Active Learning Instruction and Active Learning Classrooms At Dawson

Produced by the Dawson Active Learning Community (DALC)

Welcome to the Active Learning (AL) classroom and Dawson's Active Learning Community (DALC)

The goal of this document is to be a resource for both new, and not so new, teachers who use Active Learning instructional methods and the Active Learning classrooms at Dawson. Additionally, to welcome all teachers to the Dawson Active Learning Community (DALC).

What is unique about the DALC is its community of practice (CoP) organizational structure. The DALC has been meeting weekly since winter 2012, the inauguration of the first room (3F.37). These regular gatherings, and more or less formal exchanges, have been a source of support and inspiration to members as they build their confidence and expertise in using Active Learning instruction. These new practices, in turn, have motivated students to work differently, specifically students report making greater efforts to engage in their learning and working collaborative both inside and outside of class.

The pages following are a collection of the "most promising practices" documented by several years of DALC Fellows. Additionally, the pages contain information and recommendations on how to use the rooms and Active Learning pedagogy effectively. We hope the document will provide ideas, insights and encouragement as you try out new practices.

We look forward to your participation and contributions that will further strengthen our community. A schedule of our DALC meetings will be published prior to the beginning of the semester. See you there!

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Section 1: Active Learning Instruction

1.1   What is Active Learning instruction?

Active Learning has become a way to describe the types of instruction and pedagogy that calls for students to participate more fully with the course content. It requires teachers to develop new ways of getting students to reflect deeply on concepts, issues and problems that are key aspects of the course content (***cognitive engagement***), to engage respectfully with peers (***social engagement***) and to care about the process (***emotional engagement***).

To achieve cognitive engagement, activities should take into account a range of thinking skills. This can be achieved by using *Bloom's taxonomy* of educational goals (Benjamin Bloom; Bloom et al. 1956).[1] Bloom's taxonomy is made up of six hierarchical levels of learning objectives increasing order of complexity: (1) remember, (2) understand, (3) apply, (4) analyze, (5) evaluate, and, (6) create. Note that these are increasing in complexity with items 4-6 being higher order thinking skills (see Figure 1).

To achieve social engagement, activities should consider how to keep students working *together collaboratively*. This often means designing tasks that call for the development of mutual accountability and mutual responsibility.

Not all active learning activities can elicit emotional engagement. If you can design an activity that draws the students into the work involved because the outcome serves a higher purpose, i.e., it can help someone, or improve our understanding of something.

Summary
In well-designed activities, when working with peers, students have the opportunity to:
- o   practice the new vocabulary (terms and concepts) of the discipline as they talk with peers;
- o   explain their understanding to others and listen to the explanation of others as they apply their knowledge in the context of working with peers;
- o   evaluate the quality of these explanations, and whether they stand up to the test of being correct and/or appropriate, respective to the norms of the discipline in question;
- o   synthesize this knowledge of how to apply these reflection about what they know, what and how others' know the same thing, and how these two can be compare – i.e., the compare and contrast tasks as well as reflections on what one knows (metacognition), that are critical to deep learning.

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[1] For more information on how to use Bloom's Taxonomy there are a variety of sources: e.g., Krathwohl, D. R. (2002). A revision of Bloom's taxonomy: An overview. *Theory into practice*, *41*(4), 212-218.
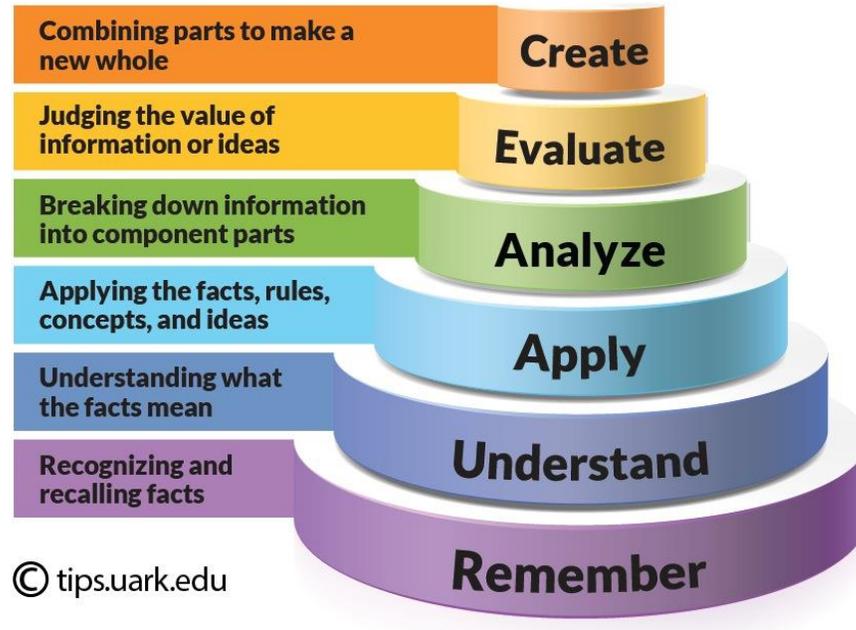
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Figure 1. Visualization of Bloom's Taxonomy obtained from http://tips.uark.edu/using-blooms-taxonomy/

