Revision of Space Utilization in the Ontario Colleges to Support Learner Centered Pedagogy, Technology and Users

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Introduction: Focus of This study

This report will explore classrooms and adjacent corridors which, when combined, form one of the central areas within the college campus. Additionally, this report will question why these areas do not reflect learning centered principles and flexibility in their physical design. Sadly, classrooms and adjacent corridor spaces within Ontario's college campuses continue to retain the physicality of the hierarchical, teacher centered stiffness that was the preferred education method popular five decades ago. In five decades since the inception and construction of college campuses, teaching pedagogy has changed dramatically. The relatively homogeneous Baby Boomer generation that were college students, five decades ago, are on the brink of retiring from the workforce and are being replaced with the new faces on college campuses who are anything but homogeneous. They are pierced and tattooed, reflecting many of the taboos from past generations. They are also the techno-savvy, socially networked Millennium generation students who demand a different learning experience. However, the physical makeup of classrooms and their adjacent space remains frozen in time. Incredibly, classrooms and corridors appear to be the neglected spaces on campus, but they are important spaces. Learning happens within the classrooms. Learning also happens in the corridors of our colleges. However, these spaces remain boring, stiff and they have become poor tools for educating Millennium students.

This report will incorporate research by those who have explored and in some cases implemented well-designed areas for education that are used to support positive human activity. It will also look at poorly designed or outdated space, which inhibits learning. It has been said that learning can happen anywhere and perhaps it can. However true this statement might appear to those that are not intimately linked to the physicality of space, it can also be said that learning can happen with far more ease where the kind of space provided is specifically targeted for education to include appropriate supportive areas for learning. This report will explore well designed areas that support and allow collaboration, discovery and social interaction to flourish. It is true after all, that the students of today want spaces that are both flexible and centered on their learning experience. Therefore, classrooms and adjacent corridors should be considered learning centered spaces designed to support education for current learners. These spaces should not appear to be a historic relic from the past, but should be flexible spaces that are well designed to facilitate student centered learning.

Introduction: Perspective view of this study

The report that I have prepared is seen through my research lens, which encompasses decades of learning and work experience within the fields of Interior Design and Adult Education. This duality of view is central

to understanding the dynamic connections between physical spaces, users of the spaces and learning centered pedagogy. Through my combined lens I have come to appreciate the connection that flows between physical space, instructional methods of teaching and the student learning experience. Additionally, through this dual lens I have grown to acknowledge the unique contribution of space as a tool. This tool, when designed properly, can be used to enhance a variety of unique teaching methodologies leading to meaningful learning experiences. Well designed space can sustain a variety of pedagogical methodologies, as well as reinforce both teaching and learning endeavours leading to the support of the two users of the classroom environment who are students and educators. Additionally, the duality of my lens offers a combined inside view of education. That is education as seen from the perspective of teaching as well as an inside view of interior design, which offers the perspective of meaningful physical change to college leaning environments. The perspective of the interior design view involved many years of space implementation for others. This work experience honed my keen understanding of the need to provide appropriate habitation for users of working environments. The perspective view of the teacher was my second career and it came years later. It has afforded work experience that considers the outlook of learning centered teaching within the southern Ontario college system. It was the sudden realization as seen through the combined lens of the designer/educator that clearly identified the disconnection between the physical space within classrooms and adjacent corridors. I noticed that spaces, specifically classrooms, were not resonating with users. In fact, space was inhibiting a myriad of pedagogical methods, collaboration of any kind, the appropriate use of technology, student engagement, ergonomics, effects of light and many other types of physical as well as teaching/learning accommodation issues that are central to the college education system. Thus, experiencing teaching on a daily basis, within inappropriate and non-supportive environments, while being inhibited by the physical space, has led me to question the effectiveness of the classic classroom setting, which I deem is a relic. It has led me to ask the central question: "why doesn't someone do something to implement change in order to create learning centered facilities?"

Introduction: Advocating for the Users of These Spaces

This report advocates for students and teachers who are the users of the classic classroom and corridor spaces that have not been changed in more than five decades. According to the text by Creswell (2009) this stance is the advocacy/participatory world view. Additionally, this report, "advocates for an action agenda" (p.9). However, in order to prepare the ground work for understanding why advocacy is necessary one must:

- understand what classic classrooms are

- understand a history of how they came to be

- understand why this spatial pattern continues to be repeated

- understand what is creating the need for change

- and finally, understand the possibilities for improvement

In order to fully understand the possibilities for improvement one need only look at the outcome of case studies that have improved other college and university spaces in order to support learning initiatives.

Classroom and Circulation Corridor Spaces

Classrooms and circulation corridors represent a large share of the overall campus space but one must question whether there really is enough space to be concerned about? It is obvious that college campuses consist of many different types of environments, why concern ourselves with the classroom and corridor spaces?

1. Classrooms and adjacent corridor environments represents a significant amount of student interactive space within the campus complex.

2. Classic classrooms are outdated. The current configuration of classic classrooms and adjacent corridor spaces are rooted in historic precedent of teacher centered pedagogy and this space pattern has retained its physical configuration for more than five decades.

3. The configuration of this space is the focus of this report. Research indicates that the classic classroom, as it remains today, is unrelated to current pedagogical methodology, technology and inappropriate for current and future user needs.

