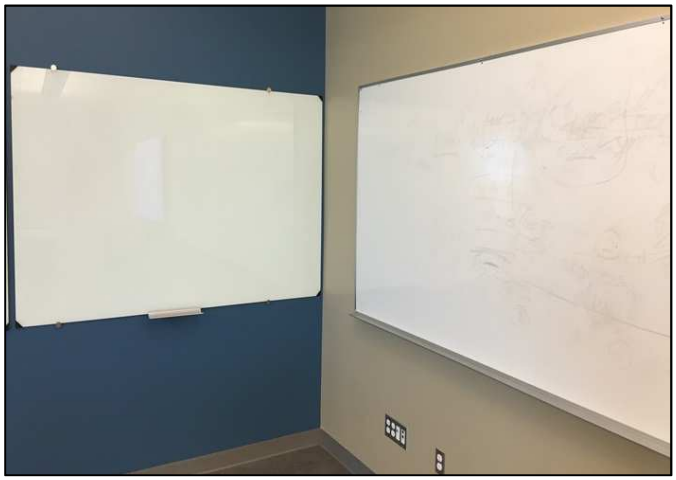


Figure 7. Glass whiteboards vs. porcelain whiteboards

Notably, many factors require consideration prior to selecting whiteboard surface material, including, but not limited to, the amount of natural light, window orientation and even whether window coverings are present.

LCD Screens

While the round tables were ideal for student group work, they resulted in diminished sight lines to the instructor and/or the primary classroom display, a significant difference when compared to the clear sight lines made possible when all students are forward-facing in traditional classrooms (see Figure 8). The extent to which students were impacted by this change

seemed to vary depending on course type and instructor teaching style. Illustrative feedback as follows:

> *For an accounting class with little to no group work, the space is crowded and the instructor does not navigate the classroom, making it difficult to follow the lesson if you are on the wrong side of the tables. (Student)*
>
> *I like to see the white board and the instructor, seeing what they write down and the PowerPoint. With the round tables sometimes I'm facing the back wall and have to turn my head or turn around with my notebook on my lap. I don't really like doing that. Overall a great room for group work but not really good for an everyday lecture. (Student)*

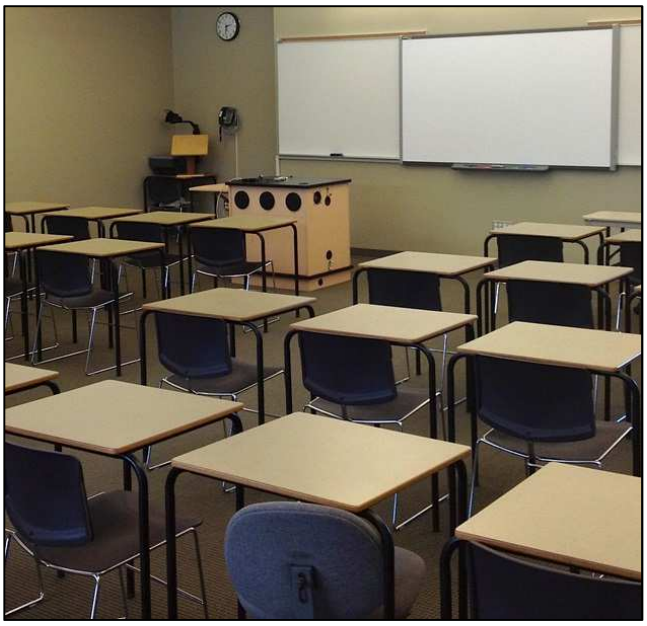


Figure 8. Traditional classroom layout

Worth mentioning is that diminished sightlines were anticipated during the initial room design and efforts to mitigate entailed mounting one or more LCD screens onto side walls so that an instructor could mirror the primary display as needed. This solution entailed installation of one Crestron Air Media unit[5] behind each LCD display. In general, instructor feedback revealed only moderate uptake of the LCD screens and by extension the Air Media units. Reasons provided included technical difficulties, an overly complicated user experience, and uncertainty as to how best to integrate multiple displays into lessons.[6] Illustrative feedback as follows:

> *I experienced a couple of challenges trying to get them to work at the beginning of the semester, and I never went back to them. This has to do with my trust in the system that they will actually work (they will), and all of this hinges on my initiative to go back to the tutorial and work through any challenges that I had. (Instructor)*
>
> *Partly ignorance to how they worked and partly apathy to what they were for. (Instructor)*

Collectively, instructor feedback suggested that the relative impact of diminished sightlines on students' viewing is contingent on lesson design, in particular, the amount of time students be required to focus their attention on the front of the class.