1.2   Examples of Active Learning instruction

Here is a short list of ways to bring AL instruction into your classes (for a more complete list see separate document):

o   <u>Think-Pair-Share</u>: Students individually work on a given problem, then asked to compare their answers with a partner; together, they are asked to come to a joint solution, which they share with the class. *This method is a simple and easy way to bring discussion into your class, and doesn't require a lot of time*.

o   <u>Peer Instruction</u>: In PI, students are presented with multiple-choice questions that feature conceptual knowledge; they select an answer; then they communicate their answer (often with response device, *clickers*, or other non-public methods such as using cards or fingers, to the chest). With this information, the teacher can determine the next pedagogical move based on this "real-time" information on the status of their students' understanding. When significant portions of the class (approximately 40-60%) have different answers to the question, students are asked to find a close by student that has a different answer and try to convince them – i.e., the peer-to-peer instruction phase. This engages students in several cognitive processes associated with deep learning: (1) <u>verbalizing</u> what they think (understand); (2) <u>actively listening to</u> what their partner says; and, (3) critically <u>evaluating explanations</u> of others compared to their own. After this brief discussion, students are asked to again communicate their answer through the same response device (or non-public polling). *PI is a quick way to bring active*

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learning into your lessons. The most difficult part of this approach is having good questions that elicit conceptual understanding. Teachers can use the results of PI to guide how the class lesson proceeds.

o Case Studies: Real-life stories that describe what happened to a community, family, school, industry or individual to prompt students to integrate their classroom knowledge with their knowledge of real-world situations, actions, and consequences. *Case studies are a good way to get students working and thinking deeply. It can also be a way to encourage creativity and diversity of solutions.*

o Problem Based Learning (PBL): Students work in groups to solve real world problems. Specific stages of PBL are: (1) identification of what is already known about the problem (eliciting prior knowledge); (2) determine what needs to be known (identify the problem); and, (3) determine how and where to access the required information need to solve problem. *PBL is useful when there is time to engage in longer in-depth project.*

o Inquiry-Based Instruction: Students investigate a specific topic or problem. A major focus of inquiry is to have students use the "scientific method" for researching something that can be approached from several perspectives and the results can elicit discussion, which becomes an important part of the learning. *Inquiry is useful when there is scope to design multiple experiments to investigate the same phenomenon.*

1.3   Explaining to students and getting buy in!

During your first lecture, explain to your students why you are using an AL approach to instruction.

1.4   How do I deal with content?

How do you get students to engage deeply with the knowledge of the discipline if they have to have some factual knowledge to engage with to start?

This is the dilemma faced by many teachers. Key to the success of active learning approaches moving some of the less important facts and information outside of precious class time. Specifically, content and warm-up assignments (generally the types of knowledge that are low on Bloom's taxonomy) can be moved to at home exercises and readings. That way, classroom time can be spent discussing concepts, addressing misconceptions and questions, applying important ideas, and building deeper understanding.

Examples of how to do this are:
  o Flipped classrooms. Learning of course content takes place outside of class through the textbook readings, short video lectures, etc. Class time is spent doing activities that engage students in using the knowledge gained in the homework.

- o [Just in Time Teaching (JiTT)](). Before class time, students are asked to complete an activity based on readings, questions, or other ways to gain content. This information is used to inform how the teacher will spend classroom time.

1.5 How do I get my students to prepare ahead of time?

- Take a few minutes **during the first class to explain why** you want students to read ahead of class.
- When possible, assign points only based on effort, not on understanding for the reading assignment.
- Make sure the amount and the difficulty of the reading(s) you assign can be tackled by your students (reading level is age appropriate; quantity does not exceed what is reasonable for the course *ponderation*).
- Try to focus the reading on the **key concepts**.
- **Show that you value the students' efforts** by not repeating (re-doing) the readings in class. Instead, ask the students what were the tricky points (what they **didn't understand**), and discuss these ideas, making sure you do not re-teach all that was in the reading.
- Ask students to complete a more elaborate task based on the reading. For example:
  - o Ask students to come up with three questions on their reading.
  - o Ask students to do a reflective writing piece (free writing) on what they did not understand in their reading.
  - o Ask students to answer really precise questions about the text in a few words.
  - o Ask students to explain a concept in simple terms that an eight-year old kid could understand.

1.6 How do I make Active Learning instruction work?

Changing the teacher's role. It would be simplistic to think that your role as merely changing from "*the sage on the stage to the guide on the side*." Moving the focus of attention from the teacher's explanations (generally in the form of lectures) to the students' performance (generally in the form of activity) means teachers need to manage many more aspects of the learning environment – i.e., designing of learning activities, providing frequent feedback (individual, group, whole class), monitoring group dynamics. Combined, these tasks are called *orchestration*. It is the management of the cognitive, pedagogical, and practical aspects of the classroom without being at the centre of the instruction.

