Improving the integration of students into the laboratory environment by intervening in orientation: A case of sensemaking

by

Rhonda Shea

Submitted to the Faculty of Extension
University of Alberta
In partial fulfillment of the requirements for the degree of
Master of Arts in Communications and Technology

August 31, 2011

Table of contents

Abstract

Medical laboratory technologists (MLTs), the third largest group of health care professionals, perform tests on body fluids and tissues in order to assist physicians in the diagnosis and prognosis of disease. In Alberta the minimum educational requirement to practice as an MLT is one year of didactic training followed by one year of clinical internship. An environmental scan showed that despite the students exhibiting adequate technical abilities they were somewhat lacking in the realm of soft skills. Upon reviewing the applicable literature, this was thought to be caused by a discord in communication specifically created by the knowledge gap between the student generations consisting of Generation X and Y and the staff generations composed of Baby Boomers and Veterans. In an attempt to focus on improving student integration into the clinical year, the focus of the mandatory clinical training orientation was changed from hard skill to soft skill with the spotlight being on laboratory cultural. Hudson, Kadan, Lavin & Vasquez, (2010) successfully performed a similar (technology mediated) intervention for hard (math) skills and found that "introducing old topics in new and exciting ways hooks students' interest and allows them to see things in a new light" (Hudson, Kadan, Lavin & Vasquez, 2010). Further to this, Rowold (2008) found that "non-technical training has an effect on soft skills" and that "interventions should be included into future theoretical models of training effectiveness" (Rowold, 2008). Thus, an intervention targeting the soft skill development of the students was performed, delivered and supported using electronic means in hopes that it would yield more successful student integration. This case study critiques the intervention from a sensemaking perspective and evidence was found that sensemaking is only accomplished through context developed via practice. Furthermore, aside from learning about and applying demographic studies into my work practice, examination of this case was fruitful as many lessons were

gleaned including the value added from utilizing simulation as a means of fine-tuning soft skills, creating and systemically utilizing a measurable device for tracking soft skills and ensuring the appropriateness of the media choice, not just from the demographic perspective but from an integration perspective (how the media choice will be integrated into the students life). Furthermore, and perhaps most importantly I learned to adjust my expectations in relation to how well students should integrate and how well I should expect subsequent interventions to work, and that the intervention would have perhaps been more successful had the focus been applied to the organization as well as the students.

Introduction/background

Health care encompasses many facets of patient services including, but not limited to, laboratory technology where technical experts perform tests on body fluids and tissues in order to assist physicians in the diagnosis and prognosis of disease. In Alberta, these technical experts are known as medical laboratory technologists (MLTs), and are the third most populace group of healthcare professionals. In order to be licensed to practice as an MLT, one must attend an accredited educational facility for a minimum of 2 years acquiring didactic knowledge, face-to-face from the learning institution and a clinical internship component from partner health-care service providers.

In the Edmonton area, there are two educational institutions that offer laboratory technology training: the University of Alberta (U of A) and NAIT. The U of A program is four years long with the first year being a pre-professional preparatory year, where the students acquire the prerequisites needed for entry into the program. Once admitted, the students spend the next two years learning the "core" components of laboratory medicine principles. Finally, the fourth year allows students to explore advanced concepts in laboratory medicine. The students graduate with a Bachelors of Science degree (BSc) as well as the Medical Laboratory Technologist (MLT) certification, which allows them the opportunity to work in a clinical laboratory setting. In contrast, the NAIT program is a two year diploma program that mirrors the two "core" years offered by the U of A program. The NAIT students graduate with an MLT diploma and the ability to work in a clinical laboratory setting. As mentioned previously, both of these institutions offer one year of theoretical and laboratory preparatory training performed at their respective facilities with a second year of clinical internship offered within the hospital and community healthcare system in the Edmonton area.

The educational model for Medical Laboratory Technology is competency-based, which means that there are defined endowments composed of attitude, skill, pre-requisite knowledge and standards (under pre-determined conditions) that each student must exhibit in every laboratory discipline in order to successfully complete their training. General competencies are characterized by the Canadian Society of Medical Laboratory Science (CSMLS) (CSMLS, date unknown) with specifics for the competencies being determined by each educational institution or representative based on site-specific limitations. All competencies must be completed prior to the licensing exam (also offered by the CSMLS) being written. The six main areas in which the students must be exhibit competency prior to being licensed include anatomical pathology, chemistry, hematology, microbiology, phlebotomy and transfusion medicine.

As the students enter their clinical internship, it is expected that their respective educational institutions have adequately prepared students to perform basic duties required by each of the six disciplines described above. In the Edmonton area the mode of educational delivery for the clinical portion of MLT training is that of simulation/facilitator/instructor where each student is provided with a brief student simulation (teaching) laboratory experience (TL) at the beginning of each discipline's rotation except phlebotomy. Within the TL environment, the students practice and gain confidence in the skills that will be performed within the clinical laboratories. Upon completion of the TL component, the students enter the "real" clinical laboratories, where they assimilate into the laboratory environment and complete a variety of competencies as facilitated by the laboratory staff (mainly fellow technologists).

In November of 2008 I began my position as the Coordinator, Staff Development and Education, Laboratory Services, with Alberta Health Services (AHS). Responsibilities in this role include (but are not limited to) overseeing staff development and education that relates to

the laboratories in AHS. The position includes coordinating the Edmonton-based training program for laboratory technology described above, which involves supervision of clinical educational staff, overseeing student clinical placements and teaching in my area of expertise (Anatomical Pathology). The whole of the student internship is overseen by myself and the clinical instructors with the majority of our involvement occurring in the TL environment. Part of the job includes ensuring that the program operates utilizing concepts of best practice to ensure that training is optimal. This often includes aspects of communications and research about communications. One of my first actions in this role was to perform an environmental scan to evaluate if our instructional methods were having the desired effect of ensuring the students integrate seamlessly into their new environment. The feedback that I received from the facilitators and instructors exposed a trend; the students enter the clinical sites with exceptional technically competence, but there was a prominent consensus that they are apathetic and do not understand the depth of what it takes to become a successful, medical laboratory professional. Staff members use terms like “lazy,” “stupid,” and “indifferent” to describe student behaviour. They declared that these behaviours seem to stem from a lack “common sense” exhibited by the students. More specifically the issues identified could be described as unprofessional, as students were demonstrating a lack of understanding of laboratory culture and inappropriate conduct in context of the laboratory environment as described above. Upon considering these comments, it became obvious to me that this indicated a problem with communication.

The TL component and following clinical site experience provides an excellent basis for the complex technical or hard skill development needed for the students to be able to adequately perform tests within each discipline. However, technical (hard) skill development is not the only critical component of successful assimilation into a working environment. Soft skills are

transferable and are encompassed by those individuals who are "dependable, resourceful, ethical, self directed, effective communicat[ors], [are] willing to work and learn and have a positive attitude"(Wats & Wats, 2009). "Communication is seen as a soft skill…, is the key to clinical governance and demands as much attention, respect and sustaining as other seemingly 'harder' targets in organisations, if relationships and systems are to be as effective as possible"(Jelphs, 2006). Problems with "communication ha[ve] been found to be at the heart of many tragedies" (Jelphs, 2006) including *The Mann Gulch Disaster* where thirteen smokejumpers perished in a forest fire when radio contact failed and expectations were not communicated effectively from the foreman to his crew (Weick, 1993). This is an extreme example of what can happen when communication fails, however the spirit of the consequences resonates in any situation where communication is less than optimal. In the case of laboratory-student integration, the communication issue turned students into semi-villains in the eyes of the staff. They began to see the students as a group of people who did not seem to respect the cultural nuances of their chosen career, which led to them simply not wanting to deal with the students anymore.

I began to explore the accusation that the students had no "common sense." How could it be that these students, who are adults, who have made it through a minimum of one year of post secondary education and (most) who have been successfully employed at some point have no "common sense"? The problem with this indictment is that common sense "enables us to grasp the common and worldly context of our experiences [and] impl[ies] a specific faculty of judgment"(Peeters, 2009). "Common sense comprises all our faculties: understanding, reasoning, the senses, memory. In particular, it becomes a faculty of judging, whether about external objects, the past, and so forth. In other words, common sense becomes a faculty of reasonable belief" (Somerville, 1987). Thus, common sense can be thought of as truly nothing more than a

consensus of reality created within the context of shared experiences; it is a way of making sense of one's situation and the information within the situation by drawing from a context where that situation has occurred in the past. In order for a person to exhibit common sense, that person must have had some sort of experience within the context upon which the common sense is expected. An example of this can be found within the game of baseball. Most North Americans know that if you get three strikes when you are at bat in the game of baseball, you are out. The North Americans that know this would expect that others should know this and would expect that this knowledge exist within the realm of common sense. Now, add into the mix a person from any country where baseball is non-existent, and that person had never heard of the game. This person certainly would not know about the three strike rule and would subsequently not even know what it would take to get a strike or what the terminology "strike" means. The person may also wonder what "at bat" and "out" denote. Does this indicate that the person lacks common sense or simply lacks common sense in relation to the game of baseball? Of course there are those that suggest that common sense is comprised of rules or knowledge sets that are common to all (Somerville, 1987), but in reality there may not be any knowledge that is actually common to every person or to the majority of people for that matter. The laboratory staff seem to use the term pragmatically citing norms common to laboratory culture as their common sense lens. They seem to believe that "the same degree of understanding which makes a man capable of acting with common prudence in the conduct of life, makes him capable of discovering what is true and what is false in matters that are self-evident, and which he distinctly apprehends" (Somerville, 1987). Again the idea of "self evidence" (Somerville, 1987) appears which leads back to the concept of common context being required if common sense is to be made. If common sense is truly contextual in nature, how does this relate to the case in question? What

contexts are common and uncommon between the staff and the students? People come into any situation with preconceived notions and ideas based on the context upon which those notions emerge. The students are no exception. There are many individual experiences each student carries forward when entering new situations and conversely, there are many experiences common to laboratory culture that the students are expected to be able to manage. Taking into account the details of each individual student and comparing these to their individual integration into the laboratory would be at best impractical, but mostly cumbersome. Thus, in light of my investigation into the integration of students into the clinical laboratory, and at the risk of propagating stereotypes, I chose to examine macro generational demographic differences between the two main groups (staff and student) involved.

