University Trading Centres and Their Role in Business Education

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The AACSB, the global accreditation body for business education, expects business schools to prepare their students for future careers, by providing a total educational experience that emphasizes conceptual reasoning, problem-solving skills, and preparation for life-long learning. Achieving this "total educational experience" entails the development and acquisition of basic and discipline-specific core competencies along with traditional university education that prepares "students to enter useful professional and societal lives". The paper focuses on the ability of University Trading Centers (UTCs) to successfully deliver needed core and professional managerial competencies. A skill-building model that merges lab technology, pedagogy, simulations, and experiential learning leading to managerial competencies is offered.

INTRODUCTION

Traditionally business education has not linked business learning with work experience, at least not to the extent of other disciplines such as Law, Medicine and Engineering. These disciplines have enhanced student and trainee professional competencies through innovative skill-building programs such as problem-based learning and experiential learning. Business schools have been slow to embrace this educational trend. Today experiential learning and in house-training are pedagogical imperatives in many professional educational settings [Klob 1984]. As educators, universities are moving from an "instruction paradigm" to a "learning paradigm" [Saunders 1997]. In recent years powerful forces such as rapid technological innovations and convergence of information are enabling schools of business to enhance their efforts in producing marketable managerial competencies relevant to today's environment [Decker 1999)]. Business Schools were created to bring relevant managerial skills to the world of business. Indeed, the success of today's managers and corporate performance are dependent upon the manger's acumen, intelligence, and insight; the ability to access and process information and to make judgments based upon social and economic trends. Similarly, increased competition for top students and faculty are driving universities to retool in pursuit of higher efficiencies.

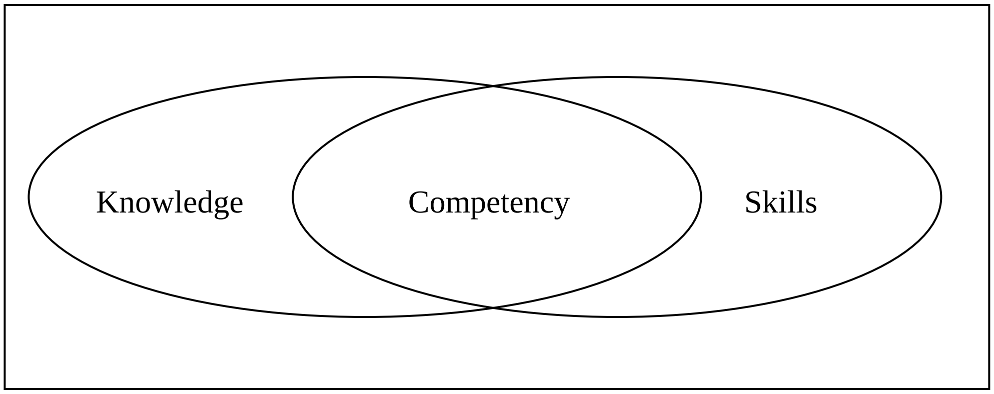
Traditional lecture-based teaching has been labelled as a "passive form" of education with room for improvement. New interactive technologies have made it possible to deliver a more "active form" of education with effective hands-on learning that complements traditional education. Today, interactive technologies provide exciting possibilities to business schools that can bridge the gap between knowledge acquisition, needed disciplinary competencies, and real-world applications. The International Association to

Advance Collegiate Schools of Business (AACSB), business schools' global accreditation body, in its outline "Standard for Business Accreditation" states "… management education must prepare students to contribute to their organization and the larger society and to grow personally and professionally throughout their careers. As part of each school's effort to prepare its students for future careers, the school should provide a total educational experience that emphasizes conceptual reasoning, problem-solving skills, and preparation for life-long learning" [AACSB, revised 2001]. To meet the challenge, business schools are adding managerial competency development to their curriculum, incorporating from other disciplines a number of pedagogical innovations, such as distance learning, service learning, problem based and experiential learning.

A relatively recent and primarily business school innovation that delivers competency development through problem based and experiential learning is the University housed Trading Centre (UTC). It represents the latest innovation to enhance the traditional form of business education. These centers function as electronic laboratories housing a number of "trading stations" delivering "real-time" data feeds, analytical tools, news and news analysis from exchanges, brokerage houses, media and financial services firms. They offer a unique experiential learning environment, where students acquire insights, experiences, skills and broad industry knowledge through problem based learning. UTCs are powerful and sophisticated tools in the hands of faculty, where academic theory comes to life through "real" and "simulated" exercises and projects. These centers bring realism to the classroom, and offer students professional training through unique programs offered jointly with senior industry practitioners who mentor and inspire students. UTCs are natural conduits to develop skills and competencies demanded by today's business environment, and as a result, many universities have setup trading centres/rooms/floors[1] on their premises. Each with its own vision of function and usage, such as enhancing academic curriculum through workshops and seminars, and providing live access to market events that tie business education to current issues. These centers are electronic laboratories that provide data and financial analysis for research, facilities that teach and develop programming and IT skills, tools that simulate and replicate trading environments to train industry professionals, and platforms that test strategic business scenarios and business tools.