SUGGESTION: For a great summary take a look at the 19 points made in the "What not to do: Practices that should be avoided when implementing active learning" document (downloaded from [www.cwsei.ubc.ca]()).

1.7 How do I design activities that will engage students at a deep level?

If you design good AL activities then your students should be having discussions that elicit deep thinking (high levels of Bloom's taxonomy). The following types of **core tasks** are known to get students doing the right type of **cognitive work**:

- <u>Compare and contrast:</u> identify differences and similarities between ideas, concepts, solutions, etc. Such tasks get students discussing their understandings, solutions, arguments, ways of doing.
- <u>Synthesize and/or extract principles</u>: identify and assembly the general and/or fundamental principles in specific cases. Such tasks get students debating the core ideas and how they should be organized.
- <u>Evaluate</u>: develop and apply rubrics that allow for the evaluation of the work product of an activity; this can often be done as <u>peer evaluation</u> or <u>self evaluation</u> tasks. Such tasks helps students to consider what are the norms and standards of the discipline and/or the specific tasks.
- <u>Transform ideas and/or data:</u> create different representations (graphs, maps, equations, etc.); alternatively, students can <u>interpret</u> these non-textual information (graphs, maps, etc.) can be translated into another representation and/or inscription (i.e., into words or text; mathematical equations). Such tasks provide students with the opportunity to think deeply about the meaning of abstract forms and find meaning in these symbols and representations.

1.8 How do I know if my students are cognitively engaged?

Look for these indicators:
- Are they at the board?
- Are they talking to each other (on topic!)
- Are they assisting the learning of their peers

Monitor if they do any of the following:
- Are the seeking/exploring resources? (web, text, ...)
- Are they making attempts at using the proper methods and tools?
- Are they offering alternatives? (critical thinking)
- Are they recognizing when they need clarification or instruction by formulating clear questions?

1.9 How do I evaluate my activities?

AL activities will always take longer than you expect so plan accordingly. Keep your students on task by making sure of the following:
- Make sure that the **explanations and directions for the activity is clearly written and/or explained**. If students do not understand the tasks it will be difficult for them to get started and to stay on task without asking for your continued help.

- Make a check-list of the **"signposts" of the stages** of the activity.
- Specify the key indicators that determine successful completion of the stages. In short, what will tell you that the students have reached the key goals of that stage of the activity? This will allow you to judge when groups need to move on and when the activity can be considered successfully complete even if there isn't an answer to the question, or solution to the problem.
  - **PRACTICAL SUGGESTION**: Give the students a timeline/check list that they can fill in as they go. The data can then be used to monitor the activity.

1.10 How might I motivate students to engage in AL instruction?

Motivation is an important part of learning. Finding ways for emotionally engagement is a key aspect of designing for learning. This is being done in disciplines of biology (e.g., Robin Wright's activities) and even in physics (e.g., Eric Mazur's project based learning).

Ideas on how to accomplish this can be found in promising practices, here are some of these principles:
- Design activities that are relevant to your students' lives or the lives of others.
- Find topics or contexts that make an impact – e.g., social, environmental, political, or historical.

1.11 How should I form groups?

There are several well-known ways and methods of determining how to create groups that work (e.g., Robert Beichner suggests that groups should always have several members of the same gender). While such research can help to provide guidance regarding group formation, the best results always seems to be influenced by context and/or the chemistry of the class. With that we do not make any specific recommendations but rather state a few of the ways our colleagues have formed groups, and describe the benefits and drawbacks of these methods.

1. Teacher-selected groups – the teachers decide the group composition based on some criteria. A recommended way to do this *planned* – e.g., based on grades or results of some tests; not recommended way to do this is *random* – e.g., alphabetical.

    Pros:
- Heterogeneity of groups. Teacher can distribute students based on capabilities, known behavioural problems, etc., thereby creating what might be more "balanced" groups.

    Cons:

o Some students may be demotivated because they are separated from a study partner. This may result in disengagement from the group.

2. <u>Student-selected groups</u> - student choose who they sit beside and groups work together. This can be done either for an entire semester or occasionally. We discuss both.

<u>Pros</u>:
o Some students can feel comfortable at their tables and that they have control over their environment.

<u>Cons</u>:
o Homogeneity of groups – often groups form along prior social relationships (friendships, same school, etc.) this can lead to very strong or very weak ability students working together
o Students who do not know other people in the class are relegated to the mismatched group(s), which may make them feel left out (like the outsiders or sometimes the "losers").

3. <u>Mixed method of group formation</u>: sometimes the teacher determines the groups, sometimes the students can choose their group (e.g., students occasionally asked to sit with 4 new people).

<u>Pros</u>:
o Students get to experience the best of both worlds – working with friends and getting to know others. Or, working with a different set of strangers which allows them to break out of the role(s) they have been given in one group – i.e., they can take up and get involved in a new role with new group members.
o Teachers get to edit the group composition after determining who gets along and who does not.