First and foremost one must recognize that classrooms and adjacent areas represent an enormous amount of space within the college campus complex. Other space types within college campuses include specialty teaching/learning areas, administration offices and support facilities to include physical fitness, food facilities and book stores. However, this report is focused on a specific type of essential teaching and learning space model within the college campus and this model takes up a considerable amount of area on the college campus. According to the Facilities Management group at Humber College (Ta and Anderson, 2010) the space allocated for 176 classrooms at the North and Lakeshore campuses represent the equivalent of approximately 2 football fields (Gardner, 2007) of internal area. This calculation does not include corridor space required to circulate around and into the classroom. If added to the classroom square footage the additional corridor space required to support 176 classrooms would inflate significantly.

College campus classroom environments in Southern Ontario have utilized the same formulaic design program that has existed, relatively undisturbed, for more than five decades. The historic formulaic pattern used to create the classic classroom is continually repeated on campus as if it were up to date and relevant to today's teaching and learning experience. However, the environment has deep roots in history. Prior to exploring potential updates and changes to classroom configuration it is necessary to understand the origins of the classic classroom that are currently in use within southern Ontario campuses.

The Historic View of Classic Classroom Design Configuration

The classic configuration of the classroom dates back centuries and the pattern of design has continued into the twenty first century. Historically the basic shape of the space was either rectangular or square. Refer to Figure 1 below. There was and continues to be a designated area for the teacher at the front of the classroom. Also found at the front of the classroom is a writing surface for use by the teacher. Newer classrooms

include a podium with controls for various types of technology intended for the exclusive use of the teacher. Refer to Figures 2 and 3 below. All students sit in a single seat facing the teacher with a personal desk space in front of them. The desks and seats follow a regimented (Lackney, 2001) row-and-column configuration (p.3). The tables are frequently heavy and are too cumbersome to move making flexibility difficult. In most classrooms, the furniture is tightly packed into the room. Flexibility (Teitelbaum, 2008) required to move this furniture around is next to impossible (p.5). Many classrooms have little natural light or none at all.

The location of the teacher in the front of the classroom is and remains fundamental to the operation of this type of classic classroom space. This space was and remains to this day hierarchical and is intended to ensure that the teacher dominates the students. Lackney (2001) commented that this historical view of the classic classroom supported curricular objectives of hierarchy and he said, "Traditionally, [this type of] classroom arrangement is dichotomized according to territorial (space organized by individual desk ownership) or functional (space organized by a specific activity) considerations. Educators have often assumed that row-and-column seating arrangements in classroom settings are the most common form of didactic teaching" (p.3). Echoing Lackney's view, Oblinger (2006) notes, "Historically, learning spaces were designed around teaching by maximizing the number of students in a room. The presumption was that good teaching results in learning-a presumption that focuses on the instructor" (p.14.3). Please indicate here how this information from the sources relate to your point of view.

The 'typical classroom' is the same configuration of a place of learning at Merton College Oxford founded in 1264. According to Hashimshony and Haina (2006), the learning space at Merton was a quadrangle shape which resembled a monastery cloister which would ensure maximum student obedience: " …the assurance of protection from the outside, the ease of surveillance over students, and the optimal utilization of small lots [of students]. This closed configuration reflects the severe character, the strict discipline and the rigor of daily routine of the college" (p.6).

The classic configuration of the classroom has not changed significantly over the years. It remains stuck in time holding tightly onto the hierarchical configuration of bygone days and the space remains inflexible. Taylor (2009) refers to the design as, 'a box car approach' useful when there was a standardized, hierarchical and rigid pedagogy and when educators were teacher-centered and required a tight enclosure for student containment (p.6). Ankerson and Pable (2008) concur but go further by saying that the classic classroom design was an assembly line business model of delivering facilities (p.256). It is time to move from this inflexible hierarchical design format to one that can reflect the needs of its users.

One would think that in more than five decades there would have been many opportunities to make changes to the classic design of the classroom and their adjacent corridor spaces. Refer to Figure 4 below. Certainly, one would think that within five decades of use something should have changed. After all, classrooms and adjacent corridor spaces are in constant use as space within colleges is at a premium. Additionally, over decades of constant wear and tear (Swan, 2010) these spaces have frequently

required renovation (p.8). However, in spite of constant renovations to these spaces which afford many opportunities for change, the physical hierarchical pattern of classrooms and corridors remains the default pattern of layout. In five decades many classrooms have undergone cosmetic adjustments, but significant changes to configuration have not happened. Three reasons for this phenomenon might account for the continuance of the spatial preference. Facilities Management departments who are the caretakers of these spaces prioritize the maintenance of campus buildings. The article written by Swan for Facilities Management Magazine (Swan, 2010) gives an overview of the attitude toward the management of building operations. That is, the Facilities Management departments within southern Ontario colleges concentrate on fixing diesel generators, leaky windows and broken plaster which is their first priority (p.6). Secondly, the article comments that facilities require funding. "Ask facilities managers about their challenges and they'll all come up with the same three: money, money and funding not necessarily in that order" (p.7). The third reason for neglecting change concerns a reactive response to design issues rather than methodical planning and thinking through issues which would foster change. The article in Facilities Management comments that whatever has to be done within the college, be it patch and repair of the existing facility, or the creation of entirely new facilities, is done quickly without much time to rethink old ideas or outdated classroom standards (p.8). The speed of construction frequently limits time to rethink and make changes to existing building standards. All too often a default configuration is recaptured and re-deployed for newly built teaching environments.

The classroom as seen as a formulaic configuration

College campuses consist of a collection of mixed use buildings that enclose a variety of facilities to include offices, cafeterias, libraries as well as classrooms. An example of a stand alone building on a campus with a singular use that might not contain classrooms might be gymnasiums. Buildings with classroom spaces represent a fundamentally important part of the teaching complex and one would think that changes to reflect new pedagogy, technology, the student attitudes of the current Millennium generation and learning centered innovations would be incorporated into newly constructed classrooms and corridors, but remarkably throughout five decades of renovation and rebuilding the areas have retained their old design pattern and remain unchanged.