Although such facilities offer an impressive array of practical uses, their overall mission must be to bring realism to the classroom, enhance the academic curriculum, offer professional training and build core and industry skills through unique training programs that enhance the educational process. The goals of such a mission can be effectively achieved through bridges to the financial community, where UTCs act as instruments of smooth integration between academia and the business community. Businesses can greatly benefit from professionalism within the business schools, and are motivated to support programs that can provide core and professional competencies. By no means does this advocate the notion that universities should abandon their mandate and become specialty shops for tailored education[2]. Rather, this emerging direction can aid universities in fulfilling their mandate of providing relevant education by developing tomorrow's leaders with the ability to function in the current business environment[3]. Such integration both benefits society through increased efficiency and adds new dimensions to business schools.

Figure 1: Competencies are the combination of Knowledge and Skills



The objective of the paper is two fold: to extend the discussion of integrating experiential learning within the business curriculum, and to explore the role of trading centers in business education. This study should be of interest to university administrators and academics alike, in the contest of evaluating whether a trading center adds value to the educational process for business students. The remainder of the paper is organised as follows. Next the paper outlines core and professional competencies needed in today's professional setting by reviewing literature and conducting business interviews. Next the paper discuses the role of UTCs and the value they add to business curriculum. And by way of an example the paper offers a guideline for a finance course on integrating UTCs in a business curriculum that complement traditional business education. The paper concludes by offering direction for the future.

NEEDED COMPETENCIES IN A PROFESSIONAL SETTING

Competence is a statement of relation between personal ability, the tasks to be performed and the environment in which those tasks occur. If education is the transfer of knowledge, and training involves the learning of new skills to perform useful functions, then competencies are the combination of knowledge and skills in a professional setting (King et al 2001; Epstein et al 2002). Building core and discipline specific competencies is the link between education and work experience in the real world (Goby et al 2000). Students who possess both a core set of skills, and an ability to adapt to changes are more valuable in the workplace and open to new career opportunities for themselves.

Academic literature and research suggests that personal skills such as writing and speaking are still valued by employers (Wilhem 1999). Equally important are interpersonal skills identified as "soft skills" needed to relate to others in a culturally diverse workplace (Decker 1999). In addition, professional managers must add technical skills and broad industry knowledge to their set of competencies (Epstein 2002; Agut 2002; Vice 2001). A short summary of these skills is presented in Table 1.0. In addition, interviews with the heads of Human Resources departments of major Canadian Financial institutions[4] were conducted[5] to explore the skills and competencies that are relevant in today's marketplace.

Table 1: Summary of Needed Competencies

Technical Competence – traditional technical skills that form the basis of professional role in a specific business discipline.
Personal and Interpersonal Skills – characteristics and soft people skills that relate to attitudes and behaviour toward work (commitment to quality and efficiency), including integrity and ethics and the ability to attract others to a well-seasoned and logical point of view.
Broad Business Knowledge/Perspective – the body of knowledge that encompasses an understanding of an organization, its industry and management practices.
Definitions
Skills – Specific abilities that relate to competency.
Competencies – Knowledge, skills and abilities required to perform a job effectively.
Basic Competencies – needed set of core skills for a new person on the job.
Intermediate Competencies – a level of performance by someone who has detailed knowledge and certain capabilities in one area.
Functional Competencies – traditional technical skills needed for a particular position.
Advanced/Professional Competencies – professional and specialised knowledge.
Experiential Learning – an educational process through which a learner constructs knowledge, skill, and value from direct experience.

In seeking industry input to define core and professional competencies, we put forward a set of questions that included:

- What are the set of competencies needed in today's professional setting?
- How should Universities provide these competencies?
- What type of assistance can the industry provide?
- Who should train the students?
- If faculty provide the training, how does the faculty obtain the body of knowledge required?

The lit survey and interviews resulted in a broad range of definitions, from basic, core, advanced and professional competencies. These can be categorised into three main categories: technical competence, personal and interpersonal skills, and broad industry knowledge or prospective.

Technical competencies relate to skills closely aligned with the specific business discipline; the value added of the profession to the firm. They include the ability to make decisions utilizing both strategic and critical reasoning, the ability to understand business risk, identify the risk of negative outcomes, mitigate and evaluate preventive methods, and apply corrective controls. A well-trained person must be able to identify what needs to be measured using appropriate industry tools and be able to report and communicate. Students need research skills to access, understand and evaluate industry information; they must be able to use technology effectively and efficiently, and communicate the results using different media.

Technical competencies are decision-making skills utilizing both strategic and critical approaches to problem solving. This involves an objective consideration of the problem, scientific evaluation of alternative solutions, and present cost-benefit analysis of available solutions. This translates into the ability to handle ill-structured problems, tolerate uncertainty, and make decisions with limited information.

Personal and interpersonal skills are characteristics and "soft people skills" that relate to attitudes and behaviour toward work (commitment to quality and efficiency), that include integrity and ethics, and the ability to attract others to your well-seasoned and logical point of view. Personal skills include self-awareness, managing personal stress and solving problems analytically and creatively. Interpersonal skills involve coaching, counselling, supportive communication, ability to use power and influence, motivating others and managing conflicts. Personal and interpersonal skills are needed to function within groups. They include the ability to work toward a common goal, to build effective teams, to empower and delegate, to reason and handle conflict, to acknowledge and correct errors, and to enhance professional relationships. Students must see personal development as a life-long learning process necessary for a successful career. Personal and interpersonal skills are usable knowledge gained through experience that enhances personal conduct and manners consistent with the established standards of the profession.