<u>Cons</u>:
o Students don't necessarily like change and may not want to work with new group members for a variety of reasons (e.g., uncertainty of how they will get along, having to take on new roles).
o There is always a period of adjustment as students learn how to work together.

1.12   How often should I change groups?

The answer to this question is dependent on your instructional, social or motivational goals. Some goals might be:
o Do you want students to have the potential of experiencing different roles by changing into different groups?

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o Do you want or need students to understand how other students learn? By being exposed to lots of other students (more that the 5-6 at their current table) they can learn to appreciate their peers learning strategies.
o Do you intend for your students to work together on a semester-long project?

RECOMMENDATION for changing groups:
o If it ain't broke don't fix it!
o If you decide to change group members do so when there is time for students to get to know each other – e.g., at the beginning of a new course module, new content. NEVER change groups just before an important test or conclusion to an activity. In all cases, teachers SHOULD monitor and evaluate the group dynamics, processes and products in order to make effective decisions regarding group formation.

1.13 How can I evaluate groups?

What are you evaluating?

- Group dynamics/processes
  o teachers must circulate the room and "eavesdrop" on the groups. This gives you insight into how the group is "working."
  o ask groups to report on "processes" when presenting their work
  o ask for individual reflections at the end of class (one minute paper) that might give insight into group dynamics/processes
- Group product
  o easily evaluated due the "public" nature of the SMARTboard

1.14 Practical Advice

1.14.1 When do you intervene

Intervening in how groups work together must be done with care. If a group is completely off task or lacking any productivity due to either behaviour issues or lack of resources in the group should you change the group membership? This is the "art" of teaching. Do you want the students to continue to struggle or are you hoping that they can change their current practices and become productive?
o Some teachers may think it's up to the individual to get involved in their learning and leave it up to the student to make changes.
o Some teachers may change the membership of the group in order to change the "roles" these group members have become accustomed to.
o Using some sort of evaluation (potentially public) in class that demonstrates their lack of productivity might be motivating for the group to start to produce.

- o ** It is very difficult to "force" change at the second half of a semester. If you let students self-select groups for the majority of the semester and then try to make changes late in the semester it is very likely you will get opposition from students.

1.14.2   Is a noisy class good or bad?

One measure of determining whether a noisy class is good or bad is to check some of the following:

- Is the noise level uniform across the tables?
  - o If yes, probably good.
  - o In no, one table is probably not following.

- Walk around the class and listen to the content of the discussion.
  - o Are they on task?
  - o Are they making progress or are they lost?

- What's the cause of the noise?
  - o Excitement, arguing on-topic?
  - o Frustration?
  - o Off task and social interactions (e.g., discussing the hockey game)

SUGGESTION: It is a good idea to plan for a dynamic enactment of your class where times of loud discussion and group knowledge building are alternating with quieter reflection segments.

Section 2: Preparing to use the AL classrooms

2.1   Accessing the Door Codes?

The AL classrooms all have door codes. If you are teaching in any of these rooms, the door CODE will be sent by email prior to the beginning of classes. For all others and the door code can be obtained from DALC Fellows.

- For 3F.3, 3F.38, 3F.45
    - to keep door unlocked: A-4-A (*after doing CODE, wait 10 sec*)
    - to re-engage the lock: A-5-A (*after doing CODE, wait 10 sec*)

- For 3F.37
    - To keep the door unlocked: turn the lock mechanism on the door under the handle
    - To re-engage the lock: return the lock mechanism to its original position

IN BOTH CASES ENSURE THE DOOR IS LOCKED WHEN YOU LEAVE THE CLASSROOM.

2.2   Where are the Active Learning classrooms located?

There are three (4) general use AL classrooms at Dawson[2]. These four classrooms are located in the 3F wing of the building (see Figure 2). Note that the F wing has two corridors that are NOT connected. Please ensure you are in the F wing that is further away from the escalators. See Figure 3, following, for specific locations of these three classrooms.
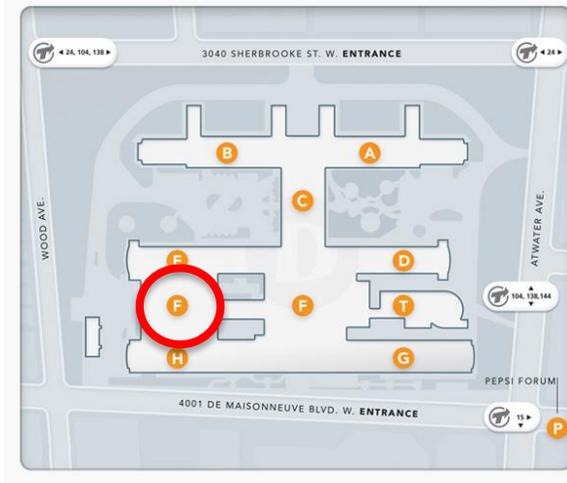

Figure 2. Dawson campus map.