Generational considerations have become a hot topic within today's knowledge savvy workplace. "Generational differences are psychological as well as technological, and these psychological differences can have a big influence on workplace behaviour" (Twenge & Campbell, 2008). In fact "organizations and managers who understand these deeper generational differences will be more successful in the long run" (Twenge & Campbell, 2008). The same holds true of the relationship between the laboratory and the laboratory students. If I as coordinator of the program can understand key differences between the existing culture and the students entering this culture, then perhaps I can create interventions that will enable a more successful integration of the students into the laboratory. The first step was to identify what the main differences are between these two groups, which are summarized in the following table:

Table 1: "Workplace characteristics" (Hammill, 2005)

WORKPLACE CHARACTERISTICS	Veterans (1922–1945)	Baby Boomers (1946–1964)	Generation X (1965–1980)	Generation Y (1981–2000)
Work Ethic and Values	Hard work Respect authority Sacrifice Duty before fun Adhere to rules	Workaholics Work efficiently Crusading causes Personal fulfillment Desire quality Question authority	Eliminate the task Self-reliance Want structure and direction Skeptical	What's next Multitasking Tenacity Entrepreneurial Tolerant Goal oriented
Work Is …	An obligation	An exciting adventure	A difficult challenge A contract	A means to an end Fulfillment
Leadership Style	Directive Command-and-control	Consensual Collegial	Everyone is the same Challenge others Ask why	*TBD
Interactive Style	Individual	Team player Loves to have meetings	Entrepreneur	Participative
Communications	Formal Memo	In person	Direct Immediate	E-mail Voice mail
Feedback and Rewards	No news is good news Satisfaction in a job well done	Don't appreciate it Money Title recognition	Sorry to interrupt, but how am I doing? Freedom is the best reward	Whenever I want it, at the push of a button Meaningful work
Messages That Motivate	Your experience is respected	You are valued You are needed	Do it your way Forget the rules	You will work with other bright, creative people
Work and Family Life	Ne'er the twain shall meet	No balance Work to live	Balance	Balance

*As this group has not spent much time in the workforce, this characteristic has yet to be determined.

Table 1 (Hammill, 2005) provides a breakdown of the generational demographics that we used to study this case. Hammill's table (Hammill, 2005) identifies key differences between the four generations of workers found in today's workplace. Using this and other demographic information available in the literature, I made many generalizations as a starting point for developing my intervention strategy. From the students' side I assumed that most of them would fall into either Generation X (Gen X) or Generation Y (Gen Y) with the majority being of Gen Y. Further to this "as a construct, a generational cohort refers to an identifiable group that shares birth years, age location and significant life events at critical development stages" (Macky,

Gardner & Forsyth, 2008), thus, I examined the "shared life experiences" (Turknett leadership group, 2007) that defined these two cohorts. This is detailed in table 2.

Table 2: Summary of "events and experiences that shaped Gen X and Gen Y" (adapted from Foot & Stoffman, 1996; Gordon & Steele, 2005; Meriac, Woehr, & Banister, 2010; Turknett leadership group, 2007; Twenge & Campbell, 2008):

Gen X	Gen Y
• Fall of Berlin wall • Challenger disaster • Desert storm and post traumatic stress disorder • Personal computers • Working mothers the norm • MTV • Divorce acceptable • Energy crisis • Recession • Birth control • Children of late Veterans or early boomers • Siblings may be late Boomers	• School shootings • 9/11 • Oklahoma city bombing • Internet • Child-centred world • Social networking • Continuous feedback – often positive • Enron/World.com • Iraq/Afghanistan • Weapons of mass destruction • Access to information anytime, anywhere • Children of boomers or early Gen X • Siblings usually other Gen Y

From these lists I extrapolated some main values including "techno-literacy, diversity, and fun/informality" (Turknett leadership group, 2007) for Gen X and "respect for diversity, informality" (Turknett leadership group, 2007) and technological superiority (Westerman & Yamamura, 2007) over the preceding cohorts (Baby Boomers and Veterans) for Gen Y. Commonalities between the Gen X and Gen Y cohorts were then compiled as follows (Foot & Stoffman, 1996; Gordon & Steele, 2005; Meriac, Woehr & Banister, 2010; Turknett leadership group, 2007; Twenge & Campbell, 2008):

- Comfort with technology
- Preference for informality
- Respect for diversity and individual needs

From the organization's side I assumed that the majority of staff members would be of the Baby Boomer (Boomer) or Veteran generations with the preponderance being Boomers. As these cohorts had been the dominating force in the laboratory setting for numerous years and were present when laboratory medicine was coming into its own, the predominance of these two distinct cohorts meant that the existing structure and processes would be designed and maintained by them. Again, I assumed commonality within the generational cohorts as depicted in table 3.

Table 3: Summary of "events and experiences that shaped Veterans and Boomers" Summary of "events and experiences that shaped Gen X and Gen Y" (adapted from Foot & Stoffman, 1996; Gordon & Steele, 2005; Meriac, Woehr, & Banister, 2010; Turknett leadership group, 2007; Twenge & Campbell, 2008):

Veterans	Boomers
• The great depression • New deal programs (social net) • Pearl harbour • WWII • Korean war • Radio and telephone • Child mortality high	• Civil rights • Feminism • Vietnam war • Cold war • Space race • Assassinations of political leaders • Scientific advances • Credit cards • Television • Economic boom • Children of Veterans • Siblings mostly other Boomers and large numbers

Again, values from these cohorts can be identified; Boomers value "work, competition and personal gratification derived from work" (Turknett leadership group, 2007), and similarly Veterans value "hard work, respect for rules and loyalty" (Turknett leadership group, 2007). Common values between these two cohorts were compiled as follows:

- Work above all else

- Structure
- Advancement through work

The comparison of these two groups of cohorts (Gen X/GenY vs Boomers/Veterans) crystallized that the scenario I faced was an organization staffed by, and shaped around, groups that value one extreme and the injection of those that have conflicting values. It must be recognized that today's workplace has been structured around norms and values set by those identified in Hammill's table (Hammill, 2005) as Veterans and Baby Boomers; this is clearly reflected in more traditional workplaces, such as healthcare facilities. A specific blend of these two generation's ideals has been realized within Laboratory Services and includes the following expected workplace norms:

- employer operates hierarchically
- employees are expected to have a sense of loyalty and obligation or dedication to the employer
- employer utilizes mostly formal (written) or face-to-face communication strategies (memos, phone calls, meetings)
- employer expects the "live to work" philosophy (this goes hand-in-hand with the dedication aspect)

This is in direct contrast to the blended value trends of the two newer identified generations, Generation X and Y, as the following workplace ideals can be noted:

- operate in a non-stratified manor – job title is not very important
- diminished loyalty to the employer – employee will accept a job that suits ones personal needs
- communication must be immediate and succinct – email, text, etc. fit this criteria

- life balance overshadows career ambitions – "work to live"

The diversity noted between the main values and workplace ideals of these two groups of cohorts leaves a knowledge gap between them; perhaps the goal of having a harmonious work environment is the same, but the path that must taken for this goal to be realized is significantly different depending on which cohort is consulted. Further to this, chart 1 provides a pictorial account of the distribution of the generational cohorts discussed in this case within the North American population.

Chart 1: The distribution of the four main generational cohorts in the North American population.

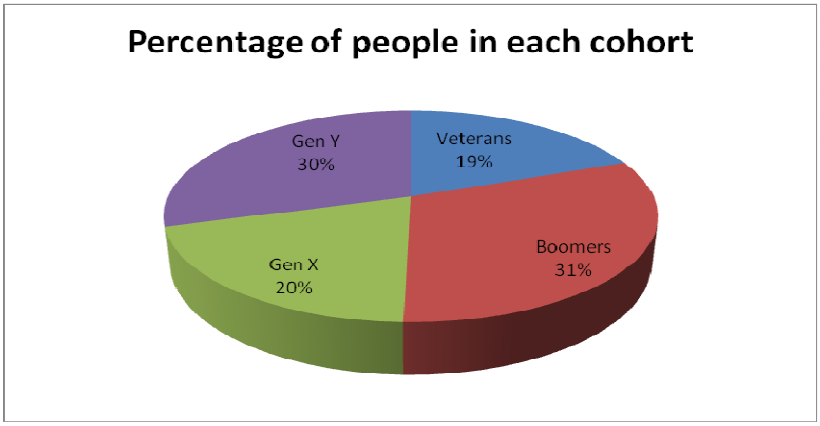


Chart 1 makes it easy to see that the distribution of cohorts is split exactly in half if they are divided into two main groups: Gen X/Gen Y and Veterans/Boomers. This chart captures that, and from a numbers perspective, each of the two main groups has equal legitimacy.

With such a vast contrast in workplace identified values and structural details, how can a new employee, or student, most of which are Gen X or Y, be expected to simply "fit" into the pre-determined workplace mould if the employee does not share the same value set or workplace ideals as the workplace itself? It could be postulated that the charge of a lack of "common sense" within the new students is unreasonable, as, from a generational perspective anyway, there is no

real commonality in attitude between the two groups of cohorts. Thus the information that is considered common by the presiding group, in this case the organization, facilitators and instructors, most of which consists of and follow a structure assembled by Boomers and Veterans, is essentially esoteric to the students belonging mainly to Gen X and Gen Y. Can the perceptions about the new generation of students, propagated by the staff, be softened, and if so, how? It was apparent that an intervention must occur at some level, either with the students or with the staff and organization. In this case I chose what I felt was the most logical place to intervene; with the students, as this was the area where I had control over what was done, making it the easiest and most practical place to intercede. As Coordinator of Staff Development and Education I am responsible for orientating the students into their clinical practice year. In an attempt to try and teach the students about the norms found within the new culture they were entering and hoping that they would be able to apply that which they have learned, I altered the orientation strategy for the medical laboratory students transitioning from didactic to clinical education.