One common theme that was stressed over and over again by the business survey was that students must have broad industry knowledge, and must be aware of industry perspective and realities. This includes core knowledge of the industry, the industry lingo, sector and industry perspective, relevant international and global perspective, legal and regulatory perspective, and exposure to industry technology. These skills involve the ability to see the big picture and use data and knowledge from numerous industry sources. Students should be able to understand and communicate industry culture, legal and regulatory environments, and recognize the agendas of current political forces relative to the industry (see Table 2.0).

In short, competencies are built on a foundation of basic industry skills, scientific knowledge and personal development. These competencies differentiate effective managers from less effective managers. Businesses are aware of how important these skills are to their success. Universities must also be aware that knowing and doing are two separate skills. Simply put, the ability to analyse a case, identify a problem and provide the correct answer to the instructor is not equivalent to building effective management skills. To this endeavour universities and business must cooperate. A strong industry mentoring system must accompany any comprehensive competencies building program.[6] At a minimum, the industry must be consulted; skill building training with an inadequate system of industry feedback will undermine even the most well conceived program.

ROLE OF UNIVERSITY TRADING CENTRE

In an effort to ascertain the most effective methods for learning innovations, universities are experimenting with a variety of methods to attract good students, faculty and employers. While educators differ in their opinions on which method is most effective, most agree that the traditional lecture format is not the most effective model of management education leading to managerial competence. This calls for a new educational approach that provides industry core competencies in its curriculum mix.

In this section we focus on the shift from teaching to learning; this new model of management education that has much in common with the model that is used to train other professionals such as physicians, engineers and lawyers. Increasingly, business schools are asked to follow in the footsteps of these disciplines to design and deliver professional education that produces well-trained managers who meet the expectations and standard of the industry. University Trading Centres are able to play a major role in delivering such education, where technical, personal and interpersonal, and broad industry competencies can be developed. At a minimum, UTCs can be used to deliver the basic industry competencies referred to in Table 1.0. The challenge with a crowded business curriculum is how to develop innovative ways to provide this professional development. To this endeavour, trading centers are able to play three major roles: enhance current curriculum, provide linkage to the business community and supply in-house training/employment[7].

Table 2.0 Summary of Report on Bay Street Visits

<table>
<tr><td colspan="2">Needed Students' Profiles
Characteristics sought by industry</td></tr>
<tr><td>▪ Top Students
▪ Quantitative skills
▪ Technical ability
▪ Personal presentation
▪ Good communication skills
▪ Well rounded individual
▪ A varied selection of courses taken
▪ Extra curricular activity
▪ eBusiness tie in</td><td>▪ Basic skills in modeling and research
▪ Knowledge of selling and selling techniques
▪ A proper professional resume (no holes) with a proper specific (to the job) cover letter
▪ Express interest in the firm
▪ Broad industry knowledge</td></tr>
<tr><td colspan="2">Needed University Efforts</td></tr>
<tr><td>Placement Efforts

Established personal contacts with the employer recruitment offices.
Foster an ongoing relationship with the industry that informs universities of
▪ Applications time
▪ Needed position skills
▪ Interview patterns
▪ Feedback on graduates
▪ Differences in training across the industry</td><td>Needed Curriculum

▪ Industry know-how and Strategic management for the Canadian Financial Industry
▪ Ethics
▪ Sales Skills for financial products
▪ Behavioral Finance
▪ Research, programming, Excel course
▪ Emerging markets</td></tr>
</table>

UTCs offer students the opportunity to learn in a state-of-the-art environment, pick up skills and competencies, and practice management effectively. They offer a platform similar to air force cockpit flight simulators in the development of flying skills for pilots. In such a platform, education is a partnership between the university, the student and the industry. Below we present the model used by the Allen H. Gould Trading Floor (GTF), at the DeGroote School of Business[8] to meet the challenge of adding skills that build the business curriculum.

Enhancing Curriculum

The GTF, as envisioned by the DeGroote School of Business plays an integral role in the curriculum of the business school. The idea here is to design a learning environment where students are active participants in the learning process and where "knowledge is created through the transformation of experience" (Kolb 1984). Through this vision, a dozen of undergraduate and MBA courses have integrated GTF technologies into their design. These include four courses in Accounting and Financial Management Services, six courses in Finance and Business Economics, and two courses in Marketing, Business policy and International Business. The approach in these courses differs from the traditional instructional paradigm where lectures are the main method of delivering knowledge. In this "learning" or "discovery" paradigm, lectures are only one of many methods to disseminate knowledge. The GTF's involvement with these courses has been to assist in delivering a specific curriculum[9] that includes modules and handouts[10]. The design and development is accomplished with the collaboration of the instructors and the course-teaching assistants (TA). Below are a number of "learning and discovery methods" that accomplish a formal integration of discipline-specific skills and competencies into the business curriculum.

- *A Course laboratory:* Students expect to learn in a technology-assisted environment; trading centers are state-of-the-art technological teaching tools. Disciplines such as engineering and medicine have laboratories to teach their professional skills. UTCs are the business school laboratories that teach business and management skills. At the GTF, exposure to industry technology starts early with hands-on weekly workshops and seminars that are designed to inform, educate and acquaint participants with industry tools and expose both students and faculty to broad knowledge of the industry. These seminars cover a variety of disciplines, areas, and products, and develop industry related skills such as retrieving data and news articles, interpreting economic data, accessing company specific information and making industry and firm comparisons.