The most common and universally recognized pattern for creating classroom space has become a default setting that stubbornly resists change. Say the word 'classroom' and for most, a universal picture of the space comes to mind. Refer to Figure 5 below.

Three influences have shaped the physical space of the classic classroom that we experience within southern Ontario campuses today.

1. Frantic construction
2. Reflection of the attitude of the generation
3. Technology of the day

Frantic Construction

In order to meet the anticipated population growth of the Baby Boom

generation, governments and teachers began to think seriously about secondary education. New colleges were established (Clark, Morgan et al., 2009) under a 1965 Act of the Legislation (p.9). Like a shot from a pistol community colleges began to build campuses and these buildings remain in use. In a recent article Swan (2010) interviewed facilities managers that were part of the construction frenzy of the 60's and they illuminate three pivotal issues concerning the construction of college campuses in southern Ontario. First and foremost the buildings had to be cost effective and short cuts were taken to meet very limited budgets. The second issue was, these buildings had to be constructed quickly and essential details concerning how colleges operate were sacrificed. According to the Director of Facilities Operations at Durham College and the University of Ontario Institute Technology (UOIT), college campus buildings (cited in Swan, 2010) went up in record time. In addition, there appeared to be no assessment of how these buildings were going to function for the users of the space. The buildings were simply seen as a generic shelter rather than a serviceable well designed college building. An operations official from Seneca College noted that at the time he thought one of the buildings looked familiar. Then later he discovered that the college building was a duplication of his high school (p.8). The outcome of this building frenzy and the consequential compromises made during the construction boom of the 1960's has resulted in a legacy of campus buildings that were built for a time when flexibility and change was unforeseen. As an additional result, the classrooms and corridors on the campuses of Southern Ontario do not support the current needs of this generation of students, pedagogy or technology.

Generations: Attitudes of Traditionalists who were the decision makers of the time

Generational differences help explain why our campus classrooms and corridors reflect a specific pattern of classroom design. Looking through the lens of the generation that were in charge five decades ago, one can understand the rigidity and inflexibility that has become the legacy of hierarchical design that remains today. Those in charge at the time established a framework of design that reflects straightforward, one dimensional, rigid thinking. They belonged to the generation commonly known as Traditionalists who experienced life in a linear way. It was their outlook that shaped the spaces that we occupy today. However, the generation that followed, the Baby Boomers, maintained this consistent attitude to campus space and they continued to perpetuate the strict design pattern of the previous generation.

A brief exploration of generational differences can shed light on the attitude toward design and education that prevailed at the time. Additionally, exploring generational differences will help to explain the attitude that shaped the physical classroom characteristics that pattern the classic classroom still in use today. But first, what is the definition of a generation? According to Shaw's journal article, *Engaging a new generation of graduates* (Shaw and Fairhurst, 2008), a generation is defined as a group which shares both the same birth years and significant life events. Thus, the generation; "share a similar world view grounded in driving social or historical events that have occurred during that generation's development years" (p.366).

The decision makers at the time of the college boom of the 1960's were Traditionalists (Sullivan, Forret et al., 2009) who were born between 1922 to 1945 (p.286). These were linear thinkers and according to the article, Community: The Hidden Context for Learning (Blackford and Wright, 2006), they were steeped in the English system based model of higher education. "During the mid-20th century, as classrooms became larger the level of social interaction diminished within the 'one size fits all' classroom and the student role increasingly became one of a scribe" (p.4.4). Thus classrooms were static spaces, as they had a one directional view. Traditionalist thinkers at that time presumed that learning only took place within the classroom and that the teacher was the primary educator. This attitude toward teaching and learning was apparent within the college environments (Brown and Long, 2006). The traditional view of classroom spaces was one-size-fits-all, and social engagement among students was never considered essential for learning. Classroom floor plans looked essentially the same and they were constructed, so that they were not conducive to discussions among learners. Social interaction was kept out of the classroom. The static hierarchical design of the classroom optimised a one way transmission of information (p.9.3). The students who occupied these classrooms five decades ago were the Baby Boomer generation whose attitude fundamentally was very different from their fore bearer generation, the Traditionalists. As the Traditionalist generation retired Baby Boomers transitioned from students to those of influence within the college system. Remarkably, the Baby Boomer generation ignored radical changes that occurred throughout five decades and it was this generation that continued to perpetuate the classic classroom design pattern. Thus the physicality of the classroom has remained unchanged and stagnant.

Generations: Attitudes of Baby Boomers who are the decision makers today

The issue that is difficult to explain is why the classic physical setting of Ontario's college classrooms has not changed in more than five decades. The question remains exactly why Baby Boomers have chosen not to make changes to the design of the classroom? Researchers have not asked this direct question to the providers of college campus spaces. However, research into generational attitudes of those that currently maintain these spaces can provide some insight. Understanding the generational attitudes of those that manage college premises today can shed light and give insight into the reasoning behind their steadfast loyalty to the configuration of the classic classroom space. Incredibly with so much advancement and change in every professional field, it is amazing to walk into these campus spaces and experience a type of time warp. As the Traditionalists generation, those born between 1922 and 1945 (Sullivan, Forret et al., 2009) retired from the work force it was Baby Boomers, those born between 1946 and 1964, who took over their jobs. Remarkably the physicality of the classrooms has remained the same, which to some degree can be explained by the generational preference of design patterning for this particular space (p.286). According to Oblinger (2006), "Learning spaces often reflect the people and learning approach of the times" (p.1.2). Although Baby Boomers are considered a different generation (Sullivan, Forret et al., 2009) they appear to covet a similar work place dynamic as their Traditionalist forbearers. That is, like Traditionalists, Baby Boomers want to maintain both control over their environment and