The methodology chosen for altering the orientation structure was design-based and entailed the implementation of a procedure or technology (in this case a change in the orientation) followed by a subsequent evaluation and changes based on the evaluation (Design based research collective, 2003). This method of study was chosen as it "is an interdisciplinary and integrative process constituting an intellectual field of thinking and research and a professional field of practice and applied research [and] plays one of two roles: (1) the scientific study of the process and the content of design, and (2) the development of methods and tools to enhance the quality of design practice based on the body of knowledge developed by the scientific study" (Inderscience enterprises, date unknown). In the context of this case the design-

based methodology was used to fulfill the later role by examining the effects of implementing an intervention in communication in an attempt to improve the student integration. The following diagram reveals the flow of the project methodology:

Diagram 1: Flowchart for students integration case methodology

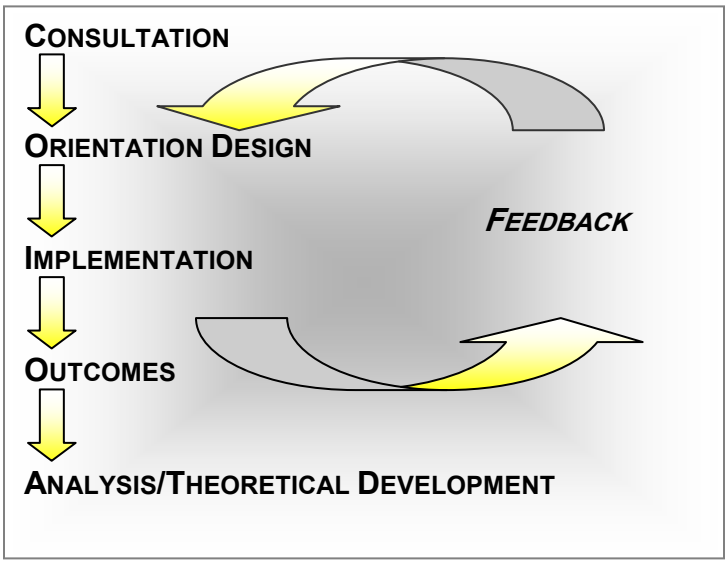


Diagram 1 illustrates our methodology for discovery where upon initial consultation, an intervention was implemented (environmental scan), outcomes were examined (lack of common sense) and a theory was developed (no common sense due to lack of context). Using critical theory as the epistemological approach to this conundrum "current assumptions [were challenged], boundaries [were altered], a paradigm shift was [produced], policies [and]/or practices were [critiqued], and inspiration [was drawn] from the intellect" (L'Etang, 2005). In relation to student integration we challenged what we "knew" to be true by examining the previous method of orientation and critiquing its value in context to new students. The project was undertaken in 2009/2010 as part of my role as the coordinator of the program, and was intended to reflect the AHS values encompassed by continuous improvement.

Orientations held prior to 2009/2010 relied heavily on the assumption of commonality of cultural expectations and focused more on the technical/housekeeping aspects of the students' clinical practice (start times, locations, etc) rather than on laboratory culture and expectations of professional behaviours. Prior to 2009/2010 the material covered was part of a full day orientation that also included a tour of the University of Alberta Hospital, a Laboratory Information Systems (LIS) introduction, an orientation to the Competency Management System (TRACCESS) and an orientation at a private partner site DynaLIFEDx (DLDX). The DLDX portion ran for ½ of the day while the other components were performed in the remaining ½ day. This left about three quarters of an hour for the remaining components.

The 2008/2009 orientation had a paper-based manual for the students to refer back to for general knowledge. However, students were not given any follow-up resource materials for the LIS portion of the orientation. LIS are used to manage the vast quantity of data that is collected daily from the patient samples processed in the laboratory. In the Edmonton Zone the following three Laboratory Information Systems are utilized in clinical laboratory practice:

- Sunquest (Misys): the DOS-like system that interacts with the Microbiology (DLDX only), Transfusion Medicine, Chemistry and Hematology instrumentation and staff. Students are required to use Sunquest extensively during the clinical rotation.
- CoPath: the Windows-based system that provides the interface between Sunquest (Mysis) and the users of DLDX and UAH Anatomical Pathology (AP). MLT students are not required to know how to manipulate CoPath, but they should be familiar with its role in the AP departments.
- Cohort: the DOS-like system that interacts with the UAH Medical Microbiology department and the Provincial Laboratory of Public Health. MLT students are not be

required to know how to manipulate Cohort, but should be familiar with its role in the Provincial Laboratory of Public Health and Medical Microbiology departments.

In the orientations held prior to 2009/2010 the majority of the LIS portion of the orientation was spent learning Sunquest, as this is the main system utilized throughout Laboratory Services in Edmonton. Not having reference material to support the Sunquest training was found to be problematic. The students did not have any indication for how to log into or manipulate the LIS other than trying to go from memory, which being a DOS-based program requires specific commands for utilization.

The remaining segment of the LIS portion of the orientation focused on TRACCESS. TRACCESS is a computer-based competency management system that AHS laboratory services uses for staff training and development and to provide students with supplemental site-specific (site found in the Edmonton area) information that is not contained in the educational institutions' learning materials. All of the Standard Operating Procedures (SOPs) are currently stored in TRACCESS. The information is sorted into folders, and the folders are made available to those who require access. For example, staff working in Anatomical Pathology will have access to the Anatomical Pathology folders that correspond to the laboratory benches that the staff member is trained on. Clinical students are required to utilize TRACCESS to complete fire and safety training and may be asked to complete other learning modules via this software. TRACCESS can be accessed using any lab-based computer, or from home by downloading the TRACCESS files. TRACCESS does not require follow-up reference material, as instructions on how to manipulate TRACCESS are found embedded in a folder within the program, and accessing the program only requires launching the software and logging in.

The only tour that was given was prior to 2009/2010 was that of the University of Alberta Hospital. In 2009/2010, the same year that the orientation was changed, the clinical rotation structure had to change in order to accommodate and reflect an increase in student numbers. Thus, other clinical training partners were introduced forcing the students to travel to alternate training sites throughout the city and making a tour of just the University of Alberta hospital inadequate.

In 2009/2010 there were 45 students that required orientating to the clinical practicum: 19 NAIT students and 26 U of A students. Students are split into groups for their clinical practicum year, so that each group can be placed in different disciplines at different times in order to address capacity issues within the clinical placement sites. In 2009/2010 the groups were split up as follows:

- U of A groups
    - U of A 1 = 7 students
    - U of A 2 = 7 students
    - U of A 3 = 6 students
    - U of A 4 = 6 students
    - Total U of A students oriented = 26
- NAIT groups
    - NAIT 1 = 5 students
    - NAIT 2 = 4 students
    - NAIT 3 = 5 students
    - NAIT 4 = 5 students
    - Total NAIT students oriented = 19

Due to space restrictions within the clinical sites the groups' start dates had to be staggered. As a result, the orientations were scheduled for three different timeframes, which corresponded with their start dates (one to two weeks prior to start date) as follows:

Table 4: Orientation and start dates for 2009/2010 MLT student groups

DATE OF ORIENTATION	CLINICAL TRAINING START DATE	GROUPS ORIENTED	# STUDENTS ORIENTED
25/26 June 2009	U of A 1 = 29 June 2009 U of A 2 and NAIT 1 = 6 July 2009	U of A 1 and 2 NAIT 1	19
23/24 July 2009	NAIT 2 and 3 = 27 July 2009 NAIT 4 = 3 Aug 2009	NAIT 2, 3, 4	14
10/11 September 2009	14 Sept 2009	U of A 3 and 4	12
		Total	45

Feedback regarding previous orientations received from students, clinical instruction staff, and clinical site staff drove the direction of the shift in the orientation. Changes were made to three main areas of the orientation: length, content, and delivery mode. The following table features the changes implemented for the 2009/2010 clinical student orientation:

Table 5: Comparison of the orientation structure between the 2008/2009 clinical year and the 2009/2010 clinical year

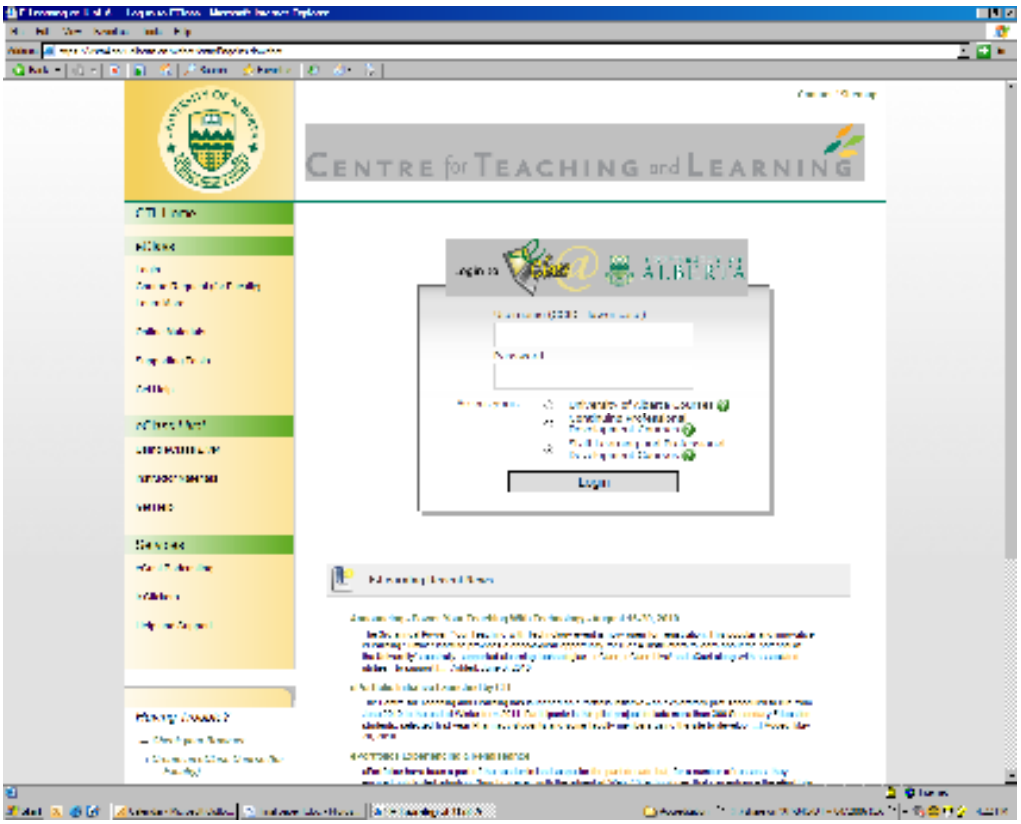
	2008/2009 STUDENT ORIENTATION	**2009/2010 STUDENT ORIENTATION**
LENGTH	1 day: ▪ ½ day at DLDX ▪ ½ to deliver the following: ▪ LIS Sunquest and TRACCESS ▪ general policies ▪ professionalism	2 days: ▪ ½ day at DLDX ▪ ½ day LIS (Sunquest and TRACCESS) ▪ ½ day general policies ▪ ½ day professionalism
DELIVERY MODE	Face-to-face, paper manual	Face-to-face, electronic
CONTENT	Hard skill focus	Soft skill focus

Table 5 shows that the length of time spent on each area of the orientation was increased. It was anticipated that increasing the length of time spent on each area and expanding the professionalism module to one half of a day would allow the students more opportunity to learn the material propagating better retention and more successful application of the material.