- *Technology Assisted Pedagogy*: GTF customized course curriculum is the next step in turning knowledge into know-how. The GTF's involvement and investment in these courses is quite substantial. The staff, under supervision of the director, works closely with the professors and TAs to create course related curriculum using GTF technologies. The task might involve several class sessions[11] that are offered at the GTF. The GTF's involvement includes preparing the course module(s), training both the professor and the TA, and running and delivering the course modules. Some faculty are reluctant to make large-scale revisions and some show little enthusiasm to invest the time needed in learning new technology[12]. Professors are motivated once they see that time invested in the new technologies actually supports their teaching and frees their time.

- *Experiential learning through team exercises and assignments:* Complimentary to lectures, the advantage of teamwork over individual work is the enhancement of students' interpersonal skills. Working in a group of people with various backgrounds, different work ethics, and different problem-solving styles develops many of the personal and interpersonal skills outlined in the previous section. It only seems logical to mirror the environment of many businesses, where team management is replacing an authoritarian top down management philosophy. The GTF is the platform for such projects, with staff ready to assist professors in the design and implementation of such projects. This type of cooperation goes a long way to assist the professor in overcoming the "technological gap". Furthermore, in such an environment, substantial skill and knowledge are passed along from student to student (i.e. student to student mentoring).

- *Curriculum linkage:* Experiential learning is used to go beyond the boundaries of a course or even a discipline. Too often students move from one theoretical concept to another as they move from one course to another without any integration of the material acquired. Trading centers can carry out a theme or a project where several courses or subjects interact to implement a program. An example would be a student managed portfolio program. There are over 100 North American universities with various versions of student-managed funds, with assets in the range of $50,000 to over $20 million.

They include Cornell, University of Texas and the University of British Columbia. A successful fund management depends on the efforts and talents of a host of individuals with diverse backgrounds and not just a few managers deciding the portfolio mix. This implies the need for managers from diverse backgrounds (Accounting, Finance, Marketing, Economics, Math and Statistics …etc) with a holistic approach to portfolio management. It only seems logical that Trading Centers be the natural homes for such a project, where the interactions among such individuals are easily accomplished.

- *New Curriculum Development:* Trading centers can be the platforms to launch new courses that focus on role-playing. One example is the DeGroote Trading and Risk Management MBA course. The course attempts to develop practical skills in trading financial securities with a focus on risk management and return enhancement. The course uses a combination of lectures, presentations, supervised and unsupervised trading, experiential learning through team exercises and assignments, and industry interaction, as outlined in the next section.
- *Research incentives*: In addition to the preparedness of the trading center staff to assist researchers (both students and faculty) to retrieve data and information, the centers provide a unique research platform to run experimental and industry related research. New research areas could emerge as a result of students and professors familiarity with tools, procedures and skills of the industry. Trading centers can also act as a conduit for research collaboration between industry professionals and academics.

Academic linkage to business practice

Trading centers offer exceptional opportunities for academic-business collaboration. They provide a linkage that merges conceptual and theoretical perspectives with industry viewpoints and experiences. Business educators should seek input from industry professionals in relation to knowledge and skills needed in the current business environment. Trading centers can serve as the forum for various academic-business initiatives, such as

- *Industry interaction*: Regular interaction between industry professionals, students and faculty provide valuable information on the knowledge and skills sought by the industry.
- *Industry Visits:* Industry visits enhance students' educational experience. Professional industry visits that go beyond "a plant tour" have the potential to be an awe-inspiring experience and help students observe professionals in their environment. Industry visits produce a deeper understanding of the industry and promote discussions (and often employment opportunities) that centre on specific roles and topics providing a window into many areas and disciplines. They expose the students to the industry and the industry to the students.
- *Industry internship*: The trading centers can provide internship opportunities for students. One such summer internship has been established between the GTF and Reuters Canada. As a result, the GTF acquired technologies and a deeper familiarity and understanding of Reuters products to the degree that GTF staff are called upon to demonstrate special features of the products to Reuters clients. Industry internships provide a mechanism for UTCs to keep pace with rapid technological changes.

- *Industry Integrated Curriculum:* The centers provide a platform for greater professional involvement in the academic curriculum and foster business university educational partnerships. These exceed the occasional guest speakers' visits to a course, and reflect the combined efforts of professionals and professors in the design and teaching of the course. One such course is the portfolio management course offered at the DeGroote School of Business, where an experienced portfolio manager teaches about 30% of the lectures. These opportunities transfer technologies from the industry to the university and vice versa. As a result, a Professional Development Centre is being planned with a motto "*learning from the best".* This center, with its obvious transfer of technology, will provide a platform offering courses, seminars and workshops to practitioners offered by both professionals and professors.
- *Linkage to Professional Associations:* Today, universities understand the value of professional designation to the industry. In light of this, the trading centers in association with professional institutions, such as a local Securities Institute, AMIR, Professional Accounting associations (CA, CMA), … etc, can offer students the ability to obtain such designations[13] while they are still in university. As a result joint programs/diplomas can be offered to enhance students' employment opportunities, such as, MBA/CFA or MBA/CA programs.
- *Business Advisory Board:* A business advisory board is comprised of members of the business community who provide advice and suggest ways in which the trading center can deliver services pertinent to the students. The members are those who can bring specific skills and provide useful outside input into specific decisions that assist the trading center with its initiatives. The GTF advisory board has been essential in providing and building contacts and relationships with the professional community. The board has supported our efforts and provided immeasurable feedback on the individuals and skills needed by the industry.