reflect a personalized space that will signal prestige. Therefore, walled offices as opposed to open environments are the preferred design model. Baby Boomers are most comfortable in a hierarchical, compartmentalized work environment. This design pattern preference is reflected throughout college campus design. An example of hierarchical design patterning is the continuation of enclosed and walled offices for college administrators. These offices reflect a singular use for the control of the occupant. The compartmentalisation of space to signal control as well as prestige for the occupant is a hierarchical method of interior design that has almost been abandoned in the corporate world. However, this design pattern remains in use within college environments. Likewise, the Baby Boomer generation view classrooms as compartments for one singular purpose and these spaces also continue the design pattern of compartmentalization. Just like offices, corridors are considered spaces that have only one purpose. It is apparent that this generation steadfastly clings to the opinion that corridors within colleges are only a means of conveyance and classrooms are only a teaching environment. Refer to Figure 4 below. In addition to being hierarchical supporters of college space, Boomers (Sullivan, Forret et al., 2009) have a 'work to live' attitude (p.285). They tend to be workaholics. They tend to work in silos. That is, they collaborate among their own but rarely collaborate with other disciplines. They tend to perpetuate the need to build and renovate college spaces quickly (Swan, 2010) and cheaply in order to provide space without input from other teams to assess how the space will be used (p.10). According to the article, Facilities Management, the Baby Boomer Managers of the facilities management workforce appear to want a master plan but have not gotten to it in five decades (p.9). They comment that they do not have time and rely on old outdated standards of design. Additionally, they tend to react quickly as soon as funding is released fearing that they will lose it unless it is spent immediately. Funding for renovation of new buildings comes suddenly and facilities management departments spring into action, making quick decisions in order to get the job done. They spend available funds and create space for students within an incredibly short period of time. They do not have time to revise standards and perpetuate old design concepts. However, reactive thinking without consideration to revised pedagogy and new student attitudes is not working for the users of these spaces. What leaders of campus management do not realize is that pedagogy has changed and so must the standards that strangle this essential educational tool. Oblinger (Oblinger 2006) comments,

> "Today's student –whether 18, 22 or 55 – have attitudes, expectation, and constraints that differ from those of students even 10 years ago. Learning spaces often reflect the people and learning approaches of the times so spaces designed in 1956 are not likely to fit perfectly with students in 2006". (p.1.1)

Generations: Attitudes of Xers who are the decision makers of the future

It is apparent that the generational attitude toward maintaining hierarchy focused design will change with the retirement of the Baby Boomer generation. Within a short period of time the Baby Boomer generation will retire and leave the workforce. The work attitude of Xers, (born between 1965 and 1983) the generation coming up behind to replace the Baby Boomers is that of, 'work to live'. According to Sullivan (Sullivan,

Forret et al. 2009) "Xers are seen as placing a higher value on balance to the point of being perceived as slackers. Xers are perceived to be more interested in doing work that expresses their personal value" (p.285). In addition to a difference in work attitude Xers have a greater comfort with technology than the previous Boomer generation. As well as being far more techno savvy the Xer generation has conducted a great deal of research focused on how people educate and how learning happens. They are fully on board with the discovery of new pedagogical practices and process of educating (Sullivan, Forret et al., 2009), which enhances meaningful learning. They understand that learning happens when participants interact and take on multiple roles such as listener, critic, mentor and presenter. They discovered that social group work enhances engagement and creates deeper learning, which is far more meaningful than the method of memorization frequently utilized by the previous generation (p.288). As well, this generation has realized that effective work is connected to supportive space. In the article, Trends in Learning Space Design, Brown and Long (2006) comment that there appears to be a renewed interest that has been demonstrated by the Xer generation, in connecting space as a tool to support learning. Brown and Long comment: "Hence it is not a surprise that learning spaces- classrooms as well as informal spaces – have an increasingly important role in catalyzing this type of learning" (p.9.2). Although the Baby Boomer generation appears to have coveted their hierarchical spaces and retained the look of the campus institution as an austere cloistered mix of boring spaces, it is anticipated that when given the opportunity, the next generation of users will make significant change.

The Traditionalist and Baby Boomer attitude toward the classroom and adjacent corridors was one of rigidity and uniformity. Classrooms were considered places to work and corridors were there only for the conveyance of people from one place to the other. However, the Xer generations see these two spaces as opportunities for learning which can happen everywhere. According to their view, learning does not exclusively happen within the classroom. It is possible that learning can happen in the corridor as well as the classroom. Thus Xers are leaning towards transforming these spaces to reflect a duality of purpose. This duality of design purpose is expressed in the article by Bickford and Wright (2006) who discuss the notion of community that happens in these two areas. They explore the blending of teaching/learning space with circulation space and then add social convening opportunities to both areas (p.4.2). They explore the expansion of the classic class space to incorporate the corridor areas and argue that this coexistence of space will improve student engagement. They comment that this newly blended environment fosters community. They also include an ever increasingly important technology component which is necessary to enable the occupants to communicate and collaborate. Bickford and Wright comment that the sense of college community is improved by "using the combination of pedagogy, curricular and co-curricular environments" (p.4.2). Their research into space explores learning spaces that are designed for new pedagogy which includes corridors that are large enough to accommodate enclaves designed for the continuance of learning. These are spaces where students can gather in teams, reflect and collaborate. This duality of space breaks down the rigid pattern of compartmentalized classroom and corridor, and it creates a communal environment designed for learning. Oblinger (2006) concurs and comments;