The concepts were now supported by electronic means in order to (presumably) increase access. The mode of delivery was changed from predominantly face-to-face with a paper back up to face-to-face with an electronic back up; the post-intervention orientation was performed face-to-face with direction on how to access the materials from any computer. The technology of choice for the delivery of the orientation materials in the newly developed 209/2010 model was the University of Alberta's eClass "a software program published by WebCT Blackboard designed to allow instructors to create and manage Web-based or Web-enhanced courses" (Centre for teaching and learning, 2011). In order for the students to be able to log into the orientation within eClass they required a Campus Computing Identification number (CCID). The U of A students already had CCIDs, as all current U of A students are assigned one when they

register. NAIT students, on the other hand, had to get special permission to access the system, and were all given temporary CCIDs. Because of this, the orientation was not a class where assignments or grades would be assigned, but rather an information-only course. These limitations meant that the orientation had to be included under the U of A staff learning and professional development courses rather than being part of the U of A's continuing education or University of Alberta courses. This is illustrated in screen shot 1 as follows, which identifies the three variations of courses available through eClass:

Screen shot 1: Login screen for the University of Alberta eClass Learning Management System



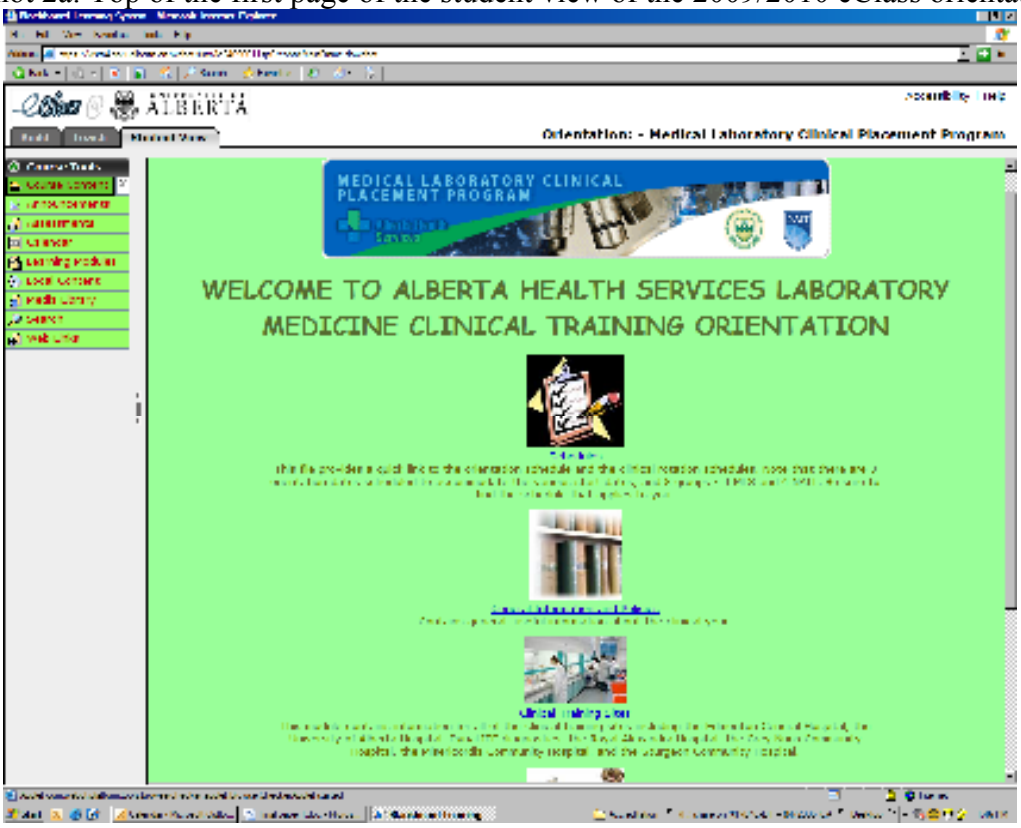
eClass was chosen, despite the limitations detailed above, because it can be accessed from any web-enabled computer terminal and does not require any special software downloads (other than Java) to operate, as everything is web-based. The clinical laboratory is a technological hot bed

with computer terminals throughout all laboratories. Furthermore, all of the students had access to computers at home, within their respective school libraries and at friends' or families homes. Thus utilizing eClass as the medium for orientation delivery ensured that students would have access to the orientation materials any time and any place. The building and design of the eClass orientation module was achieved primarily with support from a University of Alberta sponsored class called "Spring institute 2009: Power you class with technology" where eClass instructors taught the basics of building a WebCT-based (eClass specifically) course. eClass staff further supported the participants on an on-going basis upon completion of the course. The orientation was developed for both NAIT and U of A students combined (as opposed to segregating as was previously done) with a new logo designed to reflect this and divided into the following five main components:

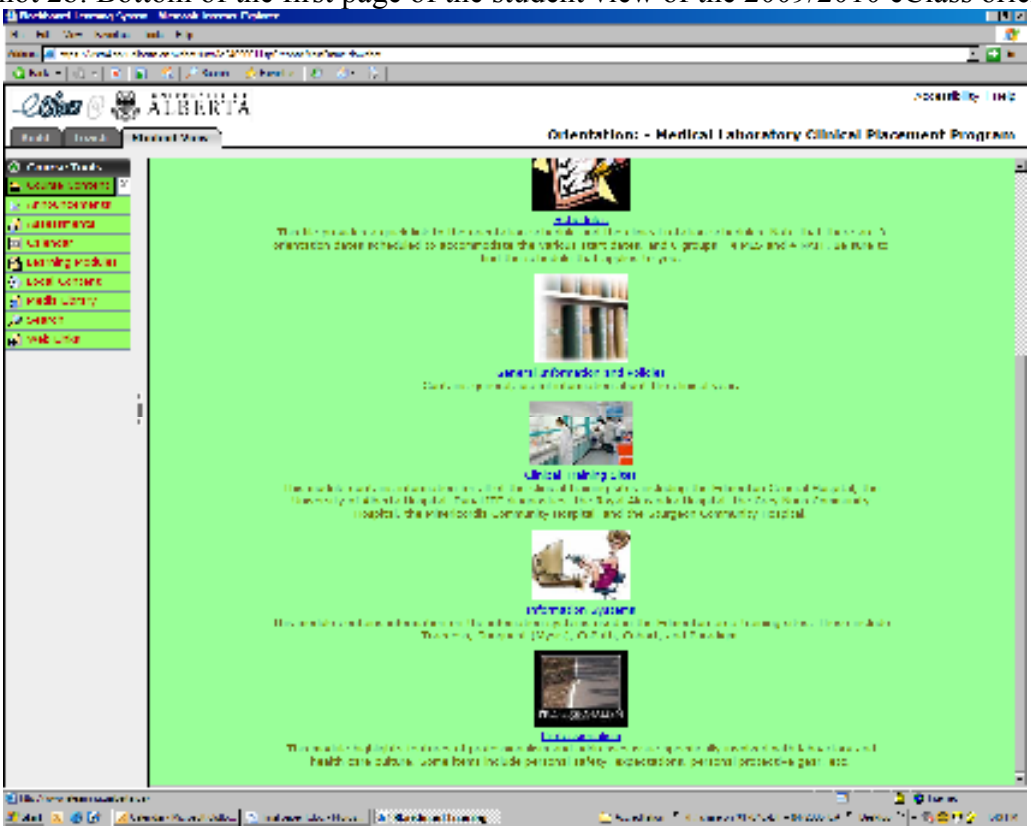
- schedules
- general information and policies
- clinical training sites
- information systems
- professionalism

These divisions were chosen in order to capture and publish all of the necessary information. The following two screen shots show the first page that the students saw when logging in:

Screen shot 2a: Top of the first page of the student view of the 2009/2010 eClass orientation