In-house Student Training and Employment Opportunities

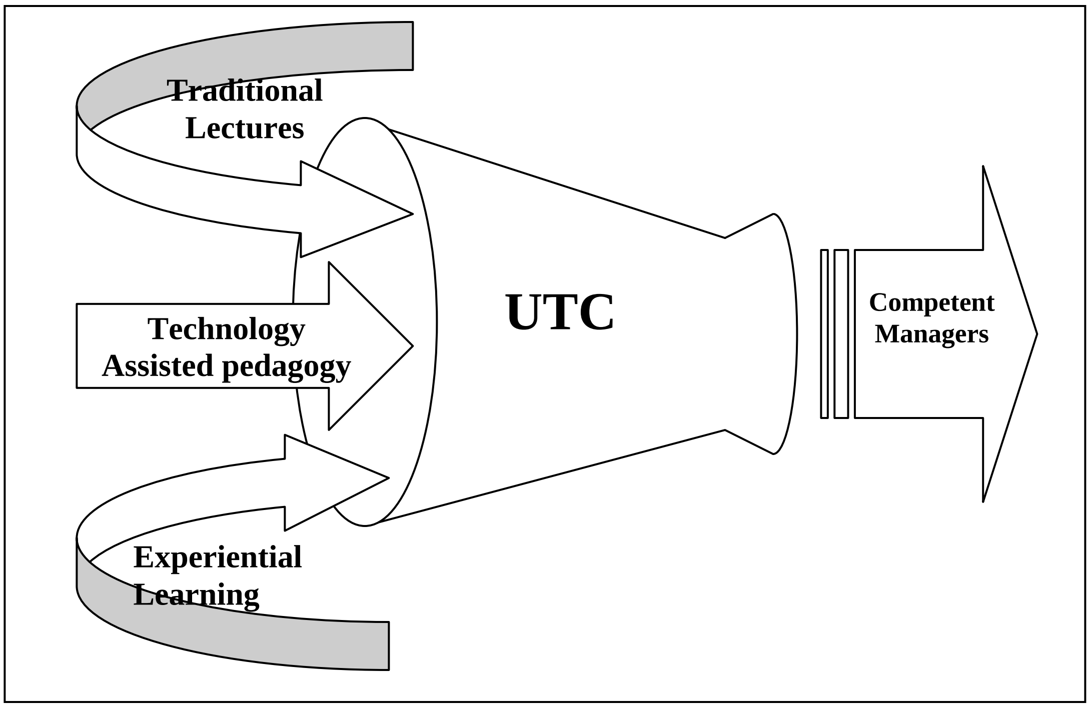
In-house employment opportunities provide students with marketable skills and knowledge of industry tools, such as Reuters, Bridge, and Bloomberg systems. These skills in turn provide students with an edge in the marketplace. The dynamic nature of the trading center, the complexity of the software and tools, plus the high demand for training and seminars (by students, faculty, alumni and the surrounding community) highlights the need for competent staff to run the trading centers. At the GTF coordinators/supervisors are drawn from the student population and are expected (from day one) to be knowledgeable in GTF tools and be ready to present all the seminars booked in their time slots.[14] Therefore, it is necessary to train potential GTF employees before they start working at the Floor. The Voluntary Internship Program (VIP) fulfills this function.[15] Through student-to-student mentoring the technology and know-how is passed from experienced students to newcomers.

It is important that the trading center become a resource for students' activities where student-to-student mentoring takes place and where technological expertise can be transformed. In addition to course and seminar participation, students used the GTF for a variety of functions such as: personal research, projects and assignments, researching firms prior to interviews, trading challenges, trading clubs and investment clubs. Student associations are frequent users of this facility.

Why is a Trading Center needed?

It might be argued that a large number of the skill building opportunities that the trading center provides can be replicated without a trading center, especially in light of current technological advances that are at the disposal of the faculty laptops and wireless communications. Therefore, why is a trading center needed[16]?

Figure 2.0: New Learning Pedagogy



The unique role of a UTC, addressed in this section and illustrated in Figure 2, is the funnelling of all tools needed to bring business theory to life. Simple access to databases and analytical tools alone do not build skills and competences, as simple access to body building literature do not build muscles. In fact, at many universities such databases and analytical tools sit unused. By creating UTCs, we form cultures that translate knowledge into business know-how, as skills[17] are transmitted from student to student and competencies are acquired through learning and discovery methods. UTCs provide windows that focus the attention of both faculty and students on current events and linkages to professionals and professional institutions. Speaking from the GTF's experience and the inputs of fellow users of such a facility, the GTF has provided the opportunity for participants to translate concepts into action, accommodate a deeper understanding of the subjects at hand, stimulate creative thinking, enhance oral and written communication skills, strengthen decision-making skills, promote the use of team approach, foster motivation through competition, provide deeper understanding of the industry, and increase student participation and discussion. Can this be provided without a trading center? Given time constraints of faculty, I personally doubt that all aspects of UTCs outlined above can be accomplished on an on-going basis without a team of individuals ready to put forth their time and effort and a vision to guide them. At the GTF we have institutionalized the process of skill and competency building and housed the technology and know-how[18] so that interested students and faculty can draw upon our resources. Finally, perhaps it's all in the name[19]. When universities started building UTCs they opted to label them "trading" centers/rooms to attract attention. This turned out to be a double edged sword and many faculty and potential donors stayed away. Today some universities are re-labelling UTCs as financial market centers or financial research laboratories. Although the main point of this paper is to explore the role of UTCs in business education, its purpose is to outline needed curriculum to add value to traditional education that provides experiential learning capabilities enhance skill sets, and build competencies of students. In this author's opinion, the best method to achieve this goal is through UTCs that house relevant databases and analytical tools with dedicated staff whose the mission is to enhance traditional education. In the following section, this paper proposes a guideline for professors seeking to integrate UTCs into their curriculum.