Chairs/Casters

Students in both room types felt the chairs were only slightly more comfortable than those in traditional classrooms. For some, the Node chairs were too small to comfortably accommodate their size, (see Figure 9) while for others the casters resulted in unintentional movement which impacted their ability to focus. In contrast, a majority of instructors preferred chairs with casters as they made classroom reconfiguration more efficient, in turn enabling a broader range of instructional strategies.

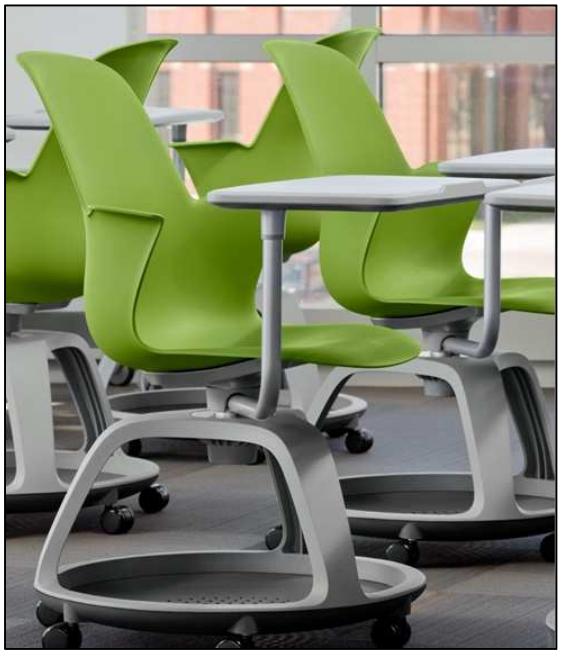


Figure 9. Node chair
Image Credit: steelcase.com

[5] Air Media is a wireless presentation solution: http://www.crestron.com/microsites/airmedia-mobile-wireless-hd-presentations

[6] Students can also use the Air Media to share content from their personal devices. This entails either downloading an app or use through a web-browser, followed by entering in a randomly generated four-digit code presented on the LCD display.

Table Stability

Nearly half of the students in the Round rooms were dissatisfied with table stability (see Figure 10) with students in the Node rooms slightly less so. Investigation revealed that loose screws connecting the table to the table base were a contributing factor, a not uncommon occurrence with newly assembled furniture. It was also discovered that the flooring in certain Round classrooms is not level, providing further insight into the "wobbly" table effect. This information draws attention to the many factors that influence table stability, an essential requirement to ensure end-user satisfaction.

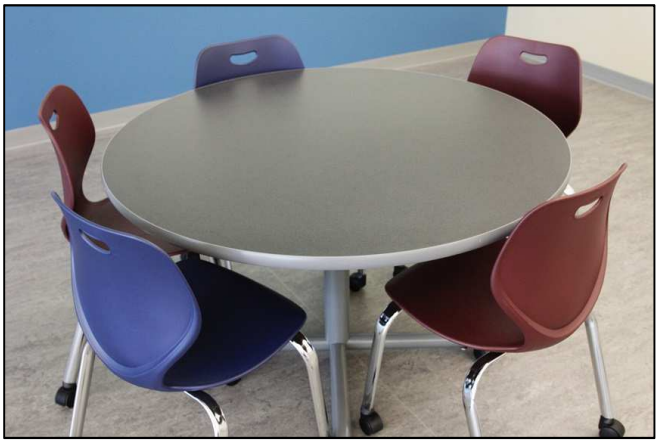


Figure 10. Round tables

Table Size

Students were dissatisfied with table size in relation to work space regardless of room design or course type. Both students and instructors indicated that seating five students per table resulted in a feeling of being crowded. For students in "Bring Your Own Device" (BYOD) programs, this problem was exacerbated by the fact that additional space was needed for books and binders in addition to a laptop. Illustrative feedback draws attention to the diverse needs of academic programs and the challenge of selecting furniture that will meet varied disciplinary needs:

> *I teach nursing skills which often require use of a skills "kit". The contents of the kits need to be set up on a flat surface that is steady. The rolling seating and the desk size is too small to accommodate these kits. (Instructor)*

> *My program is a BYOD and there is not enough room for my laptop, binder and textbook. The best rooms I have been in for classes are the theatres. (Student)*

> *The tables are cramped when working with other people at the table! If you are sitting on the wrong side of the table, you have to have your back to the instructor if you want to write something!!! (Student)*

Table 2. Learning Environment Design. Student and Instructor Results.

Question	Students Round Rooms (n=96)	Students Node Rooms (n=24)	Instructors Requested (n=16)	Instructors Not Requested (n=15)
More conducive to group work when compared to traditional classroom	77% Agree 10% Disagree	90% Agree 0% Disagree	94% Agree 0% Disagree	93% Agree 0% Disagree
More welcoming when compared to traditional classroom	57% Agree 28% Disagree	70% Agree 10% Disagree	88% Agree 0% Disagree	73% Agree 13% Disagree
More comfortable when compared to traditional classroom	39% Agree 47% Disagree	58% Agree 32% Disagree	81% Agree 13% Disagree	53% Agree 20% Disagree
More conducive to instructor teaching style when compared to traditional classroom	35% Agree 47% Disagree	65% Agree 0% Disagree	n/a	n/a
More conducive to course type when compared to traditional classroom	33% Agree 45% Disagree	75% Agree 10% Disagree	n/a	n/a
More conducive to formative assessments	n/a	n/a	63% Yes; 7% No	47% Yes; 33% No
More conducive to summative assessments	n/a	n/a	7% Yes; 80% No	7% Yes; 86% No
More pleasant to teach in when compared to traditional classrooms	n/a	n/a	88% Agree 6% Disagree	60% Agree 27% Disagree
More flexible when compared to traditional classroom	n/a	n/a	94% Agree 6% Disagree	73% Agree 20% Disagree

2. Learning Environment Design

Welcoming and Pleasant to Teach In

The majority of instructors and students felt the active classrooms were more welcoming when compared to traditional classrooms. Open-ended feedback provided numerous insights: one instructor indicated that some students required time to adjust to the new space while another made a connection between the environment and its ability to meet students' "social needs." Instructors in both subgroups rated the active learning classrooms as being more pleasant to teach in with significantly more of the requestor subgroup expressing agreement. One student mentioned the active learning classrooms were "fun" and "easier to learn in". Illustrative feedback as follows:

> *Although I find the flexible classroom more welcoming, some students find it more intimidating initially, but most of them come to appreciate it. (Instructor)*
>
> *The environment is conducive to the social needs of most students and allows for better discussion and participation. (Instructor)*
>
> *It's more fun and easier to learn in. I find that I learn just as much from other students as the instructor. (Student)*

Flexibility, Group Work and Room Comfort

Instructors indicated that the flexible room designs resulted in more efficient use of classroom time with significantly more in the requestor subgroup expressing agreement. Moreover, both students and instructors were in agreement that the active learning classrooms were more conducive to group work when compared to traditional classrooms. Illustrative feedback as follows:

> *They do not always need to sit in their groups and its better for them to be flexible to move around when needed rather than to sit in the same spot all the time. With chairs with tables I can make much more and better use of your class time and it speeds up movement into groups when necessary. (Instructor)*
>
> *I incorporate group work into my teaching and this classroom setup works well for students to move around desks to join groups without scraping the chairs and tables on the floor and possibly disrupting the rooms being taught in below. (Instructor)*

However, instructor feedback also drew attention to a wide range of factors that require consideration in order to create a comfortable and/or flexible classroom. Illustrative feedback as follows:

> *Tables need to be larger. Students had difficulty sitting at the rolling desks if they were not a small student. (Instructor)*
>
> *Some students reported that although they preferred the interaction at the round tables in AN1510, they also preferred the amount of personal space at the rectangular tables in AN 2739. (Instructor)*
>
> *The circular tables are not comfortable to sit at while trying to see what is being taught at the front. (Student)*