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[2] There are also three (3) other AL spaces in the College but these are dedicated to specific departments. For further information about these spaces please contact the AL coordinators, Chris Whittaker and/or Liz Charles.

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Figure 3. Map of the F-wing ALCs

Specific locations of the AL classrooms on the third floor (3F wing)

- Room 3F.38 – <u>High Tech</u> (equipped with 7 interactive whiteboards – SMART Boards™)
- Room 3F.37 - <u>High Tech</u> (equipped with 8 interactive whiteboards – SMART Boards™)
- Room 3F.45 – <u>Low Tech</u> (equipped 1 interactive whiteboard – SMART Boards™ and with static white boards + pin-up boards)
- Room 3F.3 – <u>Low Tech</u> (equipped 1 interactive whiteboard – SMART Boards™ and with static white boards + pin-up boards)
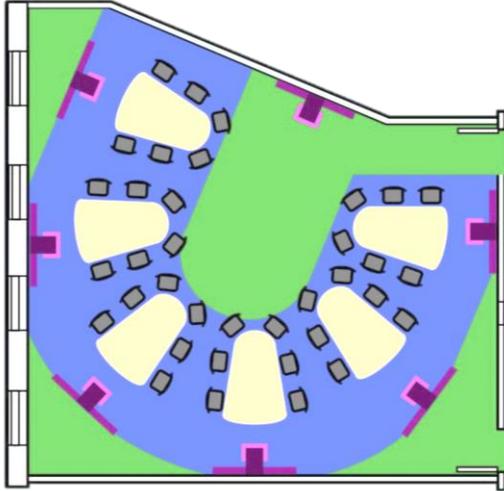
2.3 Designs of the Active Learning (AL) classrooms
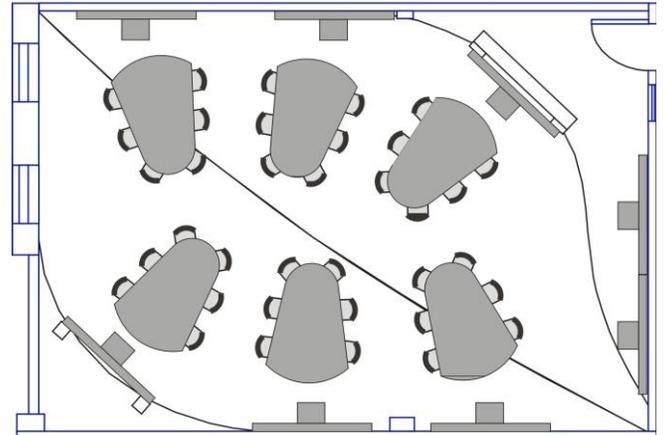

Figure 4.1 Layout of 3F.38
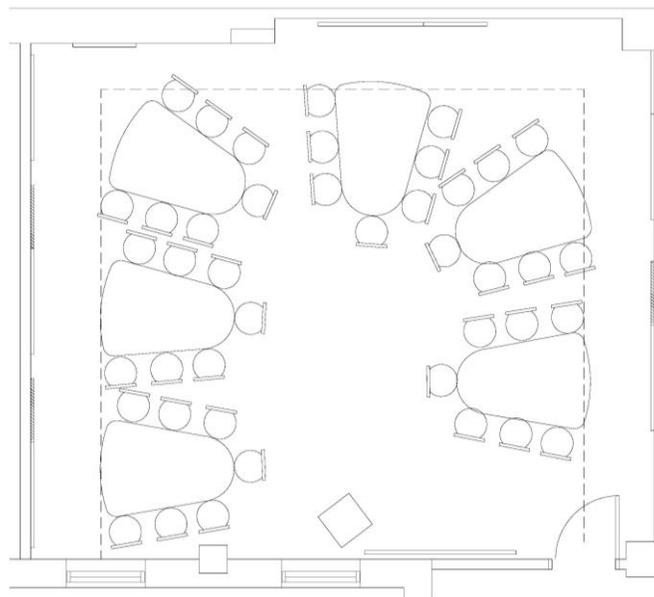

Figure 4.2 Layout of 3F.37

Figure 5. Layout of 3F.45

2.4   What's the intention behind the AL classroom design?

To support the enactment of Active Learning instruction which involves students' collaborating and teacher planning and managing of the learning – what is referred to as "*orchestration*."

- o   The tables are custom designed to maximize interaction with the boards without interfering with peer interactions.
- o   Student desks are clear (without technology or other obstructions) – nothing to get in the way of sharing ideas on work sheets, writing notes; as well as the sightline for discussions, etc.
- o   The whiteboards (interactive or static) are purposefully designed to "form the space" – just as they help to "form the teaching and learning" that happens in the rooms.
- o   The layout of the furniture allows teachers to see easily what groups are doing and to interact with them as needed.
- o   All whiteboards (interactive or static) are visible at a glance – which helps teachers manage and orchestrate the learning.