GUIDELINE FOR ONE FINANCE COURSE

Bringing Business Theory into the Laboratory

Learning pedagogies increasingly involve the synthesis between traditional lectures, technology assisted pedagogy, and experiential learning through team exercises and projects. In recent years such a synthesis has been achieved through university in-house resources such as UTCs. The purpose of this section is to describe an experiential learning course that has successfully integrated the principle of competency building in its curriculum. We present the curriculum and new learning pedagogy of this finance course that is being offered at the MBA[20] level as a guideline for using the UTC as part of the curriculum. The general ideas outlined in this paper are applicable to most disciplines.[21] Since the course was developed (1994[22]) over 500 students have found employment with the financial services industry. The course attempts to develop practical skills by focusing on hedging and hedging strategies, financial engineering, risk management (market risk), measuring and monitoring market risk across complex and volatile financial markets.[23]

The Course Skill Building Tools

The course uses a variety of tools to develop skills and competencies, which foster lifetime learning that produces competent managers. The tools include trading sessions, weekly group projects (Market and Security Analysis), financial trading systems (FTS) assignments, a trader-in-residence program, Bay Street visits, and an individual final project.

I. Trading Sessions – At the beginning of the course each student is assigned equities, fixed income securities (together, the "cash securities") and a fictional account of one million dollars. During the first four weeks, students trade the cash securities. In week five, students are assigned options and futures (together, the "derivatives") on each of their underlying securities, as well as market indices. After receiving their derivatives, students begin trading the cash securities and the derivatives. Risk minimizing strategies typically involve trading combinations of cash and derivatives securities.

II. Weekly Group Project: Market And Securities Analysis – At the outset students are assigned to groups of five individuals; each group submits weekly market and securities reports. The reports present each groups outlook for debt, equity, currencies, and commodities markets, plus detailed analysis of the cash securities assigned to each member of the group. The outlook of these reports (buy, sell, and hold recommendations) form the basis for the individual's trading.

III. Financial Trading System (FTS) Assignments – A number of FTS trading cases are assigned throughout the course. The objectives of the trading cases is to provide an understanding of important market microstructure concepts, such as trading, market making and market taking, price discovery, bid-ask spreads and their depth, trading frequency and trading volume. The FTS is an ECN (Electronic Communications Network) installed on the GTF Network. The FTS forms a dealing system, that lets the instructor run cases using the students as the trading crowd. Each case poses a different trading problem. The trading problem is designed so students can apply finance concepts while formulating their trading strategies. Typically, before each trading session, the students are quizzed on the content of the assigned case.

IV. Traders In Residence – The trader-in-residence program is unique to the DeGroote School of Business. The program is designed to add "market reality", "street insights" and "professional trading experience" to the Gould Trading Floor. The trader-in-residence position is a revolving one; professionals from different financial institutions visit the Gould trading floor on a weekly basis to discuss a variety of subjects related to the financial services industry, and act as advisers to students and faculty. The traders-in-residence program is another tool of the GTF. The aim is to enhance students' trading knowledge and offer professional market view and experiences.

V. Bay Street visits – Visits of the Canadian financial services industry called "A day at Bay Street[24]" are scheduled to the brokerage houses. Students are invited to sit in on the morning meeting, tour the facility and spend a day with professional traders in their environments thus observing professionals in "their natural habitat". The visits expose the students to the industry and the industry to the students.

VI. Individual Final Project – The individual final project (IFP) is a record of the student trading activities, trading justifications, summary of return(s) on trading positions, analysis of market risk (inherent in trading), collection of students' acquired market insight and savvy. The report must build on the student's weekly group assignments (Weekly Market and Securities Analysis Reports) with emphases on individual reasoning and student's value added insight. The report starts with an executive summary followed by an economic review detailing the universal economic outlook, markets outlook and the outlook for the student's trading horizon. The IFP summarizes weekly expectations in a coherent manner, and includes an in-depth analysis and justification for the trading activities. The grade received is based on the final value of the portfolio (return on investment on $1,000,000), market and securities analysis, individual reasoning, risk management applications and "the manner" in which the wealth was accumulated.