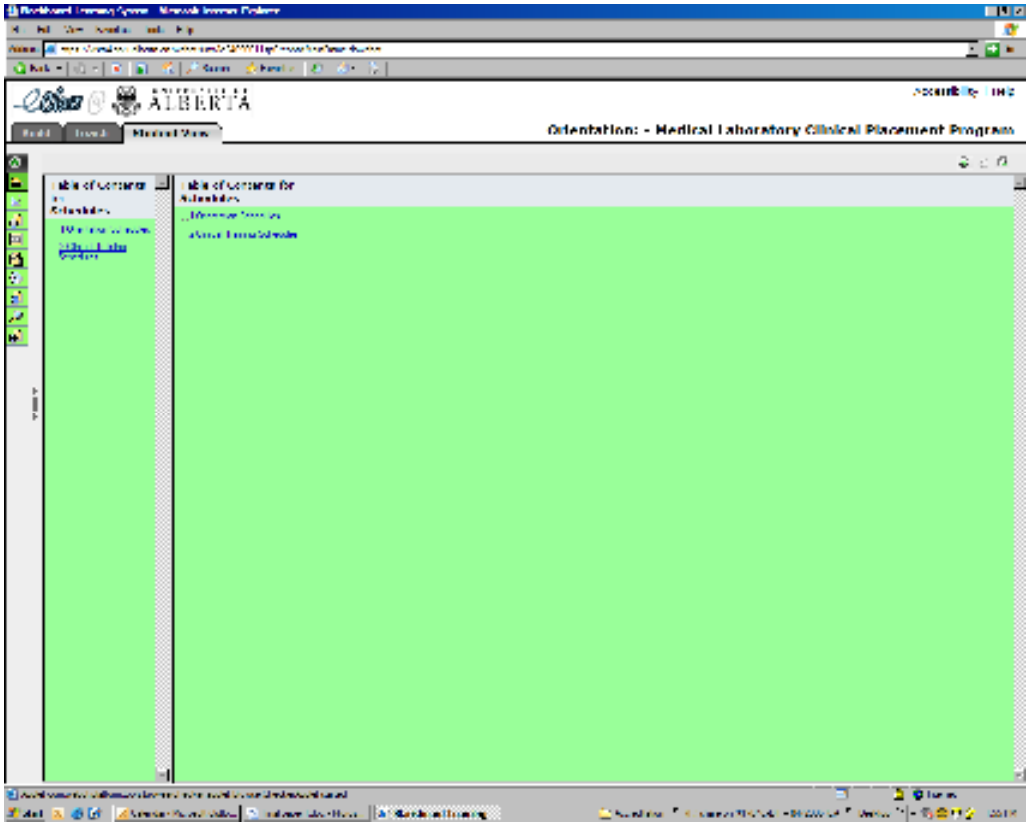


Screen shot 2b: Bottom of the first page of the student view of the 2009/2010 eClass orientation



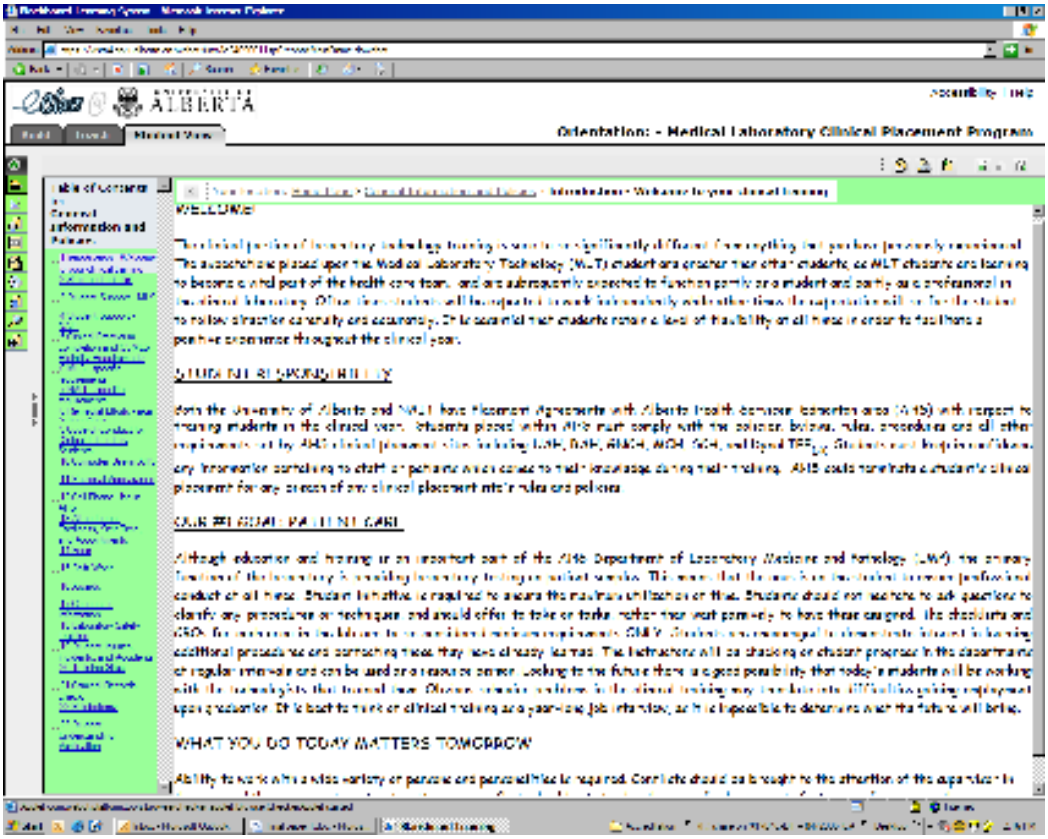
This page contained links to the five main areas of the orientation mentioned above. The schedule area contained details of the schedules that were relevant to the 2009/2010 students. The schedules included were for the student orientation and their clinical rotations. Screen shot 3 illustrates this.

Screen shot 3: Subcategories of the schedule portion of the student view of the 2009/2010 eClass orientation



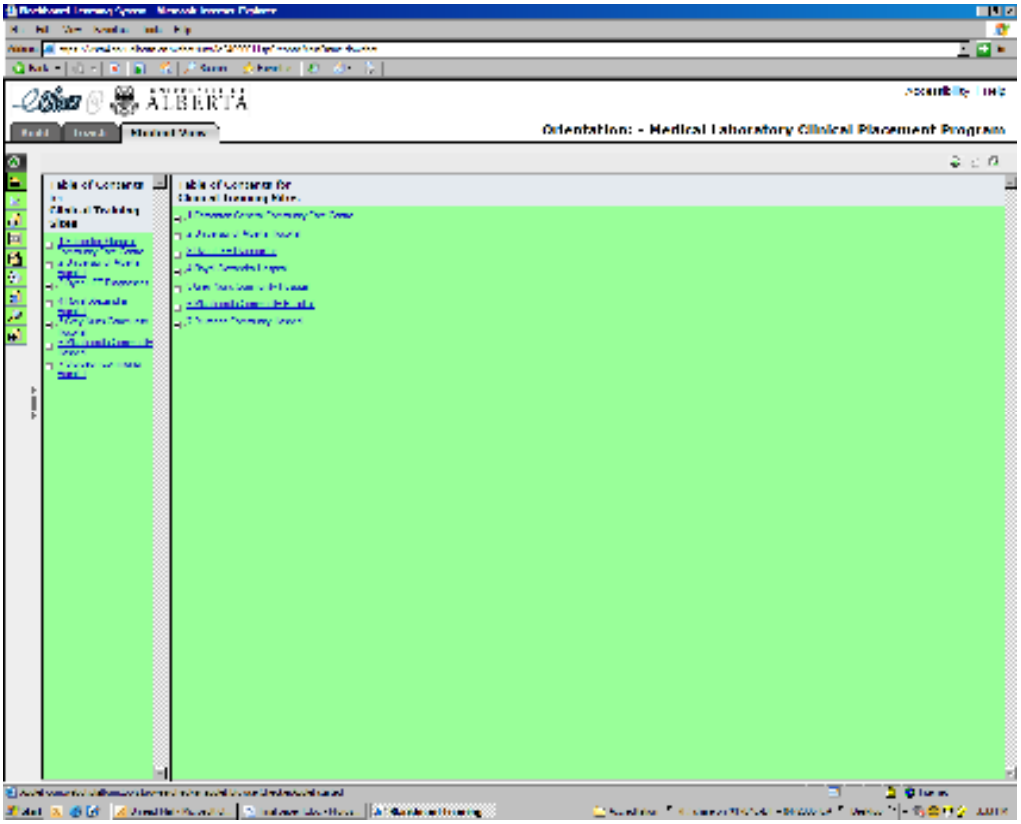
The general information and policies section provided an introduction to the students' clinical year, and contained a reiteration of the 2008/2009 general policy manual, but in easy-to-find chunks of information with links, located in a column on the left hand side of the page. The following screen shot demonstrates this:

Screen shot 4: General information portion of the student view of the 2009/2010 eClass orientation



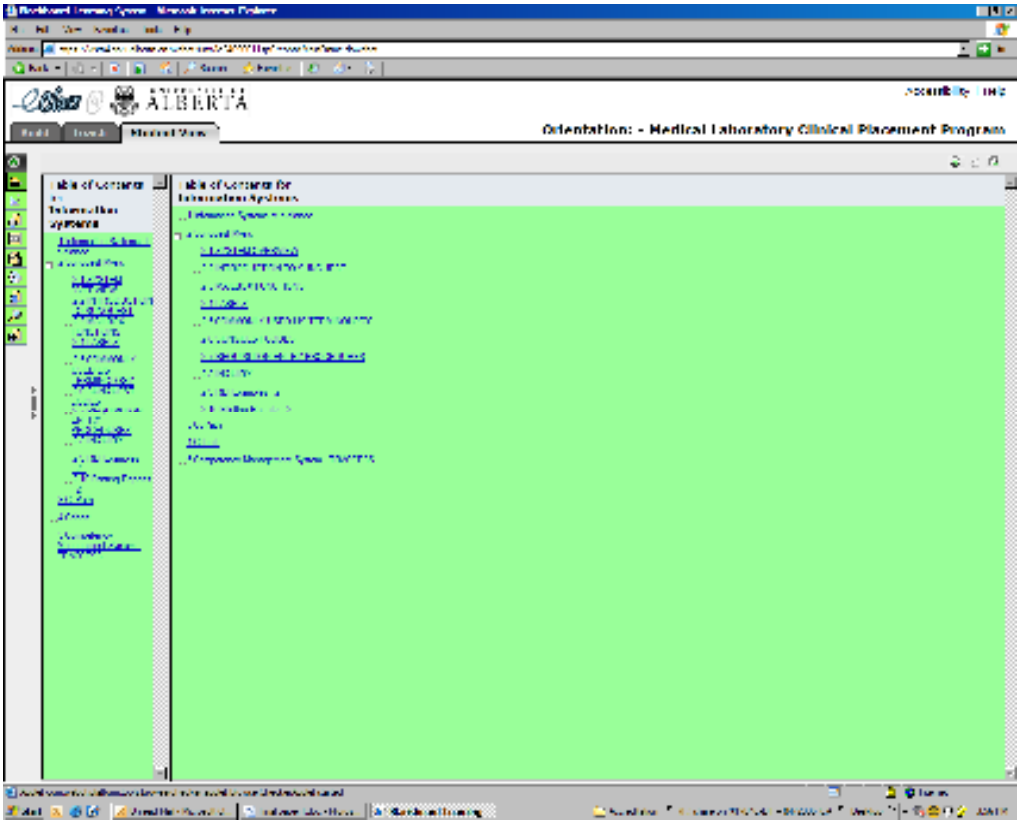
As mentioned previously, students were given a tour of the University of Alberta hospital as part of their orientation prior to 2009/2010. This practice was continued, but due to the fact that the students were now required to train at various locations throughout the Edmonton zone, it was essential that basic information be given to the students about the sites that they would be expected to travel to. Hence a link to fact sheets about each site was placed in the eClass student orientation. Each fact sheet contained a link to the Edmonton Transit System trip planner website, so that the students could plan their routes to the site via public transportation easily. Screen shot 5 displays this.