2.5　Matching AL Classroom Design to Learning Principles

The AL classrooms at Dawson have been designed based on key learning principles. It aims to provide students with an environment that <u>leverages Active Learning instruction</u> with a particular focus on maximizing engagement with peers and with tools that support learning.

Objective: to promote **collaboration** among groups (students at a table)
Design: Provide **unobstructed work surface** (open table tops) at a scale that allows reaching across the table, thereby, maximizing opportunities for working together and construction of <u>jointly shared learning objects</u>:
- Students have an opportunity to work together easily and engage in the back and forth discussion that is critical for constructing deep understanding of a topic.
- Students also rise to the opportunities to help each other. Specifically, students can engage in peer-to-peer support and mentoring sharing documents, textbooks, worksheets, etc. – this is called "reciprocal teaching".
- Interactions between group members have also been shown to promote a <u>sense of belonging and motivation</u>.

Objective: to promote development of **Shared & Shareable Knowledge**
Design: Provide **space to groups to work at their board**s, thereby, making it possible for all group members' easy access to work together on a single jointly shared learning object:
- Students all have equal access to contributing to creating the joint work. This also allows all students to have an opportunity to take part in the construction of the <u>learning objects</u>. This is very different from single user keyboards.
- Even shy students can contribute to the knowledge creation when they are not prevented from access to the shared knowledge objects that are being created at the boards.

Objective: to make **Knowledge Visible**; to increase opportunities for Feedback
Design: Put **whiteboards[3] in the hands of students**, and not just the teacher, thereby, <u>making knowledge visible</u>:
- Students have the opportunity to make their thinking visible through a variety of visualizations – writing, drawing, manipulating inscriptions (abstract symbols and equations), and experimenting with simulations.
- Teachers have the opportunity to "see" what students understand and what they do not. Revealing the state of students' understanding provides teachers with new opportunities to provide <u>immediate and targeted feedback</u>. Students thereby can get the specific support with learning at critical moments when help is most effective. This is a big change from waiting until students are at home and alone with their problems.

Objective: to increase the **Teacher's Accessibility** to all students
Design: Move the teacher desk to a central location in the room, thereby, improving the teacher's proximity to all students; and, their ability to move easily throughout the room:
- Teachers have better sightlines to all students and to all group work.

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[3] The technology of choice has been SMART Technology interactive whiteboards. For simplicity we refer to the interactive whiteboards as SMART boards in the remainder of the document.

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- Teachers can better "orchestrate" group work thereby manage activities designed with an Active Learning instructional approach.

Objective: to create a true **learning community** and increase the collaboration between groups
Design: Network interactive whiteboards to maximize the instructional and learning opportunities activities thereby knowledge can be distributed throughout the classroom:

- Teachers have the opportunity to use examples from the class itself, which helps to make the classroom a true "community of learners." Thereby, encourages and motivates students to develop values of mutual responsibility and accountability.

2.6　Lessons Learned From Our High Tech AL Classroom Use

- Interactive whiteboards are more powerful tools for learning when used by students as a device for sharing ideas and problem solving compared to presenting instruction and instructional materials (e.g., projecting PowerPoint slides).
- The act of getting up to the interactive whiteboard and physically manipulating objects in the document (what might be called knowledge objects), compared to using a mouse or keyboard for that same action, offers qualitatively different learning experiences.

  In particular, the act of working directly on the interactive whiteboard removes a couple of the barriers to collaborative thinking:
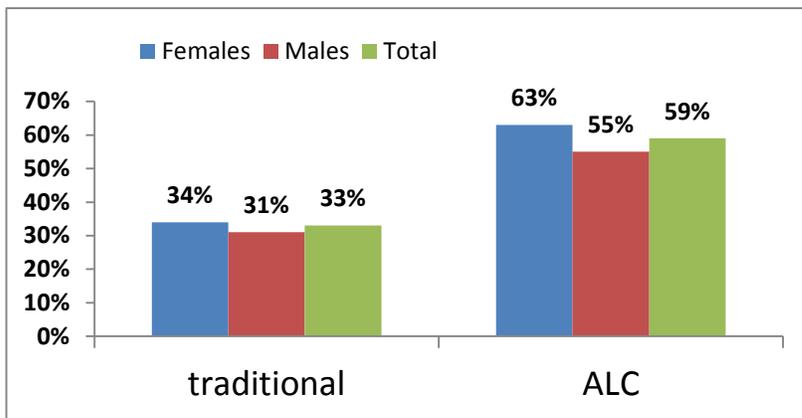
  1) removing the isolation of a single user by having multiple students contribute directly to the document;
  2) liberating the ability to express thinking by allowing for drawing out of ideas instead of converting them to keyboard characters and symbols.

- Unlike classrooms with desktop or personal computing devices that often support the development of knowledge in isolation (individual or small group), these new classrooms promote two new values around the creation of knowledge: (1) public; and, (2) shared. In doing so, both students and the teacher are no longer isolated from what is happening in the classroom. And, the opportunities and benefits related to group and social learning can be fully leveraged.