As we have come to understand more about learners, how people learn and technology, our notions of effective learning spaces have changed. Increasingly those spaces are flexible and networked bringing together formal and informal activities in a seamless environment that acknowledges that learning can occur anyplace at any time in either physical or virtual spaces. (p.1.3)

Technology that has shaped Ontario Campuses

College campuses in southern Ontario were developed at a time when technology was at its infancy. Gillett (1966) describes the technology available in schools during the 1950's and 1960's. It is hard to fathom that a simple teaching machine like the over head projector was looked upon as an item that could undermine the established pedagogy of the era. Gillett explains that during the period of the 50's and 60's there was an explosion of reading materials, magazines and journals. According to Gillett, the greatest threat to learning was the machines that would create microscopic images for reproducing this vast amount of information for storage into computers that could also be viewed on screen by means of over head projectors. Libraries were just in the process of obtaining scanners, screens and listening devices. "Other technological innovations such as overhead projectors, films, television are designed for group instruction. The most versatile and powerful of these is television" (p.288). In 1956 twelve American schools experimented with closed circuit TV. Canada's first experiment in classroom television was in 1954 (p.289). New courses in technology were recognized at that time. Gillette comments:

> One manufacturer of electronic equipment estimated in 1965 that Canada would need 30,000 computer programmers by 1970 and offered to provide equipment, help establish laboratories, and assisted in the development of curricula for computer training in secondary and technical schools. (p.292)

At this period of time colleges in Ontario were under construction and there was no way to forecast the rampant advancements of technology that would occur within five decades. There was no comprehension that technology would advance and become available, main-stream and part of our everyday life. Likewise, planners of college campuses at the time could not possibly comprehend the enormous changes that would take place within five decades and could not possibly have foreseen the need to provide the services necessary to support the technological infrastructure requirement needed today. The current state of technological provision of services has increased and has tried to keep pace with the demands of change but in most instances the addition of technology has fallen short. In the area of teaching technology there is little to support the current range of flexibility needed for the variety of pedagogical preferences in use today. Pedagogical types can range from static lecture to group discovery learning. However, technology in the classic classroom today still favours projectors that allow for only one static view at the front of the room. Refer to Figure 5 (Appendix p.31). Admittedly, there have been some technological enhancements to southern Ontario campuses. However beneficial to campus they are, they have failed to address the requirement for real change to the physically rigid outdated state of the classic classroom. Current technical services administrators would argue that

there have been huge advancements to the design of the classic classrooms and corridors. However, the injection of projectors into the classroom only enhances and in some cases replaces the chalk board. While there is positive benefit to the device it only augments what is already there and does not alter the learning experience. Furthermore, the orientation of these devices does not change the configuration of the classic pattern which is entrenched within the pattern of hierarchical teaching. Additionally, adding internet and WiFi does not significantly change the rigid pattern of college classroom design. It only allows users to access their personal devices. Although technology has only marginally enhanced the learning experience there must be credit given to those who develop technology services on campuses. Looking back five decades ago it was impossible to appreciate how far technology would impact colleges. Likewise it is equally difficult to determine and make allowances for technology five decades from now. However, if history is a good teacher then we have learned that our campus building must change and become flexible and able to absorb future technological changes.

Transition; a need for change to future learning spaces

Examining what we have today we can see that the legacy of classroom and adjacent corridor spaces on campuses in southern Ontario is undoubtedly a considerable amount of inflexible teaching centered space that has not changed in more than five decades. This space does not address current pedagogy, technology or student needs. The legacy of old campus design results from campuses that were built quickly without considering the need for physical support for the users of the space. They were designed without consideration of a need for flexible pedagogy and without an understanding of student needs in order to support learning. They were considered only as a means of providing a dry space where learning could happen and it was expected that learning would happen only in specific areas like the classroom. They were built without an understanding of a broader picture of the learner. They were built inexpensively and the combination of rapid building with insufficient funding, produced environments that today do not support learners. They were built without a clear vision of future technological needs. Additionally, past generational attitudes concerning a connection with space as a learning tool was not and continues to be ignored as Baby Boomers that remain in the workforce preserve the status quo of their Traditionalist predecessors. Further, Colleges in southern Ontario were built without an understanding of the connection between space as a tool that would support and enhance leaning centered endeavours.

The need for change:

Current classroom and corridor spaces in most of the 24 community colleges in southern Ontario are hierarchical in functional structure and they are physically devoid of character. In her article titled, *Challenging Traditional Assumptions and Rethinking Learning Spaces,* Chism (2005) comments that these spaces in particular are boring and without character. She points out current classrooms are, "Antiseptic environments consisting of white rectangles with overhead lights and bland tiled floors" (p.2.7). She then adds that human beings yearn for sensory stimulation with spaces that provide light colour and interesting room shapes. Additionally, classrooms and adjacent corridor spaces were and continue to

be designed for limited purposes. Classrooms were designed for teaching and corridors for the conveyance of people from one place to the other. For students inflexible classroom orientation fixes their direction of view to eyes forward and it sends them the message that they have only one option and that is that they must pay attention to the teacher in the front of the room. From the view of the teacher the space affords little opportunity to be flexible, collaborative and interactive with students. College corridors are equally stiff, hierarchal and boring leaving no opportunity for students to engage in socialization outside of the formal learning environment. They currently consist of long spaces designed strictly for the placement of lockers (storage containers) and the movement of people from one internal space to the other. For our students this type of environment has a negative effect on learning. Oblinger (2006) notes that space can either bring people together or drive them away. Conversely, if executed correctly appropriate space can support exploration, collaboration and discussion thus fostering engagement.