Table 3.0 Building Competencies

	Technical	Personal and Interpersonal	Broad Industry Knowledge
Trading Sessions	X		X
Weekly Group Project	X	X	X
FTS Assignments	X	X	
Traders In Residence		X	X
Bay Street visits	X	X	X
Individual Final Project	X	X	X

How do the above tools build the skills and competencies outlined in section 2.0? Table 3.0 summarizes the skills being built by the course tools. Technical skills are compiled by the trading sessions, weekly group projects, FTS assignments, Bay Street visits, and the individual final project. These include extensive knowledge of the trading platforms (Reuters, Bridge, Bloomberg and FTS), which requires customizing trading screens that access securities, market and securities news and analysis. The ability to read the "sign of the markets" requires detailed knowledge and understanding of the dynamics of market microstructure[25]. This produces the ability to make decisions utilizing both strategic and critical approaches to problem solving. Students must also be competent in using the trade execution platforms[26] (FTS real trader). Knowledge of back office operations[27] is also required for order and execution management. In addition, FTS brings in knowledge of market making ability not possible in the price taking[28] trading sessions. Acquiring the course technical skills translates into the ability to handle ill-structured problems, tolerate uncertainty, and make decisions with limited information.

Personal and interpersonal skills are developed through the traders in residence series, weekly group projects, FTS assignments, Bay Street visits, and the individual final project. Traders in residence and Bay Street visits bring knowledge of the industry and open doors to students. The skills developed here are usable knowledge gained through the guest professional experiences, and help enhance personal conduct and manners consistent with the established standards of the profession. The groups compete with each other for the best weekly report that forces social and managerial skills to develop such as coaching, supportive communication, the ability to attract others to one's well-seasoned and logical point of view, motivating others, and managing personal stress and conflicts. Working toward a common goal, building effective teams, and teamwork enhance interpersonal skills and professional relationships. Students come to understand that personal development is a necessity and a life-long learning process for a successful career.

Among the first skills trading sessions, traders in residence, weekly group projects, and Bay Street visits bring about is the exposure of the student to broad industry knowledge that encompasses an understanding of financial institution, the financial sector industry and industry perspective and realities. Other skills developed include communication skills, the ability to see the big picture and use of information from different sources. The total set of skills and competencies acquired in the course are assessed by the final project: a record of the student accomplishments and achievements in the course. One other benchmark to judge the effectiveness of the course and assess the students' competencies, is the students' trading performance relative to the market. This is offered in the following section.

Table 4 Comparing Class Performance with Market Indices

Market Return					
Groups Return	**DOW JONES**	**SP500**	**NASDAQ**	**TSE 300**	**Markets Average**
0.1010	0.0504	0.0615	0.0939	0.0574	0.0658
Groups Return					
	Average	**Low**	**High**		
UG1					
Group 1	0.2022	0.1657	0.2324		
Group 2	0.2305	-0.0353	0.5036		
Group 3	-0.1098	-0.4816	0.1610		
UG1 Ave.	**0.1076**	**-0.1170**	**0.2929**		
UG2					
Group 4	-0.0127	-0.5128	0.4068		
Group 5	-0.1160	-0.1995	0.1877		
Group 6	0.0212	-0.1501	0.2534		
Group 7	0.1596	-0.3080	0.4734		
UG2 Ave.	**0.0130**	**-0.2926**	**0.3303**		
MBA					
Group M	0.2885	-0.6805	0.7908		
Group B	0.0841	0.0195	0.3193		
Group A	0.1741	0.0713	0.3010		
MBA Ave.	**0.1822**	**-0.1965**	**0.4704**		

Students Performance Evaluation

Students are asked to pick two Canadian and two US stock in a particular industry (Tech, pharmaceutical … etc.). Later, as their skills develop, they are allowed to add more securities. Trading profit or loss accounts for only 10% of the final report grade (5% of the overall grade)[29]. How did the students fair in their trading?

Table 4.0 displays the results of three classes from fall 2003. Two undergraduates' classes (UG1 and UG2) and the other is an MBA class. There are ten groups in total with five students per group. Admittedly, this is just one sample and no great inferences should be drawn from it, except as a benchmark to students' performance against market indices from September 15th to November 29th (nine weeks), and as a testament to their acquired skills and competency. The groups' averages outperformed the market indices averages with 10.1% compared to 6.58%. There were a variety of return ranges in each of the sections and within the groups. Only three groups lost money (Group 3, 4, and 5) and six (1, 2, 7, M, B, A) out of ten of the groups outperformed the market averages. Five outperformed the Nasdaq (highest market average for the period) by at least 70%. The worst performance was given by UG2 (1.3%), and the best performance was given by the MBA class[30] with an average of 18% for the nine weeks compared to 11% for UG1. The results suggest that the design of the course has achieved its stated objectives. Students' and employers' comments suggest that the trading course is an asset to the DeGroote School of Business curriculum.

Direction for the Future

If we believe that learning occurs through doing, then the curriculum of “doing” can be implemented through UTCs. Trading centres put emphasis on experiential learning and encourage critical reasoning and creative thinking. Intensive workshops, team projects, and real world experience with traditional lectures establishes a dynamic forum for producing competent managers. Partnerships with industry ensure that the skills and competencies developed are relevant in today’s marketplace. The methodology is unique because it involves the integration of the students and industry into the curriculum. Education thus becomes a partnership between the university, the industry and the students. The value added for business schools is enormous: establishing a reputation for high innovative teaching methodology, developing an innovative new curriculum, promoting cutting edge research in key areas, increasing student admissions, job placements, alumni networking, and industry involvement and contributions.