Screen shot 5: Clinical training site portion of the student view of the 2009/2010 eClass orientation



In an attempt to support the face-to-face session covering the information systems utilized by Laboratory Services in the Edmonton area, an information systems module was developed. This section contained a general overview of what an information system is, and provided details regarding the systems that the students may encounter. Unlike pre-2009/2010, Sunquest support materials were provided to the students in this module to provide on-going support. The following screen shot 6 captures this:

Screen shot 6: Information systems portion of the student view of the 2009/2010 eClass orientation



The most important component of the intervention is that the focus was altered from hard skills to soft skills. This was achieved twofold: increasing the amount of time spent focusing on professionalism issues from the perspective of the cultural expectations of the laboratory, and compiling or creating electronic resources to support this concept, so that the students could refer back to it at any given time. Under the previous orientation format, professionalism was but one point in a series of points in the general orientation. The basic premise was the students were given a list of rules and were expected to follow them – no questions asked. By teasing out the most applicable aspects of professionalism as defined by the clinical staff and placing them into their own separate category their importance was highlighted. The goal of this intervention was

to provide the students with a more comprehensive overview of professionalism in relation to the laboratory environment. This section was divided into several subcategories as follows:

1. Laboratory culture
    1.1. Your personality type and the laboratory
    1.2. Generational considerations
2. Professional ethics and societal responsibilities
    2.1. Confidentiality
    2.2. Professional organizations
        2.2.1. ACMLT code of ethics
        2.2.2. CSMLS code of conduct
    2.3. AHS code of conduct
3. Laboratory medicine: a knowledge-intensive profession
4. Medical and non-medical incidents
5. Safety: AHS perspectives

This module contained multiple links to videos, articles and other resources and was created to ensure that the information that the students required was at their fingertips at any given time as long as they had access to the internet. Further to this was the inclusion of multiple resources detailing issues that the students should expect to experience in the laboratory, namely, generational concerns and personality issues. Emphasis was placed on professional conduct as defined by all governing bodies that relate to student clinical training.

The content of the orientation was presented to the students in a room where each student had access to individual computer terminals. Students were encouraged to log in and follow along interactively with the presenter. The purpose of this was not only to engage the student, but

to ensure the student had access to the system and there were no technically difficulties. The housekeeping and technical sections of the orientation (schedules, general information and policies, clinical training sites and information systems) were briefly addressed, with the majority of the time being spent on the professionalism section. Within this section students took a Myers-Briggs test and shared their results anecdotally. They were given opportunity to watch the videos and have open discussion about what to expect during the clinical training year. I shared personal stories about my own laboratory experiences and supported the expression of questions, comments and concerns from the students.

Case data collection and results

Both quantitative and qualitative data was collected: Quantitative data was pulled from the eClass online orientation module and qualitatively, students were asked to provide verbal comment in an informal focus group setting where they could openly and honestly discuss the effectiveness of their orientation. This discussion was integrated into the feedback collected as part of their student experience by the training program. Feedback was also gathered informally from the clinical staff involved in student instruction. These functions were performed several months after the students had begun their clinical training in order to allow the students ample opportunity to utilize the orientation resources and acclimatize to the laboratory setting as well as providing the staff opportunity to observe student behaviours.

Table 4 reveals the quantitative data gathered from the eClass orientation module regarding usage of the software in the 2009/2010 clinical training year.

Table 4: eClass usage data for 2009/2010 Medical Laboratory Technology clinical training orientation

Statistic	Value
Total user sessions	176
Course designer sessions	71
Other student sessions	105

The table clearly shows that 60% of the access was generated by students with the remaining 40% from the class administrator. The 40% administration access included any maintenance required after the students were given access, but excludes the build time prior to student access. The 60% includes the time the students were given to access the orientation modules during their orientations sessions, which would account for thirty five of one hundred and five or 33% of the user sessions generated by the students. This means that 67% of the student user sessions were generated by the students independently.

As mentioned previously, qualitative data was gathered from both the students and the staff. Students were asked a series of questions regarding the effect the orientation had on their subsequent integration into the laboratory setting as well as questions about the technology used (eClass). There were three main themes that emerged from their feedback:

- There is redundancy in the iteration of the concepts of professionalism
- Electronic access, particularly in the context of eClass, was not effective
- A paper manual should be provided

Instructional staff members are asked to provide regular feedback regarding student progress. This is performed during monthly staff meetings and on an ongoing basis when issues arise. Furthermore, clinical site staff is asked to provide ongoing feedback regarding student progress. The main theme that emerged from the staff responses is that the students seem ostensibly unaware of general policies regarding clinical training expectations, predominantly in the realm of professionalism. Examples include persistent tardiness and absenteeism, and failure to perform clerical checks (patient identity checks) – one student was even required to withdraw from their program due to continuous failure of to perform this critical step.

Discussion

Knowledge – what is it? How do we know something? There are many definitions of knowledge, but for the purpose of this case study I have chosen the concept of Justified True Belief (JTB) as my context for the definition of knowledge, a confounding conviction that knowledge is subjective (Dawson, 1981). What does this mean exactly? Basically "knowledge is not sometimes, but always given in context and so can only be relied on to be true in that context" (Compton & Jansen, 2010). Choosing to intervene, based on what was known about the general demographics and subsequent values of the two groups of cohorts, was a valid approach at bridging the gap between the generations. Given that the Gen X/Gen Y cohorts value technology it made sense to try and integrate the technology into their orientation experience, and given that their work ethic is so very different from that of their predecessors it was reasonable to try and inform the students of what type of environment they were about to enter.

However, despite the best intentions of using the orientation as a means of narrowing the gap between the two groups of cohorts and creating a shared pool of knowledge where their values could intermingle, the results were mixed at best. Upon studying the literature it was concluded that a technologically robust approach would be best for the Gen X/Gen Y cohort, yet the results of this case refute this. Quantitatively the students used the software sparsely (see table 4), and qualitatively, the students practically begged for a paper manual to refer to rather than having to access the materials electronically. Furthermore, despite the students being told about the cultural norms of the clinical laboratory, they continued to portray a lack of awareness of the expectations. So why the discrepancy? This will be examined under the sensemaking lens.

The intervention occurred within the "what" realm of student knowledge base, rather than the "how" or the "tacit" aspects. It was felt that if the students arrived in the clinical lab

preloaded with the information of what was accepted, they could demonstrate to their trainers that they had a basic understanding of what was expected. This was naïve; since the students had not had a chance to practice the skills, they could not show that they had learned them. They had not been immersed into the culture, and therefore could not yet live it or understand it. This builds on the concept that "knowledge only exists in relation to other knowledge (here, the experiential knowledge of lab culture) [and that] there is no absolute underlying knowledge on which the rest of knowledge is built" (Compton & Jansen, 2010). In this case the interventionist tried to impose an "absolute underlying knowledge" (Compton & Jansen, 2010), which is really information thinly veiled as knowledge, expecting that the students would be able to immediately incorporate and use it. By not allowing the students to integrate this new information into their own identities and use it in context, the information itself could not make the leap from mere facts or opinions to actual workable knowledge that could be applied by the students. This would account for the students' comments about not needing to learn about professionalism. When trying to convey a concept as general as professionalism it becomes subjected to redundancy, as the subject matter is so broad that the same idea will likely be recycled throughout the students' academic careers (Compton & Jansen, 2010). Again this suggests that the "cognitive processes" required for integrating information into applicable knowledge "are contextual in the sense that they depend on the environment, or context, inside which they are carried on" (Contextual reasoning group, date unknown).

On a more pragmatic level, Pfeffer & Sutton (1999) suggest that knowing what needs to be done and actually executing the action are two distinct processes, and any disconnect between them leads to a gap. The authors suggest the following three reasons why this occurs:

- "Talk substitutes action"

- "Memory substitutes thinking"
- "Fear prevents action" (Pfeffer & Sutton, 1999)

All of these are rooted in the philosophical context of JTB: they must be placed in context in order for action to occur, action here being defined as "experiences that are not only lived through, but have been projected by the self and are performed in relation to [a] project" (Luckmann, 2008). When "talk substitutes action" (Pfeffer & Sutton, 1999) the concept requiring action gets pondered, presented, written up, prolonged but nothing concrete is actually done to ensure it comes to fruition (Pfeffer & Sutton, 1999). In this case study, this was done by the interventionist/instructional team and the students on some level. The interventionist placed the materials on line (presented it) and lengthened the orientation (prolonged it), but it was never truly tested in a simulation environment prior to the students being allowed test it in a real life situation where they would be evaluated on what they learned. One might wonder how it this step was skipped when the educational model in Edmonton is simulation-based; basically, the instructors did not adopt the same expectations of professionalism in the simulation environment as what was expected in the clinical sites. Thus the students had little or no opportunity to practice and integrate the information and "extract relevant cues [in order to] make plausible sense retrospectively, while enacting more or less order into these ongoing circumstances" (Weick, Sutcliffe & Obstfeld, 2005). From the student perspective it seems that they simply had too much to do, and therefore displaced this particular obligation sensing that any information presented in the orientation would be something they would experience anyway and therefore learn the expectations by trial and error. They knew that they were not going to be graded on their adaptation of the information into observable knowledge, so they most likely wondered why they should bother focusing on such details. In this case there was student-to-student chatter

observed by the instructors regarding how "unfair" the rules were, but the students did not take any immediate action to correct the situation. Instead they just let the situation unfold organically.