The recognition of spaces as a tool to support learning

To recap the original question: why haven't these spaces changed in more than five decades? A partial answer is that in five decades past generations have been satisfied with the retention of the status quo and they have not realized that appropriate space can support learning. In fact, until the most recent generations of students arrived onto college campuses bringing their technology with them there has not been a compelling reason to enact change. Three significant issues have begun to make the providers of college classroom space take notice and recognize that the users view space differently, yet still do not enact change.

The call for change from students and parents

Perhaps the most influential group to speak for change to the existing classroom condition are students. According to the article written by Oblinger (2006) for they want their college spaces to meet, their education and social expectations . In addition they want their environment to support their ergonomic, social and learning objectives as well as the maintenance of their personal devices. Accordingly, students today want casual, multi functional learning spaces where they can relax within a comfortable environment while accessing a variety of electronic devices.

> As we have come to understand more about learners, how people learn, and technology, our notions of effective learning spaces have changed. Increasingly, those spaces are flexible and networked, bringing together formal and informal activities. (p.1.3)

However, few formally organized spaces exist on college campuses resulting in students creating their own areas.

Unlike other generations, today's students are beginning to look for supportive space of a different kind. These students are looking for a space to collaborate, network and plug in. Milne (2006) describes the Millennium students as 'digital natives' and he comments that they have redefined the meaning of cut and paste from users of paper and scissors to digital manipulation (p.11.1). According to Oblinger (2006) characteristics of these techno savvy students is that they "have no fear of technology. Mobile phones, digital cameras, and MP3 players constitute today's backpack.

Browsing, downloading and messaging can happen anywhere and any time" (p.1.2). In fact all of the aforementioned activities happen all of the time. However, on the campuses of southern Ontario colleges there are very few spaces available for students to plug in their devices and it is not unusual to see students huddled on the floor in corridors with all types of devices plugged into an adjacent duplex receptacle. Likewise with the proliferation of laptop computers it is not unusual to see students lining the walls of a classroom with their devices plugged into any available socket. Refer to Figure 6 below. Millennium students love their technology and with the ease of use and accessibility the Net generation want more and need more from their education environment in order to support their needs.

Providers of college spaces cannot help but notice the clusters of students in hallways as well as the proliferation of electrical devices that have invaded the education environment. Refer to Figure 7 below. Conditions are inconvenient as well as hazardous and students are starting to voice their opinions in Macleans Magazine (Dwyer, 2010) about the suitability of old facilities and more importantly so are their parents (p.164). Both students and parents feel the cost of education is high and they want suitable facilities that reflect their financial output.

The call for change from educators

Another group exerting pressure on colleges to create physically supportive change are teachers who recognize that spaces are impeding their ability to use pedagogy effectively. Additionally, they recognize the environmental structure of the classroom (Graetz, 2006) must support their learning strategies (p.6.2).

Teachers are growing frustrated with antiquated classroom environments. They realize that enacting change to the design of current hierarchical classrooms requires significant modification of traditional assumptions concerning the design features of classroom space. Additionally, they understand that by altering the design message they can create spaces for learning that are rich and meaningful. However, to date no one appears to be taking notice. Consequently, teachers are not using their full pedagogical arsenal and they are holding back. If a space will not support interactive learning then teachers will not use interactive teaching techniques. It is too much bother to rearrange seating and tables in order to form interactive, collaborative groups. To begin making change to antiquated classroom spaces, leaders within the colleges must recognize that institutions of higher education are places where community experts foster learning and support a multitude of teaching experiences in order to engage learners. Teachers in higher education institutions should be challenging higher order thinking, encouraging abilities and communication skills to name only a few of the many pedagogy methodologies that can happen on college campuses. Well constructed space that has been designed appropriately to support these endeavours is one of the most important tools.

Environmental impediments to learning

The current stagnant classrooms are not what our students or faculty want. In fact the learning experience is impeded by the design of the classic classroom. In accordance with Shaw (Shaw and Fairhurst, 2008) the name given the student generation on campus is the Millennial generation

(p.367). They have a preference for doing rather than listening, and for them experience counts. Both faculty and students want environments to support a variety of active pedagogy. Oblinger (2006) comments "There is value from hands-on active learning as well as from discussion and reflection." (p.1.2). She continues to say:

> …as we have come to understand more about learners how people learn and technology our notions of effective learning spaces have changed. Increasingly those spaces are flexible and net worked, bringing together formal and informal activities in a seamless environment that acknowledges that learning can occur anyplace, any time. (p.1.3)

More frequently students are expressing that they want to move around and work within their learning environment. They do not want to be lectured all of the time. Students appear to have a need for entertainment. The Millennium generation has grown up with instant distractions and expect teaching to be fun and exciting. In addition to an active fun learning experience they are predisposed to social interaction. Even though they might be texting to others in virtual space they enjoy doing it within their social group over coffee. Shaw (Shaw and Fairhurst, 2008) comments that learning has to be creative, use technology, be flexible, stimulating exciting and learning experiences have to give instant feedback (p.376).