Although the main objective of this paper was to explore the role of UTCs in developing core and professional competencies, future work can explore additional roles this infrastructure can play. Mainly, facilitating unique research and establishing new and ongoing partnerships with industry. UTCs are tools that can foster research collaboration within the business school, across different disciplines and with industry. It provides a unique supporting role through data feeds, archiving and retrieving data, specialized software and programming. The role in cultivating strategic alliances with industry should also be explored. New partnerships can be established for ongoing training not only for new employees, but also to upgrade the skills of existing ones. Simply speaking, through this resource we are breaking and establishing new grounds in education.

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Appendix A
Finance *F722,* Market Trading and Risk Management

COURSE DESCRIPTION

The course attempts to develop practical skills in trading financial securities with a focus on risk management and return enhancement. The course deals comprehensively with the increased importance played by risk and uncertainty in today's financial markets. Students are introduced to theoretical and empirical issues related to various financial instruments, their valuation methodology, and their institutional uses in risk management. Market microstructure knowledge provides students guidance in implementing their trading strategies. A fictional account of one million dollars is created and will be evaluated throughout the course, and at the end of the course. In addition, students are divided into subgroups that act as individual investment/trading houses. Students will supply market weekly reports with "buy", "hold", and "sell" recommendations. The report must include the students' weekly outlook for North American Markets and form the basis for the individual's trading.

COURSE ORGANIZATION

The course uses a combination of lectures, presentations, supervised trading and unsupervised trading. The class meets twice per week, once for a two-hour session and again for a one-hour supervised trading session. Classes and trading will be conducted at the Allen H. Gould Trading Floor. In the two-hour session lectures are presented in the first hour; in the second hour students trading strategies are scrutinized; the students are expected to justifying their trading positions/decisions. Supervised trading sessions are also used to systematically evaluate students' trading positions and offer suggestions and recommendations. Students are responsible for trading their portfolio for a *maximum* of four hours per week (at times of their choice). All trades are logged to prevent falsification of trading histories.

CONTENT OF THE LECTURES

The aim of the course is to provide a comprehensive treatment of financial risk and uncertainty faced by firms and individuals exposed to financial markets. The course starts with lectures that review stocks, bonds, money and currency markets, as well as derivatives and derivatives markets. Students are introduced to different financial instruments, institutional details, markets microstructure, exchange and over-the-counter derivatives, principles of valuation, risk management and hedging techniques. Speculative strategies are also discussed and examined in great detail.

The course attempts to develop practical skills by focusing on hedging and hedging strategies, financial engineering, risk management (market risk), measuring and monitoring market risk across complex and volatile financial markets. Specific topics covered include: exchange and over-the-counter trading, market microstructure, reading the "signs" and "pulse" of the market, understanding the electronic book, risk/reward analysis, arbitrage, government securities, strategies selection criteria, basis risk vs. price risk, degrees of trading aggressiveness, uses of derivatives and various exotic spreads.

ENDNOTE

[1] Over thirty universities in North America, includes MIT, Yale, Carnegie Mellon and McMaster University.
[2] To fit specific jobs and by providing “finished goods” to the employer
[3] Universities will be able to offer employers “intermediate goods” rather than the traditional “raw materials”.
[4] Three major Banks (CIBC, Royal Bank, Scotia Bank), two brokerage houses (Merrill Lynch Canada, Nesbit Thomson), and the largest two Canadian pension funds (Teachers and OMERS).
[5] A business survey was conducted by the Office of the Associate Dean of the DeGroote School of Business (McMaster University, Hamilton, Ontario). The interview panel consisted of the Associate Dean, the Directors of the MBA and Undergraduate programs, and the Director Allen H. Gould Trading Floor.
[6] See section 3.0
[7] See Section 4.0 as an illustration.
[8] McMaster University.
[9] Developed in-house by the GTF.
[10] Mini-manuals developed specifically for the course
[11] Some courses like Market Trading and Risk Management are offered exclusively at the trading center (discussed in section 4.0).
[12] That’s why as a preliminary step we work with teacher assistants first.
[13] A number of universities have launched programs that provide both universities degrees and professional designations such as, MBA/CFA and MBA/CA programs.
[14] At the GTF 15 to 20 students are hired every semester to run the Floor’s daily operations (the GTF is open 76 hrs/week).
[15] Potential GTF employees must have a minimum of 20 hrs as VIPs under GTF staff supervision to be considered for employment.
[16] The same argument is being used to advance virtual universities.
[17] Skills that are outside the realm of traditional curriculum and outside the skills set of many faculty.
[18] Which is an on going process.
[19] To quote Shakespeare “what’s in a name”.
[20] F722, Market Trading and Risk Management.
[21] Other disciplines such as Accounting, Marketing, …etc. have use some or all of the skill building tools outlined in this section.
[22] The course started at Molson School of Business, Concordia University, Montreal Canada and the course was offered at the Montreal Exchange during business hours.
[23] For more details see Appendix A.
[24] The Canadian version of Wall Street.
[25] Understanding the demand and supply of the securities requires detailed knowledge of market microstructure variables such as depth, width, bid, and ask.
[26] Trading errors must be observed by the student.
[27] Term used to identify settlements of trades between traders and firms.
[28] In these sessions students must accept market prices offered by the screen, FTS cases allow student to trade against one anther by improving on market prices therefore, building market-making skills.
[29] Final report counts for 50%, midterm (30%) and FTS trading cases and weekly reports account for 10% each.
[30] The MBA class had more emphasis placed on risk management (hedging).