The students also relied heavily on personal memory in order to muddle through the clinical culture. Instead of asking "what's going on here?" and "what do I do next?" (Weick, Sutcliffe & Obstfeld, 2005) they chose inaction. Action "factors centrally into any understanding of sensemaking," as it "is much a matter of thinking that is acted out conversationally in the world as it is a matter of knowledge and technique applied to the world" (Weick, Sutcliffe & Obstfeld, 2005) suggesting that action is stimulated by the conversation and application of information. "Fear prevents action" (Pfeffer & Sutton, 1999) in this case, as the students regularly display a fear of the unknown (as we all do) and therefore continue to exhibit the same patterns of behaviour that they are comfortable with; they are essentially propagating inaction or exist in a stasis of comfortable action. There could be many reasons for doing so including peer pressure and not wanting to stand out in the crowd. David (2003) suggests that social exclusion may occur in newly implemented technological environments where those who are not involved in using the technology would be excluded socially. In this case the reverse may have been true. Students in laboratory training programs, like the ones described in the case, often do not want to stand out as being "too smart" or "too keen" and therefore try their best to blend into the background. This is also an inherent characteristic of laboratory professionals. People choose MLT as their profession for a reason: likely it is due to their desire to be part of the healthcare team without having to deal with the public. Instead they handle patient specimens and operate quietly in the background. The students of the laboratory are no exception. They tend to want to assimilate rather than distinguish themselves publicly.

As mentioned previously assumptions were made about student media choice in reference to orientation materials. Traditionally paper-based materials were given to the students, but since the students mostly belonged to Gen X and Gen Y it was assumed that an electronic medium would be an improved form of content delivery, as the students would be more familiar with this media choice and would therefore be able to make better sense of it. These cohorts are known to be comfortable with technology and students have access to computers in both their professional and personal lives. Yet they failed to access the content despite it being readily available anytime, anywhere. Why did this medium choice fail? Perhaps this is due to the students being forced to belong to a specific "interpretive community" (Littlejohn & Foss, 2004, p. 283) in relation to the medium which in this case is the eClass orientation module. Traditionally those who belong to such social constructs "define their own meanings for media," (Littlejohn & Foss, 2004, p. 283) and belong to these communities voluntarily. The students that participated in the orientation were required to do so using electronic media and therefore forced to belong to the eClass orientation community. They had no vested interest as far as they could tell, and therefore chose to place the orientation material on the back burner. Because of this there was no context for the material, since the students were not yet aware of its importance, thus there was no shared meaning within the group. Successful "electronic communication creates the paradox of separation through difference and the importance of participatory democracy" (Littlejohn & Foss, 2004, p. 279). Only one of these criteria were met; the group was separate because they are a unique group of students within the academic community and a unique group within the laboratory setting, but there was no "participatory democracy" (Littlejohn & Foss, 2004, p. 279) as they did not choose to belong to this group. Despite electronic media being described as a "retribalizing" media (Oosterhoff, 2001), the students had

no former context and therefore no desire to belong to this community and therefore unification failed in this case. Perhaps a paper manual would provide a sense of stability as the written word "freezes speech" (Postman, 1985, p. 11) and could provide a connection for the students with the teaching methods they are familiar with from their educational institutions. Since the students are experiencing extreme change at the time of the orientation, one constant, a paper-based manual, may symbolize a sort of grounding or connection to their educational roots. "The written word is far more powerful than simply a reminder: it re-creates the past in the present, and gives us, not the familiar remembered thing, but the glittering intensity of the summoned-up hallucination" (Postman, 1985, p. 11), which could provide the community context they do not consciously realize they are seeking.

Further to the lack of community context comes the idea of information overload. Both programs (NAIT and U of A) are extremely demanding. Students exist in a sort of purgatory state where they are not quite a student, but they are not quite a staff member either. They are responsible for knowing and recalling all of the information learned in the previous year and applying it to their practice. They must demonstrate competency in all of the laboratory disciplines in both the academic and technical realm. They must complete modules in TRACCESS related to each discipline, as well as safety-related modules. They must perform all of these while attending a clinical site for a regularly scheduled shift every day for nine months. They must follow the rules of both the educational institution from which they are enrolled, the rules from whichever clinical site they are at on any given day as well as the rules set out by the clinical training program that facilitates their placements and learning. It is easy to see how the "perception on the part of the [student] that the flow of information associated with work tasks is greater than can be managed effectively, and [the] perception that overload in this sense creates a

degree of stress for which [the students'] coping strategies are ineffective" (Wilson, 2001). Wilson (2001) identifies several effects of such overload including too much time wasted searching for applicable information, a delays in making decisions and distraction from the task at hand. "In order to investigate the information-seeking behaviors of professionals, the broader working context in which professional practice is conducted must be closely examined and understood" (MacDonald, Bath & Booth, 2011). In relation to the laboratory students (Wilson, 2001) postulates described above correspond well to the student experience.

From a time management perspective the electronic substitution of the clinical training manual may not have been the best choice. Retrospectively it becomes clear that in order for the students to access the eClass system, they require logins and passwords that are separate from those that they use for other tasks and they must find computer resources that are available. This all must be done at the exact moment that they require the information. If they do manage to remember their login and password, they must then remember where in the orientation they saw the information they are seeking. Orientation materials are traditionally reference materials in that they are not something one reads cover-to-cover like a novel, but rather a source of information when the information is pertinent; the eClass module in its designed format could not accomplish this objective. In relative terms (relative to the technologically savvy cohorts that were expected to utilize eClass), eClass simply requires too much time and effort on the students' part to utilize. Aside from the time and effort required to find pertinent information, if there is too much information to sift through then there is a propensity to simply shut down particularly if the information is not seen as essential for completing a task. This is known as information fatigue syndrome (MacDonald, Bath & Booth, 2011) and can be recognized by many symptoms including (as mentioned) a sort of "paralysis of the analytical capacity"

(Goulding, 2001) The eClass orientation modules contained vast amounts of information and despite the fact that they were chunked into what I perceived as manageable portions, this may assist in our understanding of the students lack of use of eClass. Furthermore, if the students are simply not spending the time perusing the information, then it would be virtually impossible for them to make any decisions relating to that information. This would be particularly notable in laboratory-minded people, as they tend to be "analytical, detail-oriented and dedicated" (Echaore-McDavid, 2008, p. 190) to providing a thorough analysis taking into account as much information as they can find. It would be typical for a laboratory professional to not bother to try and make decisions if the decisions are not founded on solid information. It is also typical for people to find something different and removed from what is expected of them to distract them in times of stress. An example of this is found within my own life. Typically, the busier I get, the more I find to do, and the more I accomplish. Does the pantry really need to be cleaned out while I write this paper? No, however it seems that I require a true distraction where something is actually accomplished in order for me to continue motivating myself to complete the paper. Using comparison between Orwell's *1984* and Huxley's *Brave New World*, Postman (1985) postulates that Huxley's vision of "man's infinite appetite for distraction" (Postman, 1985, p. 4) and fear that "what we love will ruin us" (Postman, 1985, p. 4), reflects the very root of the students' rejection of yet another piece of practical information to decode. The material presented in the orientation was simply not entertaining despite it being presented in a medium that was familiar and even preferred by the users. I imagine that instead of reviewing their orientation materials, the students were checking their friends' Facebook status, or played an amusing video on YouTube. Perhaps this is the students parallel to me cleaning my pantry instead of doing what I am supposed to be doing? Of course if the students do not review the

orientation materials, they will not be "ruined" as suggested by Postman (1985, p. 4), but it did have obvious consequences, as the behaviours exhibited by the students were not deemed acceptable by the staff. How can the important material contained in the orientation module compete with the satisfaction contained within distractions that are personally satisfying? It cannot, "for America is engaged in the world's most ambitious experiment to accommodate itself to the technological distractions made possible by the electric plug," (Postman, 1985, p. 91) or other pertinent distractions depending on the individual (me and my pantry) "as entertainment itself [has become] the natural format for the representation of all experience" (Postman, 1985, p. 63). Thus, the students rejected my meagre attempt to modernize and engage them in traditionally unfashionable and boring materials, ones that they were used to seeing in more traditional formats when associated with a learning environment. Thus, "our educators…need worry less about satisfying the demands of their discipline than the demands of good showmanship" (Postman, 1985, p. 71).

Other confounding variables

I chose to focus on the most substantial piece when studying this case: sensemaking. However there are other factors that may have played a role in the (lack of) success of the intervention. For instance, 2009/2010 was a transition year for the clinical training program. Funding was provided to the program, which allowed for the development of a fully-functional simulation laboratory and the hiring of new staff. The funding was received in response to an increase in enrolment of students into the clinical practice year. With the build of the new simulation environment came the moving of the program from the University of Alberta Hospital (UAH) and U of A, where discipline-specific labs were scattered throughout wherever space was available, to the Edmonton General Continuing Care Centre (EGCCC) in one giant consolidated space. Instructors now had to function together in the same room rather than in discreet pockets as they had done prior. New instructors were hired and trained along side the existing instructors. This highlighted differences in training styles and emphasized the new instructors' inexperience and the existing instructors' disconnection with current clinical practice. Once the move was complete and the new instructors were in place issues of standardization and best practice began rearing their heads. It became apparent that not only was there no interdisciplinary standardization, there was not even intradisciplinary standardization; the concept of evaluating best practice had never been considered. These issues cannot be covered in depth within the scope of this case study, but all of these changes undoubtedly had an impact on the student integration in 2009/2010 and most likely confounded the issues noted post implementation of the new orientation structure.