Instructor Teaching Style and Course Type

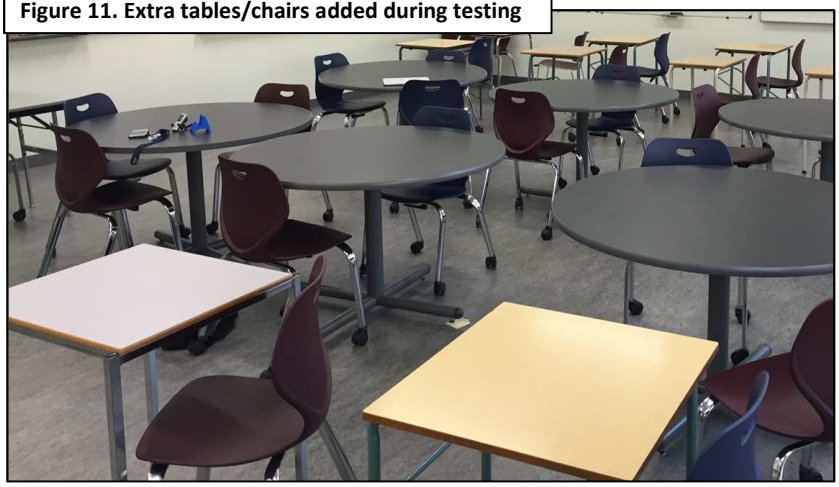
Results from the two student sub-groups varied significantly when asked whether the active learning classrooms were more conducive to instructor teaching style and course type. In general, the majority of students in Node rooms expressed agreement, whereas students in the Round rooms did not. The difference in results may be partially explained by the fact that some instructors prefer to lecture more than others, a factor that necessitates students being forward facing in order to view and hear what is being presented by their instructor. Illustrative feedback as follows:

> *For classes [in our program], we do a combination of small group work and power point lectures. The active learning classroom just isn't very conducive to the power point lecture. If I had been trying to use my laptop to take notes in that classroom, I wouldn't have been able to do it because otherwise my back would have been towards the instructor. (Student)*
>
> *Unfortunately, when the class is full, like my sections were, half the students have their back to me at any given time. This was hard and frustrating from an instructor stand point but even more so for students. They continually complained about not being able to hear properly, not having enough room and having to face away from the instructor, whiteboard and smartboard. (Instructor)*

Formative and Summative Assessment

The majority of instructors indicated the classrooms were not conducive to summative assessments. For instructors in Round rooms, five students seated at a round table was particularly problematic. Instructors undertook a range of actions to maintain exam integrity, including: making ad-hoc requests to reserve space in traditional classrooms where students would be forward facing and in some instances by adding extra tables/chairs to reduce the number of students at each table (see figure 11). This finding draws attention to the challenge of designing classroom spaces intended to

Figure 11. Extra tables/chairs added during testing



enable collaboration and group work while at the same time ensuring secure testing. Illustrative feedback as follows:

> *More tables as it is enticing for students to look at the exams when writing the exams in class. (Instructor)*
>
> *The round table rooms are not conducive to giving exams. Whether students actually cheat or not we are placing them in a situation that makes the temptation to cheat very real…That goes so contrary to the many things we are trying to teach them. Because many of us will not give exams in the round table rooms this has caused additional pressure on scheduling. I know a testing centre has been mentioned but for many of our business classes a test centre of 30 seats is not enough for the often class sizes of 40 or more. (Instructor)*

3. Interaction

Interaction

A majority of students and a high majority of instructors identified positive changes in student-to-student interaction attributable to the room design. The "requestor" sub-group expressed a much higher level of agreement than the "non-requestor" sub-group with respect to positive gains in student-to-instructor interaction and instructor-to-student interaction. Open-ended feedback revealed that the "requestor" sub group had an expressed goal of enhancing interaction, group discussion/work, and more generally because they viewed the spaces as being more congruent with their "approach" to teaching. Illustrative feedback when asked to explain why they requested to teach in the active learning classrooms as follows:

> *To see what could happen with group activities and interaction in the class – to accommodate more options. (Instructor)*
>
> *The course I was teaching involved many opportunities for small group discussion and work. The round tables and moving chairs facilitated this process. (Instructor)*
>
> *My approach to teaching is more in line with a flexible classroom. (Instructor)*

In contrast, the "non-requestor" sub-group may not have had time to adapt their lessons to leverage the active learning classroom design or more simply because the space itself was not conducive to their specific course or preferred approach to teaching.