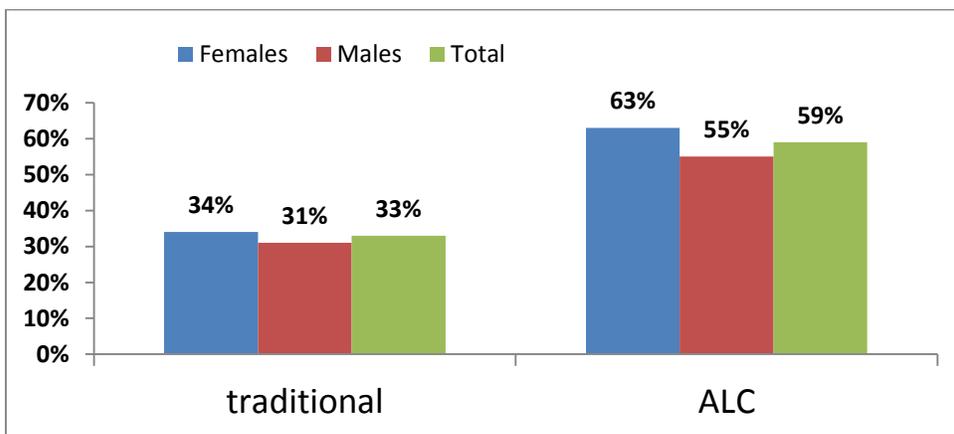## 2.7　Lessons Learned from Surveys of the Students

What we know from our survey of students who have had classes in Dawson's Active Learning classrooms. These results were produced from over 600 students who were surveyed over a period of 4 semesters (Winter 2012 – Fall 2013); the results represent the perceptions of the science students surveyed.

Compared to classes taught in traditional classrooms, when it is taught in the AL classrooms:
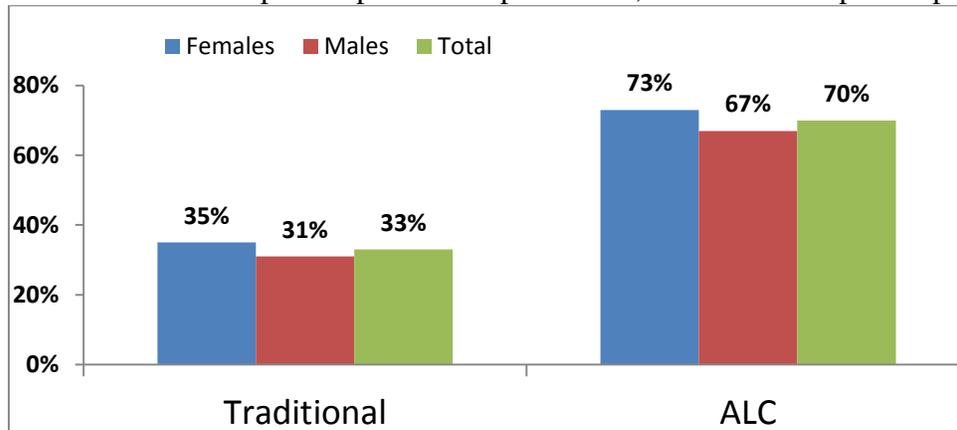
1. More students never miss a class.

2. More students report working collaboratively with peers.

3. More students attempted to provide help to others, and ask for help from peers.

Section 3: Starting to Use The AL classrooms

There are interactive whiteboards for teachers in all four AL classrooms. However, only 3F.37and 3F.38 have these interactive boards for the students.

3.1 How do I turn on the SMART Board?

Turn on the Smart projector FIRST, and wait for the power led light on the projector to have a strong green color (Figure 6). THEN turn on the computer (the black box under the SMART board).

Figure 6. On/off power control for the SMART board.

3.2 Developing good habits

- To start you will likely want to calibrate the board. To do so, press the two pen-tray buttons at the same time (Figure 7).

Figure 7. Starting the calibration process.

- A crosshair symbol should appear on the board (Figure 8). On certain boards, you can also press on the crosshair button right away to make the crosshair appear on the screen.

Figure 8. Crosshair for the calibration process.

- Touch the screen with the pen (or your finger) in the middle of the crosshair. Do it for all the crosshairs that appear.
- Your Board is now calibrated!

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3.3   How do I report problems?

- <u>ALL</u> <u>problems</u> with the technology (SMART boards and/or computers) are to be dealt with promptly and in the following manners:
  - o   In <u>ALL cases,</u> contact the Helpdesk by email (helpdesk@dawsoncollege.qc.ca) and leave a message in the log book (see wall pocket beside the teacher SMART board).
  - o   <u>If urgent</u> (computers or SMART boards are not working), <u>call the HelpDesk</u> immediately – (local 4357). Additionally, David Bannout (extension 1119) is the main SMART board IT expert <u>dbannout@dawsoncollege.qc.ca</u>

  - o   in <u>ALL cases</u>, please leave a <u>visible note</u> for the teacher who is directly following, if the problem cannot be fixed immediately.
- All other problems and concerns should be communicated to the DALC fellows and/or DALC coordinators by email.