With a clear picture of what Millenniums want we can see why our current stagnant environments tend to turn students off of learning. Classic classrooms tend to be dull boring and frequently uncomfortable spaces. According to Graetz (2006) learning/ teaching environments should be 'quantifiable', meaning tactile, visual and stimulating. He continues to comment that students do not enjoy common institutional feeling space. That is, students do not want spaces that are bland and without character. What they want is space that has real objects that have real meaning. A designer of space might interoperate that comment to mean areas with windows that connect to a view or spaces that include interior walls with texture and character. Graetz notes that within teaching environments students are "awash in environmental information, only a small fraction of which constitute the sights and sounds of instruction" (p.6.1). He notes that environments that are less industrial in appearance and are not stark and boring tend to enhance learning. In addition to visual enhancements Graetz comments that an appropriate overall environmental structure to include air quality, lighting and situational comfort within a classroom supports learning (p.6.2). Unfortunately many of the classic classrooms built during the 1960's (Swan, 2010) were designed and built without attention to proper heating, cooling or ventilation (p.8). Graetz argues that if lighting, temperature and other essential conditions are conducive to creature comfort then users of the space can relax and learning can happen. Over crowded or uncomfortable spaces that cause discomfort can be expected to interfere with learning (p.6.2). There are studies that indicate that learning improves with environmental enhancements. The article by Gee (2006) indicates that daylight makes a difference. She points to a study by the Heschong Mahone Group which was conducted in 1999 that studied more than 2000 classrooms and it concluded that students in classrooms with daylight improved 20 percent faster in math scores and 26 percent in reading scores over one year, as compared to students in classrooms

without daylight. The follow up study confirmed a benefit to teachers as well (p.10.1).

In addition Gee comments that, "Humans seek both physical and psychological comfort". She notes that if people aren't comfortable and don't have a sense of well-being they become distracted. Gee goes on to say that designers must consider the factors that make people feel comfortable and by making people feel comfortable it will free their brains and bodies for learning (p.10.2). Graetz agrees with Gee's philosophical approach to design for creating conducive learning. He uses research from Weinstein who concludes that environmental variables can impact learners indirectly and that the effects of different physical settings often depend on the nature of the task and the learner. For example, distracting noises appear to slow reaction time and degrade performance to a greater degree in older versus younger adults and for introverts to a greater degree than extroverts (p.6.3).

Advocating for improvements to existing classroom conditions is necessary in order to enact change. Change is necessary in order to support the next generation of educators and learners, because supportive and appropriate space modifications will benefit the users of these important college campus spaces.

Leadership is needed to advocate for change: tearing down the road blocks

Within the college system there are four areas of expertise which tend to work in isolation or in silos. Silos are detrimental to the flow of expertise needed to change the physicality of the classis classroom.

The silos of expertise are;

1. Faculty
2. Information Technology
3. Facilities Management
4. Students

Bickford and Wright (2006) note that campus expertise tend to work in silos which creates roadblocks to progress. These roadblocks create obstacles which are so effective that they have and continue to foster the stagnation of classroom redesign. Bickford and Wright comment that this behavioural tendency among faculty, information technology, facilities management and students leads to the creation of roadblocks which inhibit change to the environment. Furthermore, this type of behaviour has become the tradition of specialists who attend to their individual areas only. These areas are silos. One such silo of expertise are the Baby Boomer generation of faculty. According to a paper titled Teachers as Placemakers: Investigating Teachers' Use of the Physical Learning Environment in Instructional Design, the researchers, Lackney and Jacobs (2006) comment that faculty tend to focus on pedagogical and interpersonal issues, while ignoring the physical-spacial context in which the teaching learning process occurs (p.3). Faculty tend to remain within their silo. Yet another silo is the Information Technology group who tend to make decisions concerning the technology placed within the classroom setting without consulting others.

McWilliam (2005) comments that technology has become a 'prosthetic culture' and as a silo it simply reproduces technology based on past requests relying on habits (p.2). The third silo is facilities management who design and develop classrooms and other spaces using strict outdated physical standards. The last silo is students. Teachers, information technology and facilities management tend to hear but do not listen to the changed needs of this group. Likewise students tend to remain within their silo. Bickford and Wright comment that this silo, the student body, is increasingly connected to each other. They devote less time to instruction driven learning and want a campus community that will reflect their needs as a way of life, "as a way to improve student, faculty and staff engagement and learning" (p.4.4). This they believe can be done by improving learning space design, technology and pedagogy.

Teachers, students, as well as the parents of students, are beginning to realize that current facilities are not working but they lack a champion to help make change. Additionally, they lack the way in which to affect spatial change. However, unbeknownst to them they possess a powerful tool that will at some point ignite change. They are the connected generation. They are socially networked to each other like never before and they constantly interface with each other. Their technological interface has enormous power because it can reach and sway so many within seconds. Just a few tweets from a Twitter conversation can work for or against a college and has the potential to change a lot. How about a simple tweet message that has the ability to be sent to thousands of potential students looking for an education that says, 'This place is great because it supports learning.' Conversely, those who are currently holding back progress can experience an avalanche of bad publicity by a simple tweet that says, 'This place sucks!' Fundamentally, our students want us to care. The Millennium generation want leaders to care about their learning experience.

The article written by Bickford and Wright (2006) asks "why care" Why care whether or not these spaces change in order to provide appropriate learning centered space for students and teachers? The answer is grounded in the outcome of the teaching experience which is to improve learning for students. And to do everything possible in order to provide the best learning centered experience for students. They argue that, "despite multiple theories about how people learn, they agree on one point: the critical nature of interaction. In particular social cognitive learning theory argue for a rich environment in which student and faculty share meaningful experiences that go beyond the one-way information flow characteristic of typical lectures in traditional classrooms" (p.4.3). Gee (2006) comments that, 'A collaborative and committed team can create a stimulating process and produce innovative results" (p.10.2) .