Key Findings and Recommendations

1. Students' need for table workspace varies depending on program requirements.
   ***Recommendation #1**: Purchase additional round tables to reduce the number of students from five to four per table.*
2. Table stability is contingent on four factors: (1) hardware connecting the table to the table base, (2) type of table leg/base, (3) type of caster vs. adjustable table feet and (4) the presence of level flooring. ***Recommendation #2**: Tighten hardware to increase table stability.*
3. The close proximity and seating orientation at round tables enhances student collaboration, an affordance that is not always desirable. Eighty-two percent of instructors indicated the active learning classrooms were not conducive to summative assessments. ***Recommendation #3**: Purchase table top dividers for each classroom to improve testing security.*

Table 3. Interaction. Student and Instructor Results.

Question	Round Rooms (n=96)	Node Rooms (n=24)	Requested (n=16)	Not Requested (n=15)
Positively changed student-to-student interaction	69% Agree 16% Disagree	70% Agree 10% Disagree	94% Agree 6% Disagree	80% Agree 7% Disagree
Positively changed student interaction with the instructor	33% Agree 44% Disagree	50% Agree 10% Disagree	75% Agree 6% Disagree	47% Agree 27% Disagree
Positively changed instructor interaction with students	38% Agree 39% Disagree	45% Agree 15% Disagree	81% Agree 6% Disagree	53% Agree 30% Disagree

4. Whiteboard markers were discovered to be a limiting factor impeding adoption and utilization of portable whiteboards.
   ***Recommendation #4**: Explore methods to ensure sustainable supply of markers in classrooms.*
   ***Recommendation #5**: Develop a list of activities to focus on the instructional applications for portable whiteboards.*
5. Student usage of mobile charging stations in active learning classrooms is low, however, anecdotal feedback suggested that stations deployed in the library are well utilized.
   ***Recommendation #6**: Redeploy the mobile charging stations from the classrooms to the library and other student common spaces across the College.*
6. Instructors required additional technical training and exposure to innovative teaching practices. ***Recommendation #7**: Provide additional resources and training on equipment to ensure instructors become proficient with LCD screens and wireless projection* ***Recommendation #8**: Establish an instructor community of practice related to active learning classrooms.*
7. Eighty-four percent of instructors felt the active learning classrooms were more flexible when compared to traditional classrooms.
8. Seventy-four percent of instructors agreed the rooms were more pleasant when compared to traditional classrooms.
9. Eighty-one percent of instructors and fifty-nine percent of students indicated the classrooms were more welcoming when compared to traditional classrooms.
10. Sixty-eight percent of instructors and forty-two percent of students agreed the rooms were more comfortable when compared to traditional classrooms.
11. Ninety-three percent of instructors and seventy-nine percent of students felt the active learning classrooms were more conducive to group work when compared to traditional classrooms.
12. Eighty-seven percent of instructors and sixty-nine percent of students identified positive changes in student-to-student interaction attributable to active learning classroom design.

Conclusion

Building on lessons learned from two small scale pilot projects, eight additional active learning classrooms were designed and implemented as part of a three-year initiative. This increase in scale created opportunities for a more diverse range of instructors and students to experience classrooms designed to support active learning. The combined results for both instructor and student sub-groups indicated that eighty-two percent of instructors would rather teach and forty-three percent of students would rather learn in an active learning classroom than a traditional one. Year one research focused on gathering student and instructor feedback on three topics (technology and equipment, learning environment design and interaction) resulting in identification of twelve key findings and eight recommendations.

Acknowledgements

The change and impact resulting from the increased scale of this initiative has required both student and instructor support and significant assistance from Karen Harker, Trudi Mason, Francis Rankin, Clarence Slomp, Bryan Czernik, Doug Aos, Elio Girardi, Gavin Brinsmead, Darwin Romanchuk and Ryan Robinson. The Academic Leadership team was integral in supporting the implementation of the project.

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Appendix 1: Addition of a Thirty-six inch Round Table