3.4   What is the etiquette in these classrooms?

- **Access**: The rooms are to be locked (see instructions for obtaining room code & keeping the door unlocked during class, if you choose to); and, generally, students are NOT allowed to be in the room without the teacher.
  - o   When you leave the room: Make sure the <u>door is locked</u> behind you.

- **Food and drinks**: no food and drink, with the exception of water, are not permitted in the room – i.e., the rooms should be considered as other computer labs.
- **Tables and equipment**: Students are <u>not permitted to write on the tables</u>. PLEASE REMIND YOUR STUDENTS!
- **Furniture**: If you move the tables, please return them back into their intended formations (see <u>Figures 4 & 5</u>).

<u>For the HIGH TECH AL classroom</u>
  - o   Make sure the SMART boards AND the computers are <u>powered off</u>.
    - ▪   the SMART boards: push twice on the on/off button
    - ▪   the computers (the black square boxes under the SMART boards).
    - ▪   NOTE: student computers can be turned off at once by clicking on the "Shut Down" button on the SMART Sync™ window (Figure 9).

Figure 9: Shut down for ALL the student computers

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3.5 Giving tests and other individual assessments in the AL classrooms

- These rooms are NOT the best for <u>traditional individual</u> tests.
- You may want to reserve another room for your test.
- Alternatively, the Physics department has developed a system of dividers that may work. Please contact Chris Whittaker for details and suggestions: cwhittaker@place.dawsoncollege.qc.ca

3.6 Other devices that can be used in the AL classrooms

- Wireless remotes can be used to flip through slides (power points, Notebook) at a distance, without having to touch the boards.
- Using laptops, ipads and other such devices can be used with the SMART Boards. Check with technicians for the correct connectors.
  - It is also possible to use web-based software that allow students and teachers to share their personal devices (e.g., SMART amp; Reflector)
- Personal response devices (often referred to as "clickers") can be used as part of an AL activity referred to as *Peer Instruction*[4]. There are several models available at the College, including several sets of Turning Point™ clickers.
  - To use these please contact the DALC fellows and/or DALC coordinators.
  - For demonstrations on how to use personal devices (i.e., smart phones) as response devices

3.7 Summary of what the technology/software can and cannot do

- You CAN:
  - Project (show) the <u>Teacher board</u> around the room (on the student boards).
  - Project <u>Student Group boards</u> around the room (on the other student boards) one at a time.
  - Send (distribute) electronic files to <u>Student Group boards</u> (see instructions on how to use the software SMART Sync)
  - Open a web browser to a specific page on all the <u>Student Group boards</u>.
  - Send instant messages to <u>one</u> or all <u>Student Group boards</u>.
  - Chat with <u>one</u> or all <u>Student Group boards</u>.
  - Show videos and play them on the all the <u>Student Group boards</u> (see instructions on how to use the video display panel – **Appendix A**).
  - ONLY the <u>Teacher board</u> (in 3F.37, Board #2) can project sound.

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[4] Peer Instruction (PI) was developed by physicist Eric Mazur at Harvard University (Mazur, 1997; Crouch & Mazur, 2001)) and now used in every discipline, particularly when students have difficulty learning conceptual knowledge. See earlier definition. PI has been used extensively as a way to implement active learning pedagogy and its use has grown dramatically around the world (Meltzer & Thornton, 2012; Henderson, 2008).

Section 4: Information About the Software

4.1 What is the main software in the AL classrooms?

- The SMART boards main software is **Notebook™**
- **SMART Sync™** is the software that allows teachers to manage the networking and collaboration potential of the multiple SMART boards.
  - information on how to use these software packages are found in the Appendices − Appendix A (instructions for Notebook); Appendix B (instructions for SMART Sync).

4.2 Learning to use Notebook ™

- You can download a copy of the Notebook software for your personal computer
  - contact one of the DALC fellows or coordinators for the certificate number to obtain a license.
  - if you have a graphical tablet, you may use it to draw like a SMART board.
- You can also use a "Lite" version of Notebook from the web browser, without downloading the software.
- By attending the DALC meetings (Friday 2:30-4:00PM in room 3F.38)
  - The first DALC community meeting of the semester is often an introduction to hardware, software and best practices.
- By viewing links to the SMART Technology tutorials
  - http://smarttech.com/Home+Page/Resources/Training
- There are also often workshops at the Dawson *Ped-Day* events.

4.3 How can I view Notebook files from a non-interactive screen?

- Teachers and students will need to view Notebook files. Here are some helpful hints:
  - To view any of the "Notebook" files that were generated on the Smart boards you can upload and view them online at < http://express.smarttech.com/ >

  - To view any of the "Notebook" files that were generated on the Smart Boards you can download and install the viewer application available here: <http://www.smarttech.com/Home+Page/Support/Browse+Support/Download+Software>
  - Scroll down until you find the "SMART Notebook Interactive Viewer software", then choose your version (Mac/Win).