Outcomes that can change classroom environments

The improvement of learning outcomes (CCCSE 2010) is grounded in quantitative and qualitative data (p.7). According to the Center for Community College Student Engagement, there are four key strategies to promote the strengthened classroom experiences "that ultimately are requisite to both increased levels of college completion and deeper levels of learning" (p.8). One of these pivotal strategies is that of the engagement and retention of students within the learning environment to include classrooms. This two part report looked at students that:

- Worked with other students on projects during class
- Students that worked with classmates outside of the class to prepare class assignments

One part of the report acknowledged that the aforementioned are important areas that require further study. However, qualitative data from this study, which was gained through faculty anecdotes, indicated that student interaction and increased collaboration are important areas that foster deeper learning. Another part of this report quantified that improved learning outcomes were realized with students whose learning experience happened in a non traditional studio environment versus a traditional classic classroom learning environment. Although not a study conducted in southern Ontario, the case study conducted at Santa Fe College in the United States is significant and relevant research. This study compared the outcome of traditional teaching with that of a studio classroom where teachers combined active classroom learning with interactive technology programs. The students who were taught in the studio classroom outperformed those who were taught in the traditional classroom. The testing was conducted over a period of years with the same results, "The studio students outperformed the non-studio students by 25 percentage points; 72% of studio students versus 47% of non studio students scored 70% or higher" (p.11).

Summary

Significant environmental change to the classic classrooms and adjacent corridors on college campuses in southern Ontario will not happen unless there is a meaningful connection made with the space that supports its users. Unless leaders come forward and break down the silos to allow for the free exchange of ideas, there will not be changes made to the environment of classic classroom design. Additionally, unless leaders come forward and advocate for appropriate changes to the physicality of the classic classroom and adjacent corridors, the appropriate environmental tools needed to support student centered learning will continue to stifle teachers who will not perform to their fullest potential. Finally, sadly and most profoundly, students will continue to underperform simply because an essential education tool does not support learning.

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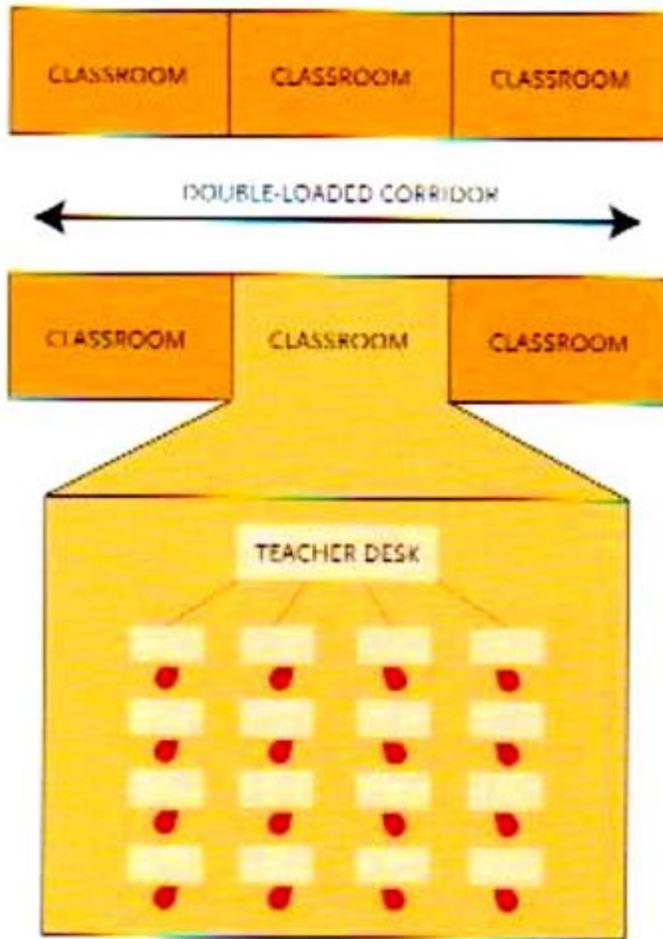
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Appendix:

Figure 1.

The Factory Model

CLASSROOM   CLASSROOM   CLASSROOM

DOUBLE-LOADED CORRIDOR

CLASSROOM   CLASSROOM   CLASSROOM

TEACHER DESK

The industrial assembly line model for school design, sometimes known as the factory model, is still seen in schools being built today even though its repetitive identical classrooms and passive classroom configuration no longer provide support for learning in today's interdisciplinary, knowledge-based economy. Graphic by Atsuko Sakai.

(Taylor 2009) page 10

Figure 2

Humber College, "B" building typical classroom. Photo depicting the classic classroom plan.
Photo taken by Marilyn Teitelbaum

Figure 3

Typical row and column desk configuration within a southern Ontario classroom. The white boards and projector also face forward.
Photo taken by Marilyn Teitelbaum

Figure 4

Typical corridor in a southern Ontario college
Photo taken by Marilyn Teitelbaum

Figure 5

Typical classroom: row-and-column work environment
Photo taken by Marilyn Teitelbuam

Figure 6

College students in class plugging in their devices
Photo taken by Marilyn Teitelbaum

Figure 7

College student making use of any available electrical socket
Photo taken by Marilyn Teitelbaum

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◀ **Contents**