Conclusions – lessons learned

The point of the intervention was to try and address the issue of student integration into laboratory culture by implementing a more comprehensive orientation that utilized tools that the student would find easily accessible and user-friendly, and by providing the student with information they could use to provide a soft landing into the new adventure they were about to undertake. Many lessons can be learned from this experience with perhaps the biggest philosophical one being that the integration of knowledge and subsequent appropriate action cannot be predicted; one can only look at what is happening, make a reasonable hypothesis as to what will improve the situation, implement changes as needed and observe the outcomes with the intention of tweaking further interventions using what was learned. Opening myself up for this type of ongoing inquiry allowed me to discover several areas where improvements are still needed. First providing the students with an opportunity to practice their soft skills in context of a laboratory setting must become a priority. Because our module of delivery includes a simulation component, this can be reasonably explored. This has already begun, as I created a daily assessment rubric for evaluation of student soft skills. The rubric focuses on the same issues of professionalism described in this paper and is being consistently utilized in the simulation environment and then carried through to the clinical sites, so the students are given an opportunity to integrate the expectations into true knowledge prior to entering the clinical sites. This rubric provides daily feedback and must be delivered back to the instructors weekly, so that any issues with professionalism may be discovered in a timely fashion. This rubric is now in its second incarnation, as it has been so well received that I have developed and expanded it to encompass all laboratory training programs across the province.

Another important lesson was the idea that simply changing the media type is not sufficient to engage the students to utilize the media. The media choice must be readily accessible and exceptionally engaging, so that it can compete with the other distractions that dominate our culture, or it must be pragmatic and familiar, so that the students know exactly what is expected from them in regards to the media. Because the electronic resource was so unsuccessful, it was disconnected and a new paper manual was created. The new manual is compact, uses graphics and provides information that the students have asked to have available at their fingertips. The students are encouraged to transfer the manual into each disciplines' binder when they enter a new rotation, so that they have the information readily available. One option that is being explored is to place the orientation materials in TRACCESS, as the students are required to utilize TRACCESS on an ongoing basis throughout the year. This would solve accessibility issues and could perhaps provide a more engaging experience for the students.

Another lesson learned is that the intervention should have occurred on both sides of the issue. In other words, I should have spent more time and energy educating the clinical sites, so that their expectations of the students could be altered. I did run facilitator courses for the staff at the sites that were receiving students for the first time, but these classes focused on evaluating students and training the trainer rather than cultural differences between the laboratory and the students. Despite not providing targeted interventions on the side of the clinical sites, a ripple effect was noted none-the-less. When staff at the sites became aware of our efforts to improve the situation, they seemed to renew their interest in student training and became engaged in the process. They now diligently fill out the daily assessment rubrics and offer suggestions for how it may be improved. They have also become more tolerant of the behaviours they, at one time,

referred to as "lacking common sense," as they seem to have come to realize that the characteristics they all have in common, students and staff alike, is a dedication to patient care.

Despite the shortcomings of this intervention I consider it a success. Not only did I learn something about the demographical differences between the generational cohorts and sensemaking, but I am now able to apply these principles to other aspects of my job – and I often find myself doing just that. This also allowed me the opportunity to become the unofficial communication expert within laboratory world in Alberta Health Services, as interventions in communications had never been previously undertaken, and their importance had not really been highlighted. This has led to other projects that have increased the visibility of what laboratory professionals have to offer other than their technical expertise. The laboratory team is now engaged in the global learning service group with AHS, something that they had never been a part of prior to the intervention. This interdisciplinary opportunity will allow the laboratory educational team to further develop materials that will expand the student soft skill set and will perhaps create a better understanding of the generations so that strengths from each generational cohort may be drawn upon to create a harmonious, efficient and effective team.

Further study

The program continues to evaluate student integration and has implemented a number of further interventions in order to try and improve student/site relations. Further studies should include the success/failure of the daily assessment rubric, re-investigation of utilizing electronic resources and providing a pre-orientation, orientation to allow students the opportunity to ask questions based on relevant information prior to attending the orientation sessions.

References

Centre for teaching and learning. (2011). eClass knowledge base (FAQ). *Centre for Teaching and Learning.* Retrieved from http://www.ctl.ualberta.ca/elearning/eClass/kbase.php#what

Compton, P. and Jansen, R. (2010). A philosophical basis for knowledge acquisition: 3rd European knowledge acquisition for knowledge based systems workshop 1989. Retrieved from http://www.google.ca/#sclient=psy&hl=en&source=hp&q=a+philosophical+basis+for+knowledge+acquisition&aq=f&aqi=&aql=&oq=&pbx=1&bav=on.2,or.r_gc.r_pw.&fp=713e0dfa54fa9dc1&biw=1680&bih=869

Contextual reasoning group. (Date unknown). Contextual reasoning. Retrieved, from http://www.google.ca/#hl=en&xhr=t&q=contextual+reasoning&cp=20&pf=p&sclient=psy&site=&source=hp&aq=0&aqi=g2g-v3&aql=&oq=contextual+reasoning&pbx=1&bav=on.2,or.r_gc.r_pw.&fp=713e0dfa54fa9dc1&biw=1680&bih=869

CSMLS. (Date unknown). *Competency profiles - Canadian society for medical laboratory science.* Retrieved from http://www.csmls.org/en/certification/competency-profiles.html

David, M. (2003). The politics of communication: Information technology, local knowledge and social exclusion. *Telematics & Informatics, 2*0(3), 235.

Dawson, G. (1981). Justified true belief is knowledge. *Philosophical Quarterly, 3*1(125), 315-329.

Design based research collective. (2003). Design-based research: An emerging paradigm for educational inquiry. *Educational Researcher, 3*2(1), August 24 2011.

Echaore-McDavid, S. (2008). *Career opportunities in scienc*e. New York: Ferguson.

Foot, D. K., & Stoffman, D. (1996). *Boom, bust & echo: How to profit from the coming demographic shift*. Toronto: Macfarlane Walter & Ross.

Gordon, V., Steele, P. (2005). The advising workplace: Generational differences and challenges. *NACADA Journal, 25*(1), 26-30.

Goulding, A. (2001). Editorial: Information poverty or overload? *Journal of Librarianship and Information Science, 33*, 109-111.

Hammill, G. (2005). Mixing and managing four generations of employees. FDU Magazine online. Retrieved, from http://www.fdu.edu/newspubs/magazine/05ws/generations.htm

Hudson, S., Kadan, S., Lavin, K. & Vasquez, T. (2010). *Improving basic math skills using technology*. Retrieved from Online Submission. (ED512698).

Inderscience enterprises. (Date unknown). Readership. *Journal of design research*. Retrieved from http://www.inderscience.com/browse/index.php?journalCODE=jdr

Jelphs, K. (2006). Communication: Soft skill, hard impact*? Clinician in Management, 1*4(1), 33-37.

L'Etang, J. (2005). Critical public relations: Some reflections. *Public Relations Review, 3*1, 521-526.

Littlejohn, S.W., Foss, K.A. (2004). *Theories of human communication by Littlejohn & Foss (8th, eighth edition*) (8th ed.) Wadsworth.

Luckmann, T. (2008). On social interaction and the communicative construction of personal identity, knowledge and reality. *Organization Studies (01708406), 2*9(2), 277-290.

MacDonald, J., Bath, P. & Booth, A. (2011). Information overload and information poverty: Challenges for healthcare services managers*? Journal of Documentation, 6*7(2), 238-263.

Macky, K., Gardner, D. & Forsyth, S. (2008). Generational differences at work: Introduction and overview. *Journal of Managerial Psychology, 2*3(8), 857-861.

Meriac, J.P., Woehr, D. J. and Banister, C. (2010). Generational differences in work ethic: An examination of measurement equivalence across three cohorts. *Journal of Business & Psychology, 25*(2), 315-324.

Oosterhoff, R. (2001). *Meyrowitz, McLuhan, medium theory and me: Why medium theory needs to be taught alongside techniques for new communication technologies*

Peeters, R. (2009). Truth, meaning and the common world: The significance and meaning of common sense in Hannah Arendt's thought -- part two. *Ethical Perspectives, 1*6(4), 411-434.

Pfeffer, J., Sutton, R.I. (1999). *The knowing-doing gap: How smart companies turn knowledge into actio*n (1st ed.) Harvard Business Press <SKU> 1578511240-2-ABF-UI32361617.

Postman, N. (1985). *Amusing ourselves to death: Public discourse in the age of show business*. New York, N.Y., U.S.A.: Penguin Books, 1986.

Rowold, J. (2008). Multiple effects of human resource development interventions. *Journal of European Industrial Training, 32*(1), 32-44.

Somerville, J. (1987). Reid's conception of common sense. *Monist, 7*0(4), 418-429.

Turknett leadership group. (2007). *Generational diversity in the workplace powerpoint* [PowerPoint slides]. Retrieved from http://www.google.ca/#hl=en&sa=X&ei=xCFQTpSfDsXn0QH91Mj4Bg&ved=0CBkQvwUoAQ&q=generational+diversity+in+the+workplace+powerpoint&spell=1&bav=on.2,or.r_gc.r_pw.&fp=713e0dfa54fa9dc1&biw=1680&bih=869

Twenge, J.M., Campbell, S.M. (2008). Generational differences in psychological traits and their impact on the workplace. *Journal of Managerial Psychology, 2*3(8), 862-877.

Wats, M., & Wats, R. (2009). Developing soft skills in students. *International Journal of Learning, 1*5(12), 1-10.

Weick, K.E., Sutcliffe, K.M., Obstfeld, D. (2005). Organizing and the process of sensemaking. *Organization Science, 1*6(4), 409-421.

Weick, K. E. (1993). The collapse of sensemaking in organizations: The Mann gulch disaster. *Administrative Science Quarterly, 3*8(4), 628-652.

Westerman, J.W. & Yamamura, J.H. (2007). Generational preferences for work environment fit: Effects on employee outcomes. *Career Development International, 1*2(2), 150-161.

Wilson, T. D. (2001). Information overload: Implications for healthcare services *Health Informatics Journal,* 7(2), 112-117.